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A transcategorial negative marker: Evidence from Buryat

Alëna Aksënova

In this paper I discuss the Buryat multifunctional negative marker *ugej* (-*guj*). Apart from the role of ‘standard’ negator, this marker also forms negative verbal or nominal underspecified modifiers that are further interpreted as adjective, participle, adverb or converb depending on their structure position. In this paper I propose a structural analysis of this transcategorial negator, whereby it occupies the head position of the predicative phrase (PredP) taking NP¹ or finite TP as its complement.

1. Introduction

In many languages we find underspecified elements such as a verb with an underspecified θ -role on its subject (1), items underspecified for part of speech (2), or a pronoun underspecified for its ϕ -features (3).

- | | | |
|-----|--------------------------------------------------------|-------------|
| (1) | ENGLISH, Bjorkman & Cowper (2014:2) | |
| a. | Dr. Smith had three operations last week. | AGENT |
| b. | David had the measles last winter. | EXPERIENCER |
| (2) | TURKISH, Göksel & Kerslake (2005:49) | |
| a. | güzel-im
beauty-1.POSS
‘my beauty’ | NOUN |
| b. | güzel bir köpek
beauty ART dog
‘a beautiful dog’ | ADJECTIVE |

¹ We do not make a distinction between NP and DP for the purposes of this paper.

- c. güzel konuŝ-tu-Ø ADVERB
 beauty speak-PST-3.SG
 ‘(S)he spoke well.’

- (3) KARACHAY-BALKAR, Koval & Aksënova (in press:4)
 eki džaŝčik an-ni egeč-i-ni süj-e
 two boy (s)he-GEN sister-3-ACC love-PRS
 1. ‘Two boys love his sister.’
 2. ‘Two boys love their sister.’

In this paper I discuss a syntactically underspecified negative item in Buryat, appearances of which could be described in two ways. The first is the ‘standard’ negation. The marker *#gej* (-*guj*) negates finite indicative verbs, attaching to the stem bearing tense characteristics and before subject-verb agreement markers (4). Here and further we consider only a short cliticized form of the negator (-*guj*) and not the full one (*#gej*) because of their identical behavior (cf. (4b) and (5)).

- (4) a. bi xugžəm šagn-a-b² ‘STANDARD’ NEGATOR
 1.SG music listen-PRT-1SG
 ‘I listened to music.’
 b. bi xugžəm šagn-a-**guj**-bi
 1.SG music listen-PRT-NEG-1SG
 ‘I didn’t listen to music.’
- (5) bi xugžəm šagn-a **#gej**-b
 1.SG music listen-PRT NEG-1SG
 ‘I didn’t listen to music.’

The second function of -*guj* is a marker deriving negative nominal or verbal modifiers (6b, 7b). Both the negative and positive form of such items are underspecified for their syntactic category. The (non)-obligatory nature of the comitative marker in the positive modifiers requires further investigation, cf. (a, c) in the following examples.

- (6) a. bi hamgə-ja šagn-a unš-a-b NEGATIVE VERBAL MODIFIER
 1.SG wife-REFL listen-NEG read-PRT-1.SG
 ‘I was reading while listening to my wife.’
 b. bi hamgə-ja šagn-a-**guj** unš-a-b
 1.SG wife-REFL listen-PRT-NEG read-PRT-1.SG
 ‘I was reading without listening to my wife.’

² The data was collected during Buryat linguistic expedition of Moscow State University. The sponsorship was implemented by RFBR, contract №13-06-00884a.

- c. bi hamgə-ja šagn-a-tə unš-a-b
 1.SG wife-REFL listen-PRT-COM read-PRT-1.SG
 ‘I was reading while listening to my wife.’

- (7) a. narə ʊdər bε-ga NEGATIVE NOMINAL MODIFIER
 sun day be-PRT
 ‘It was a sunny day.’
 b. narə-**guj** ʊdər bε-ga
 sun-NEG day be-PRT
 ‘It was a sunless day.’
 c. narə-tə ʊdər bε-ga
 sun-COM day be-PRT
 ‘It was a sunny day.’

The two examples provided above show positive (a, c) and negative (b) underspecified modifiers in Buryat. However, in this paper I discuss only the negative ones.

The paper is structured as follows: in section 2 I provide a brief overview of Buryat negative markers and describe their functional distribution; section 3 presents the key data on underspecified negative items. A syntactic account for the data is given in section 4. Section 5 summarizes all the conclusions and ideas.

2. Functional distribution of Buryat negative markers

In Buryat, there are three negative markers: constituent negator *b3šə*, prohibitive particle *bʰ*, and transcategorical marker *ugej* (-*guj*).

Constituent negation (i.e. negation of truth-values of a particular constituent) can be expressed using the postpositional negator *b3šə* (8, 9).

- (8) a. xubun flejtə d3:rə na:d-a CONSTITUENT NEGATION
 boy flute on play-PRT
 ‘The boy was playing the flute.’
 b. xubun **b3šə** xarin basəgən flejtə d3:rə na:d-a
 boy NEG.CONST but girl flute on play-PRT
 ‘Not the boy, but the girl was playing the flute.’
- (9) a. xubun gitarə d3:rə na:d-a
 boy guitar on play-PRT
 ‘The boy was playing the guitar’
 b. xubun gitarə d3:rə na:d-a **b3šə** xarin basəgən tangə xatər-a
 boy guitar on play-PRT NEG.CONST but girl tango dance-PRT
 ‘Not the boy was playing the guitar, but the girl was doing the tango.’

Negation of non-indicative forms requires the prepositional prohibitive particle *bu* (10).

- (10) a. *tatə* PROHIBITIVE
 draw.in.IMP
 ‘Smoke!’
 b. **bu** *tatə*
 PROH draw.in.IMP
 ‘Don’t smoke!’

The third negator is the one under discussion in (4 – 7). There is no special existential negator, because this type of negation can be expressed through the appropriate negative modifier formed by *ugej* (*-guj*) (11).

- (11) a. *mjačik* *bε-ga*
 ball *be-PRT*
 ‘There was a ball.’
 b. *mjačik-tε* *bε-ga*
 ball-COM *be-PRT*
 ‘There was a ball.’ (= ‘It was ball-y’).
 c. *mjačik-guj* *bε-ga* EXISTENTIAL NEGATION
 ball-NEG *be-PRT*
 ‘There were no balls.’ (= ‘It was ball-less’).

3. Transcategorical marker *ugej* (*-guj*)

The marker *-guj* that is located between tense and person affixes plays role of ‘standard’ negation (4, 12) being the basic way the language has ‘for negating declarative verbal main clauses’ (Miestamo 2006:345).

- (12) a. *ši* *ʒʒi* *du:lə-nə-š*
 2.SG *ezhi* *sing-PRS-2SG*
 ‘You sing *Ezhi*³.’
 b. *ši* *ʒʒi* *du:lə-nə-guj-š*
 2.SG *ezhi* *sing-PRS-NEG-2SG*
 ‘You don’t sing *Ezhi*.’

Negative modifiers are formed by adding *-guj* to a noun phrase or finite tense phrase. In the former case the resulting interpretations are as adjective (nominal modifier, 13) or adverb (verbal modifier, 14). When the complement of *-guj* is finite TP, the gained interpretations are as participle (nominal modifier, 15) or converb (verbal modifier, 16). For the sake of simplicity I demonstrate this distinction in the table (17).

³ *Ezhi* (Эжы) ‘Mother’ is a Buryat traditional song.

- (13) mənədər narə-**guj** ʊdər bɛ-ga ADJECTIVE
 today sun-NEG day be-PST
 ‘Today it was a sunless day.’
- (14) tʰrən-də ʒnə xubən-**guj** xən bɛ-na ADVERB
 (s)he-DAT this boy-NEG good be-PRS
 ‘(S)he feels better without this guy.’
- (15) xubən-e šar-a-**guj** zagəhən stol dʒ:rə xʒbtə-nə⁴ PARTICIPLE
 boy-GEN cook-PRT-NEG fish table on lie-PRS
 ‘The fish that wasn’t cooked by the boy was lying on the table.’
- (16) bi hamgə-ja šagn-a-**guj** unš-a-b CONVERB
 1.SG wife-REFL listen-PRT-NEG read-PRT-1SG
 ‘I was reading without listening to my wife.’

Type of complement of -guj	Nominal modifier	Verbal modifier
Noun Phrase	Adjective	Adverb
Tense Phrase	Participle	Converb

Table 1

Only NPs and finite TPs can be in the complement position of *-guj*. For example, it is impossible to attach *-guj* affix to ‘true’ adjectives (18) or ‘true’ participles (19).

- (18) a. mʊ: ʊdər
 bad day
 ‘a bad day’
 b. *mʊ:-**guj**
 bad-NEG
- (19) a. xodə ʒnjʒg-ʒʂə xubən
 always smile-PART.FREQ boy
 ‘a boy that always smiles’
 b. *ʒnjʒg-ʒʂə-**guj**
 smile-PART.FREQ-NEG

⁴ In this case *xubən-e šar-a-guj* ‘that wasn’t cooked by the boy’ is definitely a relative clause, because the agreement between the subject and predicate of RC is totally ungrammatical:

- (i) a. minij tal-a-**guj** ši aʒəl-də jab-a-š
 1.SG.GEN kiss-PRT-NEG 2.SG work-LOC go-PRT-2SG
 ‘You, whom I didn’t kiss, went to a work.’
 b. *minij tal-a-**guj**-b ši aʒəl-də jab-a-š
 1.SG.GEN kiss-PRT-NEG-1SG 2.SG work-LOC go-PRT-2SG

We can be sure that there is only one marker *-guj* and not several homonymous ones, because it licenses Negative Polarity Items (NPI) in all its instances, see examples below with the strong NPI *n3gəšjə* ‘no one’ that cannot be used in positive sentences and becomes legitimate in negative contexts. Consider examples below with the ‘standard’ negation (20), privative adjective (21) and adverb (22).

- (20) a. **n3gəšjə* xən radiə šagnə-nə ‘STANDARD’ NEGATION
 one-NPI man radio listen-PRS
 b. *n3gəšjə* xən radiə šagnə-nə-**guj**
 one-NPI man radio listen-PRS-NEG
 ‘Nobody listens to the radio.’
- (21) a. **n3gəšjə* ovəš-təi salət ADJECTIVE
 one-NPI vegetable-COM salad
 b. *n3gəšjə* ovəš-**guj** salət
 one-NPI vegetable-NEG salad
 ‘a salad without any vegetables’
- (22) a. **n3gəšjə* nuxər-təj ulə-hən basəgən ujdə-nə ADVERB
 one-NPI friend-COM remain-PFCT girl be.sad-PRS
 b. *n3gəšjə* nuxər-**guj** ulə-hən basəgən ujdə-nə
 one-NPI friend-NEG remain-PFCT girl be.sad-PRS
 ‘The girl that remained without any friends is sad.’

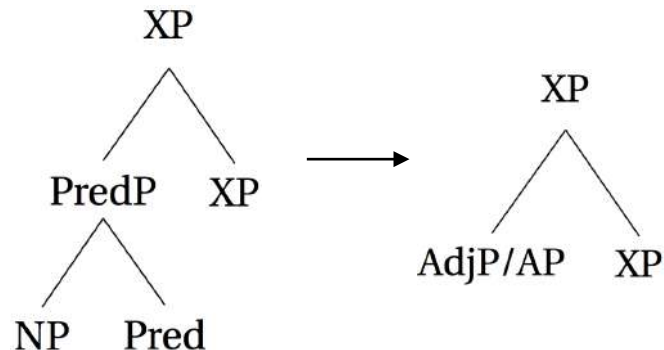
4. Syntactic account

I consider the element *-guj* to be a single transcategorial affix, therefore it should be head of the same projection in cases where it takes either a noun phrase or finite tense phrase as its complement. This means that it is necessary to have an appropriate projection that can take both NPs and finite TPs in complement position. It would appear that the predicative phrase can do this work.

To explain the appearance of *-guj* with a nominal complement I make the two following assumptions. Firstly, several linguists (e.g. Joseph, 1990; Ramm, 2012) consider the comitative marker and its complement to the predication phrase that further undergoes conversion to another type of phrase depending on its structural position (for example, *predicate-to-preposition conversion*, Postal (1985)). Secondly, according to Hamari (2011), there is a parallelism between comitative (*with X*) and abessive (*without X*) structures. Therefore the “nominal” marker *-guj* can be analyzed as the head of a predicative phrase that takes nominal phrases as its complement. If this PredP is inserted into the structure in the position of a verbal modifier, it is interpreted as an adverb; in the nominal modifier position it is interpreted as an adjective. The tree diagram in (23) shows the structure of the predicative

phrase with *-gɥj* occupying the head position and NP as its complement, that is further interpreted as an adjective or adverbial phrase⁵.

(23)



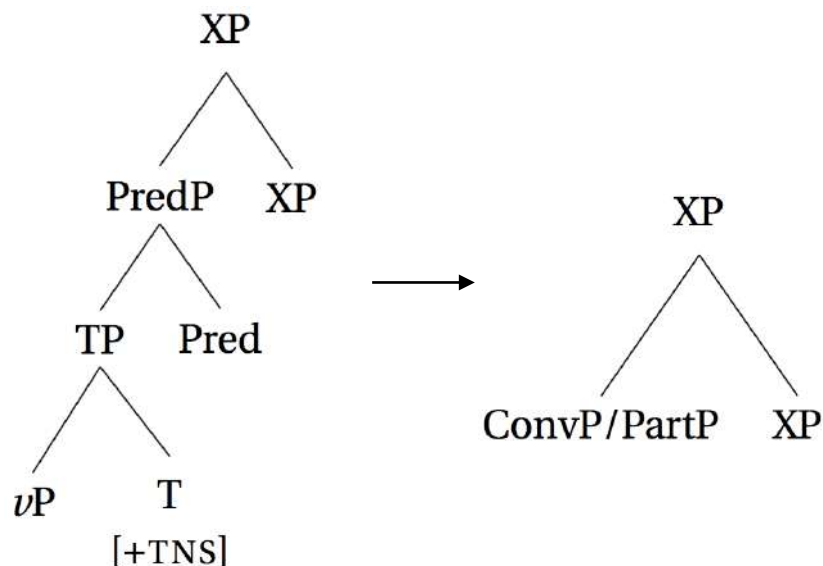
To find an appropriate place for *-gɥj* above finite TP I assume Johnson's (2004) clausal structure provided below in (24).

(24) Johnson (2004: 81)

[AgrP [Agr] [PredP [Pred] [TP [T] [vP]]]]

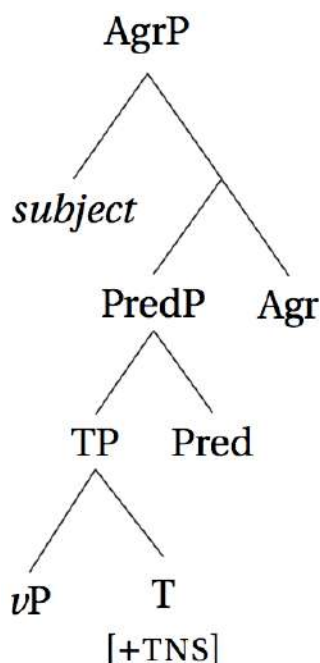
As in the case with a nominal complement, the “verbal” *-gɥj* is located in the head of the predicative phrase, but the role of its complement is played by a finite TP. The resulting structure can either be a modifier, attaching to another structure as an adjunct (25) and further interpreted as a nominal (participle) or a verbal modifier (converb), or can be in complement position of subject agreement phrase (26). In the latter case *-gɥj* serves as a ‘standard’ negator.

(25)



⁵ In the trees provided above I do not represent any syntactic conversion, but rather show an interpretational change.

(26)



5. Conclusion

In this paper I discussed the transcategorial negative marker *ugej* (*-guj*) in Buryat. At first glance it derives unconnected forms: negative counterparts of indicative verbs and negative modifiers of different types (adjectives, adverbs, participles and converbs). I briefly described its distribution and properties and proposed the following analysis: the negator *ugej* (*-guj*) is located in the head position of a predicative phrase that takes NPs and finite TPs in its complement. In the former case such a PredP is interpreted as a modifier (adjective or adverb) depending on its structural position; in the latter case it could be also interpreted as a modifier (participle or converb) or as a finite negative verb when located within the matrix structure (i.e. immediately below the subject agreement phrase).

This analysis unifies seemingly unconnected uses of this marker and explains the resulting interpretations. However, some questions, such as the structural position of the positive counterpart of *-guj* and its alternation with zero remain unclear and need further elaboration.

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Probing the naturalness bias in learning stress: A cross-linguistic study

Matías Guzmán Naranjo and Joanna Zaleska

In the present paper we report on a cross-linguistic artificial grammar learning study, whose objective was twofold. On the methodological side, its goal was to address the question as to whether the native language of the participants could be a confounding factor in artificial language learning experiments even if it does not contain the pattern under investigation. On the phonological side, its aim was to probe Carpenter's (2010) observation that it is easier to learn an artificial language in which stress is attracted to low vowels than one where stress occurs on high vowels. The results of our research do not provide support for Carpenter's findings and suggest that artificial language experiments can be affected by the participants' native language even when that language does not contain the relevant structures.

1. Introduction

A prominent theme in the recent phonological literature is the question of how we can account for the cross-linguistic distribution of phonological patterns. Some patterns, such as the devoicing of word-final obstruents, recur all over the world. Other, seemingly similar, patterns, such as the *voicing* of word-final obstruents, are rare or unattested.

One hypothesis attributes at least some of the typological tendencies to human learner's cognitive predispositions, or *inductive biases* (Moreton & Pater 2012a,b), which facilitate the learning of some patterns and inhibit the learning of others. These predispositions can be divided into *structural biases* (Pater & Moreton 2012), which favour patterns that are formally simple over those that are complex, and *naturalness* or *substantive biases* (Wilson 2006), which favour patterns that are phonetically grounded over those that are phonetically arbitrary. An example of the former is a prejudice in favour of phonological rules that manipulate fewer features. The latter could explain the preference for devoicing over voicing of obstruents.

While structural biases find ample support in the literature (e.g. Pycha et al. 2003; Peperkamp & Dupoux 2006), the evidence for substantive biases has been more equivocal. Some investigators have found no effect of naturalness (e.g. Pycha et al. 2003; Seidl & Buckley 2005). Other studies have found that phonetically grounded patterns may be easier to learn than patterns that

do not show phonetic grounding. One example is a study by Carpenter (2010), where an artificial language in which low vowels attract exceptional stress was learned more readily than a similar language, in which high vowels attract stress.

In light of such conflicting evidence on the presence of substantive biases in language learning, our first aim in this study was to answer the question in (1).

- (1) Could the results of Carpenter (2010) be replicated, using new materials and different participants?

A common method for investigating the existence of inductive biases is to create two or more miniature languages that differ along one dimension only and to observe which one is learned more successfully. Moreton (2014) makes explicit an important assumption underlying these experiments, namely that they simulate second-language learning rather than first-language acquisition. L2 learning is assumed to be subject to transfer effects from inductive biases that may either come from Universal Grammar, or the participants' native language. To permit any conclusions about the UG, the design of the experiment must exclude L1 transfer as a source of the discovered biases.

It is often assumed that if the pattern under investigation is absent from the native language of the participants, L1 influence should not be expected. Thus, for example, Finley (2012:1551), expressly states that "[b]ecause languages (specifically English) do not make use of all phonological patterns, it is possible to expose naïve (English speaking) participants to novel phonological patterns and test whether such participants are more likely to learn the pattern that follows a proposed universal tendency." We take this assumption to be an empirical question that cannot be resolved a priori but can be addressed experimentally. The second research question underlying our research was therefore (2).

- (2) Could the native language of the participants be a confound even if it does not contain the phonological pattern under investigation?

To investigate the two questions posed above, we ran an experiment that used design and methods similar to those used by Carpenter (2010). However, we extended the study by involving participants from different language backgrounds, none of which contain the relevant phonological pattern. The experiment incorporated some additional modifications related to the design and statistical analysis, motivated by the cross-linguistic nature of the experiment and practical limitations.¹ The modifications are pointed out throughout the text and reiterated in the Discussion section. Thus far, the experiment has been carried out with speakers of Polish, Spanish and English.² As far as the phonological question in (2) is concerned, our results so far do not provide support for Carpenter's findings. As regards the methodological question in (1), the differences between the three different groups of speakers lead us to believe that the native language of participants does play a significant role in artificial grammar learning experiments, even when the structure of the artificial languages is independent of the native language and no effects would be expected.

¹To be precise, because our experiment was run online and the participants were not remunerated for completing the tasks, the experiment needed to be made shorter and simpler than Carpenter (2010)'s, which was run in a lab and included a total of 19 experimental blocks.

²Experiments with three different target groups – German, Czech and Italian – are still underway.

The remainder of the article is structured as follows: Section 2 provides a brief summary of Carpenter’s (2010) study, which inspired our research. Section 3 describes the method used in the experiment. Section 4 offers a brief comment on the properties of the native languages of the participants to see what they bring to the task of learning our artificial languages and how that could influence the outcome. Section 5 presents the results and Section 6 explores some of the possible explanations for the findings. Section 7 offers some concluding remarks.

2. Background: Carpenter (2010)

Carpenter (2010) uses the artificial grammar learning paradigm to test the hypothesis that learners show a bias towards low vowels as stress attractors. She compares the acquisition of two artificial languages which differ only in terms of their stress patterns. In both languages stress typically falls on the leftmost syllable, unless there is a stress-attracting vowel elsewhere in the word. The only difference between the two languages is the quality of the vowels which can attract stress away from the default. In the ‘natural’ language, the vowels that attract stress are ([a] and [æ]), that is, low vowels, whereas in the ‘unnatural’ language, it is the *high* vowels ([u] or [i]) that attract stress. The resulting stress rules are therefore equally complex and differ only along the substantive axis.

Carpenter (2010) deems the stress-to-low rule to be a good candidate for the ‘natural’ category for two reasons, one typological, and one theoretical. First, rules in which stress falls on high sonority segments are attested cross-linguistically, in contrast to rules seeking out low-sonority sounds. Examples of languages which make use of such ‘natural’ rules include Gujarati, where stress falls on the low vowel [a], rather than on mid or high vowels; and Moksha Mordvin, where stress occurs on the leftmost “broad” (non-high) vowel [e o æ a], as in (3a), else on a leftmost vowel, (3b). Carpenter (2010)’s artificial language is, in fact, modelled on the latter. On the other hand, there are no attested languages that exemplify the opposite pattern.

(3) Moksha Mordvin stress pattern (Kenstowicz 1994, 1997)

- a. *Stress attracted to the leftmost non-high vowel*
[tir'gadət] ‘you fight’, [tuʃin'dat] ‘you go away’, [pu'tat] ‘you set down’
- b. *Stress on a leftmost vowel*
[noldasak] ‘you release it’, [kuliti'i] ‘in that ash’, [putims] ‘to set down’

The second characteristic of the stress-to-low rule which makes it more natural than the reverse one is the fact that it follows a universally fixed hierarchy of constraints, the *Stress Prominence Hierarchy* (Smith 2002; based on Prince & Smolensky’s 1993 *Peak Prominence Hierarchy*), cited in (4).

(4) Stress Prominence Hierarchy³

[*PK/T]/'σ » [*PK/D]/'σ » [*PK/D]/'σ » [*PK/L]/'σ » [*PK/R]/'σ » [*PK/I]/'σ » [*PK/ə]/'σ
» [*PK/A]/'σ

³T stands for voiceless stops, D stands for voiced stops, N stands for nasals, L stands for liquids, R stands for rhotics, I stands for high vowels, ə stands for mid vowels, and A stands for low vowels.

The last three constraints in (4) are relevant for the present study. [$*PK/I$]/ σ bans stressed high vowels, [$*PK/\partial$]/ σ bans stressed mid vowels, and [$*PK/A$]/ σ bans stressed low vowels. Because these constraints are universally ranked, a form that contains a stressed low vowel incurs a less costly violation than a form that contains a mid vowel, which in turn fares better than a form containing a stressed high vowel. Thus, a language which chooses to stress high vowels over low ones (all else being equal) is impossible.

The basic idea for Carpenter's experiment is as follows. Participants are randomly assigned to learn either the natural or unnatural condition. First, they are exposed to a set of forms from the artificial language. The goal is to familiarize them with the grammar of the language without explicit instruction. The participants are then tested on their knowledge of the artificial language by having to select forms which agree with the rules of the language they have learnt. Subsequently, the results of the participants in the natural and the unnatural conditions are compared.

Carpenter's experiments were conducted with native speakers of English and Quebec French. Participants in both groups were found to learn the natural pattern significantly better than the unnatural one. She concludes that her findings support the claim that language-specific cognitive mechanisms aid the learners in distinguishing and learning phonological patterns.

3. *Method*

As in Carpenter's study, our experiment involved exposing the participants to one of two artificially constructed languages that were identical except for the stress rule. In the 'natural' language (language A), stress was attracted by nonhigh vowels. In the 'unnatural' language (language B), stress was attracted by high vowels. The familiarization phase was followed by a test phase, split into two parts, one involving items to which the participants had been exposed to, and one involving new items. Both test stages had the form of a two-alternative forced choice task, in which the participants had to select the correct form between two forms provided.

By comparing the level of attainment between the two groups of participants, we could see whether learners exhibit a bias towards any of the two stress rules. Additionally, running the same experiment with native speakers of three different languages allows us to make a cross-linguistic comparison.

3.1. *Participants*

Three groups of speakers were recruited for the experiments and randomly assigned to one of the two conditions (natural vs. unnatural).

- Polish speakers: 17 for language A and 17 for language B.
- Spanish speakers (mostly from the Iberian peninsula but also from Latin America): 19 for language A and 9 for language B.
- English speakers: 11 for language A and 13 for language B.

The participants were between 20 and 36 years old. They were not paid or otherwise compensated for participation.

3.2. Conditions

For the experiment, we designed two artificial languages that only differed in terms of the stress rule. One language (‘Language A’) followed a ‘natural’ stress rule, (5), where stress was attracted by nonhigh vowels and the other one followed an ‘unnatural’ stress rule, (6), where stress was attracted by high vowels.

- (5) *Natural stress rule (Language A)*
Stress the rightmost *nonhigh* vowel, otherwise stress the rightmost vowel
- (6) *Unatural stress rule (Language B)*
Stress the rightmost *high* vowel, otherwise stress the rightmost vowel

In both languages, the default stress was on the final syllable⁴ when there were either no stress attractors in the word (in language A, this could be illustrated by a word like [tipi'ku], where all the vowels are high), or when the final syllable was the stress attractor (in language A this is illustrated by [muma'ta], where the final syllable is low).

The final stress could be attracted away from the right margin in the case when the word contains a stress-attracting vowel. In the ‘natural’ language (A), this means non-high vowels, while in the case of the ‘unnatural’ language, this means high vowels. To illustrate, in language A, in the word [pi'saku], the low vowel attracts the stress to the penultimate syllable, and in ['fasumi], where the penultimate and ultimate syllables contain high vowels, the stress falls on the first syllable.

Because the two languages used trisyllabic words, there were eight different types of possible stimuli, which differed in the number and order of high vs. non-high vowels. These are illustrated in Table 1.

ID	Type	Language A	Language B
01	HHH	HH H	HH H
02	HHL	HH L	H H L
03	HLH	H L H	HL H
04	LHH	L HH	L HH
05	HLL	HL L	H LL
06	LHL	LH L	L H L
07	LLH	L L H	LL H
08	LLL	LL L	LL L

Table 1: Stimuli types and stress patterns in both artificial languages. *H* stands for a syllable with a high vowel, *L* stands for a syllable with a nonhigh vowel. Boldface marks stress-attracting syllables. Stressed syllables are boxed.

⁴Note that this differs from Carpenter’s study, where the stress was attracted to the left edge of the word. We changed the rule because we intend to run the test with Czech participants. Because stress in Czech falls on the initial syllable, Carpenter’s original stress rule would be too similar to the rule used by the participants, making the comparison between this and other groups difficult.

As the directionality of the stress rule (and the quality of the vowels that attract stress, see subsection 3.3, ‘Stimuli’) was changed with respect to Carpenter (2010), the question needs to be asked whether language A is still more natural than language B. As discussed above, the two criteria that Carpenter used to assess naturalness were whether the language is attested and whether it agrees with universal linguistic principles of markedness and faithfulness or fixed universal hierarchies of constraints.

From the typological perspective, languages in which non-high vowels (rather than just low vowels) attract stress are attested. In fact, Moksha Mordvin, on which Carpenter modelled her artificial language is one such language. However, languages which target vowels of different sonority and in which the default stress falls on the final syllable are not attested. Still, languages where primary stress takes vowel height into account are relatively rare in the first place, so the fact that such languages have not been found does not provide conclusive evidence against the naturalness of the pattern.

As far as the second criterion is concerned, language A does follow the Stress Prominence Hierarchy, cited in (4) above, while language B does not. In this sense, language A can be viewed as more natural than language B.

3.3. *Stimuli*

Materials for all stages of the experiment were open trisyllabic words in a CVCVCV pattern.⁵ The consonant inventory was drawn from the set [p t k f s m n l].⁶ This was a subset of the consonantal inventories of the native languages of the participants. The vowels were drawn from the set [a ɔ i u].⁷

Using the inventories described above, two sets of words were created, serving both the natural and unnatural language (modulo the stress pattern): training words and test words. First, all possible 32 CV syllables were generated. Then, using the set of syllables, 32 training words were randomly chosen for use in the familiarization phase, subject to the some constraints that ensured that the stimulus set is balanced.⁸ Each possible word type was represented by four words. The stimuli were counterbalanced to contain all four possible front-back vowels combinations within each word type, so in both language A and language B an equal number

⁵This differed from Carpenter’s study, where both three- and four-syllable words were used. This modification was dictated by time constraints.

⁶Carpenter’s consonant set included the stops [b d g p t k] and the fricatives [s z]. The consonant set in our experiment included sonorants in order to make the language sound more natural. Voiced obstruents were excluded because of their different realizations in the native languages of the participants.

⁷Carpenter’s more balanced set [a æ i u], with two low and two high vowels differing in terms of backness, could not be used because most of the native languages of the participants do not contain the front low vowel [æ]. Consequently, there was a risk of native speakers categorizing [æ] as [ɛ] (Polish speakers) or [e] (Spanish speakers). Another option would be a three vowel system, [i u a]. Such an inventory, however, would not require the participants to generalize over a natural class of sounds. Rather, they could learn a rule in which it is the sound [a] that attracts (or repels) stress. We settled on the [a ɔ i u] inventory, as a pattern where [a ɔ] are stressed still follows the Stress Prominence Hierarchy, (4), while the pattern where [i u] attract stress still goes against it.

⁸Carpenter used different stimuli for her natural and unnatural languages. Both conditions used the same consonant sequences but the vowels differed depending on the condition. We used the same stimuli (with appropriate stress patterns) in both languages to make the two conditions more easily comparable.

of front vowels and back vowels was stressed. The training items are listed in Table 2. Another set of 32 test words, disjoint from the first one, was randomly chosen for use as test items. The words followed the same constraints as the training words. The test items are listed in Table 3.

ID	Type				
01	HHH	tipiku	kitupu	pumipi	fipupi
02	HHL	kupisa	nusuka	mufiso	punuko
03	HLH	pisaku	sinapi	mifofo	tusoki
04	LHH	fasumi	sopulu	mofimi	tafilu
05	HLL	mumasa	mikata	kimoso	kufoso
06	LHL	matipa	nosiko	tolusa	lakumo
07	LLH	manami	nasalu	ponopi	kasofu
08	LLL	lasoto	kosafu	kasama	kapofa

Table 2: Training items for both languages

ID	Type				
01	HHH	lifipu	kitunu	fupiti	pifupi
02	HHL	nunifa	mupufa	lupilo	fufuto
03	HLH	kitamu	mipani	fipotu	nukoti
04	LHH	fanusi	momutu	sokini	lafisu
05	HLL	sufata	sikafa	siloko	kukoso
06	LHL	natisa	lonifo	sufuka	manumo
07	LLH	satasi	kafalu	noponi	nafofu
08	LLL	kapoto	tonapo	mataka	matosa

Table 3: Test items for both languages

Whole words, with every possible stress pattern (on the initial, penultimate and final syllable) were digitally recorded by a native speaker of Polish using sound device T788 and a head-set mic Audix HT-5, with 48kHz/16bit. The items were then cut into 2500ms (familiarization)/2000ms (test files) soundfiles (with 500ms silence at the beginning) using Audacity (Audacity Team 2013). Apart from minor corrections, no normalization or adjustments were made.⁹

For every word in the test session, an image was assigned (selected from the BOSS database, Brodeur et al. 2010). The images could be classified into four equally sized categories: clothing, food, office and home. Table 4 contains representative sample images from each category.

⁹Carpenter’s synthesized stimuli were manipulated in order to neutralize the phonetic differences between stressed high and low-vowel syllables, as otherwise low vowels are intrinsically more audible. This, on the one hand allowed her to tease apart the phonetics from abstract representation of stress, but on the other hand made the stimuli sound more artificial and less language-like than natural ones.

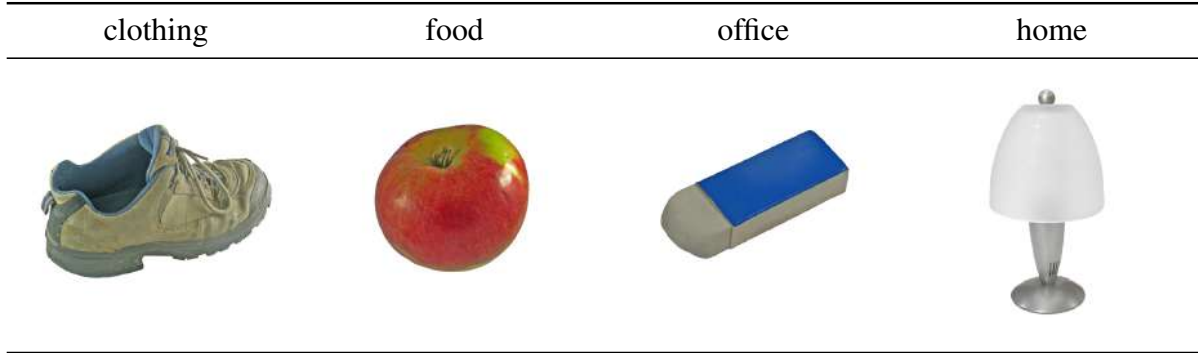


Table 4: Sample images for each category

Each of 4 words in each stimulus type was assigned to a different category, according to the schema shown in Table 5. This was done to ensure that participants cannot form generalizations relating stress to the meaning of presented items.

ID	Type	clothing	food	office	home
1	HHH	tipiku (shoe)	kitupu (apple)	pumipi (eraser)	fipupi (lamp)
2	HHL	kupisa (belt)	nusuka (banana)	mufiso (pen)	punuko (iron)
3	HLH	pisaku (glasses)	sinapi (carrot)	mifofo (pencil)	tusoki (key)
4	LHH	fasumi (t-shirt)	sopulu (cucumber)	mofimi (ruler)	tafilu (pot)
5	HLL	mumasa (trousers)	mikata (onion)	kimoso (gluestick)	kufoso (clock)
6	LHL	matipa (handbag)	nosiko (orange)	tolusa (sharpener)	lakumo (book)
7	LLH	manami (cap)	nasalu (pineapple)	ponopi (laptop)	kasofu (cellphone)
8	LLL	lasoto (scarf)	kosafu (tomato)	kasama (crayon)	kapofa (chair)

Table 5: Sound-image pairings for training items

3.4. Procedure

The experiment was coded using Experigen (Becker & Levine 2014) and accessed online. Each of the versions included instructions in the appropriate language. The English version of the instructions is reproduced in Appendix A.

In each condition there were three experimental stages: familiarization, test phase I and test phase II.¹⁰ At the beginning of the *familiarization* stage, participants were informed about the purpose of the experiment, what stress was and how the experiment would proceed. They were told they should try to learn the language from the examples they hear and that they would later be tested. In this stage, participants were exposed to the language for about 6 minutes. They heard the 32 familiarisation items, each repeated four times, accompanied by a photographic image corresponding to each item. Each sound/image combination was shown for 2.5 seconds. All tokens appeared in random order for all participants. At the end of this phase, participants were given a self-timed break. Afterwards, they were given two types of tests.

¹⁰As mentioned above, Carpenter's experiment was run in a lab and involved a total of 19 experimental blocks. Our simplified design was determined by practical considerations.

The *first test phase* examined participants' knowledge of familiar items (see Table 2). In this part, upon hearing a word, participants had to decide if the word belonged to the language they had learned. There were 32 trials altogether. In 16 of them, the items had a correct stress pattern. In 16, the items had an incorrect stress pattern, which, for item types 2-7 meant the stress pattern for the other condition, and for item types 1,8 (which bore final stress in both language A and in language B) meant stress on the penult in 50% of the items and on the antepenult on the other 50%. Participants received no feedback.

In the *second test phase*, the procedure was identical as in the first test phase but unfamiliar items (Table 3) were used.

At the end of the experiment, participants filled in a short demographics questionnaire, in which they were asked about their gender, year of birth, known foreign languages, place of origin and level of education.

4. Native languages of the participants

The experiment was conducted with native speakers of Polish, Spanish, and English, so the stress patterns of these languages should be examined in search for potential L1 interference.

In Polish, stress is quality- and quantity-insensitive. It falls on the penultimate syllable, with the notable exception of a small but well-defined set of forms in which the stress falls on the antepenult. This, according to Peperkamp & Dupoux (2002) allows Polish speakers to distinguish stress contrasts even though stress is generally non-contrastive in Polish. Vowels in unstressed syllables do not undergo reduction. Acoustically, some scholars have regarded Polish stress as weak (Dogil 1999), whereas others argue that it is perceptually very robust (Newlin-Łukowicz 2012). The phonetic cues that have been shown to correlate with stress with Polish are intensity (Jassem et al. 1968; Łukaszewicz & Rozborski 2008; the latter authors argue that intensity is the most reliable cue for primary stress in Polish), vocalic duration (Jassem 1962; Malisz & Wagner 2012), pitch movement (Jassem 1962; Dogil 1999; Malisz & Wagner 2012), and spectral emphasis (Malisz et al. 2015). Fundamental frequency encodes prominence at the sentence level (Malisz et al. 2015).

All varieties of Spanish have contrastive, quantity-sensitive stress, which occurs within a three-syllable window at the right edge of the word. The fact that stress is allowed in different positions might give Spanish speakers a slight advantage over the speakers of Polish for learning either of the two artificial languages. Spanish does not reduce vowels in unstressed positions (Quilis & Esgueva 1983). Acoustically, duration is the most reliable correlate of stress, with stressed syllables being significantly longer than unstressed ones (Ortega-Llebaria & Prieto 2010). Another stress cue is F0 (Quilis & Esgueva 1983). Intensity and spectral tilt are more controversial. Intensity seems to be significant in accented environments only (Ortega-Llebaria & Prieto 2010), but it is used by speakers to perceive stress (Ortega-Llebaria et al. 2008). Although spectral tilt is present acoustically in stressed syllables (Ortega-Llebaria & Prieto 2010), it is not used by Spanish speakers to detect stress (Ortega-Llebaria et al. 2008). Finally, stress detection seems to depend on vowel quality: in a perception experiment conducted by Ortega-Llebaria et al. (2008), speakers found it easier to detect stress on the low vowel [a], as opposed to the high vowel [i]. This might result in a bias in favour of the 'natural' pattern.

Like in Spanish, English stress can appear on one of the last three syllables of the word, giving the participants an advantage over Polish speakers for learning both artificial languages. Although earlier research identifies intensity and F0 movement are reliable acoustic correlates of stress, (e.g. Fry 1955; Lehto 1969; Berinstein 1979), Sluijter & Van Heuven (1996a,b) demonstrate that those cues are correlates of accent, rather than stress. They argue that the best correlate for stress is duration, followed by glottal parameters (i.e. high-frequency emphasis and glottal leakage) and vowel quality (with stressed vowels being characterised by fuller vowel quality than unstressed vowels). The relationship between stress and vowel reduction may make the experiment participants more perceptive to stress rules sensitive to vowel quality, giving them an advantage over Spanish and Polish speakers in both conditions. Furthermore, Carpenter (2010) cites Rice’s (1996) arguments that stress in English might be attracted to low vowels, an effect visible on certain irregular nouns. If this were the case, English learners would have an advantage over Polish and Spanish learners. In particular, they might find learning the ‘natural’ pattern easier. On the other hand, results of perception experiments conducted by Huss (1977) indicate that English listeners rely on vowel reduction as a cue to stress. In absence of vowel reduction in the stimuli, English-speaking participants might find it difficult to identify the stressed syllable, thus becoming disadvantaged relative to Polish and Spanish participants.

5. Results

This section presents the results of the experiment for each of the tested languages, and the comparison across languages.

5.1. Polish

The total number of speakers for Polish was 17 for the natural pattern and 17 for the unnatural pattern. The mean proportion of correct answers and standard deviations are presented in Table 6.

	Natural		Unnatural	
	Test 1	Test 2	Test 1	Test 2
Mean	0.66	0.53	0.68	0.62
SD	0.1	0.08	0.09	0.07

Table 6: Mean and standard deviation of the proportions of correct answers for each test for each language type for Polish speakers.

As can be observed in Table 6, there was some variation between participants. Additionally, the unnatural pattern had a slight advantage over the natural pattern. Figure 1 presents the averaged results for each participant. It is clear from this figure that most participants are above chance for the first test, and around chance, or slightly above chance for the second test. We can also see that there seems to be a slight advantage for the unnatural pattern over the natural pattern, just as we saw in Table 6.

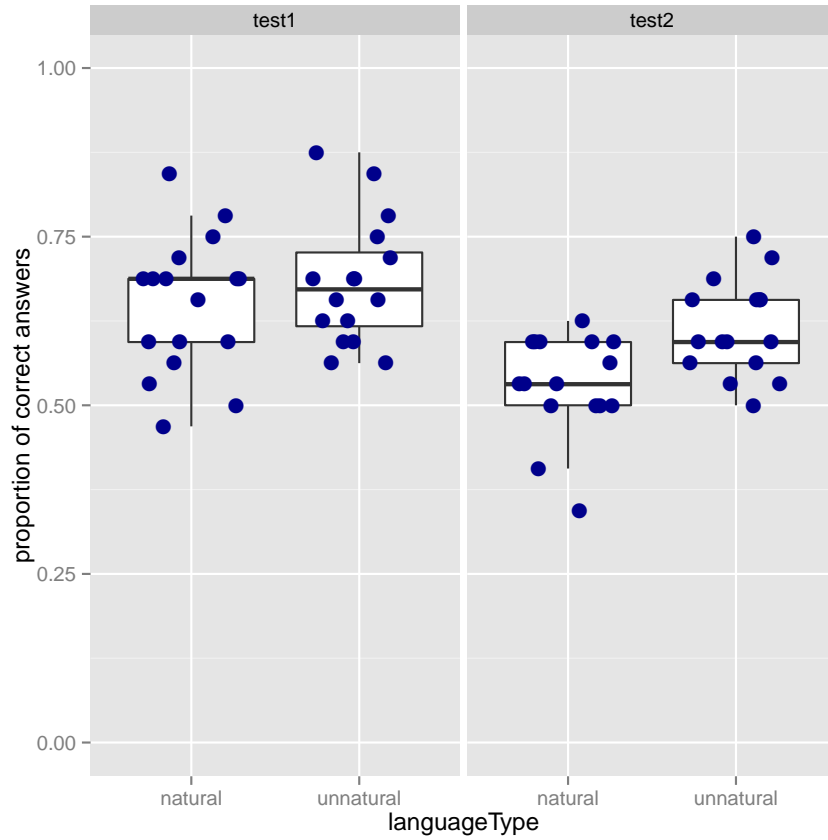


Figure 1: Box plots for each test for each language type for Polish speakers. The dots represent the proportion of correct answers for each participant, which have been jittered on the x axis to avoid overlapping. The lines inside the boxes represent the median value.

To test the possible effects, we fitted a mixed effect logistic regression model to the Polish data with the formula: $\text{RESULT} \sim \text{LANGUAGE TYPE} + \text{TEST} + (1|\text{USER}) + (1|\text{ITEM})$, where RESULT is the outcome (right or wrong), LANGUAGE TYPE refers to whether the participant was dealing with the natural or unnatural pattern, TEST refers to the first and second part of the experiment (observed items vs. new items), USER is the participant (as a random effect), and ITEM is each individual item (also as a random effect). This model allows us to investigate the effect of natural vs. unnatural pattern, while controlling for individual variation in the participants and the items. The table of coefficients of this model is shown in Table 7.

If we analyze the coefficients in Table 7, the first thing we can observe is that the intercept is above 0, indicating that participants in the natural pattern, for the first test performed overall better than chance (this was the case for all three experiments). We can also see that, as expected, participants performed worse in the second part of the test, where they were dealing with new items. Contrary to the naturalness hypothesis, however, we see that Polish speakers did better with the unnatural pattern than with the natural pattern. We also see that this effect was almost as large as the effect of TEST. From the random effects we can see there was relatively high variance in the by item performance of speakers, and also some degree of variation between speakers (although much lower than the by item variation).

Random effects					
Groups	Name	Variance	Std.Dev.		
item	(Intercept)	0.1766	0.4202		
user	(Intercept)	0.0204	0.1428		
Number of obs: 2083, groups: item, 64; user, 34					
Fixed effects					
	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	0.6016	0.1147	5.243	1.58e-07	***
languageType-unnatural	0.2641	0.1054	2.505	0.01224	*
test-test2	-0.4239	0.1406	-3.014	0.00257	**

Table 7: Mixed effect regression model for Polish.

Model evaluation using a threshold of 0.5¹¹ reveals an accuracy score of 0.6385 and a C score of 0.6231. These results are rather poor for model performance, which means that the predictors, although significant in the statistical sense, have very little explanatory power, and the difference between the natural and unnatural pattern is rather small.

From these results we can conclude that there is no evidence in the Polish speakers' data for the hypothesis that the unnatural pattern is harder to learn than the natural pattern. On the contrary, there is weak evidence that Polish speakers performed better on the unnatural pattern than on the natural one.

5.2. Spanish

The total number of Spanish speakers was 19 for the natural language and 9 for the unnatural one. The mean proportion of correct answers and standard deviations are presented in Table 8.

	Natural		Unnatural	
	Test 1	Test 2	Test 1	Test 2
Mean	0.63	0.54	0.66	0.61
SD	0.12	0.1	0.08	0.06

Table 8: Mean and standard deviation of the proportions of correct answers for each test for each language type for Spanish speakers.

From Table 8 we can see again that there was very large variation between participants, and that the unnatural language had a slight advantage. Figure 2 presents averaged results for each participant.

¹¹Since logistic regression outputs a probability score from 0 to 1, we can decide on a threshold for what we consider a success. A threshold of 0.5 means that we give equal likelihood to a 'success' or a 'failure'.

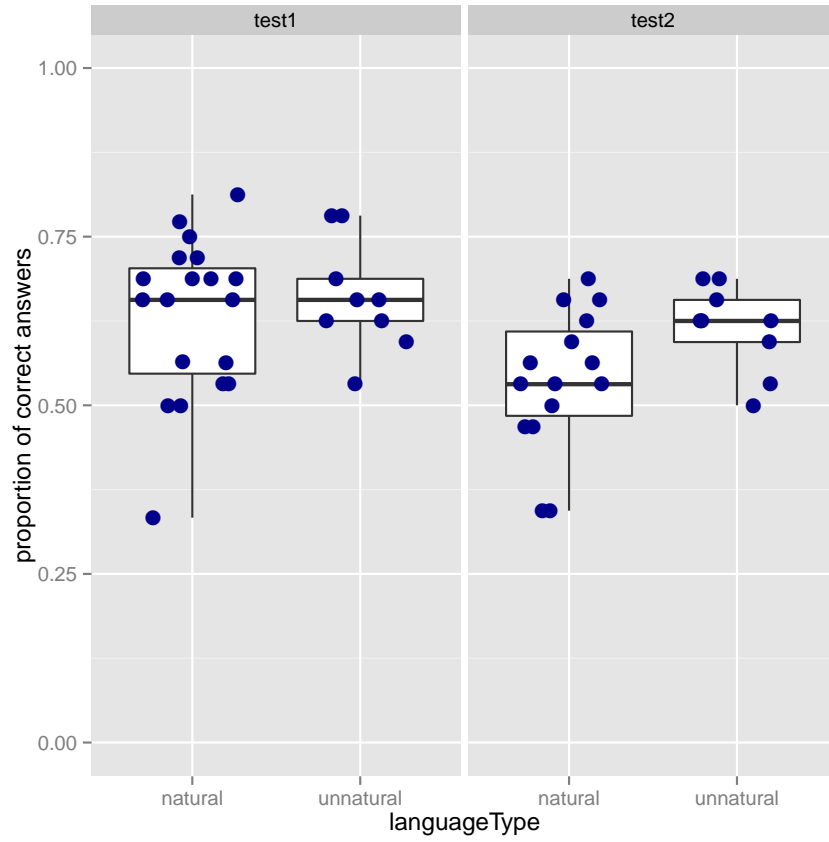


Figure 2: Box plots for each test for each language type for Spanish speakers. The blue dots represent the proportion of correct answers for each participant. These have been jittered on the x axis to avoid overlapping.

We fit the same model we used for the Polish speakers to the data from the Spanish speaking participants. The results can be seen in Table 9.

Random effects				
Groups	Name	Variance	Std.Dev.	
item	(Intercept)	0.025622	0.16007	
user	(Intercept)	0.005492	0.07411	
Number of obs: 1616, groups: item, 64; user, 28				
Fixed effects				
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.56481	0.08736	6.465	1.01e-10 ***
languageType-unnatural	0.18930	0.11244	1.683	0.092279 .
test-test2	-0.36464	0.11069	-3.294	0.000987 ***

Table 9: Mixed effect regression model for Spanish.

We see once again a relatively large effect of TEST, with speakers performing better during the first test than during the second test. The effect of LANGUAGE TYPE is considerably smaller than what we observed for Polish, and its standard error is too large (which makes the p-value also quite large). Model evaluation at a 0.5 threshold fails because the model cannot discriminate and only predicts successes. Increasing the threshold to 0.6 an accuracy score of 0.5859 and a C score of 0.569, both almost at chance. This shows that in general both predictors are extremely weak, and we see no evidence for either the natural or the unnatural pattern.

5.3. English

The total number of speakers for English was 11 for the natural pattern, and 13 for the unnatural pattern. The mean proportion of correct answers and standard deviations are presented in Table 10.

	Natural		Unnatural	
	Test 1	Test 2	Test 1	Test 2
Mean	0.63	0.50	0.63	0.53
SD	0.04	0.06	0.06	0.06

Table 10: Mean and standard deviation of the proportions of correct answers for each test for each language type for English speakers.

Table 10 shows no perceivable difference between the natural and unnatural patterns for the first test, and only a very slight difference in favour of the unnatural pattern for the second test. We can also see that in this case the variation between participants was smaller than for the Polish and Spanish speakers. Figure 3 presents the results for each participant.

Table 11 presents the coefficients for the mixed effect regression model for the English data. We see again that the effect of LANGUAGE TYPE is relatively small, and its standard error large (the p-value is again fairly large). Interestingly, in this case we see no effect from the random variable USER, which confirms what we could observe from the plot of the results.

Random effects				
Groups	Name	Variance	Std.Dev.	
item	(Intercept)	0.2429	0.4929	
user	(Intercept)	0.0000	0.0000	
Number of obs: 1473, groups: item, 64; user, 24				
Fixed effects				
	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0.4407	0.1320	3.339	0.000841 ***
languageType-unnatural	0.1449	0.1096	1.322	0.186104
test-test2	-0.4341	0.1646	-2.638	0.008348 **

Table 11: Mixed effect regression model for English.

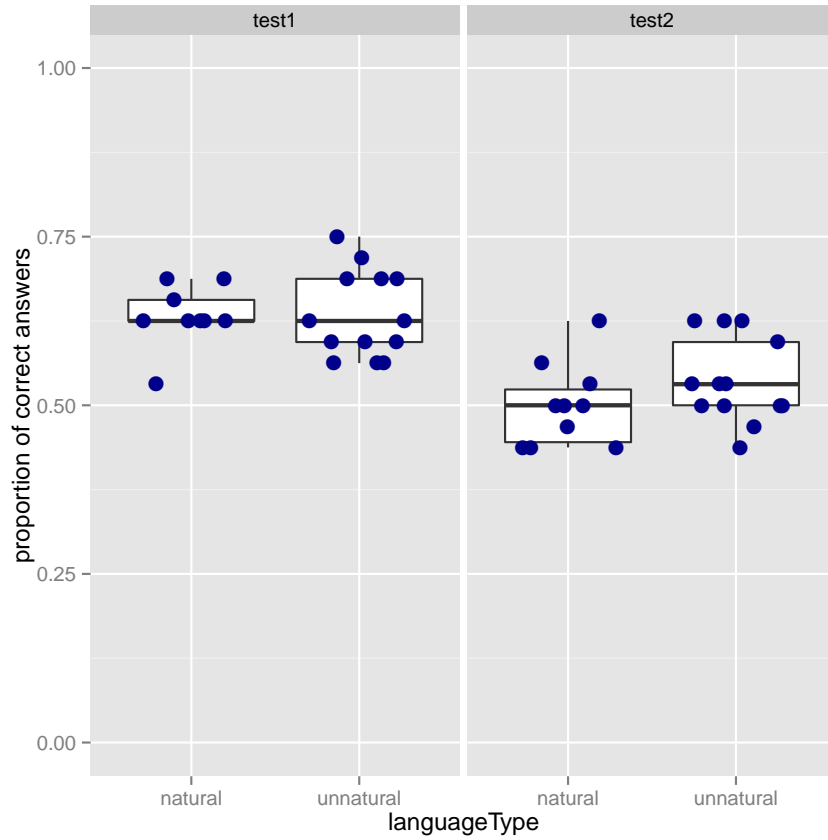


Figure 3: Box plots for each test for each language type for English speakers. The blue dots represent the proportion of correct answers for each participant. These have been jittered on the x axis to avoid overlapping.

Model evaluation reveals an accuracy score of 0.6259 and a C score of 0.6244, which is once again extremely low, and indicates that the factors considered explain only a very small portion of the variation in the data. As with Spanish, the data for English do not support the claim that the natural pattern is easier to learn than the unnatural pattern.

5.4. Cross-linguistic comparison

We now proceed to test the whole data set combined. The complete averaged results for the participants of all three languages are presented in Figure 4, and the means and standard deviations in Table 12. We can see that when we add the three languages up, we get two almost identical distributions for both Language Types in the first test, but a small shift in favour of the unnatural pattern in the second test.

At first sight, it is hard to see any clear differences between the participants of different languages in the plot in Figure 4, representing the aggregated results. Nevertheless, Polish and Spanish speakers seem to have a small advantage over English speakers.

	Natural		Unnatural	
	Test 1	Test 2	Test 1	Test 2
Mean	0.65	0.54	0.66	0.59
SD	0.09	0.07	0.08	0.08

Table 12: Mean and standard deviation of the proportions of correct answers for each test for each language type for speakers of all three languages.

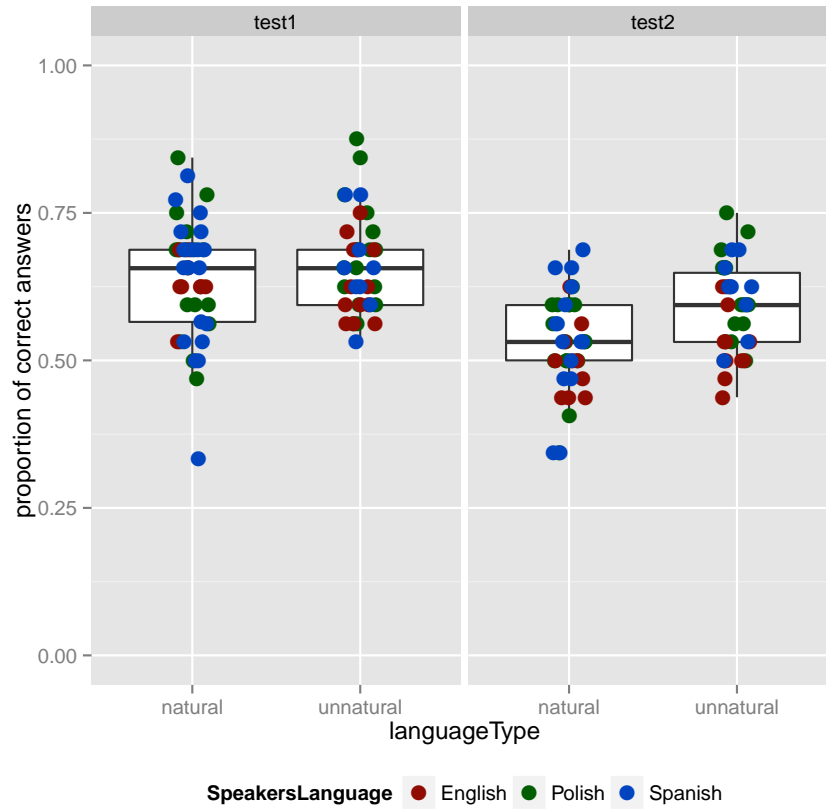


Figure 4: Box plots for each test for each language type for participants of all three languages. The dots represent the proportion of correct answers for each participant, with colour indicating the native language of the participant. The dots have been jittered on the x axis to avoid overlapping.

Because we aggregated the data for the three languages, we now have to add an additional variable `SPEAKER'S LANGUAGE` to the mixed effects model as follows: $\text{RESULT} \sim \text{LANGUAGE TYPE} + \text{TEST} + \text{SPEAKERS LANGUAGE} + (1|\text{USER}) + (1|\text{ITEM})$.

Random effects					
Groups	Name	Variance	Std.Dev.		
user	(Intercept)	0.004542	0.06739		
item	(Intercept)	0.128167	0.35800		
Number of obs: 5236, groups: user, 87; item, 64					
Fixed effects					
	Estimate	Std. Error	z value	Pr(> z)	
(Intercept)	0.36972	0.09528	3.880	0.000104	***
languageTypeunnatural	0.22354	0.06058	3.690	0.000224	***
SpeakersLanguagePolish	0.20461	0.07278	2.811	0.004936	**
SpeakersLanguageSpanish	0.20975	0.07834	2.677	0.007418	**
testtest2	-0.39349	0.10658	-3.692	0.000222	***

Table 13: Mixed effect regression model for English.

Table 13 shows that there are small differences in performance across languages, with Polish and Spanish speakers performing better than English speakers. The model does suggest that the `LANGUAGE TYPE` has an effect in favour of the unnatural pattern. We see that the effect of `TEST` remains consistent as it was for the individual languages, at about the same effect size. In this case the accuracy of the model was of 0.6157 and the C score of 0.5904. We see again that the factors considered have very little explanatory power, even if they are statistically significant.

From the aggregated data we find no evidence for a naturalness bias, but rather a very small effect for bias in the opposite direction. Moreover, we find an equally large effect for the native language of the speakers. Furthermore, if we take to account the fact that the random effects for English speakers found no effect for `USER`, we can conclude that the speakers of different native languages did not perform the same in the experiment, even though L1 was not expected to interact with the tested pattern.

6. Discussion

The results of the present study have failed to replicate Carpenter's (2010) findings with speakers of three different languages: English, Polish and Spanish. As noted above, our experiment diverged in places from the one carried out by Carpenter. A summary of the differences is provided in (7) below, where each relevant aspect of our experiment (on the left) is contrasted with Carpenter's (on the right). Each of these differences could conceivably have a bearing on the results. If, however, slight variations in a naturalness bias experiment produce radically different results (evidence for the opposite bias or no bias at all), it is questionable how active or important such a bias actually is.

(7) *Differences between the present study and Carpenter (2010)*

- a. General
 - i. Focus on the cross-linguistic perspective vs. focus on the naturalness bias
 - ii. Experiment performed online vs. phonetics lab setting
 - iii. Remuneration for participants: none vs. money/course credit
 - iv. Native language of the participants: Polish, Spanish and English vs. English and Quebec French
- b. Procedure
 - i. Number of experimental blocks: 3 vs. 19
 - ii. Type of test task: lexical decision task vs. two-alternative forced choice task
- c. Method
 - i. Direction of the main stress rule: right edge vs. left edge
 - ii. Difference between natural and unnatural language: stress change vs. vowel change
 - iii. Length of stimuli: 3-syllabic only vs. 3- and 4-syllable words
 - iv. Consonant inventory: [p t k f s m n l] vs. [p t k b d g s z]
 - v. Vowel quality: [a ɔ u i] vs. [a æ u i]
 - vi. Method of stimulus creation: whole tokens vs. concatenating pre-recorded syllables
 - vii. Type of phonetic manipulation: none vs. neutralizing the phonetic cues that might give a perceptual advantage to the natural language
- d. Statistics: Mixed effect regression model vs. ANOVA

Some of the variables noted above are difficult to control for in a cross-linguistic study. The con- found that is the most challenging to overcome pertains to the fact that in each language, stress may be instantiated by (a combination of) different phonetic cues, such as duration, intensity or F0. This means that participants in some groups may have misperceived or completely failed to perceive the stressed syllables. In light of Huss's (1977) experimental results discussed in Section 4, this seems particularly probable for the English-speaking participants. Furthermore, as pointed out by the anonymous ConSOLE reviewer, perceptual stress shift related to duration has also been reported (Ouellet & Tardif 1996; Tokuma 2008). Consequently, even though most speakers performed above chance in the experiment, and there were no extreme differences in performance, indicating that they were able to identify stress, further control of stress perception in the stimuli is still necessary.

To this end, we are currently performing a follow-up experiment to investigate how well speakers of Polish, Spanish and English are able to identify the stressed syllable in the stimuli used for the experiment discussed here. The study is based on research by Greenwood (2015), who found that naturalness bias in her artificial language learning experiments (similar to Car- penter's) was related to the perceptability of the stimuli: participants were significantly less accurate at correctly identifying stress in the unnatural than in the natural stimuli. Given our results, it would be particularly interesting to see how well the speakers of English are able to identify the stressed syllables in the stimuli and whether the speakers of Spanish and Polish find

the stressed syllable easier to perceive in the unnatural stimuli. If different groups of participants perform differently in a stress perceptability task, it would indicate that the bias we have identified could stem from their L1 experience rather than from any universal perceptability differences between high and low vowels.

Even if perceptability of the natural and unnatural stimuli turns out not to be relevant, another possible confound could be that different languages with superficially similar vowels might organize their inventories differently. The potential influence of native language phonology on artificial language experiments was recently noted by Baer-Henney et al., who point out that “although a pattern may superficially appear not to occur in the language, at the level of natural classes there may be evidence in its favor” (2015:1542). In the case at hand, this might, for example, mean that even though Polish contains both high, low and mid vowels, the [\pm high] dimension may not be as relevant in its phonology as it is in a language in which the [\pm high] is clearly active, such as in the Asturian dialect of Lena, which has vowel height harmony (Hualde 1989). Polish speakers could then suffer from ‘height deafness’, as it were, which would make it difficult for them to form generalizations related to high vs. nonhigh vowels. A different example could be related to the co-variation of stress and vowel reduction in English, which might make the participants more perceptive to stress rules sensitive to vowel quality. Baer-Henney et al. (2015) do indeed observe that L1 phonotactics might be a factor in the acquisition of morphophonological alternations with exceptions. In their experiments, language-specific knowledge and the universal naturalness biases are found to interact; a naturalness bias is stronger than L1 influence in a setting in which the training phase is relatively short and the stimuli exhibit a low level of regularity. With more exposure and more regular stimuli, the influence of L1 becomes greater.

If subtle differences between native languages of the participants turn out to play a role in artificial language experiments, the task of making cross-linguistic comparison of this kind of experiments becomes more challenging. Additionally, this suggests that before any conclusions about the universality of a discovered bias can be drawn, the phonotactics of the native language of the participants should be analyzed more closely than has heretofore been the practice.

7. Summary

To sum up, the results of our study, run with speakers of English, Polish and Spanish, indicate that artificial grammar learning experiments might be influenced by the native language of the participants, even when the structure of the artificial languages is independent of the native language and no effects would be expected. Additionally, they do not support the hypothesis that a pattern in which exceptional stress is attracted to nonhigh vowels is easier to learn than one in which it is attracted to high vowels. On the contrary, they provide weak evidence that the opposite might be true. It is important to note that a linguistic universal may not necessarily be part of the cognitive abilities of the language learner, but may be the result of unrelated variables or a series of historical changes (which may or may not be grounded in cognitive or phonetic principles; Blevins 2004). Our results do not challenge the typology, but suggest that it did not arise because of cognitive biases but rather due to some property of the articulatory-acoustic channel of the learners (*channel bias*, see Moreton 2008) or a historical accident.

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A. Experiment instructions (English version)

Before familiarization stage

Welcome! In this experiment, you are going to hear words in a language that you've never heard before. Then you'll be tested to see how well you can identify words that belong to that language.

You will hear words with stress on different syllables. Stress can be described as the part of the word that sounds more prominent than another part. In English we can usually say exactly which syllable in a word should be more prominent than the others. For example, we say baNAna, not banaNA.

In this new language you will learn to do the same thing. After hearing several repetitions of words in the language, you will hear words that differ in their stress pattern. You will be asked to decide whether each of those words could belong to the language you have learnt or not. The whole experiment will last about 15 minutes. When you're ready, click 'continue' to begin.

Before test phase 1

You have just finished the study phase. You'll now be tested on the words you've just heard. You will hear a word. Your task is to decide whether it belongs to the language you've just heard or not. Press 'yes' if you think the words belongs to the language and 'no' if you think if it doesn't. If you can't tell, make your best guess. The computer will then play you the next word, until you have finished the test. Click 'continue' to move to the test.

During each item presented in test phase 1

Listen to the following word...

Does this word belong to the language you just learned?

Before test phase 2

You have just finished the first part of the test! It's time for a break. In the second part, you will hear some new words. Your task is to decide whether they could belong to the language you have learned. Press 'yes' if you think the word could belong to the language and 'no' if you think if it couldn't. If you can't tell, make your best guess. The computer will then play the next word, until you have finished the test. Click 'continue' when you're ready to move to the second part.

During each item presented in test phase 2

Listen to the following word ...

Could this word belong to the language you just learned?

Before the questionnaire

Thank you! Please answer the following questions about your language background.

At the end of the test

Thank you for your time and effort. Tell your friends about our questionnaire!

Deixis and embedded tense:
Revisiting tense in English and Japanese subordinate clauses

Emilia Melara

This paper examines how tense in embedded clauses interacts with the past tense of an embedding clause in English and Japanese. I propose that the tense morphology that surfaces in embedded clauses is a function of how the language anchors its clauses with respect to time and viewpoint. English is proposed to evaluate situations relative to the speech time as a result of the specification of a temporal deixis feature in T^0 . Japanese is argued to lack this particular feature, evaluating embedded clauses relative to the time of the matrix situation. Generalizations are made to capture sequence of tense phenomena.

1. Introduction

This paper investigates the variation in how tenses of subordinate indicative clauses are interpreted. Specifically, this paper explores how tense in subordinate clauses interacts with matrix clause tenses in English and Japanese, focusing on a past or present tense embedded under a past tense. What will be shown is that embedded tenses in English are interpreted relative to the utterance time, whereas embedded tenses in Japanese are interpreted relative to the time of the matrix clause situation.¹

Sequence of tense (henceforth SOT) traditionally refers to the pattern observed in some languages in which temporal coincidence between an embedded clause and a matrix clause referring to the past is expressed by a subordinate past tense (Enç 1987; Ogihara 1996; Stowell 2007). For example, in English – a language that exhibits SOT – to express that the situation described by a subordinate clause overlaps in time with a past matrix situation, speakers use the past tense in the subordinate clause. This pattern is shown in the past-under-past construction in (1a), in which the time of Becky’s pregnancy is interpreted as overlapping in time with Kevin’s report of it.

- (1) Kevin **said** that Becky **was** pregnant.²
- | | |
|--------------------------------------|----------------|
| a. Kevin said: “Becky is pregnant.” | (Simultaneous) |
| b. Kevin said: “Becky was pregnant.” | (Past-shifted) |

¹ I use ‘situation’ to refer to both events and states.

² Unless there is a reference, the data are my own, collected from native speakers of the language.

This past-under-past construction is ambiguous in English between a simultaneous reading and a past-shifted one, as in (1b), in which the embedded situation is interpreted as preceding the matrix clause situation. In Japanese, a non-SOT language, the past-under-past configuration derives only the past-shifted reading (Ogihara 1996).

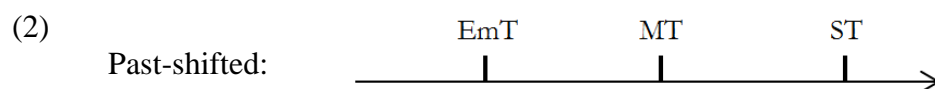
I propose an analysis of sequence of tense phenomena in which the tense morphology that surfaces in subordinate clauses is a function of the ways in which they are anchored with respect to both time and point of view. The topic is approached morphosemantically, with a set of features that distinguish tense-mood-aspect systems cross-linguistically, as proposed by Cowper (2005), working within the Distributed Morphology framework (Halle & Marantz 1993).

The contribution of this paper to our understanding of tense is that it emphasizes that there is a connection between the speaker's point of view and the way in which tense is interpreted, which is instantiated morphosemantically with deixis features in T^0 and C^0 . Moreover, I claim that what distinguishes SOT- from non-SOT-exhibiting languages is that clauses in languages of the former type contain a temporal anchoring feature in their INFL feature inventories that sets the evaluation time of clauses at the moment of speech. Non-SOT languages will be said to lack this temporal anchoring feature. Further, while prior accounts of SOT treat the interpretations that arise from past-under-past constructions as distinct semantically and syntactically, I treat the simultaneous and past-shifted readings here as subsets of a single reading: before utterance time.

2. Tense in embedded contexts

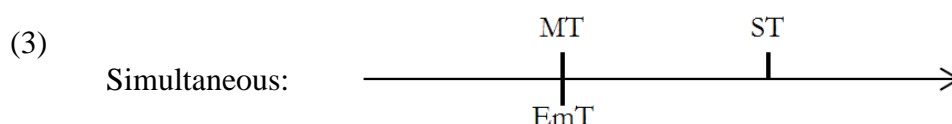
How an embedded event or state is interpreted to be temporally situated relative to a matrix situation depends on whether the embedded clause is in the past or present tense.³ It also depends on the language and the type of subordinate clause. In general, the time of the embedded situation in English is evaluated relative to the moment of speech, whereas, in Japanese, it is evaluated relative to the time of the matrix clause.

There are three possible interpretations a past subordinate clause may have under a matrix past tense. Not all, however, are necessarily expressed with an embedded past tense. As will be shown, these interpretations depend on the type of clause and how a language anchors its clauses personally and temporally. One interpretation is the *past-shifted* reading, schematized in (2), where 'EmT' refers to the embedded clause time, 'MT' to the matrix clause time, and 'ST' to the speech time. Under the past-shifted reading, the embedded situation is interpreted as holding in time prior to the matrix time, both the EmT and MT preceding the speech time.

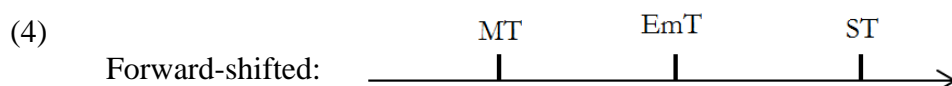


The second interpretation is the *simultaneous* reading, schematized in (3). Under this reading, the times of the matrix and embedded situations coincide. Again, both precede the speech time, given the matrix past tense.

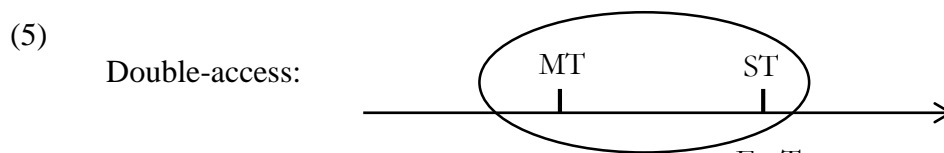
³ This description is a simplification. For a more elaborated discussion, see Melara (2014).



The third interpretation is the *forward-shifted* reading (see Enc, 1987; Abusch, 1988), schematized in (4). Under this reading, the time of the embedded situation is located after the time of the matrix situation, preceding the speech time.



A reading that arises in constructions with an embedded present tense under a matrix past in SOT languages is the *double-access* reading (see Abusch 1991, 1997, Ogihara 1999), schematized in (5). Under this reading, the situation of the lower clause extends temporally over an interval that holds minimally from the matrix time to the utterance time (Cowper 1996:1).



What follows illustrates how the interpretations in (2) to (5) arise in English and Japanese complement clauses and relative clauses.

2.1. Tense in subordinate clauses

English is a language that exhibits SOT. In SOT languages, a construction with a past-under-past complement clause is ambiguous between a past-shifted reading and a simultaneous reading. This is shown in (6a) and (6b), repeated from (1). (6c) shows that the forward-shifted reading is not available in constructions with past-under-past complement clauses (Abusch 1997:16).

- (6) Kevin **said** that Becky **was** pregnant.
- a. Kevin said: “Becky is pregnant.” (Simultaneous)
 - b. Kevin said: “Becky was pregnant.” (Past-shifted)
 - c. #Kevin said: “Becky will/would be pregnant.” (Forward-shifted)

Only the past-shifted, and not the simultaneous (or forward-shifted), reading arises in similar constructions in non-SOT languages, such as Japanese (Ogihara 1996). This is shown in (7).

- (7) Taroo-wa [Hanako-ga Tookyoo-ni **i-ta** to] **it-ta**.
 Taro-TOP Hanako-NOM Tokyo-LOC **be-PST** COMP **say-PST**
 ‘Taro said that Hanako was in Tokyo.’ (Stowell 2007: 451)
- a. Taro said: “Hanako was in Tokyo.” (Past-shifted)
 - b. #Taro said: “Hanako is in Tokyo.” (Simultaneous)

In order to get the simultaneous reading, Japanese uses the present tense in the embedded clause (Ogihara 1996), as shown in (8).

- (8) Hanako wa [Akira ga hon o yon-de **i-ru** to] **it-ta**
 Hanako TOP Akira NOM book ACC read-TE **be-PRS** that **say-PST**
 ‘Hanako said that Akira was reading a book.’
 (i.e. Hanako said: “Akira is reading a book.”)

A construction with a present-under-past complement clause in English receives a double-access interpretation. That is, the interpretation of (9) is that Becky was pregnant at the time that Kevin reported her pregnancy and is still pregnant at the time that the sentence is uttered. Non-SOT languages like Japanese are said to lack this type of reading.

- (9) Kevin **said** that Becky **is** pregnant.

Relative clauses behave somewhat differently from complement clauses in both English and Japanese. In English, past-under-past relative clauses that modify a nominal read *de re* are three-ways-ambiguous (Ogihara 1996). The *de re* (i.e. ‘of (the) thing’) and *de dicto* (i.e. ‘of (the) word/saying’) distinction is illustrated by the contrast exemplified in (10).

- (10) Sam wants to marry an American woman.
 a. *De re*: specific American woman denoted.
 (‘...I think her name is Betty.’)
 b. *De dicto*: non-specific about which woman, just some American woman.
 (‘...I hope he finds one.’)

A *de re* reading of ‘an American woman’ in (10) is one in which the DP is interpreted as denoting a specific woman. On the other hand, the *de dicto* reading is one which is non-committal about any specific individual.

(11) shows that a past-under-past relative clause in English may receive the past-shifted, simultaneous, or forward-shifted readings when the modified nominal is read *de re*.

- (11) Mary **saw** a man who appeared on TV.
 a. This morning, Mary saw a man who appeared on TV last night. (Past-shifted)
 b. Mary saw a man who appeared on TV (i.e. as he was on TV). (Simultaneous)
 c. Mary saw a man who, long after Mary saw him, appeared on TV. (Forward-shifted)

When the nominal modified by a past-under-past relative clause is read *de dicto*, the forward-shifted interpretation is not possible (Ogihara 1996).

In Japanese, nominals modified by past-under-past relative clauses read *de re* are ambiguous among the past-shifted, simultaneous, and forward-shifted readings (Ogihara 1996), like in English. This is shown in (12).

- (12) Taroo-wa [nai-te **i-ta** otoko]-o **sagasi-ta**
 Taro-TOP cry-PROG **be-PST** man-ACC **seek-PST**
 ‘Taro looked for a man who was crying.’
 a. Taro, this morning, looked for a man who was crying last night. (Past-shifted)
 b. Taro looked for a man who was crying as Taro noticed him. (Simultaneous)
 c. Last night, Taro looked for a man who was crying this morning. (Forward-shifted)

Under a *de dicto* reading of the nominal, the simultaneous reading is only marginally possible. A present-under-past relative clause in Japanese is used to express simultaneity between matrix and subordinate situations, as shown in (13).

- (13) Taroo-wa [nai-te **i-ru** otoko]-o **mi-ta**
 Taro-TOP cry-PROG **be-PRES** man-ACC **see-PST**
 ‘Taro saw a man who was crying (at the time of the meeting).’ (Ogihara 1996:154)

In English, present-under-past relative clauses are interpreted as holding at speech time, as shown in (14).

- (14) Mary **saw** a man who is on TV.
 a. Mary saw a man who is on TV now. (=UT)
 b. #Mary saw a man who is on TV when Mary saw him. (<UT⁴)

Table 1 shows a summary of the readings that arise with past and present tense indicative clauses embedded under a matrix past tense in English and Japanese.

		Readings	
Clause	Tense under past	English	Japanese
Complement	Past	• Past-shifted • Simultaneous	• Past-shifted
	Present	• Double-access	• Simultaneous
Relative	Past	• Past-shifted (<i>de re</i> , <i>de dicto</i>) • Simultaneous (<i>de re/de dicto</i>) • Forward-shifted (<i>de re</i>)	• Past-shifted (<i>de re/de dicto</i>) • Simultaneous (<i>de re/?de dicto</i>) • Forward-shifted (<i>de re</i>)
	Present	• Deictic	• Simultaneous

Table 1. Summary of interpretations of embedded tenses in English and Japanese

2.2. Recent analyses

The literature on the interaction between embedded and matrix tenses and, specifically, sequence of tense is certainly not scant. Nevertheless, an account that considers and captures the differences between English and Japanese shown in the previous subsection and, more generally, captures the differences between the tense systems of SOT and non-SOT languages has yet to be proposed.

Recent analyses vary between syntactic and semantic perspectives. Well-known is Ogihara’s (1996, 1999) work on SOT, comparing the tense systems of English and Japanese. Ogihara (1996) proposes that SOT languages have an SOT rule, which optionally deletes a lower tense at LF if it is c-commanded by an occurrence of the same tense. Deletion of an embedded past produces the simultaneous reading while non-deletion produces the past-shifted reading. Ogihara (1999) proposes that the present tense in Japanese is semantically vacuous; in English, the present tense is absolute. Thus, the present tense in Japanese is interpreted relative to the matrix time while the English present tense is evaluated relative to the utterance time. Accordingly, the double-access reading arises in English as the language’s absolute present tense must be interpreted at both the utterance time and the current time of the matrix clause’s

⁴ ‘<’ indicates anteriority.

subject. The proposal of the present paper takes these observations, particularly that of the double-access reading in English, as a point of departure.

Under a more recent syntactic analysis of embedded tense, tense morphemes have been proposed to be polarity items. According to Stowell (2007), tense morphology and tense semantic features are instantiated on separate heads, with the morphology appearing lower than the semantic features. Stowell equates past tense morphology to past polarity items. That is, if an embedded past morpheme is c-commanded in the syntax by a past semantic feature in the matrix clause, the lower semantic tense feature may be either past or present. Either way, the lower past morpheme is licensed given its c-command relation with the higher past semantic feature. Where the lower clause has past tense morphology, if the lower semantic tense feature is present, the simultaneous reading arises. All else equal, if the lower semantic feature is past, the past-shifted reading arises. In non-SOT languages, under this proposal, tense morphemes are also polarity items, which are locally licensed, unlike in SOT languages, and the complement past tense morpheme must therefore be within the scope of a local past semantic feature.

Stowell's (2007) analysis appears to show similarities at times with components of the Distributed Morphology (DM) framework (Halle & Marantz 1993). For example, for both, certain types of morphemes are compatible with particular semantic features in some languages but not in others. Under DM, however, morphology appears *because* of the features in the syntax. It is unclear, though, in Stowell's account how tense morphology and tense features are linked or why they should be realized separately. Nonetheless, the proposal formalizes Ogiwara's (1996) observations, showing the possibilities of accounting for the SOT/non-SOT differences morphosyntactically.

Finally, SOT has recently been treated as a result of feature transmission. For Grønn & von Stechow (2010) and von Stechow & Grønn (2013), verbs are temporal quantifiers and a language exhibits SOT if and only if its temporal quantifiers transmit tense features. In SOT languages, a matrix past tense may be transmitted to the lower clause, deriving a simultaneous reading. If the lower clause already has a past feature, feature transmission is blocked and the past-shifted reading arises. If the lower clause has a present tense, it deictically refers to the speech time. In non-SOT languages, there is no feature transmission and the lower clause has its own past tense, hence only the past-shifted reading arises. Thus, to get the simultaneous reading, the present tense must appear in the lower clause (in these languages, however, the present tense does not refer to the speech time). There is nothing in this analysis that links the matrix past tense and embedded present interpretively to ensure that the right reading – the double-access interpretation – arises in English present-under-past complement constructions. Furthermore, the account does not address the *de re* versus *de dicto* distinction. Overall, these recent analyses show that various properties of tense systems have yet to be captured in a formal account.

In what follows, I develop an analysis of the English and Japanese data presented based on the insights and framework of Cowper (2005).

3. The roles of personal and temporal anchoring

3.1. Cowper's (2005) feature geometry of Infl

Cowper (2005) proposes a feature geometry – a dependency structure – of the Infl domain, in which clausal inflectional properties are encoded. The features in this geometry are interpretable, privative, and organized as bundles that interact to mark contrast according to their levels of dependency. Thus, if a feature [b] is dominated by a feature [a] in a feature

geometry, the presence of [b] is dependent on the presence of [a] – without [a]’s presence in the structure, [b]’s presence is impossible. A feature that is absent, of course, is not interpreted. This structure is available to UG, with languages utilizing subsets of its features to mark contrast in their own systems (Cowper 2005:13). Figure 1 shows the features of the geometry relevant to the analysis that will be proposed in this paper.

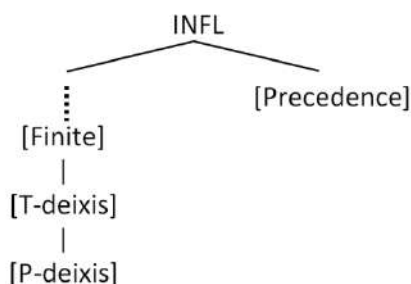


Figure 1. Cowper's (2005) universal dependency structure of *Infl* (adapted from p.14)

Under Cowper's proposal, the feature [Finite] is a completely syntactic feature, licensing verb agreement and nominative case. [T-deixis] is the feature that anchors a clause to the speech time. The tense feature [Precedence] interacts with [T-deixis], locating at least one moment of the situation denoted by the clause prior to the clause's temporal anchor, which is the speech time when [T-deixis] is specified. In the case that [T-deixis] is specified but [Precedence] is not, the situation is interpreted as holding simultaneously to the moment of speech and present tense morphology surfaces.

The deictic centre of an utterance is the speaker in the location and at the moment of speech (Cowper 2005:17). As Hall (2001:20) describes, the speaker of an utterance is an individual and the consciousness at the deictic centre is a stage of the speaker. The set of propositions held by the speaker contains the propositions believed by him/her at utterance time (*ibid.*). P-deixis is the feature that indexes a clause to the speaker, or rather, indexes a clause to the consciousness at the deictic centre. According to Cowper (2005), a clause specified for [P-deixis] denotes a proposition viewed from the speaker's perspective. The subjunctive and indicative moods differ in that the former lacks [P-deixis], whereas the latter is specified for [P-deixis]. A proposition of a clause in the indicative mood is a "cognitive manifestation" (Hall 2001; Cowper 2005:16) found in the speaker's consciousness, whereas a clause in the subjunctive does not denote a proposition that can be said to be held by a speaker in the same way. This distinction between the indicative and subjunctive moods is difficult to discern for English because in English, according to Cowper, [T-deixis] is never present in a lexical item in the absence of [P-deixis] – the two deixis features are packaged together as a single deixis feature. Conversely, in Spanish, [T-deixis] may occur independently of [P-deixis]. Cowper argues that this can be shown by the fact that subjunctives in Spanish are temporally deictic.

Recall that according to Cowper (2005), [P-deixis] is dependent on [T-deixis], but [T-deixis] does not entail [P-deixis]. In Spanish, an SOT language, a subjunctive clause embedded under a past matrix clause must appear in its past tense form if the interpretation is that the time of the subordinate situation coincides with the embedding time, as in (15). The subordinate subjunctive must also occur in its past tense form when embedded under a past embedding verb in the case that the subordinate situation is located between the matrix time and the utterance time, which is the interpretation of (16). Importantly, given that the embedded clauses are T-

deictic, they are interpreted with respect to the utterance time and therefore the embedded situations must precede the moment of speech.

- (15) Les sorprendió [que no lo supiera/*sepa].
 them surprise.PRET.3SG that not it know.IMPF.SUBJ.3SG/*PRES.SUBJ.3SG
 ‘They were surprised she didn’t know.’
 (Butt & Benjamin:224, cited in Cowper 2005:27)
- (16) Me dijo [que lo hiciera/*hague].
 me say.PRET.3SG that it do.IMPF.SUBJ.1SG/*PRES.SUBJ.1SG
 ‘She told me to do it.’
 (Butt & Benjamin:220, cited in Cowper 2005:28)

Recall also that subjunctives lack [P-deixis] and that indicatives must be both temporally and personally anchored, i.e. bear both [T-deixis] and [P-deixis]. Thus, the subordinate clauses of the English sentences above in (6) and (9) are fully deictic, i.e. are specified for both [T-deixis] and [P-deixis]. Following this line of thought, the subordinate clauses of the Japanese sentence in (8) (and, generally, others like it in non-SOT languages) should also be fully deictic clauses as they are also in the indicative mood. However, as was discussed in section 2, the present tense in the Japanese subordinate clause is interpreted with respect to the matrix time rather than the utterance time. If full deixis entails [T-deixis] – interpretation relative the speech time – though, the embedded indicative clauses in (8) cannot be said to be temporally deictic. Moreover, if they are not T-deictic, given that [P-deixis] is dependent on [T-deixis], they also cannot be said to be specified for [P-deixis]. Intuitively, though, the subordinate clauses in (8) seem to be no different from similar complement clauses in English, which are fully deictic, in terms of personal anchoring.

Despite the reworking that needs to be done to this analysis to capture tense in non-SOT languages, Cowper’s (2005) framework provides the tools with which to capture the observations made in the previous sections. A component of the analysis argued for here is therefore the proposal that [P-deixis] is not specified on the same head as [T-deixis] – $I(nfl)^0/T^0$. Rather, I claim here that [P-deixis], which anchors a clause to the speaker’s perspective, is specified on C^0 . I additionally claim that the English complementizer *that* does not have [P-deixis]. This accounts for, for example, the impossibility of *that* in direct speech contexts, as in (17). The idea is that the lower clause in (17a) lacks [P-deixis] and is therefore anchored to the point of view of the matrix subject while *that* cannot appear in C^0 in (17b) because of the specification of [P-deixis].

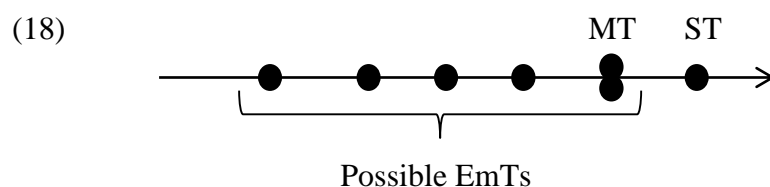
- (17) a. Becky said (**that**) she is hungry.
 b. Becky said (***that**) “I am hungry.”

3.2. The proposal

The analysis proposed here is grounded within Cowper’s (2005) approach and, by extension, the DM framework, according to which vocabulary items spell out the semantic features of functional morphemes at the phonological level – an operation known as Late Insertion (Halle & Marantz 1993). It is assumed here that indicative clauses must be anchored temporally and personally (cf. Enç 1987). In the analysis I propose, a temporal anchor is a time relative to which another time – the time at which a situation holds – is evaluated (by means of tense features). [T(emporal)-deixis], a feature of T^0 , anchors a situation to the utterance time (Cowper

2005). The time evaluated is the time at which the situation denoted by the vP holds. I refer to this evaluated time as a *reference point*. In indicative clauses, past tense morphology spells out T^0 specified for the feature [Precedence], which places the situation described by the clause prior to the temporal anchor (present tense is represented by the absence of [Precedence]) (Cowper 2005:15). I propose here that what distinguishes English and Japanese with respect to the differences outlined in subsection 2.1 is that Japanese lacks [T-deixis] in its inflectional feature inventory. English, conversely, has [T-deixis] and its indicative clauses are anchored temporally by this feature. Languages lacking [T-deixis] anchor their matrix clauses to the speech time by default. Embedded indicative clauses in these languages are anchored to the reference point of the embedding clause. Hence, Japanese embedded tenses are anchored relative to the time of the embedding situation.

A personal anchor establishes the personal vantage point from which the situation denoted by a clause is viewed (Hall 2001; but cf. Ritter & Wiltschko 2005, 2014). [P(ersonal)-deixis] (Cowper 2005), a feature of C (as viewed here) anchors a clause to the point of view of the speaker (Hall 2001; Cowper 2005). Matrix clauses bear [P-deixis]. Propositional attitude verbs (verbs that take indicative complement clauses) s-select non-P-deictic clauses. When [P-deixis] is absent from a lower clause, the clause gets anchored to the point of view of the higher subject, bearing the agent/experiencer theta-role. In the absence of [P-deixis] without a higher personal anchor, a clause is anchored to the point of view of the speaker by default. Unlike previous accounts, which have tended to attempt to account for the SOT/non-SOT differences by assuming the simultaneous and shifted readings are distinct semantically and syntactically, I assume these readings are all captured under one reading: the past tense always means ‘preceding the temporal anchor’. I claim there is no need to postulate different semantics for each reading if past-under-past simply refers to some point in time prior to the moment of speech. That is, the embedded reference point may occur at any of a number of points prior to the speech time, one of which is the reference point of the matrix clause. This is schematized in (18).



Theoretically, then, a past complement clause is vague and disambiguating the sentence requires the support of adverbials, such as in (19), or contextual support.

- (19)
- a. Kevin thought yesterday that Becky was pregnant (at the time he thought it).
 - b. Kevin thought yesterday that Becky was pregnant last year
(and she has since had her baby).
 - c. In 1982, Kevin thought that Becky was pregnant (in 1980/at the time).

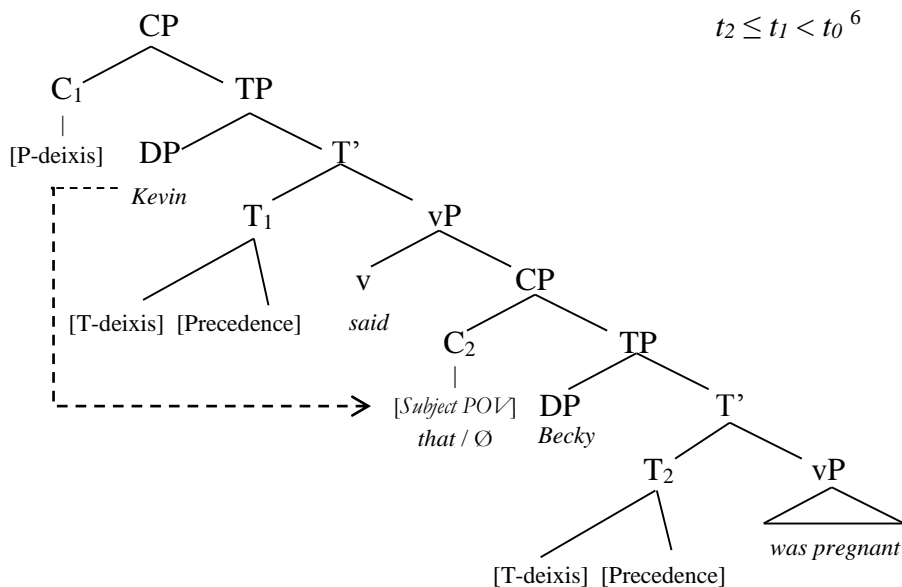
With these assumptions in place, the observed differences between English and Japanese subordinate clauses can be accounted for. What follows illustrates the analysis in action.

3.3. English and SOT

English clauses in the indicative mood are specified for [T-deixis] and are therefore temporally anchored to the speech time. English matrix indicative clauses are additionally specified for [P-deixis] and are therefore personally anchored to the speaker's point of view. English embedded clauses may or may not be P-deictic: verbs that take indicative clausal complements s-select non-P-deictic clauses; clausal adjuncts, such as relative clauses, are optionally P-deictic given that they are not subcategorized for⁵.

In English constructions with past-under-past complement clauses, the matrix clause is anchored to the speech time because of the specification of [T-deixis] on T^0 . The situation described by the matrix vP holds at a reference point prior to the speech time because of the specification of [Precedence] on T^0 , hence the spell-out of past tense morphology. The same holds for the lower T^0 . However, the lower situation cannot be read as holding after the matrix subject's 'here and now' because of the lack of [P-deixis] on the lower C^0 – the subject cannot see into his/her/their future (without the use of modality). (20) illustrates this.

(20) English past complement under past matrix



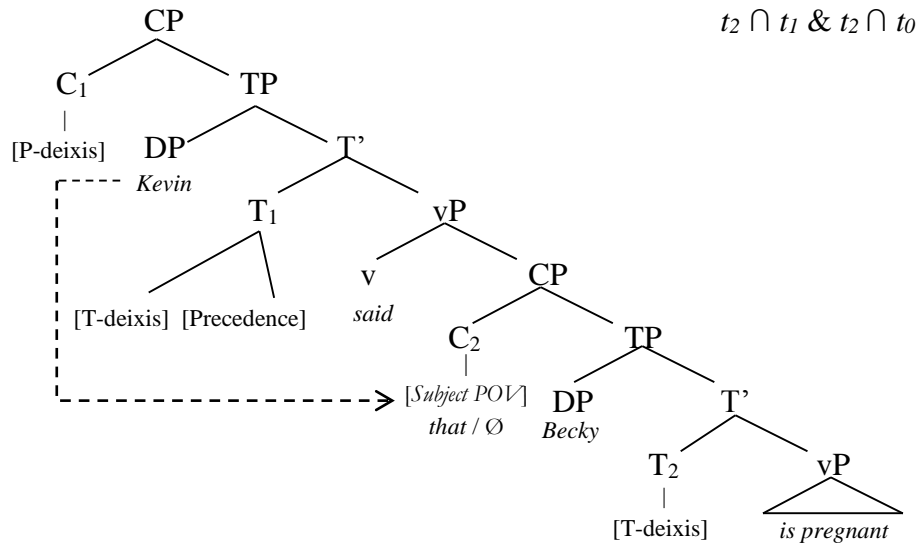
In English constructions with present-under-past complement clauses, the featural representation is similar to that of (20) except that the lower T^0 is unspecified for [Precedence]. Thus, the embedded T^0 is spelled out with present tense morphology and the lower clause is interpreted as holding at the moment of speech. With the lower clause anchored to the point of view of the matrix subject, given the non-specification of [P-deixis] on the embedded clause, the lower situation must hold, in addition to the speech time, at the subject's 'now', which is

⁵ It has been pointed out to me by a reviewer that this contradicts Potts (2005), where the reviewer understands Potts to argue that relative clauses are obligatorily speaker-oriented. In fact, this claim made by Potts refers to non-restrictive relative clauses (and other "supplements", such as appositives). I am perfectly comfortable accepting that non-restrictive relative clauses are strictly P-deictic. In this paper, though, I speak exclusively about restrictive relative clauses, which I am arguing can be either P-deictic or not.

⁶ Where t_0 represents the speech time, t_1 the reference point of the matrix situation, and t_2 the reference point of the embedded situation.

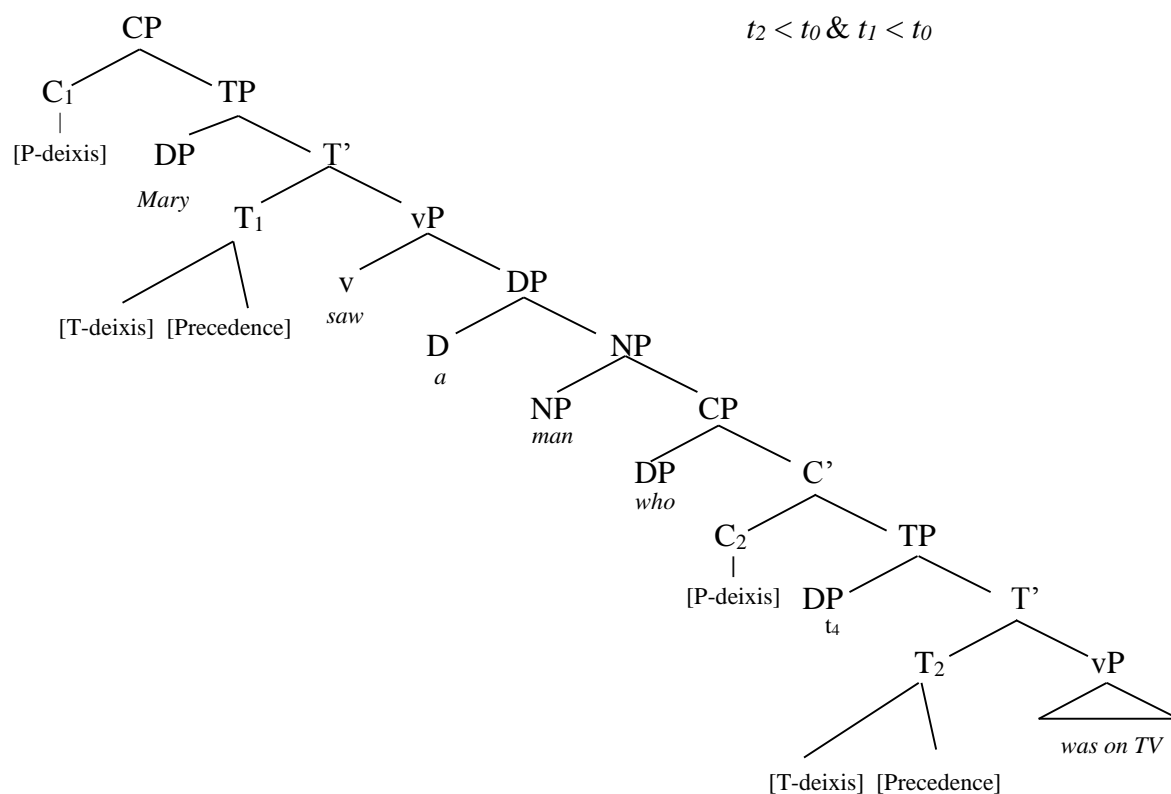
some point prior to the speech time. It is in this way that the double-access interpretation arises. The illustrative example is provided in (21).

(21) English present complement under past matrix



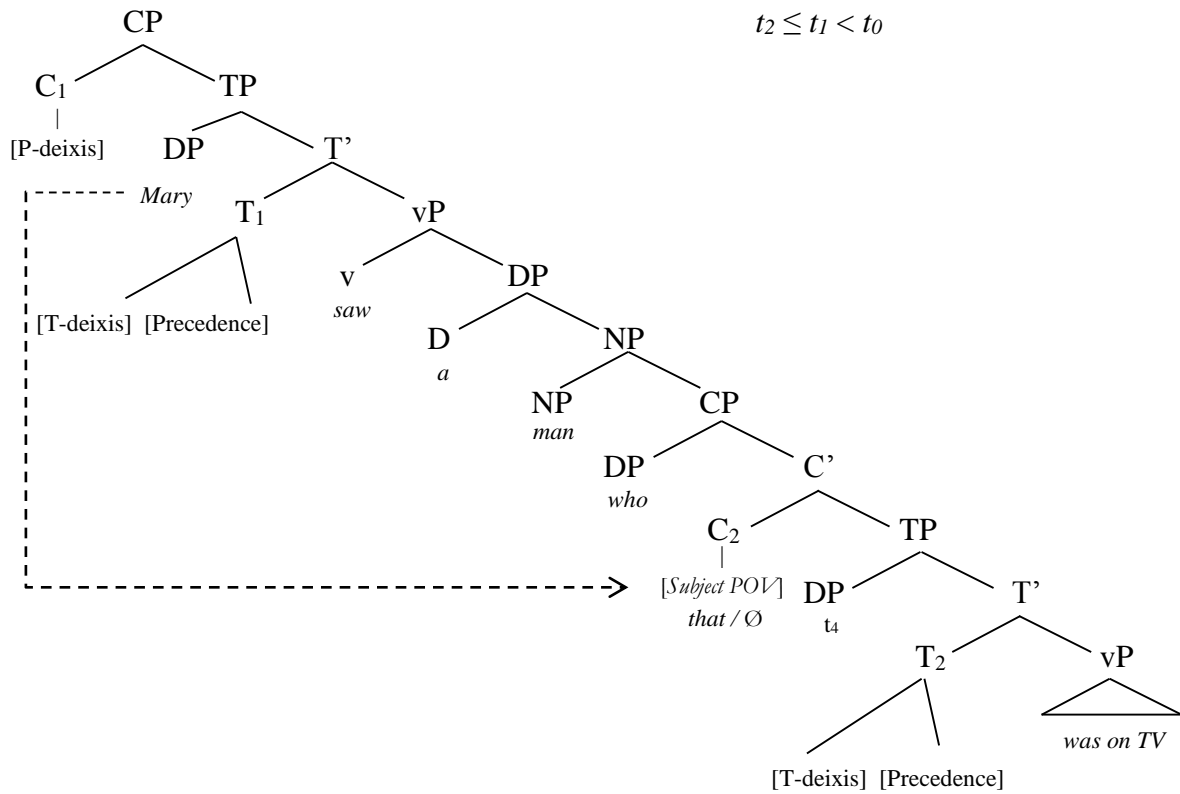
The difference between past-under-past complement clauses and past-under-past relative clauses that allow the *de re* reading is the specification of [P-deixis] on the lower clause. Recall that the difference between the *de re* versus *de dicto* readings of nominals modified by a relative clause is a difference in endorsement of the description provided by the relative clause. That is, a relative clause modifying a nominal read *de re* provides “a description endorsed by the speaker” (Stowell 2007:456), whereas a relative clause modifying a nominal read *de dicto* provides one endorsed by the sentential subject. [P-deixis] on the lower C allows the lower past tense to be interpreted at any point prior to the speech time relative to the point of view of the speaker, hence the forward-shifted reading may arise. This is shown in (22).

(22) English past-under-past relative clause, *de re*



Past tense morphology spells out both the matrix and embedded T heads because of the specification of [Precedence] on each.

Relative clauses that do not allow the forward-shifted reading and only allow the modified nominal to be read *de dicto* have the same deixis feature specification as past-under-past complement clauses, as shown in (23).

(23) English past relative clause under past matrix, *de dicto*

With respect to present-under-past relative clauses, [T-deixis] in the absence of [Precedence] on the embedded T^0 is spelled out with present tense morphology. In this case, the lower clause is interpreted at speech time (i.e. $t_2 \cap t_0$ & $t_1 < t_0$) and at the speaker's perspective, if also specified for [P-deixis]. Theoretically, the double-access reading should be available with present-under-past relative clauses as well. Further, if [P-deixis] is optional in past relatives, it must also be optional in present relatives. Consider the sentence in (24). When read *de dicto*, Samantha seeks a man who specifically fits the criteria of the relative clause. Read *de re*, the relative clause provides “a description endorsed by the speaker” (Stowell 2007:456).

(24) Samantha **was** searching for a man who **models** ties for a living.

[P-deixis] is an optional feature in relative clauses, which, when specified, anchors a clause to the speaker. This analysis predicts that if the content of a P-deictic relative clause is relevant to the speaker and must at the same time hold at the utterance time, a double-access reading arises. This should not be unusual given that present complement clauses and *de dicto* present relative clauses are anchored in the same ways – the lower C^0 is anchored by the perspective of the matrix subject and the lower T^0 is anchored to the utterance time. Therefore, the same principles hold in present-under-past relative clauses as present-under-past complement clauses.

3.4. Japanese and non-SOT

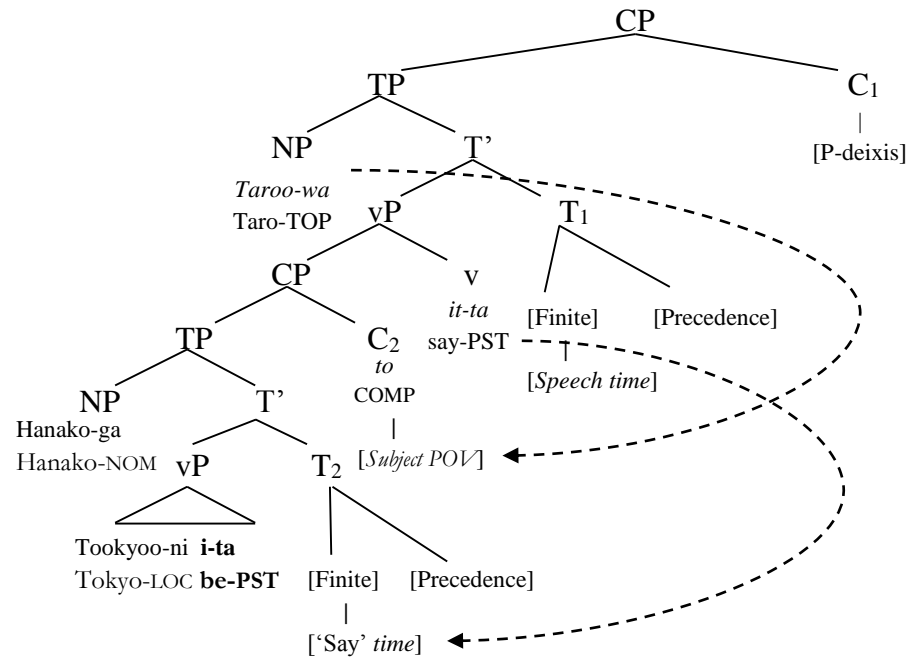
Recall the claim that what accounts for the lack of sequence of tense in Japanese is the absence of [T-deixis] in the language's Infl feature inventory. Here, the proposal is that Japanese clauses

in the indicative mood bear [Finite] on T^0 . Embedded indicative clauses are temporally anchored to the reference point of the embedding clause. By default, matrix clauses are anchored temporally to the speech time as there is no time higher in the structure to be anchored to. Matrix clauses are specified for [P-deixis] and therefore anchored to the speaker while embedded clauses may be P-deictic or not: verbs that take indicative clausal complements s-select non-P-deictic clauses; clausal adjuncts, such as relative clauses, are optionally P-deictic.

As in English, past-under-past complement clauses in Japanese lack [P-deixis]. Because Japanese lacks [T-deixis], the matrix T^0 is anchored temporally to the moment of speech by default and the embedded T^0 is anchored to the time at which the embedding situation holds. [Precedence] on the lower T^0 means that the subordinate clause is interpreted prior to the matrix situation time. Because the lower clause is not specified for [P-deixis], the forward-shifted reading is unavailable, just as in English. Finally, [Precedence] in both clauses means the spell-out of past tense morphology. (25) shows this.

(25) Japanese past complement under past matrix

$$t_2 < t_1 < t_0$$



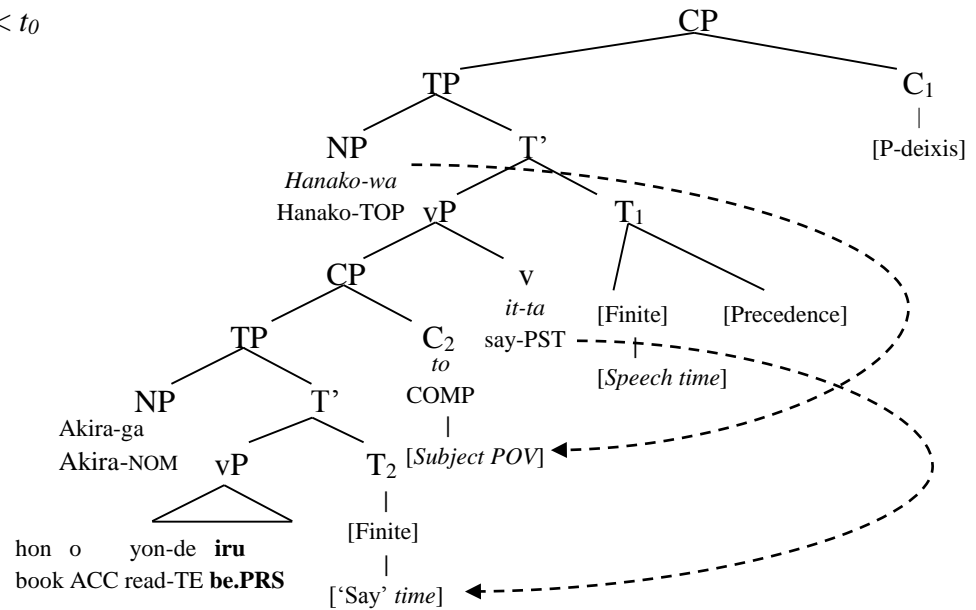
As in (25), the absence of [T-deixis] in (26), below, means that the lower clause is anchored to the situation time of the matrix clause, so the embedded situation is interpreted as coinciding in time with the embedding situation. The non-specification of [Precedence] in the lower clause means T^0 is spelled out with present tense morphology.

A reviewer of this paper points out that the proposal I present here appears to be compatible in ways with one proposed of double access readings by Giorgi, specifically Giorgi (2010). For Giorgi, the double access reading is derived from the evaluation of the subordinate event according to, first, the “temporal coordinate” of the matrix subject (i.e. the superordinate event), then to the speaker’s “temporal coordinate”. Under Giorgi’s view, the temporal coordinate of the speaker is the utterance event itself. From my understanding, it is the features of the matrix subject and the speaker that value the temporal properties of T^0 and, in languages that have the double access reading, C^0 . Notice that Giorgi’s proposal for how the double access reading arises in SOT languages is similar to my proposal for how the double access reading does not arise in non-SOT languages. That is, according to my proposal, in

Japanese, the lower clause is transparent in such a way that allows the lower event to be evaluated to the superordinate event, which is itself evaluated according to the utterance event. Conversely, I claim that in SOT languages, like English, the transparency between super- and subordinate clauses only affects the PoV coordinate such that the lower event is evaluated according to the specified temporal anchor along with the PoV of the nearest PoV-holder, namely the subject of the higher event. Furthermore, the PoV of the matrix subject is inherently linked to the time of the matrix event, having been a participant of the event. Overall, then, while seemingly similar, the analysis proposed in this paper and that of Giorgi's (2010) are dissimilar.

(26) Japanese present complement under past matrix

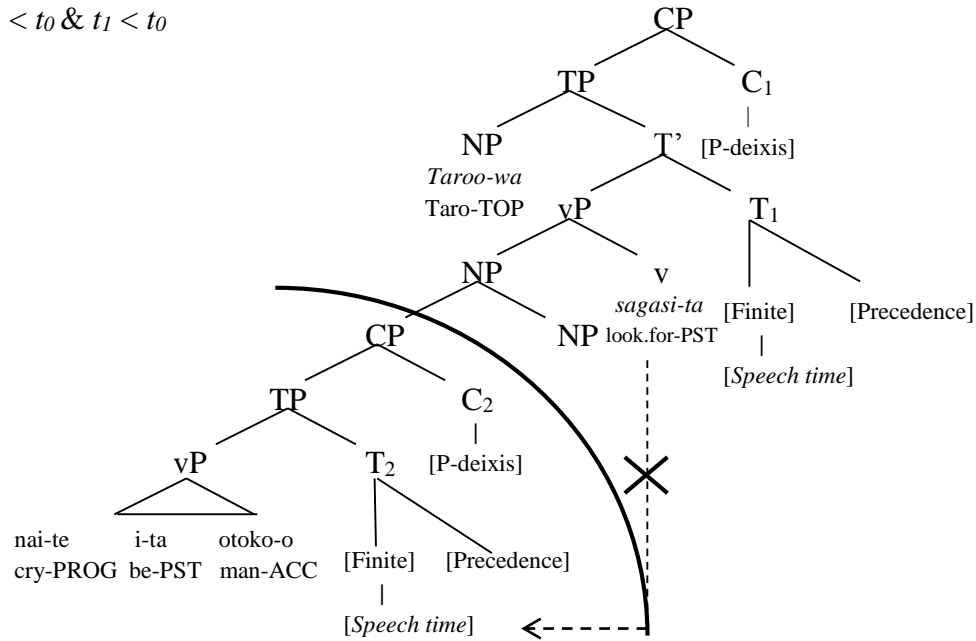
$$t_2 \cap t_1 \ \& \ t_1 < t_0$$



With respect to past-under-past relative clauses, like the English structure in (22), the simultaneous and both shifted readings are available when [P-deixis] is specified on the lower C^0 . I stipulate this is so because the specification of [P-deixis] blocks the operation that would otherwise anchor the lower clause to the matrix situation time. With the speech time being the default temporal anchor of clauses that cannot be anchored by something higher, the embedded past is interpreted relative to the speech time.

(27) Japanese past relative under past matrix, *de re*

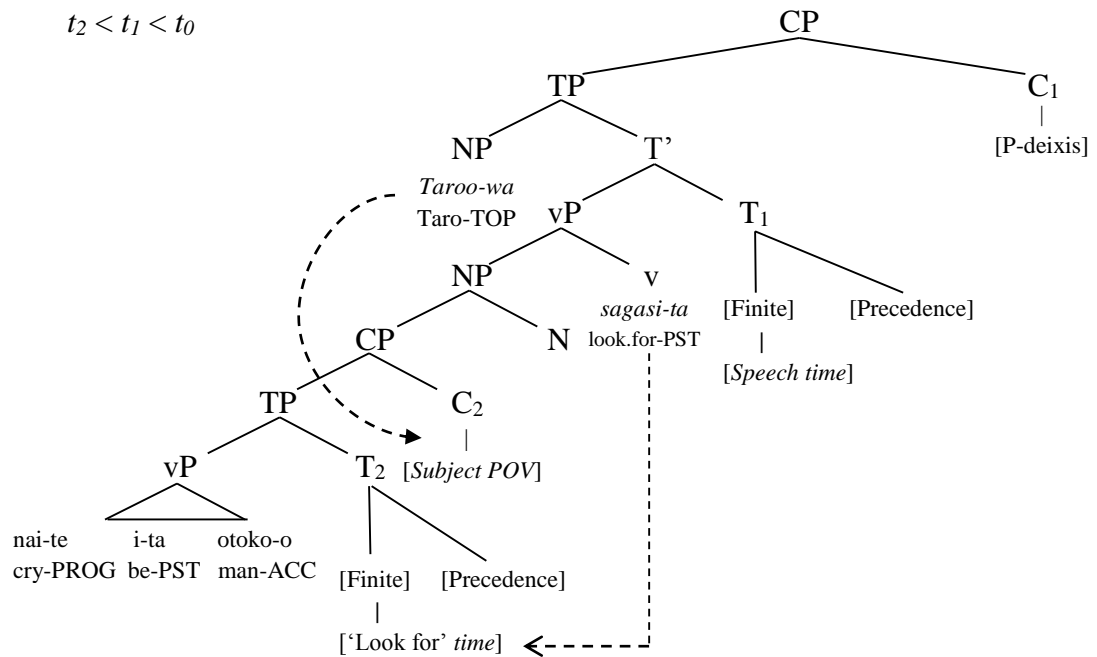
$$t_2 < t_0 \text{ \& } t_1 < t_0$$



The forward-shifted and *de re* readings are unavailable when past-under-past relative clauses lack [P-deixis]. This would predict that there is no simultaneous reading, however, contrary to what was noted in subsection 2.1.: the simultaneous reading is marginally possible. I speculate that the simultaneous reading arises from the interpretive ambiguity between a P-deictic clause and non-P-deictic one.

(28) Japanese past relative under past matrix, *de dicto*

$$t_2 < t_1 < t_0$$



Finally, the non-specification of [Precedence] on a relative clause means that the lower T^0 is spelled out with present tense morphology and the time of the denoted situation is interpreted relative to the matrix time, hence simultaneity (i.e. $t_2 \cap t_1$ & $t_1 < t_0$). The difference between a present-under-past relative clause specified for [P-deixis] and one not is that a P-deictic present-under-past relative clause would be interpreted relative to the speech time given the blocking process suggested just above for (27). I leave investigating this stipulation for future work.

In summary, Table 2 outlines the features on T^0 (*lexical items* or *LIs*) and the features of the morphemes that spell them out (*vocabulary items* or *VIs*). Recall that the specification of these features entails the specification of any higher features in the interpretable feature geometry.

	LI		VI
English	[T-deixis, Precedence]	-(e)d	[T-deixis, Precedence]
	[T-deixis]	-(e)s	[T-deixis]
Japanese	[Finite, Precedence]	-ta	[Finite, Precedence]
	[Finite]	-(r)u	[Finite]

Table 2. *LIs and corresponding VIs for English and Japanese T^0*

4. Implications and further investigation

Under the analysis just proposed, SOT is characterized by the anchoring properties of a language. If we generalize based on the languages discussed in this paper, SOT languages anchor their clauses temporally with the Infl feature [T-deixis]; non-SOT languages anchor their clauses temporally through a relation between T heads.

Interestingly, there are languages whose complement clauses pattern like those in Japanese but whose relative clauses pattern like those in English. Russian and Polish are some such languages (Hollebrandse 2005; Grønn & von Stechow 2010; von Stechow & Grønn 2013). How and why this is the case has yet to receive a complete account. Merely speculating, it might be the case that some languages distinguish complement clauses from adjunct clauses with the feature [T-deixis]. Moreover, this would entail that a language whose complement clauses behave like those in English while its relative clauses behave like those in Japanese is theoretically possible. To my knowledge, a language of this sort and this typology, more generally, has not yet been identified in the literature. Table 3 below summarizes the cross-linguistic variation in how the tense of an embedded clause interacts with the tense of a matrix clause. The shades in the cells indicate similarity in interpretation according to tense and clause type.

Clause type	Under past	Readings			???
		English	Russian/Polish	Japanese	
Complement	Past	• Past-shifted • Simultaneous	• Past-shifted	• Past-shifted	• Past-shifted • Simultaneous
	Present	• Double-access	• Simultaneous	• Simultaneous	• Double-access
Relative	Past	• Past-shifted (<i>de re</i> , <i>de dicto</i>) • Simultaneous (<i>de re/de dicto</i>) • Forward-shifted (<i>de re</i>)	• Past-shifted (<i>de re/de dicto</i>) • Simultaneous (<i>de re</i>) • Forward-shifted (<i>de re</i>)	• Past-shifted (<i>de re/de dicto</i>) • Simultaneous (<i>de re/?de dicto</i>) • Forward-shifted (<i>de re</i>)	• Past-shifted (<i>de re/de dicto</i>) • Simultaneous (<i>de re/?de dicto</i>) • Forward-shifted (<i>de re</i>)
	Present	• Deictic ⁷	• Deictic	• Simultaneous	• Simultaneous

Table 3. Cross-linguistic variation of tense-under-past interpretations

The analysis presented in this paper makes a further prediction, namely, one which pertains to subjunctives in English and Japanese. Because English has the feature [T-deixis], a finite clause unspecified for [T-deixis], I claim, derives the subjunctive mood (where still present in the language). Japanese does not have subjunctive morphology. Hence, indicatives need only be minimally specified for Finite.

Cowper's (2005) feature geometry and the DM framework have been shown in this paper to be invaluable tools in approaching the interaction between matrix and subordinate tenses and the varying behaviour across typologically distinct languages. Rather than assuming that within a given language a particular tense morpheme is ambiguous among more than one homophonous form, which is quite stipulative, the theoretical framework the present analysis is based on allows me to claim that tense morphology is not ambiguous. What derives the different interpretations are the features of the LIs present at the terminal stage of a syntactic derivation. At the end of the day, a past tense morpheme bears the feature [Precedence] as this is the relation it establishes between two times, and a present tense morpheme spells out an LI lacking tense features.

5. Conclusion

This paper has shown that the variation in subordinate past and present tense interpretations in English and Japanese indicative clauses results from the different ways in which the languages anchor these clauses temporally. I have proposed that English anchors clauses by means of the feature [T-deixis], which sets the evaluation time at the moment of speech. Japanese, I have proposed, lacks this feature and therefore anchors its clauses temporally to the situation time of an immediately embedding clause or the speech time in the absence of a higher reference point by default. Generalizing, what distinguishes SOT from non-SOT languages based on the present account can be said to be a difference in languages' temporal anchoring properties: SOT languages could be said to anchor their clauses with the feature [T-deixis], non-SOT languages by means of T-head relations. In this way, past tenses are always past, i.e. are specified for [Precedence].

⁷ By 'deictic', I mean reference to the speech time.

It has also been shown that point of view affects temporal interpretations. [P-deixis] is the feature that anchors a clause to the speaker's perspective and this feature is hosted in C^0 . Personal anchoring operates similarly to temporal anchoring in that when a clause is unspecified for [P-deixis], a clause is personally anchored to the perspective of the subject of the embedding clause or to the speaker in the absence of a higher clause by default. Verbs that select indicative complement clauses have been claimed here to s-select non-P-deictic complement clauses, accounting for the impossibility of a forward-shifted interpretation in past-under-past complement clauses. Relative clauses have been posited to be optionally P-deictic given that they are adjuncts and therefore not selected. P-deictic relative clauses are compatible with a *de re* reading of the modified nominal and allow the forward-shifted reading in the case of a past-under-past relative clause; P-deictic present-under-past relatives are interpreted as holding at utterance time. Non-P-deictic relative clauses are not compatible with a *de re* reading (but are compatible with a *de dicto* reading) of the modified nominal and therefore also disallow the forward-shifted reading in past-under-past relatives. Non-P-deictic present-under-past relative clauses receive a double-access reading. The specification of [P-deixis] may also block the temporal anchoring process exhibited in Japanese.

As it stands, the present proposal provides a simpler solution to analysing tense cross-linguistically than previous analyses have allowed and offers a new perspective on inter- and intra-clausal inflectional relations.

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On deriving inherent complement verb constructions

Sampson Korsah

This paper has two main goals. First, it highlights an empirical observation about the so-called inherent complement verb constructions in Kwa (Niger-Congo) languages, claiming that such verb-noun (V-N) complexes have a dual status; they behave like regular transitive verbs on the one hand, and like idioms on the other hand. Second, it accounts for this observation as follows: The V-N is initially stored as a fixed complex unit in the lexicon, as per its opaqueness for certain syntactic operations. This accounts for their idiom-like behaviour. In the syntax, this is a problem; the V-N lacks a label (Chomsky 2013). However, the labeling problem can be solved by a movement operation in which V moves to *v*, allowing the hitherto [V-N] to be labeled as NP. The consequent structure is then able to undergo the relevant morphosyntactic processes.

1. Introduction

The term *inherent complement verbs* (ICVs) was used by Nwachukwu (1984) to refer to the class of verbs such as those in (1), which are quite common in many Kwa languages of West Africa.¹ When we compare these verbs to those in (2) which I will refer to as *regular transitive verbs* (RTVs), we notice that those in (1) appear to have non-compositional meanings. For instance while the verb phrase (VP) *na wolo* corresponds to ‘see book’ in (2-a), the VP *jo foi* corresponds to ‘run’ in (1-a) and not say ‘dance race’ as one would expect (at least based on (2)). Given the scheme of things, and following Essegbey (1999), I will gloss verbs such as those in (1) as ICV whenever they occur in constructions.²

¹‘Kwa’ (Niger-Congo) is used in the sense of Williamson (1989). Therefore I will occasionally refer to languages like Igbo. Unless otherwise stated, all examples are from Gã. All non-referenced Akan and Gã examples are based on my speaker intuitions corroborated by other native speakers. Both languages have high and low tones, but only high tones will be marked in this paper. Also, tones of proper names are not marked at all. Either convention has no bearing on the analysis.

²As a note on the terminology used in this paper, whenever the term *inherent complement verb construction* is used, reference is made to any construction which involves an ICV (and of course an IC).

(1) *Inherent complement verb (ICV)*

- | | |
|---------------------------------------------------------|--------------------------------------------------------------------------|
| a. Kwei jo foi.
K. dance speed
'Kwei ran.' | b. Kwei wo Dede ɲaa.
K. wear D. advice
'Kwei advised Dede.' |
|---------------------------------------------------------|--------------------------------------------------------------------------|

(2) *Regular transitive verb (RTV)*

- | | |
|-------------------------------------------------------------|-----------------------------------------------------------------------------|
| a. Kwei na wolo.
K. see book
'Kwei saw a book' | b. Kwei há Dede wolo.
K. give D. book
'Kwei gave Dede a book.' |
|-------------------------------------------------------------|-----------------------------------------------------------------------------|

There are a number of issues that come to the fore as far as the analyses of ICVs are concerned. For instance, the fact that their meanings, when combined with their ICs, are non-compositional, suggest that such V-N structures may be idiomatic. If this is correct, one would expect the verb and the nominal complement to exhibit certain morphosyntactic tendencies. For instance, verbs in idiomatic expressions are subject to certain tense-aspect restrictions. But as we will see later, some of these restrictions do not hold for ICVs, while others do. Also, there are issues about the place of the IC in the argument structure of the verb i.e. is it an argument of the same status as for instance arguments of RTVs, like in (2)? If it is an argument, then we would expect that it participates in similar morphosyntactic processes as would arguments of RTVs, such as, adjectival modification and movement. In this respect, we will show that the status of ICs is fuzzy; certain processes are possible, others are not.

Given the above background, this paper makes two main contributions, one empirical, one theoretical. From the empirical perspective, I will show that ICVs have dual status; on the one hand they behave like idioms. On the other hand they behave like RTVs. On the theory side, I will claim that the idiom-like properties of ICV constructions follow from the fact that they are first stored as non-headed (in the sense of Chomsky 2013), [V-N] complex units in the lexicon. The [V-N] has no head because it combines two heads (of equal status). At this stage, they are opaque for certain syntactic processes. Conversely, they behave like RTVs when they enter into the syntax. Here, the V-N unit is forced to break up and allow its constituents to be marked with particular morphosyntactic features. Consequently, the parts the hitherto unit, are able to exhibit certain morphosyntactic properties. This is possible only after the V of the V-N complex moves, thereby allowing the hitherto non-headed structure to be labeled as NP.

The remainder of the paper is structured as follows: In section 2, I give a general background to ICV constructions. I look at the relationship between ICVs, RTVs and idioms in section 3. Section 4 provides the analysis, and sketches a few derivations. Section 5 is the conclusion.

2. *Inherent complement verbs*

Apart from the lack of one-to-one correspondence between meaning and form or structure, as in the particular instance of (1), inherent complement verbs exhibit other properties. In constructions in which they occur, the interpretation of what the predicate expresses seems to be intricately tied to the meaning (of at least one) of what appears to be its argument(s) i.e. 'speed' (1-a) and 'advice' (1-b). (Nwachukwu 1984:109) accordingly sees ICVs as verbs whose cita-

tion form also includes a nominal element which may or may not be cognate with the verb. He says further that “...the root (i.e. the verb) and its nominal complement form one semantic unit, and any dictionary entry which excludes the complement is so ambiguous as to be meaningless.” (Nwachukwu 1987:40).³ Thus, ICVs are typically cited with their inherent complement. This is true for all instances of ICVs that have been investigated in the literature such as for *Igbo* (Nwachukwu 1984), *Fon* (Avolonto 1995), *Ewe* (Essegbey 1999), *Gã* (Korsah 2011), and *Gungbe* (Aboh 2015). In these and other related languages, verbs which have similar morphological shape get (sometimes) unrelated meanings whenever they occur with their IC. In (3), the verbs are in bold face and the meaning of their (italicized) ICs are in brackets.

(3) *Citing ICVs*

Akan

- a. **hyɛ** *ebuɸúw* (anger) ‘to cause anger’
- b. **hyɛ** *nkóm* (prophecy) ‘to prophesy’
- c. **tu** *emriká* (speed) ‘to run’

Ewe (Essegbey 1999)

- a. **fú** *tsi* (water) ‘to swim’
- b. **fú** *kó* (fist) ‘to knock’
- c. **fú** *du* (race) ‘to run’

Gã

- a. **wo** *hó* (pregnancy) ‘to impregnate’
- b. **wo** *ɲaa* (advice) ‘to advise’
- c. **jo** *foi* (speed) ‘to run’

Igbo (Nwachukwu 1987)

- a. **tụ** *ụjọ* (fear) ‘to be afraid’
- b. **tụ** *ntụ* (lie) ‘tell a lie’
- c. **fu** *ufu* (pain) ‘be painful’

On the form-meaning issue, since the meaning of the two put together is usually closer to the IC, there is a certain tendency to construe the verb as being meaningless. This may be seen from how such verbs are glossed by some authors. For instance, in (4), the verb has been glossed in (almost) the same way as the IC. However, it is apparent that the IC is not the sole determinant of the meaning of the VP part of an ICV construction. In (5), different verbs with the same IC have different meanings. Essegbey (1999) reports of a similar situation about ICVs in Ewe.

(4) *Igbo* (Anyanwu 2012:1564)

Ézè **mgbàrà** àmà.

Eze pr.betray.past betrayal.IC

‘Eze betrayed (somebody).’

- (5) a. Dede **kpá** shiká lé naa.
D. ICV money DEF mouth.IC
‘Dede counted the money.’

- b. Dede **gbá** awulá lé naa.
D. ICV lady DEF mouth.IC
‘Dede worried the lady.’

Data like (5) make ICV constructions comparable to other complex predicate constructions in other languages such as *light verb* constructions in Persian (Folli et al. 2005), Japanese (Grimshaw & Mester 1988), Urdu (Butt 2010), Hindi (Mohanan 1997), *support verb* constructions in German (Langer 2004), and *noun-verb complex predicates* in Kurmanji (Gündoğdu

³There are indeed ICVs whose complements are adpositional. For instance *shishi* ‘under’ in *je shishi* ‘to begin’, but such lexical items in most Kwa languages have been argued to be (relator) nouns, see Osam et al. (2011).

2014), among others. For instance, Mohanan (1997) reports that the verb in such constructions affects valency and argument meaning. Though the analysis to be presented may be extended to these related constructions, I postpone the details of such discourse for discussion elsewhere.

The utility of the IC in computing the meaning of ICV constructions cannot be underestimated, given that almost every ICV has a homophonous non-ICV i.e. RTV counterpart in the languages in which they occur. Take *wo* in (6) for instance. Whenever this verb is cited alone, it means ‘wear’, as in (6-a). Here, other DPs may replace *atadé* ‘dress’ without any alteration in the meaning of the VP. But the meaning in (6-b) i.e. ‘impregnate’ is only possible when the verb is cited as *wo hó*, bringing to mind Nwachukwu’s definition above. This suggests that particular meanings are only instantiated in a configuration of an ICV and its IC, an indication of a restriction on the kind of complement an ICV can take.

- (6) a. Dede **wo** abifáó lé atadé.
 D. wear baby DEF dress
 ‘Dede dressed the baby.’
- b. Kwei **wo** Dede hó.
 K. ICV Dede pregnancy.IC
 ‘Kwei impregnated Dede.’

3. ICVs vis RTVs and idioms

The purpose of this section is to provide empirical evidence in support of the claim that ICVs have dual status i.e. in some morpho-syntactic contexts, they behave like regular transitive verbs while in others, they behave like idioms. This is based on how ICVs behave with respect to the tests and grammatical properties in Table 1, when compared to RTVs and idioms. I will compare ICVs and RTVs in Section 3.1. In Section 3.2, I will show how, in similar contexts (as 3.1), constructions involving idioms behave.

Word order SV(O _i)(O _d)
<i>ke</i> introduced complement
Generic-meaning complement
N-complement modifiability
Nominalisation strategy
Restricted N complement
Pronominalisation of N
TAMP restrictions
Wh-feature on N
Case of N
Focus

Table 1: *Basis for comparing ICVs with RTVs and Idioms*

3.1. ICV versus RTV

In this section, I will first show how RTVs behave with respect to the morphosyntactic contexts outlined in Table 1, and then proceed to discuss how ICVs behave in similar contexts.

3.1.1. Morphosyntactic properties of RTV constructions

As may be obvious from the examples in (2) (repeated as (7)), the languages under investigation have SVO word order in RTV constructions (Aboh & Essegbey 2010). Note that in double object constructions (7-b), the indirect object *Dede*, occurs immediately after the verb, and before the direct object. So they have SVO_iO_d structure (where O_i, and O_d correspond to the Goal and Theme arguments respectively). In languages like Akan and Gã, the Theme argument in such double object constructions may be expressed using a sort of serial verb construction (Kropp Dakubu 2008). Thus for Gã, *wolo* in (7-b), may be introduced by *kɛ*, as (8) shows.⁴

- | | | |
|-----|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| (7) | <i>Two-place predicates</i>
a. Kwei na wolo.
K. see book
‘Kwei saw a book’ | <i>Three-place predicates</i>
b. Kwei há Dede wolo.
K. give D. book
‘Kwei gave Dede a book.’ |
| (8) | Kwei <i>kɛ</i> wolo há Dede
K. <i>kɛ</i> book give D.
‘Kwei gave Dede a book.’ | |

RTVs inflect for all relevant grammatical properties associated with verbs including tense (9-a), aspect, polarity (9-b), and mood, without any restriction.⁵

- | | | |
|-----|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| (9) | a. Kwei baá- na Dede.
K. FUT-see D.
‘Kwei will see Dede’ | b. Kwei é- ná -ŋ Dede.
K. NEG-see-NEG D.
‘Kwei won’t see Dede’ |
|-----|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|

An RTV can take a bare NP as complement, but such an NP is interpreted as indefinite e.g. (7-a), suggesting that they are possibly DPs with a covert D (Aboh 2010:13). Indeed such NPs may occur with a definite determiner (10-a). Also, the nominal complement of an RTV can inflect for number (11-a), and it may be modified by an adjective (11-b).

- | | | |
|------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| (10) | Kwei na wolo lé.
K. see book DEF
‘Kwei saw the book’ | |
| (11) | a. Kwei na tsofa-i lé.
K. see drug-PL DEF
‘Kwei saw the drugs’ | b. Kwei na tsofa hee lé.
K. see book new DEF
‘Kwei saw the new drug’ |

⁴In Akan, this corresponds to the *de*-serialization (Osam 1994). I will not delve into the analysis of *kɛ* or *de*.

⁵Note that in Gã, an uninflected verb has a default aorist or past interpretation.

Verbs of RTV constructions may be nominalised, just as in other languages, see e.g. (Alexiadou 2010). In many Kwa languages, this morphological process also affects the syntax of a VP. In order to nominalise a transitive verb, the object (= nominal complement) is preposed to the verb. Thus *na* in (7a) for instance, can be nominalised as in (12).

- (12) wolo-**na**-a
 book-see-NML
 ‘book-seeing.’

RTVs allow complements with a generic meaning. Though the complement only needs to meet the selectional requirement(s) of the verb, and thus in the case of (11) for instance, other DPs e.g. *child*, *house*, *car* etc. may replace *drug*, Essegbey (1999) notes that Kwa languages also tend to have RTVs which allow generic-meaning nominal complements i.e. NPs which mean either *entity/thing* or *human/person*, and which do not refer to specific things or individuals. In (13-a) for instance, *mɔ* does not refer to any particular individual. Thus it may be replaced by specific meaning nouns such as *gbékébíí* in (13-b), without affecting the meaning of the predicate i.e. ‘kill’. According to Essegbey, this shows that such verbs have specific meaning.

- (13) a. Atríidií **gbe**-ɔ mɔ.
 Malaria kill-HAB human
 ‘Malaria is a killer.’
 b. Atríidií **gbe**-ɔ gbékébíí.
 Malaria kill-HAB children
 ‘Malaria kills children.’

The nominal complements of RTV may also be pronominalised. In Gã, only animate DPs can have overt pronouns. (14) shows how *gbékébíí* (13-b) may be realised as a pronoun. But as (15-b) shows, in languages like Igbo, an inanimate DP may also have an overt pronoun.

- (14) Atríidií **gbe**-ɔ amɛ.
 Malaria kill-HAB 3PL
 ‘Malaria kills them.’

- (15) *Igbo* (Anyanwu 2012:1564)
 a. Adhá **nvuru** eketé
 A. carry basket
 ‘Adha carried a basket.’
 b. Adhá **nvuru** yá
 A. carry 3SG.ACC
 ‘Adha carried it.’

The complement of an RTV also has some inherent case features. For instance, (15-b) also shows that the object DP in (15-a) has an accusative case. This is quite common among Kwa languages i.e. where the form of the pronoun is the sole indication of the case properties of its referent DP. This is crucial since many of such languages have poor nominal morphology.

In terms of A-bar operations involving RTVs, the nominal complement can be marked with a focus, a *Wh*-, or a relativisation feature. In Gã, focused constituents require being moved to the left periphery of the clause, followed by the focus marker *ni*. Consider (16-a) for (7-a). Apart from DPs, verbs may also be focused. In many Kwa languages, predicate focus requires nominalizing and fronting the verb, and leaving a copy of the verb in its base position, see for example Aboh & Dyakonova (2009).⁶ (16-b) shows how *na* may be focused.

⁶(See also Hein 2016) for an analysis of the Akan case.

- (16) a. Wolo_i ni Kwei **na** t_i.
book FOC K. see
'Kwei saw a BOOK.'
b. Na_i-a ni Kwei **na**_i wolo.
see-NML FOC K. see book
'Kwei SAW a book.'

For questions, DPs may be *Wh*-marked both *in-situ* (17-a), and *ex-situ*, except that the latter case requires cleft focusing the relevant DP (17-b). Example (18) shows how such the DPs may be relativized.⁷

- (17) a. Kwei **na** méni?
K. see what
'What did Kwei see?'
b. Méni ni Kwei na?
what FOC K. see
'WHAT did Kwei see?'
- (18) Wolo lé ní Kwei na...
book DEF REL K. see
'The book that Kwei saw...'

3.1.2. Morphosyntactic properties of ICV constructions

This section discusses the behaviour of ICV constructions in contexts similar to those in which RTVs have been discussed so far. I will show that ICVs seem to exhibit mixed properties with respect to these contexts.

Considering example (19), we get the impression that ICV constructions also follow the standard SV(O)(O) word order in these language. When (19) is compared with (7) however, we notice that although the complement of the verb i.e. the IC, is a bare NP, it does not get an indefinite DP interpretation. Also, an IC cannot occur with a definite determiner (20-a). In the case of what appears to be the equivalent of a double object construction (19-b), the direct object (= IC) cannot be introduced by *kɛ* (20-b).

- (19) a. Kwei **jo** foi.
K. ICV speed.IC
'Kwei ran.'
b. Kwei **wo** Dede ηaa.
K. ICV D. advice.IC
'Kwei advised Dede.'
- (20) a. Kwei **wo** Dede ηaa (*lé).
K. ICV D. advice.IC DEF
'Kwei advised Dede.'
b. *Kwei *kɛ* ηaa **wo** Dede.
K. *kɛ* advice.IC ICV D.
'Kwei advised Dede.'

One important evidence in support of ICVs as verbs, is that they inflect for tense, aspect, mood, and polarity (21), just like RTVs. Yet their ICs cannot be readily marked for number, as seen with for instance, the marking of plural on *foi* in (22). Also adjectival modification of ICs in the sense of what obtains with RTVs, is a bit fuzzy. While ICs like *ηaa* in (19-b) may be modified, as example (23-a) shows, many ICs e.g. *wɔŋ* (23-b) cannot be readily modified by an adjective. In fact the equivalent of (23-a) in Akan is illicit (24-a). (Instead a nominalised ICV-IC is used in order to allow such modification (24-b).) Based on these (and other properties), I will assume that the the IC is an N, not a D.

⁷Note that REL has high tone, different from FOC.

- (21) a. Kwei baá-**jo** foi.
K. FUT-ICV speed.IC
'Kwei will run (away).'
- b. Kwei é-**jó**-**ŋ** foi.
K. NEG-ICV-NEG speed.IC
'Kwei will not run (away).'
- (22) a. Kwei **jo** foi(-*i).
K. ICV speed.IC-PL
'Kwei ran.'
- b. Kwei **wo** Dede **ŋaa**(-*i).
K. ICV D. advice.IC-PL
'Kwei advised Dede.'
- (23) a. Kwei **wo** Dede **ŋaa** kpákpá.
K. ICV D. advice.IC good
'Kwei gave Dede a good advice.'
- b. *Kwei **bo** Dede wón **ŋ** gbónyo.
K. ICV D. deity.IC bad
'Kwei cursed Dede.'
- (24) *Akan*
- a. Kofi **tu**-u Amma fo (*papa).
K. ICV-PST A. advice.IC good
'Kofi gave Ama a good advice.'
- b. Kofi ma-a Amma e-fu-**tu** papa.
K. give-PST A. NML-advice.IC-ICV good
'Kofi gave Ama a good advice.'

ICVs are restricted in terms of the nominal element they select as ICs. They do not occur with generic meaning complements. For instance, *nii* cannot replace the IC *ŋaa* (19-b) as in (25). According to Essegbey (1999), ICVs only allow specific meaning complements. He argues that generic-meaning nouns cannot occur with ICVs because ICVs by themselves are vague and do need complements with more specific meaning, hence the IC. This observation perhaps explains why the IC does not receive indefinite DP interpretation even though it is typically a bare noun. This might also be related to why the IC does not occur with a definite determiner i.e. since it is inherently specific, it does not need further specification as definite or indefinite. Further support for the claim that ICs are specific meaning complements include the existence of ICV clusters in Kwa languages. For instance, Korsah (2011) shows that, in Gã, it is possible for different ICs to occur with a morphologically similar ICV and yield different interpretation of the V-N complex so formed. These are the so-called *ICV clusters*. A few are cited in (26).⁸

- (25) *Kwei **wo** Dede *nii*.
K. ICV D. thing

(26) *ICV clusters*

je fu 'smell badly'	bo wón 'curse'	wo gbe 'send away'
je kpo 'exit'	bo kó 'be truant'	wo shi 'warn'
je shishi 'begin'	bo nyomo 'incur debt'	wo món 'imprison'

⁸See Uchechukwu (2004) for instance, for a discussion of ICV clusters in Igbo.

It is possible to nominalise an ICV by using the same strategy as is used for RTVs i.e. by preposing the IC to its verb. Thus *wo ɲaa* ‘advise’ can be realized as (27).

- (27) ɲaa-**wo**-o.
advice.IC-ICV-NML
‘advice-giving’

When it comes to the pronominalisation of the IC, there seem to be mixed results from the various languages. For instance, while it is not possible to pronominalise the IC in Gã, and in Igbo (28-b), in Akan (29), and Ewe (30), the pronoun is required in certain discourse contexts. It is not absolutely clear why Gã and Igbo do not allow pronominalisation of ICs. But if we consider other facts about Akan and Ewe, it is reasonable to assume that ICs have *phi* features.

- (28) *Igbo* (Anyanwu 2012:1564)

- | | | | |
|----|------------------------------------------------------------|----|--------------------------------------------------------------|
| a. | Adhá nvuru ónú.
A. ICV mouthIC
‘Adha fasted.’ | b. | Adhá nvuru (*yá).
A. ICV 3SG.ACC
‘Adha fasted.’ |
|----|------------------------------------------------------------|----|--------------------------------------------------------------|

- (29) *Akan*

- Kofi **hyɛ-e** nkóm_i áa *(é_i)-bé-bá mú.
K. ICV-PST prophecy.IC REL 3SG.NOM-FUT-come inside
‘Kofi gave a prophecy that will be fulfilled.’

- (30) *Ewe* (Essegbey 2002)

- Núfíá lá **nɔ** anyí_i háfí suku-ví-á-wó **nɔ**-(e_i).
teacher DEF ICV ground.IC before school-child-DEF-PL ICV-3SG.ACC
‘The teacher sat down before the school children did’

Other properties for which ICV constructions behave differently from RTV constructions are focusing, relativisation, and *Wh*-marking. Only the IC may be focused, as in (31-a); it is illicit to focus an ICV, as in (31-b). It is important to mention that a focused IC has a predicate focus reading (and not a DP focus reading). Similarly, a relativised IC has a factive reading, (see (32)). With questions, IC cannot be marked with a question feature, whether *in-situ* or *ex-situ* (33).

- (31) a. ɲaa_i ni Kwei **wo** Dede t_i.
advice.IC FOC K. ICV D.
‘Kwei ADVISED Dede.’
- b. ***Wo**-o ni Kwei **wo** Dede ɲaa.
ICV-NML FOC K. ICV Dede advice.IC
- (32) ɲaa_i ní Kwei **wo** Dede t_i...
advice.IC REL K. ICV D.
‘The fact that Kwei advised Dede...’

- (33) a. *Kwei wo Dede méni ?.
K. ICV D. what
b. *Méni_i ni Kwei wo Dede t_i
what FOC K. ICV D.

Given the above discussions, I conclude that ICV constructions differ from RTV constructions in terms of the restrictions on the type of nominal complements they take i.e. while RTVs allow generic meaning complements, ICVs only take specific meaning complements, the IC cannot be introduced by *kɛ* in a (pseudo)-double object ICV construction. With regard to A-bar properties, only the IC can be focused, and when this happens, only a predicate focus reading is possible. Also, when an IC is relativised, the resultant construction is interpreted as a factive construction. The IC cannot, however, be marked with a *Wh*-feature. Thus there are contexts, such as word order, and verb phrase nominalisation, where ICV constructions behave like RTVs. There are situations, where they partially behave like RTV. For instance, it is possible to move the IC as a constituent, in constructions that involve A-bar operations, such as focusing, and relativisation. However unlike RTV, such operations in the context of ICVs, have a different effect on their interpretation. Finally, with regards to *Wh*-marking the nominal complement of the verb, ICV constructions, and RTV constructions, behave differently.

3.2. ICVs and idioms

In this section, I will discuss how idioms behave with respect to the morphosyntactic contexts in which ICVs and RTVs have been compared in previous sections. Like ICVs, idioms are also known for their semantic non-compositionality (Horvath & Sioni 2009). I will show that they share several properties with ICV constructions. Example (34) shows common idioms in Gã. The citation forms of the predicates involved are *gbó toí* ‘be stubborn’ in (34-a), and *tse (híe) atuá* ‘to rebel’.

- (34) a. Kwei **gbó** toí.
K. die ear
‘Kwei was stubborn.’
b. Kwei **tsé** Dede híe atuá.
K. tear D. face rebellion
‘Kwei rebelled against Dede.’

In terms of word order, we can see, considering (34), that idioms in Kwa also follow the SV(O)(O) structure. If we considered the structure of (34-b) as a double object construction, we are able to show that the direct object cannot be introduced by *kɛ* (35).

- (35) *Kwei *kɛ* atuá **tsé** Dede híe.
K. *kɛ* rebellion tear D. face

Like idioms across many languages, idioms in Gã are also subject to certain tense/aspect restrictions. For instance, the verb can be marked for perfective aspect (36-a) but not future tense (36-b). Note that past tense interpretation is felicitous (34-a).

- (36) a. Kwei é-**gbó** toí.
K. PERF-die ear
‘Kwei has been stubborn.’
b. *Kwei baá-**gbó** toí.
K. FUT-die ear
‘Kwei will be stubborn.’

The nominal complement of idioms can neither be marked for number (37-b), nor can it be modified by an adjective (37-b). It can also not occur with a definite determiner (38-a). However, the verb can be nominalised by preposing the complement (38-b).

- (37) a. *Kwei **gbó** toí-i.
K. die ear-PL
b. *Kwei **gbó** toí gbónyo.
K. die ear bad
- (38) a. *Kwei **gbó** toí lé.
K. die ear DEF
b. toí-gbé-lé
ear-die-NML
'stubbornness'

In addition to the above, verbs in idioms have a strict selectional restriction. They occur only with particular nominal complements, and do not allow generic meaning complements. For instance, *toí* 'ear' in *gbó toí* cannot be replaced by any other body part noun in order to yield a similar meaning. Their nominal complements also do not allow pronominalisation of any sort, not even in Ewe, as in (39). Finally, (40-41) suggest that, it is not possible to focus (40-a), relativize (40-b), or *Wh*-mark (41) the nominal complement in an idiomatic construction.

- (39) *Ewe* (Elvis Yevudey, p.c.)
a. Torgbui **mu** zi_i.
chief turnover stool
'The chief is dead.'
b. *Torgbui **mu-i**_i.
chief turnover-3G.ACC
- (40) a. *Toí ní Kwei **é-gbó** t_i.
ear FOC K. PERF-die
'Kwei has been stubborn.'
b. *Toí ní Kwei **gbó** t_i...
ear REL K. die
- (41) *Kwei **é-gbó** méni?..
K. PERF-die what
'Kwei will be stubborn.'

3.3. Interim summary

Thus, ICV constructions are similar to RTV construction with regards to word order, nominalisation strategies, non-restriction on verbal morphology, and the bearing of case features by the nominal complement. For focus properties, both ICVs and RTV constructions allow their complements to be focused except that in the case of ICVs, it results in a predicate focus interpretation. With regard to properties like adjectival modification and pronominalisation, there is no uniform behaviour by the languages under investigation. But it is obvious that ICV constructions show mixed properties even in this respect.

With idioms, ICVs share the following properties: (i) Both have the same word order and nominalisation strategies, (ii) Both allow no generic meaning complements, (iii) Both do not allow their complements to occur with a definite determiner or be inflected for number or *Wh*-feature, (iv) Both do not allow their nominal complements to be introduced by *ké* in a serialisation. The outcome of the above comparisons is summarized in Table 2.

Property	RTVs	ICVs	Idioms
Word order $SV(O_i)(O_d)$	✓	✓	✓
$k\epsilon$ introduced complement	✓	✗	✗
Generic meaning complement	✓	✗	✗
N-complement modifiability	✓	?	✗
Nominalisation strategy x	✓	✓	✓
Restricted N complement	✗	✓	✓
Pronominalisation of N	✓	?	✗
TAMP restrictions	✗	✗	✓
<i>Wh</i> on N	✓	✗	✗
Case on N	✓	✓	✗
FOC	V & N	N+pred	✗
REL on N	✓	✓ +factive	✗

Table 2: Comparing ICVs with RTVs and Idioms

As Table 2 shows, an ICV seems to straddle the border between RTVs and idioms, hence the claim that they have dual status. I acknowledge the various discussions and proposed analyses of inherent complement verbs in the literature e.g. Nwachukwu (1987); Avolonto (1995); Essegbey (1999); Korsah (2011); Anyanwu (2012); Aboh (2015). But I am of the view that the empirical observations outlined above have not received much emphasis in these previous works. More importantly, I propose a novel way to account for the observed dual properties.

4. Analysis

As we saw in the previous section, ICV constructions exhibit morphosyntactic and semantic properties that are associated with both regular transitive constructions and idioms (see Table 2). In this section, I develop an analysis that formally accounts for this dual behaviour.

4.1. ICV-IC in the Lexicon

I assume that an ICV and its IC are stored differently in the lexicon when compared to an RTV and its object (complement). I argue that, this explains the semantic compositionality differences. I also demonstrate how such verbs participate in various syntactic operations.

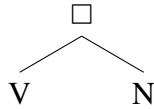
First, I assume that in the lexicon, the V and N of an ICV-IC, are stored as a fixed unit, with a concrete meaning. This [V-N] complex is not formed by a regular syntactic process. Thus, no part of it can be altered or replaced without altering its semantics. Crucially, since two heads i.e. V and N, form this complex unit, it does not have a label; the label of such a configuration cannot be determined, at least not based on *minimal search* (Chomsky 2013); (see (42)). Therefore, I assume example (43), to be the resulting structure. I claim that this representation of ICV-IC in the lexicon is the source of the idiom-like behaviour of ICV constructions. At this level, only syntactic processes which do not make reference to the label of the [V-N] complex may apply.

This is different for RTVs. Thus, in (44) when V and DP are merged, the resultant object will be either V or VP, given that V is the head.

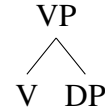
(42) *minimal search* (Chomsky 2008)'

For any syntactic object $K = \{\alpha, \beta\}$, α is the label if α is an LI and β is an XP

(43) *ICV-IC in the lexicon*



(44) *RTVs in the lexicon:*

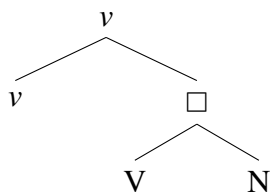


We saw that ICV constructions also exhibit properties of regular transitive verbs e.g. focus and nominalisation. Such processes are possible when the structure in (43) is put in the syntax. In that case, all grammatical properties of V and N need to be fixed at the earliest stage in the derivation. This is necessary in order to decipher, for instance, if the N can bear any case feature, or whether it can be marked for A-bar features such as, *Wh-*, focus, or relativisation. It is also necessary in order to understand whether it needs to undergo movement or not. This is also the stage at which it has to be determined whether the V needs to carry tense features etc., or otherwise. But since the concrete V-N is fixed in the lexicon (just as idioms), syntactic processes such as *Wh*-movement, pronominalisation, internal modification, pure NP focus etc, which typically make reference to the features that N lacks while it is part of a fixed unit in the lexicon, cannot apply. The syntactic label of (43) needs to be determined before these properties can be fixed. If the label is fixed, (43) can then be recognized as a syntactic object; as Hornstein et al. (2005) point out, "Labels are required for thematic interpretation: for a syntactic object Z to be interpreted as an element of the thematic domain, Z must be labeled." Once the labeling problem is solved, the relevant morphosyntactic features can readily be marked on V and N.

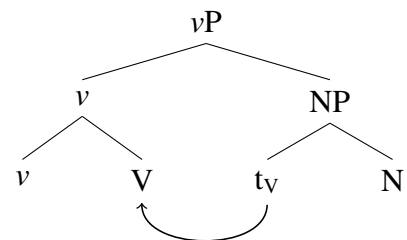
4.2. Resolving labeling problem

Assuming that the V-N in (43) is merged via a regular syntactic process, it is apparent that *minimal search* cannot be a reliable mechanism to resolve the labeling problem at hand; the merged items are symmetrical i.e. two heads. Instead, a solution can be found in movement (Chomsky 2008, 2013). By moving one of the constituents, an asymmetry is created for a label to be projected. This is illustrated in (46).

(45) *Merging V-N with v*



(46) *V-to-v movement*



In (45), (43) is merged as a complement of *v*. In order for (43) to have a syntactic label,

V moves to adjoin to v (46), leaving N as the sole head of (43) within (46), and therefore projecting NP (46). Once the labeling is resolved, the NP and V in (46) can now participate in the relevant syntactic operations. For instance, the verb may be inflected for tense, and the N may be assigned case. This accounts for the RTV properties that ICV constructions exhibit.

4.3. On the cyclicity of syntactic operations

A few predictions follow from the account proposed above with respect to the morphosyntactic operations that are possible with ICV constructions. In this section, I will discuss why only some of these operations may apply before and after the V-to- v movement, as summarized in Table 3. I argue that this is basically due to cyclicity and the order of operations in the syntax.

Pre-V movement	Post-V movement
Pure N(P) focus	Pars-pro-toto focus
Relativisation	Event relativisation
Pronominalisation	Case assignment
Modification	Standard linearisation
Wh-movement	Nominalisation

Table 3: *Pre/Post-V movement operations*

The general observation seems to be that, all the morphosyntactic operations which may apply only after V movement has taken place, are those that require accessibility to the internal structure of the initial [V-N] complex before it enters the syntax. Thus, such operations are not possible at the pre-movement stage because they make reference to the constituents of a structure which does not count as a syntactic object. For instance, *Wh*-movement requires the identification of NP/DP with a *Wh*-feature. But before V moves, the NP headed by the IC cannot be marked with *Wh*-feature since it is part of a [V-N] idiom. This is an instance of *counter-bleeding* i.e. these (unsuccessful) operations try to apply too early, see Georgi (2014). On the other hand, the pre-V movement operations fail to apply after V movement because otherwise they violate the *strict cyclic condition* i.e. they try to access subdomains of a completed structure. This follows from Chomsky (1973), that:

- (47) “No operation can apply to a domain dominated by a cyclic node α in such a way as to affect solely a proper subdomain of α dominated by a node β which is also a cyclic node.”

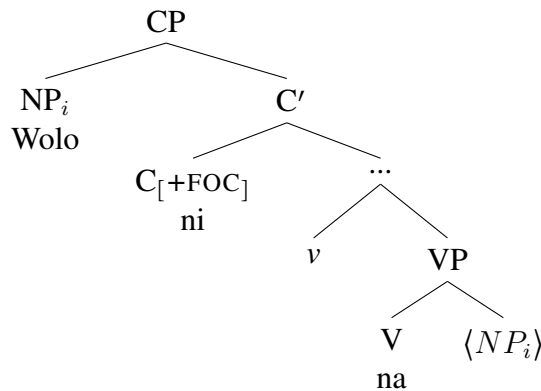
For our purposes, the NP complement of V in (46) is thus a cyclic node. *Wh*-movement for instance requires syntax to inspect the *Wh*-feature of N before the NP can move. However at the pre-V movement stage when the complex [V-N] is not yet a syntactic object, syntax cannot see this feature. On the other hand, in the course of the derivation after V-movement has taken place, reference cannot be made to the N subdomain of the syntactic object NP (this will violate *strict cyclicity*). This latter scenario is an instance of *counter-feeding* i.e. these operations try to apply too late.

4.4. Accounting for the focus properties

As we saw in Section 3.1, it is perfectly licit to focus the various constituents in RTV constructions including the object and the verb (48). The significant thing here is that either process results in the expected reading i.e. the object focus has argument focus reading, and the verb focus has predicate focus reading. (49) sketches how object focus may be derived for RTVs.

- (48) a. Wolo_i ni Kwei na t_i.
 book FOC K. see
 ‘Kwei saw a BOOK.’
 b. Na_i-a ni Kwei **na**_i wolo.
 see-NML FOC K. see book
 ‘Kwei SAW a book.’

(49) *Object focus:*

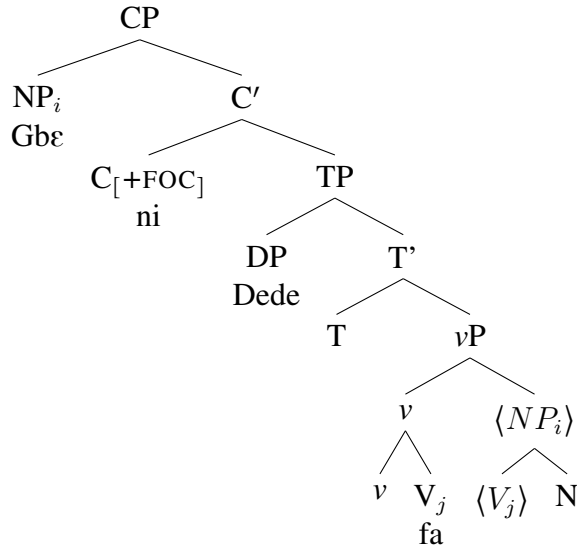
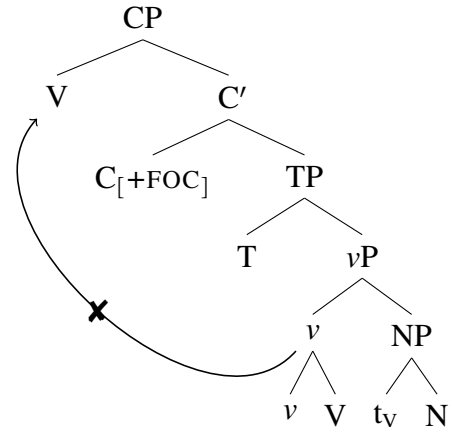


Essentially, the NP object of the verb in (49) is marked with a focus feature which is checked in a Spec-Head configuration with a C_[+FOC]. This triggers its movement to Spec-CP. I assume that a similar derivational process holds for predicate focus construction in (48-b).

For focus constructions involving ICVs, however, we encounter two main problems: (a) only the IC may be focused; it is illicit to focus an ICV (50-b), (b) a focused IC has a predicate focus reading, not an argument focus reading, as (50-a) shows (when compared to (48)).

- (50) a. Gbε_i ni Dede **fa** t_i.
 way.IC FOC Dede ICV
 ‘Dede TRAVELED.’
 b. ***Fa**_i-a ni Dede **fa**_i gbε.
 ICV-NML FOC Dede ICV way

Given the approach to ICV constructions proposed here, this observation can be adequately explained. The predicate focus interpretation of (50-a) is to be expected. On independent grounds, Fanselow & Lenertova (2011) argue that only a part of what is focused can undergo movement to the left periphery though the interpretation of what is focused also includes the part of the focused constituent that was not moved. Also, given the copy theory of movement (Nunes 2004), it seems that the interpretation of the focused N(P) includes the V which has been (copy-)moved to v. The remaining challenge is to account for why (50-b) represented in (52) is illicit.

(51) *NP(IC) focus:*(52) *V(ICV) focus:*

There are two possible explanations for the structure in (52); one based on syntax, the other based on semantics. Syntactically, we would need V in order to focus a VP. This would require that N is scrambled out of the VP to Spec-vP. But this is not possible given that it is the head which gives the NP its label. Alternatively, we could try to move *v* (made up of *v* and a null V). But this is not possible because it would require crossing T and C, and this will constitute a violation of the *Head Movement Constraint*.

From a functional or semantic perspective, the illicitness of the movement operation in (52) may be due to the fact that the verb in an ICV construction is semantically light as argued for by Essegbey (1999), and Aboh & Dyakonova (2009). If this is correct, then ICVs, like *light verbs* (Butt 2010), cannot fully perform the function of carrying the extra semantic burden that focused elements carry for information structure reasons.

5. Conclusion

In this paper, I have demonstrated that constructions involving inherent complement verbs exhibit dual behaviour; they behave both like regular transitive verbs, and idioms. Based on this, I have claimed that ICVs have dual status; they are partially regular transitive verbs, and they are partially idioms.

In order to account for this dual status, I have proposed that the ICV and its IC are initially stored as a non-headed unit, with a fixed and concrete meaning, in the lexicon. This is the mechanism that gives them their idiom-like properties, since at this stage, neither the V nor the N can be separately marked with any morphosyntactic feature, making them opaque for certain syntactic operations. When the V-N complex unit is put in the syntax however, the V, i.e. the ICV, moves in order for the N, i.e. the IC, to project a label as NP. This makes it possible to fix all the morphosyntactic properties associated with both the V and the N. Subsequently, either constituent can participate in various syntactic operations. This latter situation accounts

for the RTV-like properties of ICV constructions.

The analysis presented here also accounts for the apparent syntactic and interpretational asymmetries between focused constituents in regular transitive constructions on the one hand, and inherent complement verb constructions on the other. The same holds for relativisation. It also explains why ICV constructions might be different from idiomatic expressions in the languages under study. In addition, it shows that the cyclic nature of syntactic operations may be critical in derivations involving ICVs. Thus, we are able to account for several cases of *counter-bleeding* and *counter-feeding* in the derivation of inherent complement verb constructions.

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Lexical preferences in Dutch verbal cluster ordering

Jelke Bloem

This study discusses lexical preferences as a factor affecting the word order variation in Dutch verbal clusters. There are two grammatical word orders for Dutch two-verb clusters, with no clear meaning difference. Using the method of collocation analysis, I find significant associations between specific verbs and word orders, and argue that these associations must be encoded in the lexicon as lexical preferences. In my data, the word orders also show some semantic associations, indicating that there might be a meaning difference after all. Based on these findings, I conclude that both word orders are stored in the lexicon as constructions.

1. Introduction

In some contexts, a speaker of a language can choose between different constructions to express a similar meaning. A well-known example of two such near-synonymous constructions in English is the dative alternation: [S *gave* DO *to* IO] or [S *gave* IO DO]. The Dutch language has a word order variation where two orders express what appears to be the same meaning: the word order in clusters of two verbs. In this study, I tested for lexical associations with a particular word order using collocation analysis, and discuss whether the two word orders should be viewed as different constructions.

In Dutch, as in other Germanic languages, grammatical categories such as tense and aspect can be expressed with auxiliary verbs. These verbs are grouped together with the main verb (a lexical verb) into verb clusters, in which the order of the verbs may vary. Unlike other Germanic languages, Dutch exhibits this variation even in clusters of two verbs. Both possible two-verb cluster orders are grammatical, leading to optionality:

- (1) Ik denk dat ik het **begrepen heb**
I think that I it understood have
'I think that I have understood it.'
- (2) Ik denk dat ik het **heb begrepen**
I think that I it have understood

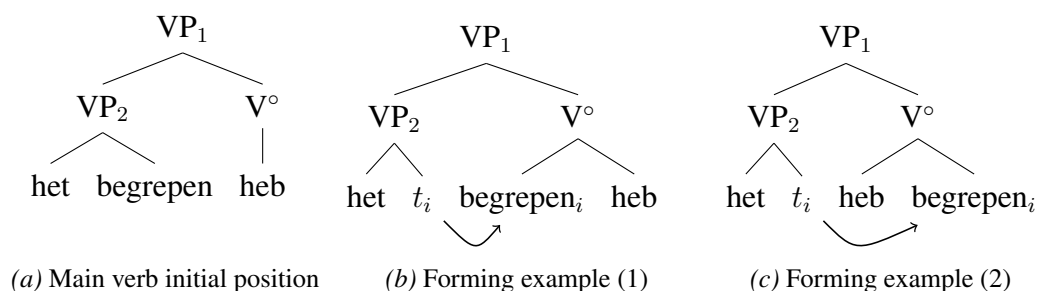


Figure 1: Verb raising to generate the verbal clusters of examples 1 and 2, following the analysis of Evers (1975).

Speakers may produce either order in similar contexts. A notable aspect of this optionality is that the difference in word order does not appear to correspond to a meaning difference. However, when speakers choose between constructions in these situations, they do not do so randomly.

Example 1 shows the 2-1 order, so called because the syntactically higher head verb (referred to as 1) comes after the lower lexical verb (referred to as 2). This is the order that is used in German. Example 2 shows the 1-2 order, where the head verb comes first. This order is used in English. In Dutch, there are no such grammatical restrictions and speakers may produce either order. A notable aspect of this optionality is that the difference in word order does not appear to correspond to a meaning difference (e.g. Bader et al. 2009), although it has been argued that there is a difference in interpretation (Pardoën 1991).

The word order variation found in verb clusters is commonly analyzed as the result of a purely syntactic process, in which one order is the base form, and others are derived from it. These analyses rely on various syntactic movements to account for the observed word orders (e.g. Evers 1975; Barbiers 2008). The original proposal of Evers (1975) states that verbal clusters are formed through the mechanism of verb raising. In verb raising, the main verb is generated as the complement of the head verb of the cluster and then moves up to join the head verb. Figure 1 illustrates this process of cluster formation. The main verb *begrepen* is raised to attach to the governing verb *heb*, forming a complex head. It can attach on either side of the head verb, resulting in either a 2-1 (Figure 1b) or 1-2 (Figure 1c) ordered verbal cluster.

Lexical-semantic considerations generally do not come into play in these purely syntactic approaches. For example, Barbiers (2008) states that semantic interpretation takes place with the entire verb cluster and its syntactic structure as an ‘atomic’ unit and that it only gets its word order during phonological interpretation (PF), which comes after semantic interpretation (LF) in minimalist grammar. Under this view, lexical semantics and verb cluster word order cannot interact.

However, when speakers choose between grammatical verb cluster orders, they do not choose randomly. Corpus studies have shown that a large portion of the variation can be statistically explained using multifactorial statistical models that incorporate a variety of linguistic factors. De Sutter (2005) and Bloem et al. (2014) found that morphological and semantic factors correlate with the variation, as well as processing-related properties such as sentence length and word frequency. This finding indicates that the syntactic mechanisms that produce verb clusters do

not operate independently from the non-syntactic factors discussed in these studies. At the same time, these models do not account for all of the variation. Bloem et al. (2014) report a concordance index of $c = 0.7649$ over the constructions investigated in the present work. The c-index measures the predictive power of a model — a value of 0.5 corresponds to chance level, and 1 indicates perfect prediction. This means there are other factors that correlate with the choice between verb clusters, but are not included in these statistical models.

In this study, I look for evidence for such factors by focusing on the usage patterns of main verbs in verb clusters in a corpus of Dutch. Previous corpus studies on verb clusters have not included main verbs, possibly due to the need for a very large corpus to find enough instances of specific verbs in verb clusters. Main verbs are the most likely source of variation that has not been studied yet, besides factors that cannot be studied using written corpora of standard language. By studying the main verbs that speakers prefer to use in each order, we can learn more about the choice between the two word orders.

I will obtain this information by computing associations between a specific verb and a specific word order using a statistical measure of association, i.e. verbs that occur significantly more often in the 1-2 order and verbs that occur significantly more often in the 2-1 order. I will then compare the two orders. These associations will be referred to as ‘lexical associations’, a measure of association in a corpus. This procedure is known as a distinctive collexeme analysis (Gries & Stefanowitsch 2004).

Lexical associations with an open class of words such as verbs or nouns, with no selectional restrictions, are not often investigated. Most likely, this is because there are so many possible words that could be used, and most of them are relatively infrequent. For example, in a 1.7 million word sample from the 700 million word Dutch Lassy Large corpus (van Noord et al. 2013), we can find 2.570 instances of two-verb verbal clusters in the 2-1 order, but to model lexical associations, one needs to find enough instances of the word order with particular verbs. The most frequent main verb in this sample occurred 129 times and the fifth most frequent verb occurred only 31 times, and this number strongly decreases for less frequent verbs following Zipf’s law. A sample of this size would give us insufficient data for all but the most frequent of words despite the overall size of the corpus.

With the increasing availability of large, automatically annotated corpora, it is now possible to obtain large samples of constructions using the same word, making it possible to compute lexical associations and study lexical preferences. I am aware of one previous study taking this approach. Lehmann & Schneider (2012) used a 580 million word dependency-parsed corpus of English to study the influence of specific lexical types on the English dative alternation. These types consist of ‘triplets’ of words: a ditransitive verb, a direct object head and an indirect object head — these slots are all filled with open-class words, making it a more difficult problem than main verbs in verb clusters. The authors note that ‘We indeed find that 580 million words are barely enough data to yield results for full lemma triplets’.

In this study, I use the Wikipedia section of the Lassy Large corpus, which is currently the largest corpus for Dutch, to automatically extract all 411,623 two-verb verbal clusters of the type investigated in this study. The size of this data set is sufficient to study lexical associations for a single open slot (the main verb in a verb cluster). I am not aware of any other studies applying collostructional analysis methods to a large dataset from an automatically annotated corpus.

Lexical associations can emerge for various reasons, and are not easily accounted for. Firstly,

observed lexical associations can be a consequence of more general factors, such as the ones investigated in the studies just mentioned. It might be the case that the construction prefers a larger class of verbs, and that particular verb is just one of them. For example, if a particular verb is significantly associated with the 1-2 word order, and it is morphologically complex, it could be because the general factor ‘morphological complexity’ is associated with the 1-2 order. Because these effects are already known, I have not studied them in detail, but I have tried to control for them. Secondly, lexical associations can indicate a lexical preference of the word order, and lastly, they can indicate a semantic preference of the word order. When controlling for more general factors, lexical and semantic preferences are two factors we might expect to find by investigating the usage patterns of main verbs. In the remainder of the introduction, I will discuss these factors in more detail.

1.1. Lexical association and preference

Because human language learning appears to make use of statistical learning abilities (e.g. Rebuschat & Williams 2012), it might be expected that the specific verbs speakers use play a direct role in the choice between grammatical verb cluster orders. A word that is more often heard in one of the two possible word orders by a speaker for whatever reason, may also be produced more often in that order, preserving the association. This phenomenon has been called lexical association (Hindle & Rooth 1993), and is also known as ‘lexical idiomaticity’ (e.g. Speelman et al. 2009).¹ When this association cannot be attributed to other, more general factors, it must be a lexical preference. A lexical association can be observed, but to establish that it is a lexical preference, other factors must be excluded. Conversely, if lexical preferences do not exist, one would expect that no statistically significant associations will be found, after controlling for other known factors that affect verb cluster word order and are properties of the main verb.

Such a preference has to be stored in the mental lexicon in some way, for example, as features of the word in the lexicon (in lexicalist grammars), or as a weighted link between the word and the word order construction in a constructional network (in a construction grammar). There are three logical options: the association is stored as a preference of the verb, as a preference of the construction whose form is the 1-2 order, or as a link between the verb and the 1-2 order in a network of constructions. The first option is unlikely because the main verb of a verb cluster is the complement of the verb cluster construction, which should not be able to affect word order according to most theories of language. It is more likely that any such preference would be stored as a preference of the verb cluster order construction for particular verbs.

In this paper, I will not discuss why particular words may prefer particular cluster orders (or the reverse). These preferences could have various origins, such as historical usage patterns, which would have to be explained for each verb individually. My interest is in simply finding evidence for or against the existence of such preferences.

Current theories on verb cluster formation do not allow for lexical preferences to affect

¹The term ‘lexical idiomaticity’ as defined by Speelman is more broad, though. It includes lexical restriction as well as association. When a construction has lexical restrictions, some combinations of words and constructions are ungrammatical rather than just preferred or dispreferred. I will use the term lexical preference as there are no apparent restrictions, lexical or otherwise, on two-verb cluster ordering with participial verbs.

word order. If such lexical preferences exist, we will have to account for them. An analysis that accounts for the role of syntax, semantics and lexical semantics simultaneously can be provided by construction-based approaches to language (e.g. Fillmore 1985; Goldberg 2002). In these approaches, syntax (form) is inextricably linked to semantics (meaning). A ‘lexicon’ of constructions is proposed, sometimes called a constructicon, which contains form-meaning pairs at various levels of abstraction, ranging from a highly abstract subject-predicate construction to fixed multi-word expressions to individual words. In construction-based approaches, both verb cluster orders would be distinct constructions, since they differ in form. As a consequence, they can have distinct properties that are stored in the constructicon, such as semantic properties, functional differences or links to other constructions.

A problem for construction-based approaches to verb clusters is the lack of clear semantic differences between the two orders. According to the approach just described, a form without a distinct function should not exist. Perhaps there is just a single verbal cluster construction, and factors external to the lexicon determine the word order. Alternatively, it might be the case that the verb cluster orders do have semantic properties, but they have not been noticed yet in previous research. One study by Pardoën (1991) does argue that there is an interpretation difference between the two orders — in this view, 1-2 orders are assigned a dynamic interpretation, while 2-1 orders are assigned a stative interpretation. For this reason, I have also tested for semantic preferences of the word orders in this study, including *STATIC* and *DYNAMIC*.

1.2. *Semantic preference*

As I mentioned earlier, lexical associations might be explained by the fact that the lexical verb belongs to a larger class of verbs, which the construction prefers. And according to construction-based approaches to language, semantic differences should exist. It therefore makes sense to test for semantic preferences among the main verbs used with the word orders. Such semantic preferences have also been observed for the English dative alternation for example, where the semantic class of the ditransitive verb (*TRANSFER* or *COMMUNICATION*) statistically explains part of the observed word order variation (Bresnan et al. 2007).

Because Dutch verbal cluster word orders do not appear to express a meaning difference, I did not have a hypothesis on what sort of semantic preferences might be found among the verbs associated with a particular order (perhaps with the exception of adjectival participles, which I will discuss later). Nevertheless, I have studied general semantic properties of the associated verbs in an attempt to find semantic associations.

If the word orders have distinct semantic preferences, and if lexical associations with verbal cluster word orders are observed, this would support the hypothesis that the word orders are constructions. To look for lexical associations that may indicate lexical preferences, and for semantic associations of the verb cluster orders, I will use a collostructional analysis method.

The rest of the paper is structured as follows. I discuss how lexical associations can be measured in section 2. Section 3 will discuss related work on Dutch verb clusters, and section 4 describes the corpus data I used for this study, as well as the way in which the analysis was performed. Section 5 presents the results of the study, followed by a discussion in section 6.

2. Measuring lexical associations

Various corpus studies have already been performed where associations between words and syntactic structures were used as evidence, particularly studies focusing on the meaning difference between constructions (e.g. Hilpert 2008; Coleman 2009; Levshina 2011). A method has been developed to measure such associations between words and constructions, called collostructional analysis (Stefanowitsch & Gries 2003). Statistical association measures, such as χ^2 , are used to calculate which words (or lexemes) co-occur with a construction most strongly in a specific syntactic position. A lexeme that is strongly associated with a construction is called a collexeme of that construction, and the combination of the collexeme and the construction is called a collostruction (hence the name collostructional analysis).

Collostructional analysis is an extension of collocational analysis. While collocational analysis measures co-occurrence of lexical items, collostructional analysis measures the association strength between constructions (usually words) that occur in other constructions (usually a grammatical structure). The method is based on the theoretical assumptions of the Construction Grammar approach to language, where constructions are seen as pairs of form and meaning and some part of the form or some part of the meaning is not entirely predictable from the components of the entire construction. The scope of what is considered a construction is quite broad, ranging from individual words to more abstract grammatical elements such as the past tense construction, which can be filled with any verb. Constructions can also be partially filled, such as a certain verb having a particular subcategorization frame, e.g. [SUBJ *give* O_i O_d]. In this case, the verb *give* is filled in, while the other elements are open slots that can be filled, e.g. O_d can be filled with a direct object that is semantically compatible with the construction. Any lexical item can occur in a more abstract construction as long as the lexical item is semantically compatible (though not necessarily identical) with the meaning of the construction it occurs in (Stefanowitsch & Gries 2003:p. 209-213).

The procedure described by Stefanowitsch & Gries (2003) is as follows. First, one particular construction that has one or more open slots to be filled by lexical items is chosen to be analyzed. Next, with the help of manual inspection and coding, all the lexemes occurring in the slot are extracted from a text corpus (Stefanowitsch & Gries 2003:p. 214-215).

In order to calculate the strength of association between the lexemes and the construction, Stefanowitsch & Gries chose the statistic Fisher's Exact Test (FET) since it is able to handle low-frequency data and it does not make any distributional assumptions. The input to FET is a 2-by-2 contingency table that contains the single and joint frequencies of the construction and the given lexeme, i.e. the frequencies of the lexeme in the construction, the lexeme in other constructions, the construction with other lexemes and finally all other constructions with all other lexemes. Table 1 is an example of this. The output is a p-value according to which the collostructions can be ranked: the smaller the p-value, the more strongly associated the construction and the collexeme are (Stefanowitsch & Gries 2003:p. 218-219).²

Finally, by way of linguistic analysis, the first ten to thirty ranks of the collexemes are ex-

²Subsequent studies have used measures of effect size such as the odds ratio for comparison and ranking, since p-values should not be compared directly — p-values of null-hypothesis significance tests are either significant or they are not, further interpretation is not meaningful.

amined, and Stefanowitsch & Gries classify them according to their semantic and sometimes also syntactical properties. For example, they state that all the collexemes occurring as objects of *cause* have a negative connotation. Furthermore, they group them according to their argument structure (Stefanowitsch & Gries 2003:p. 221). As a result of knowing what collexemes a construction has, they claim that one can objectively identify the meaning of the construction.

The work was later extended to a family of methods, including distinctive collexeme analysis (Gries & Stefanowitsch 2004), which provides a measure of the preference of a collexeme for one of two different constructions. The collexeme lists of two constructions are compared directly. Distinctive collexeme analysis is typically used for identifying meaning differences between grammatical constructions. Some of the collexemes that are associated with the same constructions generally share some semantic properties, as shown by Stefanowitsch & Gries (2003).

In the present work, I apply the collostructional analysis method to a phenomenon in which the form-meaning or form-function mapping is not so clear: verb clusters in Dutch.

3. Verb clusters

The Dutch language, like other Germanic languages, can use auxiliary verbs to express properties such as tense and aspect. This creates groups of verbs which, in some of the West-Germanic languages, have particular syntactic properties. When this is the case, these verb groups are called verb clusters. Languages with verb clusters have some degree of word order variation in multiple verb constructions with more than two verbs, and they all exhibit the *Infinitivus Pro Participio* (IPP) effect, where modal verbs that would normally be participles show up as infinitives (Wurmbrand 2006). Besides Dutch, verb clusters are also found in German, Frisian, Swiss-German, Afrikaans and various dialects and subgroups related to these languages. Verb clusters are a widely studied phenomenon in the syntactic literature on Dutch, particularly for their syntactic structure and for their optionality (Evers 1975; Haegeman & van Riemsdijk 1986; Zwart 1996; Barbiers 2008). The mechanism of verb raising is used to account for the existence of verbal clusters as a syntactic phenomenon, as illustrated in the introduction. A broad overview of verb raising across Germanic languages, as well as different theoretical accounts of the phenomenon, is provided in Wurmbrand (2006).

Dutch verb clusters were originally noted for their regional variation. In the literature, the 2-1 order construction in Example 3 (repeated from the introduction) is often called the ‘groene volgorde’ (green order), and the 1-2 order of Example 4 is called the ‘rode volgorde’ (red order):

- (3) Ik denk dat ik het **begrepen heb**
 I think that I it understood have
 ‘I think that I have understood it.’
- (4) Ik denk dat ik het **heb begrepen**
 I think that I it have understood

This terminology dates back to a study on regional differences by Pauwels (1953). The orders were named after their color on a dialect map. This terminology has been used among Dutch

linguists since then, though because it is somewhat confusing and does not cover the cases with more than two verbs, alternatives have been used. In my terminology (1-2 and 2-1 order) I follow Stroop (1970), who calls the green order *descending* and the red order *ascending*. These terms refer to the idea that the finite auxiliary is the verb that is highest in the syntactic tree, while the main verb is the lowest. This lets us number the verbs: example 3 shows a 2-1 order. Larger clusters can thus be adequately described, e.g. a 4-3-2-1 cluster, where 4 is the main verb, although discussion in this paper is limited to two-verb clusters.

There are various types of two-verb clusters to consider, all of them exhibiting free variation but with different probabilities. Examples 3 and 4 show two-verb clusters with auxiliary heads, and a participial main verb. When I discuss clusters with auxiliary verbs (or ‘auxiliary clusters’), I am referring to the following types of auxiliary verbs that can occur as the head of a verb cluster:

- Auxiliaries of time (*zijn* ‘to be’ and *hebben* ‘to have’)
- The passive auxiliary (*worden* ‘to be’)
- The copular verbs *zijn* ‘to be’ and *worden* ‘to be’

These three verb lemmas are all of the auxiliary verbs that take participial main verbs, and this categorization follows the terminology used by De Sutter (2005). The two copular verbs are only included because they have the same form as other auxiliary verbs, which makes them difficult to distinguish in a corpus. Auxiliary clusters as defined here appear to exhibit the greatest amount of variation, and the present study includes only auxiliary clusters.

Other auxiliary verb types can occur as heads of verb clusters. The most frequent of these are clusters with modal verbs, such as *kunnen* ‘can’. These clusters are used in the 1-2 order overwhelmingly frequently, though 2-1 orders with modals do occur and are considered grammatical by most speakers (Pauwels 1953). Furthermore, clusters can be formed with the causal auxiliary *laten* ‘let’, and with some non-auxiliary grouping verbs such as *zien* ‘see’, or other copular verbs such as *blijven* ‘remain’. These constructions are also grammatical in both orders. I consider all these to be different constructions from the auxiliary clusters, since they have clearly different word order preferences.

Besides the theoretical syntax work on verbal clusters, there have been various studies looking into other aspects of language as possible explanations for the order variation. The rules and mechanisms that are used to account for the phenomenon of verb clusters in generative literature allow for a lot of optionality, and thus mainly outline the constructions in which order variation can occur. Coussé et al. (2008) provide a summary of recent work on verbal cluster variation, summarizing three dissertations on the topic (De Sutter 2005; Coussé 2008; Arfs 2007). A diverse set of factors that may influence the use of 2-1 and 1-2 orders has been discussed in these works, and Coussé et al. (2008) group them into four broad categories.

- Contextual factors include the regional background of the speaker and mode of communication. This factor does not affect intra-speaker variation, however.
- Rhythmic factors relate to the hypothesis that speakers may change the order of verbs to match the standard stress pattern of Dutch. This may not be so important in written

language, though. De Sutter (2009) did not find a strong effect of stressed syllables near the cluster in his corpus study of written texts.

- Discourse factors are mentioned with syntactic priming as an example. In a psycholinguistic study, Hartsuiker & Westenberg (2000) showed that verbal cluster orders can undergo structural priming, which also suggests that both verbal cluster orders may be considered to be distinct linguistic units or constructions.
- Semantic factors are also mentioned, even though verb cluster orders are said not to differ in meaning. Coussé et al. (2008) mostly seem to refer to the semantics of the auxiliary verb when discussing this factor, not the main verb. There is one exception to this, however. De Sutter (2005) showed that adjectival participial main verbs, such as *vermist* ‘missing’ (the man is missing / the missing man), occur more in the 2-1 order. This is probably because a real adjective could not come after the head verb in Dutch, a language that is verb-final at least in subordinate clauses.

There have been a few studies that took many factors into account at the same time, initially by De Sutter (2009), and expanded by Bloem et al. (2014). These two studies tested the association of 10 factors with various types of verbal clusters, and found clear effects for a variety of factors, such as the type of auxiliary verb and the sentence length. However, the models used in these studies do not explain all of the variation observed in the corpora. Bloem et al. (2014) reports a c-score of 0.76, where 1 is a perfect model (though that should be impossible to achieve). One possible cause of this is that they do not take the main verb into account as a factor in their model. There are simply too many possible main verbs to include as factors in a logistic regression model. In contrast, the method of collostructional analysis used in the present work makes it possible to quantify lexical associations, allowing for the analysis of the factor of main verb lexical preferences. However, collostructional analysis methods are not multifactorial, and therefore do not control for the other factors directly. Some of the factors that were found to affect verb cluster order by De Sutter (2009) and Bloem et al. (2014) are contextual, such as the length of the middle field of the clause the verb cluster occurred in. Such factors are not likely to affect lexical associations — there is at most an indirect link. For example, there could be a verb that occurs only in long clauses, and a lexical association with a word order computed for such a verb might also include the association between long clauses and that word order. However, other factors, such as the morphological complexity of the verb, are properties of the verb and may also affect the computed lexical associations. I will take these factors into account when I discuss the results. Next, I will describe the data and method used to perform this analysis.

4. Method and data

For my analysis, I have extracted data from a syntactically annotated corpus, the Wikipedia part of the Dutch-language Lassy Large corpus (van Noord et al. 2013). The Lassy Large corpora have their own search tools with which they can be queried, and in this way I automatically extracted the verb cluster constructions I am looking for. In this section, I will describe how I

	<i>horen</i>	\neg <i>horen</i>	totals
2-1	<i>c</i> =406	367,181	<i>vn</i> =367,587
\neg 2-1	974	198,876	199,850
totals	<i>cn</i> =1,380	566,057	<i>n</i> =567,437

Table 1: An example contingency table for the verb *horen* ‘to hear’, used in collostructional analysis

extracted the relevant data from the corpus and applied the collostructional analysis method to it.

I used a corpus that is fully syntactically annotated because I need to know about syntactic relations between verbs in order to extract the constructions that are relevant for the analysis. I need to know which verbs belong together in a cluster (rather than just being adjacent in the text but in different clauses), and which verb is syntactically higher. This kind of information is only included in corpora with full syntactic annotation, such as the treebanks created by natural language parsers.

4.1. Method of analysis

As mentioned before, I use distinctive collexeme analysis to obtain lexical associations, and perform this analysis on large amounts of corpus data.

In their first study using collostructional analysis, Stefanowitsch & Gries extracted their data using item-by-item inspection and manual coding. They argue that the syntactic (tree) structure is not always enough to extract a construction, and that the constructions should be looked at on a more abstract level of representation. However, I decided that it is better to automatically extract every syntactic pattern of a construction that occurs. This allows for the analysis of more data, at the risk of including some errors. These errors are less likely to be a significant factor in the analysis when there is more data. Furthermore, by using an automatically annotated corpus for Dutch, I have already introduced the chance of errors anyway — the annotation may contain errors, since automatic parsers are not perfect. Because verbs are still analyzed correctly most of the time, the use of a frequency cutoff for my data should mitigate their effect on the outcome of the analysis. Manual inspection of the data showed that erroneously annotated word forms only appear with low frequency, so by using a frequency cutoff and excluding low-frequency words, I mostly exclude such errors. The use of a frequency cutoff is also important to make sure that only words that are frequent enough for statistical analysis are included. Furthermore, to ensure that the extraction queries only returned the constructions I am looking for, I manually tested and inspected samples of the data that the queries returned.

In my distinctive collexeme analysis, I test for associations between each verb cluster order and particular main verbs. The method considers a construction to be a grammatical structure with open slots or variables for words. Example 4 can be abstracted to a structure [*heb* V], in which V is an open slot that takes any main verb that is semantically compatible with this construction (with *hebben* ‘to have’). Associations between instances of V and this particular

construction [*heb* V], as opposed to the construction [V *heb*], can then be calculated using a statistical measure of association, similar to collocation identification.

There are four frequency counts I need to extract from the corpus to be able to perform this calculation, as shown in Table 1. The value *c* is the frequency of co-occurrence of a potential collexeme with the 2-1 order construction. To extract this I looked up all instances of the construction and counted the frequencies of the verbs occurring in them. The value *vn* is the frequency of occurrence of the potential collexeme in all verb clusters. The value *cn* is the frequency of occurrence of the 2-1 word order in verb clusters in the corpus. Lastly, the contingency table requires the frequency of all constructions with all lexemes, *n*. In their analysis of the construction [N *waiting to happen*], Stefanowitsch & Gries (2003) use the total number of verb tags in their corpus, since their construction centers around the verb ‘wait’. Since I only look at verbs in clusters, I use the total number of verb clusters. The other values in the contingency table can be calculated automatically based on these four values.

As mentioned previously, a disadvantage of the distinctive collexeme analysis method is that other factors that may affect the lexical association cannot be controlled for in the computation, besides the factor ‘frequency’. This means that part of the lexical association may come from more general factors, rather than from a lexical preference. To compensate for this, I ran some additional tests to exclude certain factors. Furthermore, as in other collostructional analysis experiments, I performed a semantic analysis of the results to look for general semantic factors. For example, Stefanowitsch & Gries (2003) analyze their lists of collexemes by looking for semantic generalizations in them, such as ‘verbs denoting ways of speaking cleverly and deviously’. I have taken a more objective approach to this analysis by using semantic properties of verb senses from the Cornetto lexical-semantic database (Vossen et al. 2013).³

4.2. Corpus data

To obtain data on Dutch verb cluster constructions, I used the Wikipedia section of the Lassy Large corpus. This section consists of the entire contents of the Dutch-language Wikipedia website on the 4th of August, 2011, automatically annotated with the Alpino parser for Dutch. This parser is currently the state of the art for Dutch, performing with an average concept accuracy (in terms of correct named dependencies) of 86.52% (van Noord 2009). The accuracy of the parser on Wikipedia text specifically is 88.38%. Lassy is the largest syntactically annotated corpus for Dutch, and the Wiki part contains 145 million tokens. While its syntactic annotation is automatically assigned and may contain errors in its analysis of verb clusters, the size of the dataset is very important in collostructional analysis. Most of the collexemes occurring in any given construction occur rarely in that construction (Stefanowitsch & Gries 2003), just as most words are infrequent (Zipf’s law), so a large dataset is required in order to draw general conclusions about collexemes.

The corpus is stored in an XML-based format, containing the syntactic tree structure and various attributes of each node in the tree that were annotated. To indicate non-local dependencies (for phenomena such as WH-movement and subject extraction), commonly a problem for tree

³ Accessed via the web interface available at <http://cornetto.clarin.inl.nl/index.html>

representations of syntactic structure, there are links between different parts of the tree.

The Lassy corpus can be explored and searched using a set of tools⁴, one of which allows users to search the treebank using XPath⁵, a standard querying language for XML. This tool makes it possible to select nodes of the treebank based on their attributes (such as finite verbs) or based on what nodes it is linked to in the tree (for example with daughter nodes that are also a verb phrase, forming a cluster).

To obtain the necessary frequency counts for a collostructional analysis, I started out by querying for all of the sentences containing two adjacent verbs in the same subordinate clause, checking that one of them (the main verb) is below a VP in the syntactic tree. I took various exceptions into account, such as conjunctions of VPs, or cases in which there is a verb particle or infinitival marker between the two verbs. Therefore, any particle verb with a stranded particle is also included in the dataset, and counted as that particle verb, not as its root. I also had to make sure the two verbs were not part of a larger verb cluster, since I am only looking at two-verb clusters in this study.

Once I had obtained all the sentences containing something that matched my definition of a two-verb cluster with an auxiliary head, I retrieved their treebank files and stored them as subcorpora, containing only those sentences with verb clusters, to speed up querying. From this, I extracted all the frequency counts necessary to perform a collostructional analysis using the alpinocorpus-python API⁶, an interface for querying the corpus data and processing it using the Python programming language.

I extracted all of the verbs that occur as the main verb of a verb cluster, headed by one of the three auxiliary verbs that take participial main verbs: *hebben* ‘to have’, *worden* ‘to be’ and *zijn* ‘to be’, as listed in section 3. Most of the variation in Dutch two-verb cluster orders can be found in these constructions. I extracted the verbs by their lemma attribute, such as *afvragen* ‘to wonder’, rather than the verb root, such as *vraag-af* or surface forms, such as *afvroegen* ‘wondered’. From this list of verbs I counted the frequencies for the contingency table as described in section 4.1.

To measure the association strength between words and constructions based on these frequencies, I used two different measures. One is Fisher’s Exact Test, as proposed by Stefanowitsch & Gries (2003). I furthermore compute odds ratios as a measure of effect size. The associations were calculated using the *fisher_exact* function from the SciPy library for Python⁷, which provides odds ratios as well as p-values from the test.

The p-value provided by Fisher’s Exact Test merely allows one to say whether an association is significant or not, based on a threshold (such as $\alpha = 0.05$). It does not allow ranking the verbs, while ranking is essential for a collostructional analysis. Furthermore, there is not an established threshold between association and non-association to use when performing a collostructional analysis. Therefore, I use the odds ratio as a measure of effect size. Using this ratio we can say, for example, that a verb is two times more strongly associated with the 1-2 order than with the 2-1 order, though we need the Fisher’s Exact Test to say whether this is statistically significant. Using these odds ratios, I can rank and compare the collexemes.

⁴Available at <http://rug-compling.github.io/dact/>

⁵Description available at <http://www.w3.org/TR/xpath/>

⁶API available at <https://github.com/rug-compling/alpinocorpus-python>

⁷SciPy library available at <http://www.scipy.org/>

Rank	1-2 order	Association	2-1 order	Association
	Collexeme		Collexeme	
1	toebehoren (76:0) 'to belong to'	inf ***	bekend (2064:75) 'to confess'	50.36710 ***
2	malen (56:0) 'to grind'	inf ***	kampen (157:6) 'to deal (with)'	47.69147 ***
3	toeleggen (212:6) 'to focus'	19.382863 ***	vertrouwen (49:2) 'to trust'	44.643377 ***
4	opzeggen (70:2) 'to cancel'	19.206565 ***	noodzaken (121:5) 'to necessitate'	44.103544 ***
5	plaatsvinden (1004:30) 'belong to'	18.323638 ***	benodigd (118:5) 'to require'	43.009776 ***
6	kwijtraken (171:8) 'to take place'	11.726689 ***	bevriend (128:7) 'to befriend'	33.325336 ***
7	binnenkomen (63:3) 'to come in'	11.524063 ***	verplichten (391:23) 'to oblige'	30.999251 ***
8	opsommen (55:3) 'to sum up'	10.06087 ***	gebruikmaken (90:7) 'to make use'	23.429862 ***

Table 2: Top eight collexemes of the 1-2 and 2-1 verb cluster orders

5. Results

In this section, I first describe the results of the standard distinctive collexeme analysis on the data just described, and then the additional tests that were performed to control for various general factors that are known to relate to verb cluster order variation.

5.1. Initial analysis

Following the method of distinctive collexeme analysis outlined in section 4.1, I have ranked the verbs that occur in each word order by their association strength with the word order. This means that verbs that occur in the 1-2 or 2-1 order more often than would be expected by chance are ranked higher. In this analysis, I have only used verbs that occur more than 50 times in the data set, to avoid spurious results for infrequent verbs. This frequency cutoff leaves me with 1,231 verbs in total. Table 2 shows the eight most strongly associated verbs for each word order, along with their association strength. The association is measured in terms of odds ratios. One asterisk indicates statistical significance at the $\alpha = 0.05$ level according to Fisher's Exact Test, with two and three asterisks indicating significance at $\alpha = 0.01$ and $\alpha = 0.001$, respectively. All of the listed verbs are significant, due to the large sample size and the exclusion of low-frequency verbs.

We can observe that out of the 1,231 verbs, there are two verbs that occur exclusively in one of the two word orders. The table shows these verbs at the top of the list for the 1-2 order, the order that is also more frequent overall (64.8% of the clusters are in the 1-2 order). The odds ratios for these top collexemes indicate strong word order preferences for the other top verbs as

well — for example, the word that is ranked 8th for the 2-1 order, *gebruikmaken* ‘to make use’, is still 23.4 times more likely to occur in the 2-1 order than what would be expected by chance, if the word order was random. These clear effect sizes continue well down the ranking: the verb *spelen* ‘to play’ is ranked as the 300th collexeme of the 1-2 order, yet is still 1.61 times more likely to occur in this order.

Taking the list of all 1,231 verbs into account, I note that a large number of the verbs under consideration have statistically significant associations with either of the two word orders. Even though there are various problems with null-hypothesis significance tests of frequency-based measures in large corpora (Gries 2005), I will report a summary of these tests as an indication of the prevalence of lexical associations. However, I consider the computed association values listed in the table to be a more important result, because they express effect sizes rather than null-hypothesis probabilities. With the common significance threshold of $\alpha = 0.05$, 864 verbs (70.2%) are significantly associated with an order. With $\alpha = 0.01$, the number is 756 (61.4%), and with $\alpha = 0.001$, 631 verbs (51.3%) have significant associations.

It can be argued that the significance threshold of a collostructional analysis should involve a Bonferroni correction for performing multiple tests on the same data. I note that Gries (2005) observed larger than expected amounts of false positives when comparing word frequencies with χ^2 -tests in different subcorpora, though I am not aware of any such experiment on collostructional data. Because I am testing for lexical associations between unique pairs of words and orders, I view each lexical item as a separate thing to be tested, thereby not requiring a correction. Nevertheless, I will report the results with corrected thresholds for completeness: with $\alpha = 0.05$, the corrected value is $0.05/1231 = 0.0000406$. Under this condition, 531 verbs (43.22%) have significant associations.

5.2. Adjectivity factor

For verb clusters, there is one general semantic effect that we might expect to observe, as discussed by De Sutter (2005): that of the adjectival participial verbs mentioned in section 3. Because some words may serve either as adjectives or participial verbs depending on their semantic context, this property of adjectivity is not completely unambiguous, and it is also not annotated in the corpus. De Sutter lists 11 factors that may indicate the adjectivity of a participle though most of them cannot be taken from an annotated corpus. He discusses three ways to measure it in a corpus:

- Testing for usage with the auxiliary verb *zijn* ‘to be’, which is frequently used as a copula verb
- The ratio of adjectival use in the corpus: if the adjectival form is used more often, the meaning is more likely to be adjectival
- The ratio of participial use in the corpus (in all contexts, not just verb clusters)

I did not see the relevance of the third measure, so I have tested my lists of collexemes against the first two measures.

The first measure, usage with *zijn*, involves calculating for each main verb what I call the *zijn*-ratio: the percentage of clusters with this main verb and the auxiliary verb *zijn*. Out of the top 20 collexemes for the 2-1 order from the first analysis listed in Table 2 (only the top 8 are shown), 15 have a ratio above 0.5. For the 1-2 order, there are only 5. These counts indicate that there is some correlation with word order, though no absolute tendency. When I calculate the correlation with the 2-1 order associations (the values listed in Table 2) over all of the verbs I get a value of $c = 0.200$, a weak correlation. I repeated the procedure with *worden*, which may also take adjectival verbs, and found that $c = 0.140$, no correlation.

The second measure is difficult to use reliably in an automatic way, because there may be mistakes in the automatic annotation of the corpus. It involves measuring how often a participial verb form was used as an adjective as opposed to a verb in the entire corpus, but an adjectival use may have been mistagged as a verb, or the other way around. They are difficult to distinguish. Nevertheless, I calculated this adjective ratio for each verb. Out of the top 20 collexemes for the 2-1 order with a frequency over 1000, 11 have a ratio above 0.5. For the 2-1 order, there are 4. The correlation is again a weak one, with $c = 0.253$. The top adjectival verbs in 2-1 order also match the ones reported by De Sutter (2005).

This adjectivity factor should be controlled for if we want to observe lexical preferences. Even though it is a property of the verb, is arguably a more general feature or semantic class that can apply to many verbs, not a lexical preference specific to one verb. In section 5.4 I will discuss an analysis where adjectivity is controlled for.

5.3. Particle verb factor

One thing to note is that the top collexemes for the 1-2 order consist mostly of particle verbs. Like English, Dutch has a class of verbs that incorporates a particle, such as ‘wash **up**’, or *afwassen* in Dutch. These verbs have the syntactic property of being separable: the particle may appear in a different place in the sentence in some contexts. In Dutch, the particle and verb are written together when they are not separated. It has previously been observed that particle verbs are more strongly associated with the 1-2 order (Bloem et al. 2014), so it might be the case that the order preferences I observe are not associated with the individual verbs, but with the syntactic property of being separable. In Table 2, 7 out of 8 verbs in the 1-2 order list are particle verbs. In the 1-2 order list, one verb is separable (*gebruikmaken*, ‘to make use (of)’), though the separable unit is a noun, not a particle.

I also noticed that the relative word order frequencies of the verbs (how often a verb occurs in the 1-2 versus the 2-1 order) are not normally distributed. Figure 2 shows a frequency distribution of the relative word orders. We can observe two peaks in the distribution, one around 60-65% 1-2 orders and one at 80-85% 1-2 orders, meaning that there are relatively many verbs with these proportion of 1-2 orders. One would expect that there is just one peak, around the general average proportion of 1-2 orders, corresponding to a normal distribution. In that case, most verbs would follow the average input pattern, but some would have more specific associations with one order due to lexical preferences. The second peak indicates that there is a second factor involved here, which might be the particle verbs as a distinct class with a distinct word order pattern.

To test this possibility, I ran another distinctive collexeme analysis in which particle verbs

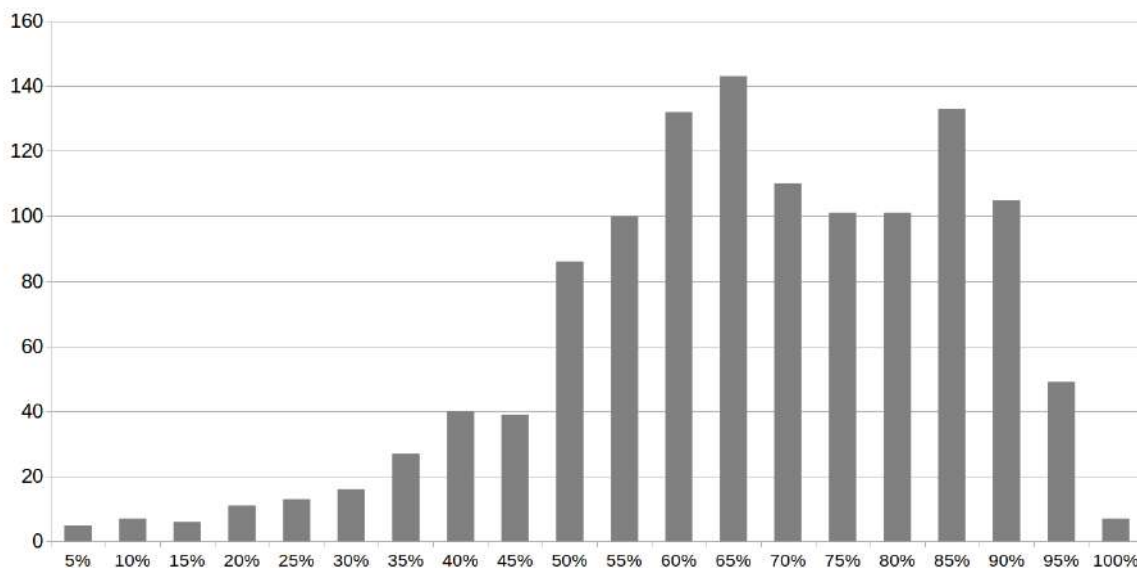


Figure 2: Frequency distribution of verb orders. The X-axis shows frequency bins of 1-2 order percentages, and the Y-axis shows how many verbs have this percentage of 1-2 orders. Values on the X-axis are the upper bound of the bin, i.e. 5% means verbs that have 0-5% 1-2 orders.

were excluded as much as possible. I filtered them out by excluding any verbs that start with any of a list of particles. This is not a foolproof method, as some verbs may start with something that looks like a particle, but at least it makes sure that anything that might look like a particle does not factor into the calculation. In this filtered analysis, there are 758 verbs. Out of those, 421 (59%) are significantly associated with either of the two word orders at $\alpha = 0.05$. With particle verbs, the percentage was 70.2%. This indicates that particle verbs can be linked to some of the observed word order preferences, but not nearly all of it. There are a large number of non-particle verbs that have an association with a particular order. Furthermore, the second peak in the word order distribution disappeared. In this analysis it is more like a normal distribution, with its peak at 65% 1-2 orders. This observation suggests that there are no longer two classes of verbs with a different mean word order preference.

5.4. Auxiliary verb factor

A further confound lies in the fact that different main verbs are used with different auxiliary verbs, which may affect word order associations. Previous work has found that the auxiliary verbs have distinct word order associations. For example, *hebben* ‘to have’ has a stronger 1-2 order association (Bloem et al. 2014). Verbs that only occur with *hebben* thus might have an association with the 1-2 order merely due to their association with *hebben*. In the previous analysis, that association would be attributed to the main verb.

To control for this auxiliary verb factor, I repeated the distinctive collexeme analysis, again excluding particle verbs, and using only frequencies from verb clusters with *hebben* as the

Rank	1-2 order	Association	2-1 order	Association
	Collexeme		Collexeme	
1	hangen (55:4) 'to hang'	5.029647 ***	kampen (157:6) 'to struggle'	71.752328 ***
2	grijpen (60:5) 'to grab'	4.3885610 ***	zeggen (65:4) 'to say'	44.426110 ***
3	staan (1271:107) 'to stand'	4.1433800 ***	danken (400:44) 'to thank'	25.1134143 ***
4	verrichten (161:15) 'to execute/perform'	3.9102099 ***	lijden (142:32) 'to suffer'	12.156137 ***
5	verlenen (110:11) 'to grant'	3.6499705 ***	munten (55:24) 'to target'	6.2607829 ***
6	goedkeuren (47:5) 'to approve'	3.4391766 **	bedoeld (54:26) 'to intend'	5.6737062 ***
7	tonen (100:12) 'to show'	3.0424888 ***	bieden (137:69) 'to offer'	5.4343953 ***
8	hebben (1800:206) 'to have'	2.9718374 ***	begrijpen (33:23) 'to understand'	3.9170367 ***
9	stellen (277:35) 'to set, to state'	2.8690793 ***	bedriegen (49:35) 'to deceive/cheat'	3.8232165 ***
10	brengen (596:77) 'to bring'	2.7695827 ***	verboden (50:36) 'to forbid/ban'	3.7929261 ***
11	zitten (398:52) 'to sit'	2.7609043 ***	leven (274:203) 'to live'	3.7016798 ***
12	behoren (111:15) 'to belong'	2.7003267 ***	verraden (57:48) 'to betray'	3.2429590 ***
13	laten (150:21) 'to allow'	2.6023152 ***	vergissen (27:24) 'to err'	3.0706499 ***
14	roepen (48:7) 'to call/shout'	2.5084791 *	besteden (28:25) 'to spend'	3.0570449 ***
15	leveren (360:53) 'to deliver'	2.4532010 ***	dwingen (29:29) 'to force'	2.7293867 ***
16	verklaren (175:26) 'to declare/state'	2.4495074 ***	verkrachten (27:27) 'to rape'	2.729311 ***
17	verwekken (53:8) 'to beget'	2.4230324 *	regelen (30:32) 'to arrange'	2.5587384 ***
18	steken (97:15) 'to stab'	2.3608368 ***	slapen (34:38) 'to sleep'	2.4420665 ***
19	geven (1094:163) 'to give'	2.3488134 ***	liegen (52:59) 'to lie'	2.4060080 ***
20	nemen (750:116) 'to take'	2.2963172 ***	eten (74:86) 'to eat'	2.3494722 ***

Table 3: Top twenty collexemes of the 1-2 and 2-1 verb cluster orders with *hebben* 'to have', excluding particle verbs

auxiliary verb. This also controls for the adjectivity factor I discussed in section 5.2, because adjectival verbs are only used with *zijn* and *worden*, not with *hebben*. This leaves only the possibility that verbs that are used with *hebben* but also with another auxiliary verb had their lexical preferences influenced by the word order preference of that other auxiliary verb. However, this would still be a lexical preference, stored as a property of the main verb, and therefore does not need to be controlled for. These restrictions leave fewer verbs for the analysis, though. There are 218 verbs that occur more than 50 times in clusters matching these criteria (compared to 758 in the previous analysis), and their frequencies are lower than in the previous analysis.

Table 3 shows the 20 most strongly associated verbs for each word order, along with their association strength, in the same format as the previous results table. Again, there are many verbs for which the association values deviate from 1 — in both top 20s, all of the collexemes are over twice as likely to occur in the order they are associated with.

Out of the 218 verbs in this analysis, 112 (51%) are significantly associated with either of the two word orders at $\alpha = 0.05$. In the analysis where only particle verbs were filtered, the percentage was 59%. There is still a clear tendency for verbs to have significant lexical associations, even within the class of verb clusters with *hebben*. If a Bonferroni correction is applied, the corrected value is $0.05/218 = 0.000229$. Under this condition, 56 verbs (25.69%) have significant associations.

5.5. Additional semantic analysis

Even though I have now controlled for various factors in my computation of the association values, there are more general properties of the main verbs that might account for part of the associations, besides lexical preference.

In a collostructional analysis, the top collexemes for each construction are usually analyzed semantically. The verb cluster orders are generally considered to express no semantic difference and, therefore, I have no specific hypothesis on any possible semantic association of each word order to test. The claim of Pardoën (1991), who suggested a *STATIC* versus *DYNAMIC* interpretation distinction, should be tested, however. Because of this, I decided to take an objective approach by using semantic properties of Dutch verb senses from the Cornetto lexical-semantic database (Vossen et al. 2013), which includes *DYNAMIC* as a feature. Unfortunately, the Lassy Large corpus is not annotated for word senses so I had to take the properties of the most common senses of each verb, as judged by a native speaker. If there were multiple commonly used senses with conflicting properties, the verb was annotated for both properties.

I performed this annotation for the top 20 collexemes of each word order from the analysis in the previous section (shown in Table 3). The results are summarized in Table 4. It lists all of the semantic features from the Cornetto database, as well as the polarity property. I list the description of each feature below, taken from the user documentation (Maks et al. 2013):

- *VALENCY*: the number of arguments of the verb
- *TRANSITIVITY*: whether a verb can take direct objects, and how many
- *CONTROL*: the subject of the verb is capable of acting with volition

- **DYNAMIC**: the verb expresses a non-static, changing situation
- **ATTRIBUTIVE**: the verb expresses a relation of ownership
- **SPATIAL**: the verb expresses a location or movement of (one of) the participants
- **COGNITION**: the verb demands emotional, perceptual or mental activity
- **POLARITY**: what kind of attitude the word's most common senses express

The polarity property was annotated on the basis of an automatic sentiment analysis system, so there may be some errors in the annotation of this property in the database.⁸

Property	Values	1-2 order	2-1 order
VALENCY	Mono	0	4
	Di	10	12
	Tri	11	6
TRANSITIVITY	Intransitive	5	5
	Transitive	16	17
	Ditransitive	4	0
CONTROL	+CONTROL	16	15
	-CONTROL	6	6
DYNAMIC	+DYNAMIC	16	17
	-DYNAMIC	6	4
ATTRIBUTIVE	+ATTRIBUTIVE	1	0
	-ATTRIBUTIVE	19	20
SPATIAL	+SPATIAL	1	0
	-SPATIAL	19	20
COGNITION	+COGNITION	2	6
	-COGNITION	19	14
POLARITY	NEGATIVE	3	8
	POSITIVE	3	1

Table 4: Frequency count of semantic properties of the top 20 words in each word order

For each semantic feature, I counted how many of the top 20 collexemes for each order have this feature. The counts do not always add up to 20 because a verb may have multiple frequent senses with conflicting properties, in which case they were counted as having both features. We can observe that the counts for the 1-2 and 2-1 order are quite similar for most features, which indicates that there are no meaning associations of those features with a particular word order. Based on Pardoën's (1991) claim that 1-2 orders are assigned a dynamic interpretation while 2-1 orders get a stative interpretation, we might expect to see a difference in the number of verbs

⁸I noticed a few possible errors, for example, the first sense of *slapen* 'to sleep' is annotated as having negative polarity

with the DYNAMIC feature between the two orders. This is not the case however — there is one more DYNAMIC verb in the 2-1 order, a negligible difference.

One notable difference can be observed for the POLARITY property. By just looking at the verbs on the right-hand side of Table 3 one may already get the impression that many of the verbs associated with the 2-1 order have a somehow negative sense. The semantic analysis in Table 4 confirms this, listing 8 negative verbs for the top 2-1 order verbs, and just three for the top 1-2 order verbs. There are also slightly more positive 1-2 verbs. Another difference is in the COGNITION verbs, of which there are more for the 2-1 order. There was only one verb with the ATTRIBUTIVE feature and one with the SPATIAL feature in either of the top 20 collexeme lists, which were both in the 1-2 order list.

A further difference can be observed in the VALENCY and TRANSITIVITY counts: among the 2-1 order verbs we find four verbs that take only a subject argument while the 1-2 order list has no such verbs. On the other hand, the 1-2 order list features four ditransitive verbs while the 2-1 order list has none.

In summary, it appears that there are a few semantic features that are more common among verbs that are strongly associated with one order, compared to the other. The negative polarity property is the clearest of these differences, however, even there it is only a tendency — there are also many neutral verbs and even a positive verb among the top 1-2 order collexemes, and there are negative verbs among the top 2-1 collexemes as well.

Lastly, it is interesting that there are some similar verbs in the overall list of collexemes that are positioned adjacent to each other. An example of this can be seen in Table 3, where the bottom two verbs in the 1-2 order list are the verbs for ‘give’ and ‘take’. In the 2-1 order list the bottom verb is ‘eat’ with rank 20, and in the 21st position I found *drinken* ‘to drink’. It appears that at least some semantically similar verbs have very similar cluster order associations.

6. Discussion

I have calculated lexical associations between main verbs and their word order in clusters, and found that significant associations are quite common. A majority of the verbs are significantly associated with either the 1-2 or 2-1 word order in the corpus that I used, even after controlling for various confounding factors. I found that the two word orders exhibit some distinct semantic preferences, but not to such an extent that all of the associations can be explained in this way.

This result indicates that verb cluster word order associations are not only a result of general contextual factors and properties of the verb, but also of a lexical preference for one of the word orders, specific to a particular main verb. Such a preference has to be stored in the mental lexicon or constructicon in some way, whether it is as a connection or as a property of the verb. These lexical preferences contribute to the choice of a word order, along with other factors.

The results also suggests that the word orders are distinct linguistic units or constructions, rather than different realizations of an underlying unit. The word orders appear to have some semantic associations, with the 2-1 order showing an association with negative verbs and cognition verbs. Such associations can be explained if each word order is a construction with distinct semantic preferences. Furthermore, in a construction grammar view of language, the existence of semantic and lexical preferences would mean that the word orders are distinct constructions. If

a word order is chosen not purely on the basis of general features, but also due to an association with a specific verb, this must be stored as a preference of a word order construction for that verb, or a preference of the verb for a word order construction. Even though the orders do not exhibit a clear meaning difference, the semantic associations I found suggest that there may be differences in semantic preferences. A further possibility that this study did not explore is that there may be a functional difference between them, related to information structure or facilitation of linguistic processing.

However, I can not exclude the possibility that some of the variation my analysis attributed to specific verbs was actually caused by something else. I excluded various factors from the analysis, but there can always be other factors that I did not know about, and it is not possible to exclude every other possible factor. I have discussed most of the known factors from the literature. The only non-contextual factor from Bloem et al. (2014) I did not analyze or control for was the inference factor — a cluster occurring as part of a fixed expression. Controlling for this is difficult to do on the basis of verb types. It is not a direct property of the verb, although there are surely verbs that occur in fixed expressions more often than others. Still, I doubt this can account for all of the remaining lexical associations I observed. The fact that the distribution of the proportions had a single peak, after removing the particle verb factor, also indicates that there are no other major categories of verbs in the data with different order preferences. Smaller effects cannot be excluded in this way, however — I saw that the 2-1 order weakly correlates with adjectival semantics, even though there was no peak in the distribution to indicate this.

7. *Conclusions and future work*

With this study, I have shown that significant associations can be observed between lexical main verbs and the word order of Dutch two-verb clusters. After controlling for known factors affecting the word order variation, lexical and semantic associations with particular word orders were still observed, indicating that the two verb cluster word orders have distinct lexical and semantic preferences. These preferences may influence the speakers' choice between the two grammatical word orders, together with more general factors such as the contextual factors mentioned by Coussé et al. (2008).

While it is usually assumed that there is no meaning difference between the two word orders, my collostructional analysis did show some semantic associations between lexical main verbs and the word orders. This can be viewed as evidence for the hypothesis that the two word orders are distinct constructions. This was already suggested previously by the finding that the finding that the orders can be primed, i.e. a 1-2 order is more likely to be followed by another 1-2 order than by a 2-1 order (Hartsuiker & Westenberg 2000). Such priming is only possible if one order can be activated independently of the other order. It also seems difficult to conceive of a theory that allows for lexical preferences of a word order for particular lexical verbs to be stored in the lexicon, when the two word orders are not distinct linguistic units (i.e. constructions).

The fact that semantic associations with verb cluster word orders were observed also indicates that it can be interesting to apply collostructional analysis to a phenomenon with an unclear form-function mapping, even though the method was intended for studying semantic differences.

Perhaps more semantic associations of verb cluster constructions can be found if different or

additional semantic categories of verbs are used in the analysis. Finding such associations could allow for more of the observed word order variation to be explained in a more general way than as lexical preferences. Discovering these semantic generalizations would have to be done by hand by linguistic experts, as it was done by Stefanowitsch & Gries (2003) in their study, though they had far fewer items to analyze. Furthermore, no obvious semantic generalizations stood out to us, nor to some conference audiences that were presented with the top 10 collexemes for both orders. The meaning generalizations that Stefanowitsch & Gries (2003) attempted to identify in their collostructional analyzes were hypothesized in advance, while I have no idea what further meaning differences there might be between the two verb cluster orders, and none are hypothesized in the literature.

Alternatively, the semantic analysis could be done computationally using some measure of semantic similarity and comparing whether similar verbs are similarly ranked in the list of collexemes. I noted that there are some pairs of words with a high semantic similarity, as well as very similar word order preferences. A measure of semantic similarity would tell us whether this is the case for other semantically similar verbs as well. A crude measure of similarity that could be used is path similarity in a lexical-semantic database. If two verbs have similar hypernyms in such a database, their meaning is probably similar. A more accurate analysis could be performed using a distributional semantic network, which models the meaning of words on the basis of their collocations, an idea that is quite compatible with collostructional analysis. However, I am not aware of the existence of any distributional semantic network for the Dutch language.

When I did exclude factors, I did so by filtering out a large part of the total dataset of verb clusters. For example, I used only clusters with *hebben*, but this is a minority of the total number of verb clusters I extracted from the corpus. It might be possible to do a collostructional analysis with two open slots, one for the main verb and one for the auxiliary, but this would still divide the verb frequencies for each order into frequencies for each order for each auxiliary, leading to smaller samples of each category and less reliable results.

Lastly, it would also be interesting to investigate the nature of lexical preferences in Dutch verb clusters. Lexical preferences could be stored as properties of the words, or as connections between constructions. In future work, it might be possible to test whether a verb's association with the 1-2 order is also a link in the mental lexicon by experimentally testing whether that verb also primes the 1-2 order, or whether the 1-2 order primes it.

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The semantics of morphological negation: nouns prefixed by *non-* in French

Edwige Dugas

This paper addresses the semantics of nouns prefixed by *non-* in French from a construction morphology perspective (Booij 2010; Goldberg 2006; Croft & Cruse 2004). On the basis of a large corpus of data drawn from the *TLFi*, Frantext and the online press watch engine GlossaNet, I show that these lexemes can have three different readings, which I call *ontological*, *complementary* and *contrary*. I describe the constraints on the base which correspond to each of these interpretations and also demonstrate that each of the three interpretations have a preference for a particular type of base.

1. Introduction

This paper provides a corpus-based and constructional account of French nouns formed by the adjunction of *non-* to a noun (henceforth [*non-N*]_N), such as *non-qualification* ‘non-qualification’, *non-Italien* ‘non-Italian’ and *non-ville* ‘non-city’ in sentences (1) to (3).

- (1) Une **non-qualification** serait un cataclysme pour l’équipe de France, qui a disputé tous les Mondiaux depuis 1997. (www)¹
‘**Non-qualification** would be a disaster for the French team, which played all World Cups since 1997.’
- (2) Pour un **non-Italien**, la cuisine italienne se résume à des plats classiques comme la pizza napoletana, les pâtes à la bolognaise ou un délicieux Tiramisu. (www)
‘For a **non-Italian**, Italian cuisine comes down to classic dishes such as pizza napoletana, pasta bolognese or a delicious tiramisu.’

¹Throughout the paper, “www” stands for the examples taken from the internet, “*TLFi*” for those from the *Trésor de la Langue Française* informatisé and “F” from the Frantext database (cf. paragraph 2.2.1. on data collection). When no indication is given, the examples are constructed examples. All English translations are mine.

- (3) Sarcelles c'est l'archétype de la **non-ville**, le chef d'œuvre de l'aberration urbanistique.
(TLFi)

lit. Sarcelles it's the archetype of the **non-city**, the masterpiece of urban aberration.'

'Sarcelles epitomizes the non-city, the masterpiece of urban aberration.'²

In section 2, I present the methodology used to collect and annotate my data and I show why $[non-N]_N$ must be analysed as morphological constructions. Section 3 is devoted to the description of the semantics of $[non-N]_N$. After a brief review of the literature on the subject, I present the three interpretations of $[non-N]_N$ that emerge from the corpus, and provide for each of them a list of tests and a description of their semantics. I show in section 4 that each interpretation imposes particular constraints on the type of base noun (henceforth bN) that can enter the construction, but that the context can also play a role.

2. Theoretical background and methodology

In this section I describe the main tenets of construction grammar and I present the methodology of data collection and annotation used in this study. I then provide evidence for an analysis of $[non-N]_N$ in morphology; more precisely, I show that in these constructions, *non-* is a prefix that attaches to nouns to form nouns (the input and the output of the prefixation belong to the nominal category).

2.1. Theoretical background

This study is grounded in construction grammar (Booij 2010; Goldberg 2006; Croft & Cruse 2004; Langacker 1987). Within this framework, a construction is conceived of as a conventionalized and symbolic pairing of form and meaning, which also includes a discourse function. Constructions vary in size and in complexity, they are organized hierarchically and each construction inherits the properties of a "higher", more schematic construction.

The schema below exemplifies the organisation of morphological constructions which derive negative deadjectival adjectives with the prefix *in-* in French. The highest schema is a purely schematic construction, which can be instantiated by *in-* prefixation. The semi-schematic *in-* prefixation morphological construction can, in turn, be instantiated by the adjective *juste* 'fair'.

²Since French and English $[non-N]_N$ are not strictly equivalent, when necessary I provide two translations, the first being a literal one.

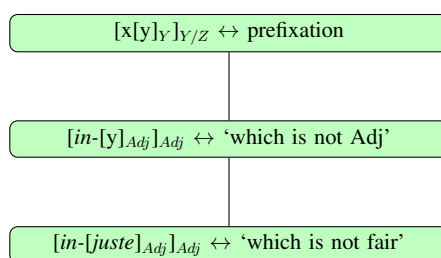


Figure 1 – Constructional network of French *in-* negative adjectives.

It is also worth noting that in construction grammar, lexical and grammatical patterns are represented in a similar fashion; these domains obey their own rules (Corbin 1987; Anderson 1982; Aronoff 1976) but their boundaries are not sharp. For instance, I have shown (Dugas 2014b) that French adjectives in *in-* are morphological constructions (prefixed lexemes), while adjectives in *non* are syntactic constructions (*non* is an adverb and the construction is an adjectival phrase); these two constructions can be represented as in (4) and (5).

- (4) $[in-[y]_{Adj}]_{Adj} \leftrightarrow \text{‘which is not } y \text{ (contrary negation)’}$
 (5) $[[non]_{ADV}[y]_{Adj}]_{AdjP} \leftrightarrow \text{‘which is not } y \text{ (contradictory negation)’}$

Finally, construction grammar is a cognitive theory which views constructions as entrenched routines. It is usage-based, which means that “substantial importance is given to the actual use of the linguistic system and a speaker’s knowledge of its use” (Langacker 1987:494). It also means that the analyses are made on the basis of large corpora and authentic data.

2.2. Methodology

I present here the methodology of data collection and annotation adopted for this study. As it relies on a large amount of data, this methodology is particularly amenable to a construction grammar analysis.

2.2.1. Data collection

This corpus-driven research is based on a variety of written data. The $[non-N]_N$ that make up the corpus come from three different sources reflecting different genres and registers: (i) the nomenclature of the *TLFi* (*Trésor de la Langue Française informatisé*)³, (ii) Frantext database (from 1900 onwards)⁴ and (iii) the internet, via the search engine GlossaNet⁵. The (mostly manual) identification of nominal $[non-N]_N$ proceeded in three steps, which I describe briefly here. Choices have been made to decide whether the candidate forms were (i) instances of syntactic or constituent negation and (ii) adjectives or nouns. Cases where *non* is used to oppose

³<http://atilf.atilf.fr/>

⁴<http://www.frantext.fr/>

⁵<http://glossa.fltr.ucl.ac.be/>

two propositions have been discarded, as well as cases where the [*non-X*] sequence is adjectival.

(i) Distinction between syntactic (6-a) and constituent (6-b) negation:

- (6) a. Nous avons écrit *village et non ville* pour garder de notre commune la notion de convivialité, de proximité, de bien être. (www)
 ‘We wrote ‘*village*’ and not ‘*town*’ to convey the idea that there is conviviality, proximity and well-being in our city.’
- b. Ville et **non ville** : quand les limites s’abolissent. (www)
 ‘City and **non-city**: when borders between the two disappear.’

An example such as the one in (6-a) is not included in the corpus, because *non* is not used to create a noun. *Non* is an adverb which opposes two propositions. In (6-b), *non-ville* is a noun, because *non-* has scope on the noun *ville* only. This is why (6-a) but not (6-b) is added to the corpus.

(ii) Distinction between adjectival (7-a) and nominal (7-b) instances:

- (7) a. Beaucoup de travailleurs sont originaires de *pays non anglophones*. (www)
 ‘Many workers come from *non-English speaking countries*.’
- b. Les **non-anglophones** représentent un potentiel d’achat conséquent. (www)
 ‘**Non-English speaking people** represent a significant purchasing power.’

In (7-a), *non anglophone* is an adjective which is used attributively to modify the noun *pays* ‘country’. In (7-b), it is used as a noun; it is preceded by a determiner and followed by a verb, which is why it is added to the corpus.

Table (1) indicates the resulting number of types for each sub-corpus and the total number of types after doublets or triplets (instances of the same type in different sub-corpora) have been removed.

	TLFi	Frantext	Internet	Total
Number of types	174	798	267	978

Table 1 – Number of [*non-N*]_N in the corpus.

2.2.2. Annotation of the data

The candidates were manually annotated with respect to the morphological complexity and to the semantics of the base noun (bN). The aim of this annotation was to identify possible constraints on the formation of [*non-N*]_N. The bNs were grouped into 10 morphological categories:

deverbal nouns (with the suffixes *-ade*, *-age*, *-ance/-ence*, *-ée*, *-ment*, *-ion*, *-ure*, or nouns derived by verb conversion); deadjectival nouns (with the suffixes *-ité*, *-eur*, *-esse*, *-ise*, *-ice*, *-ion*, *-erie*, *-itude*, *-ance/-ence*, or nouns derived by adjective conversion); denominal nouns (with the suffixes *-ade*, *-age*, *-ance*, *-aille*, *-at*, *-ier*, *-ure*); nouns related to pronouns (*moi_N* ‘self’); nouns related to infinitives (*être_N* ‘being’); nouns related to past or present participles (*admis_N*, *combattant_N* ‘admitted’, ‘combatant’); nominal compounds (*auteur-compositeur* ‘composer-songwriter’); polylexical nouns (*roman policier* ‘police novel’); simplex nouns. Proper nouns constituted the tenth class.

Concerning the semantics of the bN, the following six classes have been distinguished: artefacts (*chaussure* ‘shoe’, *livre* ‘book’); natural entities (*oiseau* ‘bird’, *soleil* ‘sun’); human beings (*journaliste* ‘journalist’, *Jew* ‘juif’); events (*guerre* ‘war’, *communication* ‘communication’); properties (*tristesse* ‘sadness’, *amour* ‘love’)⁶; abstractions (*l’être*, *la beauté* ‘being, beauty’ as philosophical concepts). Proper nouns constitute a distinct seventh class, given that their denotation is different from that of common nouns (Flaux & Van de Velde 2000; Flaux 1991; Kleiber 1981).

2.3. The status of [*non-N*]_N

The aim of this paper is not to give a detailed account of how [*non-N*]_N are formed, yet a brief presentation of the status of these sequences is in order. When addressing the nature and formation mode of these constructions, three possibilities were investigated:

- (i) They are lexical units which have been built in syntax and which have undergone a process of univerbation, ‘the process whereby independent, usually monomorphemic, words are formed from more complex constructions’ (Traugott 1994:1485), such as *couche-tard* (lit. sleep-late, ‘night owl’), *boit-sans-soif* (lit. drinks-without-thirst, ‘drunkard’). In this case, *non* corresponds to the phrastic adverb *non* which is used in syntax (as in *C’est une victoire, non une qualification* ‘It’s a victory, not a qualification’);
- (ii) They are compounds and *non* is an adverb;
- (iii) They are derived lexemes and *non-* is a prefix.

Three arguments can be put forward to demonstrate that [*non-N*]_N are not syntactic constructions. First, syntax does not allow the adverb *non* to appear in front of a bare noun, which makes impossible for these constructions to be the product of univerbation. The sequence [*non* + N], such as *non qualification*, cannot be found in syntax (8).

- (8) * Ce n’est qu’une victoire, **non** ∅ qualification.
lit. ‘It’s only a victory, **non** ∅ qualification.’

The presence of a determiner is necessary, as in (9).

⁶This class is actually comprised of nouns denoting qualities (*intelligence* ‘intelligence’), feelings (*tristesse*) and states (*amour*), that is, entities which have no temporal extension (Flaux & Van de Velde 2000).

- (9) Ce n'est qu'une victoire, **non** une qualification.
lit. 'It's only a victory, **non** a qualification.'

Second, in sentences such as (9), the role of the adverb *non* is to oppose two propositions; the second proposition *non une qualification* has no naming function and it cannot be interpreted independently from the first proposition *ce n'est qu'une victoire*, since it takes its meaning from its combination with that first proposition. The case of $[non-N]_N$ is different: they have a naming function (they refer to extra-linguistic objects), and they do not depend on another proposition to be interpreted.

Third, the pattern which forms $[non-N]_N$ is highly available, i.e. it can easily form new lexemes (see Bauer 2001; Plag 1999; Corbin 1987 for more details on the notion of *availability*). This has been stressed many times in the literature (Huot 2007; Kalik 1971; Zimmer 1964; Jespersen 1917). The availability of the construction is also reflected in the corpus which has been constituted for this study. This goes against an analysis of $[non-N]_N$ as syntactic constructions, as univertation does not usually yield productive patterns.

Since $[non-N]_N$ are not built in syntax, we are left with the possibility that they are compounds or prefixed lexemes. Several authors have proposed an analysis of $[non-N]_N$ as compounds. Yet they do not make a difference between compounding and prefixation (Staaff 1928; Darmesteter 1874) or between morphology and syntax (Disciullo & Tremblay 1993). Actually, most of the accounts provided in the literature treat $[non-N]_N$ as prefixed lexemes (Huot 2007; Dal et al. 2007; Gaatone 1971; Kalik 1971; Zimmer 1964; Jespersen 1917). As is well-established now, only lexemes can be the input and the output of morphological processes (rules or constructions). Compounding involves lexemes, not grammatical words (Fradin 2003; Ten Hacken 1994; Scalise 1992; Selkirk 1982; Allen 1978), yet *non*, in syntax, is an adverb. From these facts I conclude that $[non-N]_N$ are morphological constructions where *non-* is a prefix that attaches to nouns to yield nouns (10).

- (10) $[non-[X]_N]_N \leftrightarrow$ 'negation of X'

I now focus in the rest of the paper on the description and analysis of the semantics of $[non-N]_N$.

3. The semantics of $[non-N]_N$

Examining the 978 different $[non-N]_N$ of my corpus, I identified three interpretations these constructions can have: what I called *ontological*, *complementary* and *contrary* interpretations. To start with, I examine the proposals made in the literature on the semantics of $[non-N]_N$. Then I provide an overview of the three readings, which are described in detail in subsections 3.3, 3.4 and 3.5. I provide the tests used to identify the different interpretations, I describe their semantics and I show the respective roles of the type of base and of the context to direct the $[non-N]_N$ toward a given interpretation.

3.1. State of the art on the semantics of *[non-N]_N*

The literature on *[non-N]_N* for French is scarce and mostly takes up the analyses proposed in the English literature for the English prefix *non-*. That is why the focus here is on the works on English *[non-N]_N*, whose semantics is very close to that of their French counterparts, but also the prefix *un-* and *[un-N]_N*, which are also quite similar.

To the best of my knowledge, Algeo (1971) is the first to sketch an analysis of English *[non-N]_N*. He distinguishes between a ‘privative’ (11), a ‘pejorative’ (12) and a ‘dissimilative’ (13) interpretation of these lexemes.

- (11) Privative:
 - a. We accept war news with the same **nonthought** as the morning cup of coffee.
 - b. UN debates may be exercises in **nonpower**. (Algeo 1971:90)
- (12) Pejorative:
 - a. **noncandidate**: one who is declared candidate but whose election is so unlikely that he can be set aside as a possible contender. (Algeo 1971:94)
 - b. (with ref. to W. S. Burroughs *The Soft Machine*): a hallucinatory little **non-book** of babble. (Algeo 1971:98)
- (13) Dissimilative:
 - a. **noncandidate**: one who is not a professed candidate and who may officially deny his candidacy but who is nevertheless regarded as a candidate by many newsmen, politicians, and possibly himself, for example, Edward Kennedy in 1972 and Ronald Reagan in 1968. (Algeo 1971:95)
 - b. The grass is usually greener in a hippie house. Sans Souci Temple, near downtown Los Angeles, accommodates a happy **non-family** of 24 people, including these adults and child-none of them related to one another. (Algeo 1971:105)

According to Algeo, the ‘basic’, privative use of *non-* (11) is that of negation: it means ‘which is not’ or ‘lack of’. In its pejorative use (12), ‘the thing *[non-]* describes possesses (...) the accidents, but not the substance named; [it] is unfavorably critical in its implications’ (Algeo 1971:95). Finally, in the dissimilative use (13), the meaning conveyed is ‘possessing the value, but not the surface characteristics or acknowledged identity of’: ‘the thing possesses the substance though not the accidents; though it may be arch, often suggests an admiration of the thing described’ (Algeo 1971:95).

More recently, Bauer et al. (2013) propose an analysis of English *[non-N]_N* where they can have two interpretations. The first interpretation is that of ‘negation’, that is, a ‘general negative reading, the distinction between contrary and contradictory being neutralized, as nouns are not gradable or scalar’ (14).

- (14) Composed of six dentists and six **non-dentists**, the committee figures to play an important role as the Health Department tries to improve its much-criticized system of detecting fraud and abuse in the state’s Medicaid dental program. (Bauer et al. 2013:370)

The authors call the second interpretation ‘stereotype negation’. In this case, the *[non-N]_N* ‘still

generally denotes the same entity or something close to it, but one that is missing several key characteristics'. So the derived noun denotes 'a non-stereotypical exemplar of its category' (15).

- (15) The man in the tweed suit wore his hair clipped short, in a crew cut. It was a flat metallic color, a **non-color**, like his eyes. (Bauer et al. 2013:370)

Algeo (1971), as well as Bauer et al. (2013), seems to make a distinction between $[non-N]_N$ which express an objective negation and those which express a more subjective negation, where it is the properties associated with the referent of the base noun that are targeted by the negation.

In his analysis of $[un-N]_N$, Horn (2002a,b) proposes a twofold distinction between what he calls 'class A' ('A' stands for 'almost') $[un-N]_N$ and 'class B' ('B' stands for 'barely') $[un-N]_N$. Class A $[un-N]_N$ 'do not satisfy the structural criteria for the category X but share its function, evoking a superset category encompassing both X and unX' (Horn 2002a:11) (16).

- (16) **unturkey**: used for mock turkey breasts made from soy sold at natural foods store.

A class B $[un-N]_N$ 'of the form unY (...) IS a member of the category Y, but a peripheral or non-prototype member (cf. Rosch 1978), one lacking a functionally significant (but not criterial) property associated with the category in question' (Horn 2002a:11) (17).

- (17) **unwomen**: label for women in Margaret Atwood's *The Handmaids Tale* (1985) who, because they are not fertile, are shipped to the colonies as slave labor.

By way of summary, I would like to emphasize that even if English $[non-N]_N$ and $[un-N]_N$ and French $[non-N]_N$ are not entirely comparable⁷ and even if the analyses which I have just described differ (see also Hamawand 2009; Plag 2003; Bauer 1983; Zimmer 1964), the authors agree on the fact that $[non-N]_N$ and $[un-N]_N$ can have several interpretations. These interpretations display the following characteristics: (i) neutral, objective expression of negation; (ii) distinction between essential and non-essential properties; (iii) expression of a negative judgement by the speaker. The literature dealing with $[non-N]_N$ for French has not provided additional insight into the semantics of $[non-N]_N$, and the authors (Huot 2007; Dal et al. 2007; Disciullo & Tremblay 1993; Gaatone 1971; Kalik 1971) generally conclude that $[non-N]_N$ can have two interpretations: privative and pejorative. I will show that, indeed, French $[non-N]_N$ display these characteristics, but that the distinctions proposed by the authors (generally based on a very small amount of data) must be refined. On the basis of my corpus, I will identify three different interpretations of French $[non-N]_N$.

⁷There is not a perfect overlap between French $[non-N]_N$ and English $[non-N]_N$ and $[un-N]_N$. In English, we are dealing with two prefixes, in French, only one. In addition, French and English both possess the prefix *in-* and also the prefix *anti-*. The latter can attach to nouns to form nouns (e.g. *anti-héros* 'antihero') with a meaning which is sometimes close to that of certain $[non-N]_N$ (see Dugas 2014a). A cross-linguistic comparison would need to take into account the fact that these two languages do not have the same number of 'negative prefixes', that their productivity varies and that the same prefix in the two languages may have different meaning effects.

3.2. The three readings of $[non-N]_N$: an overview

I assume that a noun denotes a set (i.e. a class) and that this set is defined by properties which the individuals must possess to belong to that set. A noun denotes a set of entities and each entity of that set is endowed with properties, and each entity of the set belongs to the set by virtue of sharing at least one common property. I assume that the semantics of a noun can be decomposed as such: (i) a referential index (e.g. Baker 2003), (ii) a set component, (iii) a properties component. Additionally, I assume that properties are of two types: classifying properties, on the one hand, and qualifying properties (stereotypical properties), on the other hand. In the remainder of this paper, I show that the three readings of $[non-N]_N$ correspond to the scope of *non-* prefixation over one of these components.

In the *ontological* reading (18), what is negated is reference. The effect of negative prefixation is to deny the existence of the referent of the base noun.

- (18) Une **non-qualification** serait un cataclysme pour l'équipe de France, qui a disputé tous les Mondiaux depuis 1997. (www)
 'Non-qualification would be a disaster for the French team, which played all World Cups since 1997.'

In the *complementary* reading (19), what is negated is the set *via* the classifying properties corresponding to that set. The base noun is seen as denoting a category of referents sharing certain properties, and *non-* prefixation establishes a distinction between the referents which belong to the set and those which do not. In other words, the prefixation creates a referent which does not belong to the same set as the referent of the base noun.

- (19) Pour un **non-Italien**, la cuisine italienne se résume à des plats classiques comme la pizza napoletana, les pâtes à la bolognaise ou un délicieux Tiramisu. (www)
 'For a **non-Italian**, Italian cuisine comes down to classic dishes such as pizza napoletana, pasta bolognese or a delicious tiramisu.'

In the *contrary* reading (20), the stereotypical properties possessed by the referent of the base noun are negated. Here, the prefix *non-* is very similar to evaluative prefixes which convey a pejorative meaning⁸; it is also metalinguistic.

- (20) Sarcelles c'est l'archétype de la **non-ville**, le chef d'œuvre de l'aberration urbanistique. (TLFi)
 lit. 'Sarcelles it's the archetype of the **non-city**, the masterpiece of urban aberration.'
 'Sarcelles epitomizes the non-city, the masterpiece of urban aberration.'

I now proceed to the analysis of each interpretation. The tests that will be given correspond to the three examples (18) to (20) given above.

⁸For example derived nouns in *-ette* such as *mesurette* 'small measure, small step', *réformette* 'small reform', which refer to small entities, sometimes with an additional pejorative meaning effect.

3.3. The ontological reading

What I called the ontological reading is the most frequent in terms of types: in the corpus, 73% of the $[non-N]_N$ have this interpretation. Here I provide the tests used to identify the ontological interpretation, then I describe this interpretation in more detail and I show that it has a preference for deverbal bases and bases denoting events.

3.3.1. Tests for the ontological reading

The derived lexeme refers to an entity which is different from the entity referred to by the base noun. An ontological $[non-N]_N$ is not a bN (21).

- (21) a. une non-qualification n'est pas une qualification
lit. 'a non-qualification is not a qualification'
- b. # une non-qualification est une qualification
lit. 'a non-qualification is a qualification'

The second test relates to the fact that an ontological $[non-N]_N$ refers to the absence of the referent of the bN. It is possible to paraphrase the examples with 'l'absence de bN' ('the absence of bN') (22).

- (22) L'absence de qualification serait un cataclysme pour l'équipe de France, qui a disputé tous les Mondiaux depuis 1997.
'The absence of qualification would be a disaster for the French team, which played all World Cups since 1997.'

Another characteristic of the ontological interpretation is that the derived lexeme and its base are in a semantic relation of contradiction (for more details on this notion, which traces back to Aristotle, see Horn 1989, and Schapansky 2002, 2010 for French). It is possible to paraphrase ontological $[non-N]_N$ by 'il s'agit soit d'un bN, soit d'un $[non-N]_N$ ' ('It's either a bN or a $[non-N]_N$ ') (23).

- (23) Il s'agit soit d'une qualification, soit d'une non-qualification.
(= Soit c'est une qualification, soit ce n'est pas une qualification.)
lit. 'It's either a qualification or a non-qualification.'

Moreover, it is impossible to paraphrase with 'c'est à la fois un bN et un $[non-N]_N$ ' ('It's both a bN and a $[non-N]_N$ ') or 'ce n'est ni un bN ni un $[non-N]_N$ ' ('It's neither a bN nor a $[non-N]_N$ ') (24).

- (24) a. # C'est à la fois une qualification et une non-qualification.
 (= # C'est une qualification et une non qualification.)
 lit. 'It's both a qualification and a non-qualification.'
- b. # Ce n'est ni une qualification ni une non qualification.
 (= # Ce n'est pas une qualification et ce n'est pas une non qualification.)
 lit. 'It's neither a qualification nor a non-qualification.'

3.3.2. Description of the ontological reading

Other examples of ontological $[non-N]_N$ include *non-livraison* 'non-delivery', *non-distribution* 'non-distribution', *non-productivité* 'non-productivity' (25).

- (25) a. La **non-livraison** du Mistral, une dispute durable et potentiellement coûteuse.
 (www)
 'The **non-delivery** of the Mistral [helicopter carrier]: a long-lasting and potentially costly quarrel.'
- b. Les Bosniens surmontent leurs traumatismes de la guerre pour s'insurger contre la **non-distribution** des numéros d'identité aux nouveau-nés depuis quatre mois.
 (www)
 'Bosnians have overcome the trauma of war and rebel against the **non-distribution** of identity numbers to newborns for four months.'
- c. Microsoft est en partie responsable de la **non-productivité** des organisations d'aujourd'hui ! (www)
 'Microsoft is partly responsible for the **non-productivity** of today's firms!'

In this interpretation, negative prefixation affects the reference of the base noun. A first, basic analysis of this reading would be to say that if the base noun denotes an event, the $[non-N]_N$ will denote the absence of this event. Similarly, if the base noun denotes a quality, then the $[non-N]_N$ will denote the absence of this quality.

Very rarely, this interpretation can be found in $[non-N]_N$ whose bN denotes an artefact, such as *non-pain* 'non-bread' in (26).

- (26) [*Monsieur déclenche les hostilités à partir de ce qu'il veut, Madame étant hautement inflammable. Je conseille quand même le "tu veux un coup de main" alors qu'il ne reste rien à faire hormis poser son cul pour passer à table. Ce qui prend donc la signification suivante dans la citerne de gaz qui sert de tête à Madame : "mais il se fout de ma gueule, à arriver après la bataille, avec son sourire provocateur, en plus ?"*] [...]
- Monsieur pensait sincèrement que mettre le **non pain** sur la table (normal, personne veut aller en acheter avec ce mistral, sans compter que Monsieur a terminé sa nuit en début d'après midi, boulange à sec de stock de Campagnette, donc), rendrait service à tout le monde. (www)

lit. ‘Mister sincerely believed that putting the **non bread** on the table (well, no one wants to go and buy some with such a strong wind, besides, Mister woke up in the afternoon, so the bakery has no baguettes any more) would be helpful to everyone’.

So if the base noun is an artefact, then the $[non-N]_N$ will denote the absence of this artefact.

A careful examination of the contexts of these $[non-N]_N$ actually reveals that this interpretation triggers a factive reading of the noun used in the construction. Whatever the semantics of the base noun (e.g. event, quality, artefact), it denotes a fact when used in the construction. For instance, (25-a) can be paraphrased as *le fait que la livraison du Mistral n’ait pas eu lieu est une cause de dispute durable et potentiellement coûteuse* ‘the fact that the delivery of the Mistral did not take place is a cause of a long-lasting and potentially costly quarrel’. The fact is denoted by the whole proposition *la non-livraison du Mistral* (‘the non-delivery of the Mistral’). That nouns denoting events take the lion’s share of the bases that enter the ontological $[non-N]_N$ construction (cf. section 3.6) might be explained by the fact that they are more prone to yield a factive interpretation of the proposition than qualities, let alone artefacts. When a noun denoting a quality or an artefact enters the construction, it is somehow ‘coerced’ to allow a factive reading of the proposition. So even *non pain* can become a fact: in (26), it is associated to the fact ‘ne pas mettre le pain sur la table’ (‘not putting the bread on the table’) (cf. *mettre le non pain sur la table* ‘put the non-bread on the table’).

The test of the subordinate clause can be used to show this factive reading of ontological $[non-N]_N$. A subordinate clause can only denote a fact (Van de Velde 2006:87-89) (27).

- (27) *Que le Mistral n’ait pas été livré* est une cause de dispute durable et potentiellement coûteuse.
 ‘That the Mistral has not been delivered is a cause of a long-lasting and potentially costly quarrel.’

To sum up, $[non-N]_N$ denote the non-occurrence of an event, a situation built on top of the absence of an individual.

The analysis of the corpus shows that the ontological interpretation imposes constraints on the morphological and semantic type of bN that enters the construction. Ontological $[non-N]_N$ have a preference for deverbal bNs and bNs denoting events (*non-dénonciation* ‘non-denunciation’, *non-application* ‘non-enforcement’, *non-communication* ‘non-communication’); conversely, deverbal nouns and nouns denoting events will most probably yield an ontological $[non-N]_N$. This is not surprising given what has been said: whatever the semantics of the bN, it denotes a fact (that is, something which is dynamic, event-like) when used in the $[non-N]_N$.

3.4. The complementary reading

The complementary reading is the second most frequent interpretation (in terms of types), with 23% of $[non-N]_N$ of the corpus. I proceed in this subsection as I did in the preceding one, with the description of the tests used to identify the interpretation and the analysis of its semantics. I show that the complementary interpretation shares features with the ontological interpretation.

3.4.1. Tests for the complementary reading

As in the ontological interpretation, the derived lexeme refers to an entity which is different from the entity referred to by the bN. So a complementary $[non-N]_N$ is not a bN (28).

- (28) a. un non-Italien n'est pas un Italien
lit. 'a non-Italian is not an Italian'
- b. # un non-Italien est un Italien
lit. 'a non-Italian is an Italian'

But unlike ontological $[non-N]_N$, the derived lexeme does not refer to the absence of a bN. The paraphrase with 'l'absence du bN...' ('the absence of bN...') is not possible (29).

- (29) # Pour l'absence d'(un) Italien, la cuisine italienne se résume à des plats classiques comme la pizza napolitaine, les pâtes à la bolognaise ou un délicieux Tiramisu.
lit. 'For the absence of an Italian, Italian cuisine comes down to classic dishes such as pizza napolitaine, pasta bolognese or a delicious tiramisu.'

The derived lexeme refers to a class of entities which is complementary to the class of entities the bN refers to. This is revealed by the paraphrase 'parmi les N-set, il y a les bN et les $[non-N]_N$ ' (where 'N-set' denotes the set including the two complementary sets) ('among the N-set, there are the bN and the $[non-N]_N$ '). It is possible to identify the set encompassing the referents of the $[non-N]_N$ and the referents of the bN. For *les Italiens et les non Italiens*, this set is the set of human beings (30).

- (30) Parmi les êtres humains, il y a les Italiens et les non Italiens.
lit. 'Among human beings, there are the Italians and the non-Italians.'

Finally, as in the ontological interpretation, the derived lexeme and its base are in a semantic relation of contradiction, which is evidenced by the tests in (31) and (32).

- (31) Il s'agit soit d'un Italien, soit d'un non Italien.
(= Soit c'est un Italien, soit ce n'est pas un Italien.)
lit. 'It's either an Italian or a non-Italian.'
- (32) a. # C'est à la fois un Italien et un non Italien.
(= # C'est un Italien et un non Italien.)
lit. 'It's both an Italian and a non-Italian.'
- b. # Ce n'est ni un Italien ni un non Italien.
(= # Ce n'est pas un Italien et ce n'est pas un non Italien.)
lit. 'It's neither an Italian nor a non-Italian.'

According to these tests, the complementary interpretation of $[non-N]_N$ is similar to the ontological one as it corresponds to contradictory negation. Yet the tests also show that it is not enough to characterise this interpretation as an example of contradictory negation: in this read-

ing, negation affects the bN as representing a set of individuals, which is not the case in the ontological interpretation.

3.4.2. Description of the complementary reading

Other examples of complementary $[non-N]_N$ found in the corpus include *non-juif* ‘non-Jew’, *non-photographe* ‘non-photographer’, *non-jeûneur* ‘non-faster’, *non-smartphone* ‘non-smartphone’ (33).

- (33) a. Marié à une **non-Juive**, il avait été rejeté par les siens, sauf par mon père qui alla vivre chez lui pendant deux ans, avant d’émigrer en France. (F)
 ‘Married to a **non-Jew**, he had been rejected by his relatives, except by my father who went to live with him for two years, before emigrating to France.’
- b. [...] il s’est mis en quatre pour satisfaire les photographes et les **non photographes** pour créer une excellente harmonie entre tous pendant cette belle semaine. (www)
 ‘He went to a great deal of trouble to please the photographers and the **non-photographers** to create a good harmony between everyone during this fantastic week.’
- c. [...] une Algérie beaucoup plus tolérante, plus ouverte, où il faisait bon vivre malgré tout et où jeûneurs et **non-jeûneurs** se fréquentaient dans une parfaite indulgence. (www)
 ‘A more tolerant Algeria, more open-minded, where it was good to live after all and where fasters and **non-fasters** were indulgently spending time together.’
- d. Sur l’ensemble des téléphones testés par le scientifique (smartphones et **non-smartphones**), la qualité de réception des antennes varie de un à dix. (www)
 ‘Among the telephones tested by the scientist (smartphones and **non-smartphones**), the reception quality of the antenna varies from one to ten.’

In the complementary interpretation, the $[non-N]_N$ and the bN denote two complementary sets of entities. The superset encompassing these two complementary sets is denoted by a hyperonym of the base noun. It is not always possible, on the sole basis of the semantics of the bN, to determine what hyperonym would denote the superset. In (33-a) to (33-c), one obvious possible hyperonym is that of human beings. Actually, in (33-c), the hyperonym is most probably that of Algerian people. Semantics is not always enough to determine which is the superset and context (that is, pragmatic information) is necessary to decide what the superset is. The hyperonym may also be recovered from the context: in (33-c), the set of Algerian people; in (33-d), the set of telephones (most probably, cellphones, since all smartphones are also cellphones) which the scientist tested. Actually, a lot of sentences with complementary $[non-N]_N$ state explicitly what the superset is. Besides, very often, both subsets appear in conjunction (‘the $[non-N]_N$ and the bN’). One also observes a tendency, for these $[non-N]_N$, to be used with a plural definite

determiner (*les non Italiens*, *les non enseignants*, *les non ordinateurs*).

To sum up, in the complementary reading, properties are negated via the negation of the set of entities which possess these particular properties. The properties that are negated are the essential, classifying properties, which is why the derived lexeme denotes an entity which is different from the entity denoted by the base noun: a non-Italian is not an Italian (not even a type of Italian).

Finally, complementary $[non-N]_N$ have a preference for denominal or deadjectival bNs and bNs denoting humans (*non-gréviste* ‘non-striker’, *non-magicien* ‘non-magician’, *non-Suisse* ‘non-Swiss’); conversely, nouns denoting humans will most probably yield a complementary $[non-N]_N$. This might be explained by the fact that human beings are very often characterised via social or professional roles, and these roles lend themselves very well to the distinction in terms of (complementary) sets.

3.5. The contrary reading

The contrary reading is the less frequent reading, with only 4% of the total of the types. I present here the tests used to identify this interpretation as well as a detailed analysis of its semantics. I show that, unlike ontological and complementary $[non-N]_N$, contrary $[non-N]_N$ do not correspond to contradictory negation. However, both contrary and complementary $[non-N]_N$ involve properties, yet not of the same nature.

3.5.1. Tests for the contrary reading

Unlike ontological and complementary $[non-N]_N$, a contrary $[non-N]_N$ refers to an entity which is the same entity as what is referred to by the bN. If we take example (3) repeated as (34), a contrary $[non-N]_N$ is a bN.

- (34) a. une non-ville est une ville
lit. ‘a non-city is a city’
- b. # une non ville n’est pas une ville
lit. ‘a non-city is not a city’

This is why a paraphrase such as ‘X est un $[non-N]_N$, mais c’est un bN quand même’ (‘bN/X is a $[non-N]_N$, but it’s a bN anyway’) works in the case of the contrary interpretation (35).

- (35) Sarcelles est une non-ville, mais c’est une ville quand même.
lit. ‘Sarcelles is a non-city, but it’s a city anyway.’

In this reading, the referent of the derived lexeme possesses the classifying, non-stereotypical, properties of the referent of the bN, which is nicely shown by the paraphrase with ‘strictement parlant, un $[non-N]_N$ est un bN’ (‘strictly speaking, a $[non-N]_N$ is a bN’) (Lakoff 1973:475) (36).

- (36) Strictement parlant, Sarcelles est une ville.
lit. 'Strictly speaking, Sarcelles is a city.'

In the case of contrary $[non-N]_N$, the paraphrase with 'X est soit un bN, soit un $[non-N]_N$ ' ('X is either a bN or a $[non-N]_N$ ') is not felicitous (37).

- (37) # Sarcelles est soit une ville, soit une non ville.
(= # Soit c'est une ville, soit ce n'est pas une ville.)
lit. 'Sarcelles is either a city or a non-city.'

Another important characteristic of contrary $[non-N]_N$ is that they are qualifying. The distinction between the classifying vs. qualifying reading of nouns and adjectives has been dealt with quite often in the literature and several tests have been proposed to identify qualifying nouns (Cadiot 2002; Legallois 2002; Anscombe 2001; Ducrot 1980; Milner 1978, among others), some of which can be used here.

One test is that of exclamation: 'Cet individu/Ce X, quel $[non-N]_N$!' ('This guy/This X, what a $[non-N]_N$!') (38).

- (38) a. Cette ville, quelle non ville !
lit. 'This city, what a non-city!'

b. Sarcelles, quelle non ville !
lit. 'Sarcelles, what a non-city!'

The authors point out that nouns in their qualifying reading cannot be questioned (Anscombe 2001; Milner 1978). In the case of contrary $[non-N]_N$, this observation is borne out (39).

- (39) # Dans quelle non ville vivez-vous ?
lit. 'In which non-city do you live?'

Finally, contrary $[non-N]_N$ are qualifying because they express the point of view of the speaker (Cadiot 2002; Legallois 2002; Ducrot 1980). The first test that can be used is 'je trouve que + object clause' ('I find that + object clause') (40).

- (40) Je trouve que Sarcelles est une non ville.
lit. 'I think that Sarcelles is a non-city.'

The second test is 'Pour moi, X est un $[non-N]_N$ ' ('For me, X is a $[non-N]_N$ ', see (41)).

- (41) Pour moi, Sarcelles est une non ville.
lit. 'For me, Sarcelles is a non-city.'

From these tests one can conclude that the contrary interpretation differs from the ontological and the complementary interpretations in that it does not correspond to contradictory negation. But like the complementary interpretation, it involves properties. These are qualifying, stereotypical properties, whereas the properties involved in the complementary interpretation are classifying, non-stereotypical properties.

3.5.2. Description of the contrary reading

Other examples of contrary $[non-N]_N$ include: *non-télé* ('non-TV'), *non-femme* ('non-woman'), *non-match* ('non-match'), *non-journaliste* ('non-journalist') (42).

- (42) a. Sans visage qui s'adresse directement à vous, la télé vous échappe. Comme au fast-food, le produit se consomme en quelques secondes ou en quelques minutes. Et l'on zappe. Ou, alors, on détourne le produit de son objectif premier : l'aspect visuel disparaît au profit du son. Une télé très radiophonique en quelque sorte, une **non-télé**. (www)
'Without a face that's directly talking to you, the TV is not under your control. Like at the fast-food restaurant, the product is consumed in a few seconds or in a few minutes. And one channel-flicks. Or one diverts the product from its primary use: the visual aspect disappears in favor of the sound. A very radio-like TV, so to say, a **non-TV**.'
- b. Je suis dingue de plantations. Les fleurs, par contre, bof, je m'en fiche ! Serais-je une **non-femme** ? (www)
'I am fond of plants. But flowers, I don't care about them. Am I a **non-woman**?'
- c. Le constat, c'est que personne n'a été bon, on a fait un **non-match**. (www)
'The thing is, no one played well, we played a **non-match**.'
- d. Le journal de 13h de Jean-Pierre Pernod sur Tf1 un **non journal**?... Poser la question cest y répondre, effectivement Jean-Pierre Pernod est un **non journaliste**, dans un **non journal**, ou le degré zéro de l'information fait pour les plus de 85 ans plus très frais psychologiquement. (www)
'Is Pernod's news programme on channel 1 a **non-news programme**? (...) Jean-Pierre Pernod is a **non-journalist**, in a **non-television news**, where the zero degree of information is made for people older than 85 and in bad psychological health.'

In the contrary reading, the properties that are negated are tied to the implicatures, whereas the properties that produce the entailment to fall into the set are not affected: a *non-woman* is a woman, a *non-journalist* is a journalist, etc. Speakers implicate other properties additional to the entailed properties, properties that are not used for the truth values. The noun *non femme* does not refer to a set, which is important to note because it implies that we do not have to deal here with vagueness:⁹ the prefixation does not affect the truth values. More specifically, I assume that these implicated properties are stereotypical properties: as defined by Geeraerts, 'stereotypes are prototypes seen from a social angle', that is, 'a socially determined minimum set of data with regard to the extension of the category' (Geeraerts 2008:26). I assume that the stereotype is an open set of properties associated with a noun; these properties do not necessarily match reality (they may be false or contradictory).

⁹Horn (2002a,b) seems to suggest an analysis of the $[un-N]_N$ in terms of vagueness.

In $[non-N]_N$ with the contrary interpretation, *non-* prefixation expresses a negation with two additional characteristics:

- (i) An axiological meaning. The $[non-N]_N$ conveys a negative evaluation: a $[non-N]_N$ is not a good bN. For example, a *non-journalist* is not a good journalist (cf. ex. (42-d)).
- (ii) A metalinguistic use. The speaker expresses her point of view and makes a judgement about the *name* 'bN'; she expresses her doubts as to the assertibility of 'the $[non-N]_N$ is a bN' and uses the $[non-N]_N$ to convey her skepticism. A $[non-N]_N$ is 'not worth being called a bN', is 'so bad that it does not deserve to be called a bN'. For example, according to the speaker/writer, the journalist J.-P. Pernod does not deserve to be called a journalist (cf. ex. (42-d)).

These characteristics cannot be found in the ontological and complementary interpretation. They may explain why the contrary interpretation is so rare, and why it does not seem to impose constraints on its bN. Most of the bases of contrary $[non-N]_N$ denote artefacts (*non-musée* 'non-museum, *non-chaussure* 'non-shoe', *non-film* 'non-movie') or human beings (*non-femme* 'non-woman', *non-journaliste* 'non-journalist'). But one finds other types of bases as well: natural entities (*non-oiseau* 'non-bird', *non-paysage* 'non-landscape'), abstractions (*non-réponse* 'non-answer'). Unlike ontological and complementary $[non-N]_N$, contrary $[non-N]_N$ do not exhibit a clear preference for a specific type of base noun, which is probably due to their metalinguistic value. Besides, one can hypothesize that the base nouns which are the most likely to yield this interpretation are those that are the most loaded with stereotypical properties; a semantic classification of the type 'event'/'artefact'/'human being', etc. is not relevant for this interpretation.¹⁰

The type of base noun entering a $[non-N]_N$ construction is not always enough to predict the interpretation of the derived lexeme and the context can also provide information, which is particularly obvious in the case of the contrary interpretation. Out of context, it is very likely that a noun such as *non-Italien* 'non-Italian' will be interpreted as denoting an individual who is not an Italian (complementary interpretation), not as someone who is an Italian but who does not have the behaviour one would expect from a stereotypical Italian (contrary interpretation). In the corpus I have gathered for this study, bNs denoting events can yield the ontological and the contrary interpretations; bNs denoting human beings can yield the complementary and contrary interpretations, bNs denoting artefacts can yield the three interpretations.

4. Conclusions and perspectives

Given their specificities, I claim that the three interpretations described in this paper correspond to three different $[non-N]_N$ constructions. The question I want to raise, then, is that of

¹⁰As pointed out by one reviewer, this is a difficult question and I think that only a psycholinguistic study could investigate the number of stereotypes conveyed by a noun in a given language and a given culture. Intuitively, I would say that words which carry a lot of stereotypes are words whose referents have a social function. That would explain why artefacts, which have mainly a practical function, rarely enter the contrary $[non-N]_N$ construction, and why human beings enter this construction much more easily.

the link between these constructions. Ontological and complementary $[non-N]_N$ have much in common: first, their productivity (the ontological interpretation makes up 73% of the types, the complementary interpretation 23% of the types); second, their semantics (both express contradictory negation); finally, diachronically, these interpretations appear first (11th century). Contrary $[non-N]_N$, on the other hand, are much less productive (6% of the types) and they appear by the end of the 19th century only (Dugas to app.). Concerning their semantics, they are non-referential, they involve stereotypes, and they have very particular pragmatic properties, namely negative evaluation and metalinguistic function. One can also wonder why the ontological and the complementary interpretations are the most productive interpretations. The data suggest that contrary $[non-N]_N$ are marked, and as a consequence, they are never the default interpretation (by default interpretation I mean the interpretation out of context). Another explanation may lie in the tendency to categorize experience in terms of binary systems of opposite terms, which has been stressed many times in the psycholinguistic literature (Apter 1982; Clark et al. 1977; Lyons 1977; Grice 1975; Osgood & Richards 1973). So it is very likely that the contrary interpretation derives from one of the other two. My hypothesis is that it derives from the complementary interpretation, because both involve properties. Complementary $[non-N]_N$ involve classifying, non-stereotypical properties, whereas contrary $[non-N]_N$ involve qualifying, stereotypical properties. The idea underlying this hypothesis is that the complementary interpretation is cognitively less costly, and that it can work as the default interpretation of a $[non-N]_N$ when the negation affects properties attached to the bN.

In line with the assumptions generally made in construction morphology about the hierarchical organization of constructions (cf. 2.1), I propose that these three constructions inherit the properties of the super-semi-schematic construction $[[non-[X]_N]_N \leftrightarrow \text{'negation of X'}]$ and that they are organised as shown in figure 2.

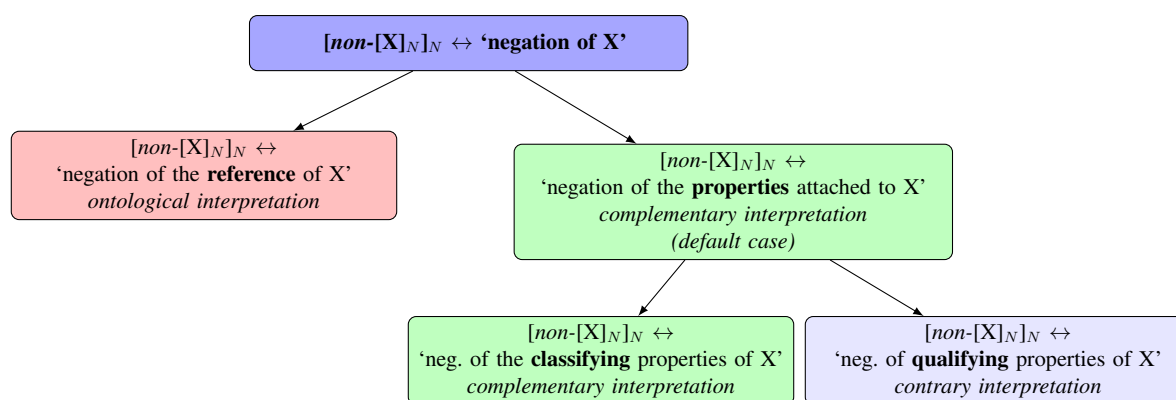


Figure 2 – Constructional network of French *non-* nouns.

Future work could now consist of a thorough examination of the role of context in the interpretation of $[non-N]_N$. The diachronic emergence and evolution of these constructions should also be investigated in more detail.

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A recipe on how to save a derivation

The Locative Impersonal in Brazilian Portuguese

Janayna Carvalho

In this paper, I examine a type of impersonal sentence in Brazilian Portuguese (BP) in which an arbitrary participant reading is present in spite of the absence of impersonal morphology. Given the fact that a locative expression is always present, I term these sentences *locative impersonals*. In contrast to previous analyses that treated the locative element as an adjunct, I claim that the locative is the external argument in BP locative impersonals. This assumption allows us to relate locative impersonals to a change in the features of INFL in BP.

1. The construction

1.1. Impersonal sentences

Impersonal sentences feature a subject with arbitrary reference that can be expressed by various means. Romance languages, for instance, use the polyfunctional clitic *se* (cf. (1)), whereas German and English have specific pronouns, as exemplified in (2) and (3).¹

(1) En Espana, se acuestan temprano. (Cabredo Hofherr 2006:248)
in Spain se go.to.bed early.
'In Spain, they go to bed early.'

(2) Man muss die Geschichte kennen.
man must the history know.
'One/we must know the history.'

(3) One must study hard to pass the exams.

In this paper, I am concerned with a specific type of impersonal sentence present in partial pro-drop languages.² (4) is an example is from Finnish. Unlike impersonals in German or English,

¹ Several languages have more than one strategy to form impersonal sentences, each one having slight different meanings. See Cabredo Hofherr (2006) for an exploration of the different readings that can arise due to different choices of pronouns, verbal morphology etc.

² In German and Dutch, similar constructions are allowed. (i) is an impersonal middle from German; (ii) is an impersonal passive from Dutch.

i. Weil auch auf der Terrasse gut sitzen lässt.

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the reading of an arbitrary participant is present in Finnish impersonals even without a specific pronoun.

- (4) Tässä istuu mukavasti. *Finnish*
 Here sit comfortably
 ‘One can sit comfortably here.’ (Holmberg 2005:548)

Consider now the example (5) from Brazilian Portuguese (BP). The sentence (5) is similar to sentence (1) from Spanish in that the clitic *se* expresses the arbitrary participant of impersonal sentences in both languages. However, in BP, but not in Spanish, this clitic does not need to be present.

- (5) Nesta casa (se) vende doce. *BP*
 in.this house (se) sell candy.
 ‘One sells candy in this house.’

At first sight, the presence or absence of the clitic *se* in (5) seems to be an optionality issue, but in section 2.2 I show some differences between BP impersonals with and without overt morphology. Moreover, the clitic *se* in (5) is in the process of disappearing from BP grammar in a variety of contexts, including impersonal sentences (see e.g. Nunes 1990).

Furthermore, when the clitic *se* is absent, a locative adverbial is mandatory.³ Because of the compulsory presence of a locative adverbial, I term sentences such as (5) *locative impersonals*. In locative impersonals, the reading of an arbitrary participant of the event arises even in the absence of a specific impersonal morphology.⁴ A remark is in order here: although (4) and (5) look very similar, the term *locative impersonals* will only be employed to BP data as (4) and (5) are different in at least two aspects. In Finnish, but not in BP, a locative adjunct is not compulsory. EPP can be satisfied for objects and expletives in Finnish impersonals. Besides that, as it will become clear in section 3.2, impersonal sentences in these two languages pattern differently with respect to syntactic tests. Locative impersonals can then be viewed as a subtype of null impersonals, impersonals without overt morphology. I will concentrate on the properties of null impersonals in BP in this article. Further research is necessary to show whether null impersonals in other partial pro-drop languages pattern more with the Finnish or BP type.

Even without a specific pronoun, (4) and (5) pattern with well-studied types of impersonals. Consider, for instance, example (6) from Italian, in which a reflexive clitic is used to obtain the arbitrary person reading (or *quasi-universal interpretation* in Cinque’s 1988 terminology).

- (6) Si lavora sempre troppo. *Italian*
 si work always too-much.

-
- ii. Because also on the terrace well sit lets
 ‘because one can also sit well on the terrace.’ (Pitteroff 2014: 160)
 Wordt hier gedanst?
 Is hier dance.prt
 ‘Is there dancing here?’ (van Urk 2014:4)

³ The locative expression must be either a PP as illustrated in (5) or adverbs such as *here* and *there*.

⁴ Sentences such as (4) and (5) are usually referred as null impersonals in the literature. As partial pro-drop languages present a parametrical change in progress (cf. Holmberg 2005), it may be the case that not all the speakers consider locative impersonals grammatical. As far as I know, they are grammatical to most speakers of BP and acceptability differences seem to be idiosyncratic rather than dialectal or generational. Some of the first occurrences were already present in 19th century data (cf. Nunes 1990).

‘One always works too much.’

(Cinque 1988:522)

According to Cinque (1988), the quasi-universal interpretation obtains when T is not specified for a particular utterance time. Present tense is an example of unspecified time interval. In both (4), (5) and (6) this reading arises if the verb is in the present. We can see that the arbitrary participant reading obtains either in the presence of an impersonal pronoun, as in (6), or in its absence, as in (4) and (5).

Since impersonals with and without morphology exhibit the quasi-universal interpretation, the question to be addressed is the role of the locative in sentences such as (5). More specifically, would the locative itself be responsible for this reading, a *pro(noun)* (Holmberg 2005, Barbosa 2011) or locative inversion (Avelar & Cyrino 2008; Avelar 2009)?⁵

In addressing this question, I will mainly be concerned with BP data, but examples from other partial and radical pro-drop languages will also be considered.

Since locatives can close variables (cf. Borer 2010), my main proposal is that they are available for this operation in impersonal sentences in the absence of a better candidate (the impersonal morphology). I will further suggest that the INFL category in BP nowadays can be specified for location rather than tense in non-referential 3rd person contexts. The locative impersonal reflects this shift.

This paper is organized as follows: in section 2, I compare the impersonal sentences to locative inversion structures. From this comparison, some hitherto underestimated properties of locative impersonals emerge. In section 3, I consider a *pro(noun)* analysis as a possible account for locative impersonals. In section 4, I explore the structure of the locatives in the impersonal constructions. Section 5 presents the main proposal. In section 6, I consider properties of INFL in BP and claim that locative impersonals are related to the change in INFL. Section 7 concludes the paper.

2. Locative inversion?

One of the possibilities to analyze (5) in BP is to assume that this is a locative inversion structure. Generally, locative inversion is defined as the non-canonical word order PP V NP that seems to be the switching of the order NP V PP. See the example (7), from Levin and Rappaport (1995).

- (7) **In the distance** appeared the towers and spires of a town which greatly resembled Oxford.
(Levin and Rappaport 1995:218)

From the point of view of information structure, locative inversion is used for presentational focus (cf. Levin and Rappaport 1995). By fronting the locative and introducing a new referent after the verb, a structure that focalizes the DP is created. Given that in both locative impersonals and locative inversion structures a PP is fronted, one could argue for a locative inversion analysis of (5). The analysis of (5) as an instance of locative inversion was put forth by Avelar & Cyrino (2008). The possibility of locative inversion with transitive verbs in BP would explain the different interpretations attributed to (8) in European Portuguese (EP) and BP.

⁵ As I will show in section 3, Barbosa (2011, 2013) and Holmberg’s (2005) approaches differ substantially.

- (8) Ele disse que **naquela loja** vende livros. (Avelar & Cyrino 2008:56)
 he said that in.that store sells books.

(9) represents the interpretation given to (8) by (EP) speakers. In this variety of Portuguese, there is a null subject, represented as *ec_i* (empty category) below, in the embedded sentence in a chain, with the subject of the matrix clause.

- (9) Ele_i disse que **naquela loja** *ec_i* vende livros. (Avelar & Cyrino 2008:56)
 he said that in.that store Ø sell books.
 ‘He said that he himself sells books in that store.’

In contrast, (10a) and (10b) represent the interpretations given to (8) by BP speakers. For these speakers, this is an indeterminate (impersonal, in my terms) construction and the possible paraphrase with *se*, the impersonal morphology, indicates this.

- (10) a. Ele disse que **naquela loja** Ø vende livros.⁶
 he said that in.that store Ø sell books.
 ‘He said that one sells books in that store.’

- b. Ele disse que se vende livros **naquela loja**.
 he said that se sell books in.that store.
 ‘He said that one sells books in that store.’

Avelar & Cyrino propose that the different interpretations assigned to (8) by BP and EP speakers can be explained if it is assumed that BP is more permissive in relation to locative inversion than other languages. More precisely, while only unaccusatives allow locative inversion in Romance languages, BP would also allow it with agentive verbs (both unergatives and transitives). Below, I provide the examples and the categorization from Avelar & Cyrino (2008:61).

(11) ‘Unaccusative verbs’:

- Na casa da Maria *chegou* algumas cartas.
 In.the house of.the Mary arrived some letters.
 ‘Some letters arrived in Mary’s house.’

(12) ‘Unergative verbs’:

- Naquele quarto *dormiu* várias pessoas.
 In.that room slept several people.
 ‘Several people slept in that house.’

⁶ The same is true for Finnish, another partial pro-drop language:
 ‘The bound reading of a null subject [in an embedded clause /JC] requires, however, that no argumental category such as an object or a locative adverbial precede the embedded finite verb/auxiliary. If that is the case, the only possible reading is that the subject of the embedded clause is generic’. (Holmberg 2005:551)

i. Oppilas tietää ettei tehtävää pysty ratkaisemaan.
 student knows that-not assignment cansolve
 ‘The student knows that the assignment can’t be solved.’

(13) ‘Ergativized transitive verbs’:

Naquele bairro aluga casa de todos os preços.
 In.that neighborhood rent house of all the prices.
 ‘In that neighborhood one can find either cheap or expensive houses.’

(14) ‘Transitive and unergative verbs without a theme or an agent’:

Nas cidades do interior não sequestra como nas grandes capitais.
 In.the cities of.the country not kidnap as in.the big cities.
 ‘In small cities, people (=criminals) do not kidnap so many people as they do in big cities.’

2.1 Problems

In this section, I will highlight three problems for a locative inversion approach to locative impersonals.

Firstly, if locative inversion is responsible for the arbitrary participant reading in (13), for example, one may think that the generic reading arises with all the verbs in sentences (11) to (14). However, (11) does not mean **One arrived the letter* nor does (12) mean **One slept several people*. In contrast, (13) and (14) mean, respectively, *One rents houses* and *One kidnaps people*.

Secondly, a locative inversion approach to locative impersonals fails to explain (14). As already said, locative inversion is generally taken to be a means of expressing subject focus. In (14), however, there is no overt postverbal DP to which this reading could be assigned.

Finally, the arbitrary participant reading only arises in the presence of a specific kind of locative. This will be discussed in detail in section 4. For the moment, it suffices to contrast the locatives licensed in real locative inversion structures and locative impersonals. In real locative inversion structures, several different locative PPs with respect to the event are licensed. In (15), for example, the PP *daquele banco* ‘from that bank’ expresses the origin of the event described by the verb, whereas *naquele banco* ‘in that bank’ expresses a fixed location in respect to the event described by the verb. This latter locative relation is a scene-setting locative modifier.

- (15) Naquele/ Daquele banco chega muito dinheiro.
 in.that/ From.that bank arrive much money.
 ‘A lot of money gets in that bank.’

In contrast to locative inversions, locatives in locative impersonals are more restrictive. They always refer to a fixed location with respect to the event perspective. More precisely, a scene setting locative modifier is needed for this reading to arise. Hence, the ungrammaticality of the structure if *De cada imobiliária* ‘From each real estate agency’ is added. Only a locative that describes a fixed location, *Em cada imobiliária* ‘In each real estate agency’, is licensed. Note that, although *De cada imobiliária* can express the origin of the actions described by the verbs *vender*, *alugar* and *emprestar* in regular transitive sentences, this locative relation does not comply with the requirement of specifying the place where the whole action took place, hence its ungrammaticality in locative impersonals.

- (16) Em cada imobiliária /*De cada imobiliária
 in each real estate agency /*From each real estate agency
 vende/ aluga/ empresta um tipo de casa diferente.
 sell/ rent/ borrow one type of house different.
 ‘Types of different houses are sold/rented/borrowed in each real estate agency.’

From this comparison, one notices that fronted locative PPs in locative inversion differ from the ones in which an arbitrary participant reading obtains.

With unaccusative VPs, the locative element seems to act like *there* in English. More precisely, it acts as a syntactic requirement in order to satisfy EPP (cf. Avelar & Cyrino 2008). Therefore, in sentences such as (11), repeated here as (17), the locative does not add a new element to the sentence; its only purpose is to introduce presentational reading, which is achieved if the locative is fronted and the DP is in a postverbal position (the reading commonly associated with locative inversion).⁷ Example (17) is from Avelar and Cyrino (2008:61).

- (17) Na casa da Maria chegou algumas cartas.
 in.the house of.the Mary arrived some letters.
 ‘Some letters arrived in Mary’s house.’

Example (12), repeated as (18), needs more attention. In (18), the external argument *várias pessoas* ‘several people’ is present, and the arbitrary participant reading does not arise.

- (18) Naquele quarto dorme várias pessoas. (Avelar & Cyrino 2008:61)
 in.that room sleep several people.
 ‘Several people slept in that room.’

However, if the external argument is not present, the interpretation of an arbitrary participant arises in the presence of the same locative.

- (19) Naquele quarto dorme bem.
 in.that bedroom sleep well.
 ‘One sleeps well in that bedroom.’

From the examples (17) and (19), one can notice that the arbitrary participant reading only arises if the locative is in complementary distribution with the external argument. As I will argue in section 5, this is due to the fact that the locative is in the specifier of Voice in locative impersonals. In the next subsection, I will discuss some selectional properties of locatives in locative impersonals to show that this hypothesis is on the right track.⁸

⁷ At first sight, (17) is thus compatible either with *On the lake are ducks* or *There are ducks on the lake*, in which the PP and the expletive *There* satisfy EPP, but do not have semantic import. Note, however, that PP-preposing and *There* do not pattern exactly alike with respect to all relevant syntactic tests in English. For a detailed account of these differences, see Stowell (1981:chapter 3) and for an investigation on the landing sites of English PPs in locative inversion structures, see Rizzi & Shlonsky (2006).

⁸ A reviewer suggests to apply the tests in Stowell (1981) to locative impersonals and locative inversion structures. Unfortunately, not all the tests can be applied to BP data. Some constructions such *I expect Bill to like this book* are not possible in BP, so it cannot be tested whether locative inversion structures and locative impersonals behave differently in infinitival complements. Conversely, a sentence such as **[That this book, Bill liked] is obvious* (Stowell 1981:272) is grammatical in BP and cannot serve to check whether locative inversion

2.2 Selection

There is a restricted verb class that can participate in locative impersonals. Sigurðsson & Egerland 2009 define the verbs licensed in Icelandic impersonal passives as ‘limited to verbs that denote (null-) subject controlled or volitional action.’ In their own words:

The impersonal passive seems to be limited to verbs that denote (null-) subject controlled or volitional action, that is, it is incompatible with temporal and modal auxiliaries, raising verbs, unaccusative verbs, most psych verbs, weather and other ‘environmental’ verbs and fate verbs (*‘drift’, ‘get swamped’, ‘get covered with snow/water,’* etc.)

(Sigurðsson & Egerland 2009:168)

A similar restriction seems to be in force in locative impersonals in BP: a subset of stage level verbs is licensed, more precisely, stage level verbs that introduce agentive external arguments. Observe that the arbitrary participant reading is neither available with unaccusative stage level verbs, in (20) and (21), nor with individual level verbs, as in (22)-(25).

- Unaccusative stage level verbs

- (20) #Naquele hospital treme de medo.
 in.that hospital trembles of scary.

Intended: ‘Anyone trembles in that hospital.’

- (21) ??#Naquele hospital nasce com saúde.
 in.that hospital born with healthy.

Intended: ‘Anyone who is born in that hospital is healthy.’

- Some individual level verbs

- (22) #Naquela casa teme a morte.
 in.that house fear the death.

Intended: ‘One fears the death in that house.’

- (23) #Naquela casa preocupa com as crianças.
 in.that house worries with the children.

Intended: ‘One worries about the children in that house.’

- (24) #Naquela cidade ama música.

structures and locative impersonals behave alike in this environment. As for questions out of locative impersonals and locative inversion, I noticed that questions with locative impersonals are usually judged as grammatical. The acceptability of questions with locative inversion depends on several factors: out of the blue questions are judged as ungrammatical, but if the verb in a locative inversion structure is unaccusative and the sentence is generic, the acceptability of the sentence improves. A more detailed study has to be carried out to diagnose whether Stowel’s tests can say something about BP data.

in.that city love song.
Intended: ‘One loves songs in that city.’

(25) #Naquela escola sabe matemática.
in. that school know math.
Intended: ‘One knows math in that school.’

This is one of the main differences between locative impersonals and impersonals with the clitic *se*. All the examples from (20) to (25) would be grammatical in the presence of *se*, since the clitic *se* closes the variable of any argument of a verb. By contrast, the locative only closes the external one. Table 1 schematizes the differences between impersonals with *se* and locative impersonals.

Type of verb	Impersonals with <i>se</i>	Locative impersonals
Unaccusative stage-level verbs	✓	X
Transitive stage-level verbs	✓	✓
Individual-level verbs	✓	X

Table 1: type of verb vs. type of impersonal

3. A null pronoun?

A second hypothesis that can be entertained is the presence of a *pro(noun)* in the sentences under analysis. There are two main proposals regarding the nature of a *pro(noun)* in these constructions: one from Barbosa (2011, 2014) and one from Holmberg (2005). I address each of these proposals separately. I conclude that neither of these two proposals can account for BP data.

3.1 Barbosa (2011)

Barbosa (2011) attempts to unify partial pro-drop and radical pro-drop language, since null impersonals are also found in the latter type of language. Example (26) is from Japanese. In the presence of the locative *beddo-de-wa* ‘in bed’, the arbitrary participant reading arises, similar to (4) and (5) from BP and Finnish.

(26) John-wa kono beddo-de-wa yoku nemu-reru-to iu
John-TOP this bed-in.TOP well sleep-can-COMP say
‘John said one sleeps very well in this bed.’ (Barbosa 2011:76)

Barbosa follows Tomioka (2003) in assuming that radical pro-drop languages have *pros* in syntactic environments in which languages like English have determiners. This *pro*, however, is not fully specified and needs to enter into a relationship with some other element. That will give it the impersonal specification (in this case). In this specific case, when this *pro* stays inside the vP, it is under the scope of an existential closure operator and gets an arbitrary participant reading by default.

If this is the right analysis, the incompatibility of this *pro* with individual level verbs and unaccusative verbs comes as a surprise (see section 2.2, on *selection*). (27) is from Avelar & Cyrino (2008:65), in which an individual level verb fails to generate the arbitrary participant reading when anteceded by a locative.

- (27) *Na casa da Maria adora os livros do Harry Potter.
 in house of.the Maria adore the book of.the Harry Potter.
 Intended: ‘One adores Harry Potter books in Maria’s house.’

Even for radical pro-drop languages, this seems to be a problematic analysis. The same verbal restriction seen in section 2.2 applies in a Chinese construction very similar to the one I deal with here since an arbitrary participant reading is also present in spite of the absence of morphology.

- (28) Dianhuahaoma zai mingpianshang yin -zhe.
 phone-numbers at name-card-on print zhe
 ‘Phone numbers are printed on the name card.’ (Pan 1996:413)

Pan claims that *zhe* performs agent suppression and argues very convincingly that (28) is not a passive. According to Pan (1996), (28) is incompatible with a *by*-phrase, and Chinese employs a different suffix for passives (the suffix *le*). Pan (1996) formulates the restriction as: ‘these predicates are thus a subset of the stage-level predicates, i.e., *zhe* is compatible with statives which are not individual-level predicates.’ This restriction is fully compatible with the one stated in the previous section.

To conclude, *pro* as a minimal pronoun that gets different values depending on whether it stays inside the vP or not should not have its distribution constrained by the presence of an event argument, the ingredient that arguably differentiates individual-level and stage-level verbs. Furthermore, this hypothesis is also problematic since such an element does not pattern with the distribution of overt pronouns (cf. section 2.2).

3.2. Holmberg (2005)

The second *pronoun* approach is offered by Holmberg (2005). For Holmberg, the reason why this element is not spelled out is a PF matter.

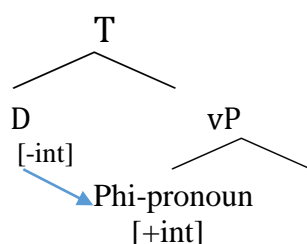
As impersonals without overt morphology are common in partial pro-drop-languages, Holmberg ties the absence of a definite feature (D) in T to the existence of a null pronoun in impersonals. The fact that pro-drop languages can dispense with subjects is modeled as a feature D in T in those languages. Because of this feature, the verbal morphology in pro-drop languages can be definite and refer to specific entities. This contrasts with the specification of T in partial pro-drop-languages. In his own words:

[The] presence of a D-feature in I[nfl] means that a null phi-pronoun that enters into an Agree relation with I[nfl] can be interpreted as definite, referring to an individual or a group. Furthermore, I assume it means that a null subject cannot be interpreted as generic (see Holmberg, to appear). Absence of D in I, on the other hand, means that a null phi-pronoun subject

must be either bound by a higher DP or else interpreted as generic.
(Holmberg 2005:555)

Hence, in null subject languages (e.g. Spanish), the D-feature will agree with a null pronoun in Spec, vP. This null-pronoun can thus be interpreted as an individual or a group, as shown in (29). That is how the interpretation of a definite entity is created for 3rd person.

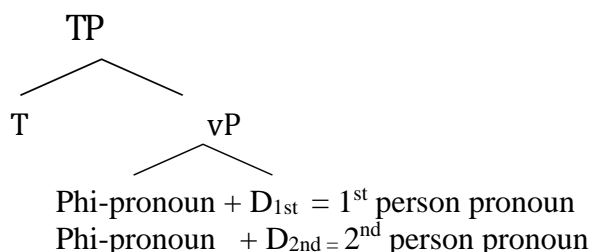
(29) Pro-drop languages⁹



- a. D_{1st} agrees with the phi-pronoun = 1st person pronoun
- b. D_{2nd} agrees with the phi-pronoun = 2nd person pronoun
- c. Impersonal morphology/third person??

In partial pro-drop-languages, there is no D in T, because subjects generally cannot be null. In order to build pronouns that refer to definite entities, a determiner (D) must merge with the phi-pronoun located in spec, vP. This being the case, a pronoun with an arbitrary human reading is a pronoun that did not enter into an agree relationship with a D feature in T.

(30) Partial pro-drop languages



Even in the absence of an overt pronoun, the null arbitrary pronoun in Finnish null impersonals is present since it can bind anaphors (31a) and can control purpose clauses (31b).

- (31) a. Shelliasemalla voi pestä autonsa.
 Shell-station-ADE can-3sg wash car-poss.RFL
 'You can wash your car at the Shell station.' (Holmberg 2005:549)
- b. Tanne tulee mielellään [PRO ostamaan keramiikkaa].
 here comes with-pleasure buy-INF pottery
 'It's nice to come here to buy pottery' (Holmberg 2010:205)
- c. Sinne ei muuta vapaahtoisesti
 there not move voluntarily.
 'One doesn't move voluntarily.' (Holmberg 2010:205)

⁹ At least in Holmberg (2005), it is not clear how the impersonal morphology in pro-drop languages is derived. Unlike the impersonal morphology in partial pro-drop languages, it must be overtly present, otherwise the sentence is interpreted as referring to a definite entity.

The same is not observed in BP. The possible counterparts of (31a) -(31c), if at all possible, refer to a specific person in BP. They do not have an arbitrary human reading.

- (32) *Depois do trabalho foi para sua própria casa.
 after of.the work went to his own house.
 ‘After the work (he) went to his own house.’
- (33) *No posto da Shell pode lavar o seu carro.¹⁰
 in.the station of.the Shell can wash the your car.
 ‘You_{def} can wash your car at the Shell station.’
- (34) *No Brasil negligencia estrangeiro indiscriminadamente.
 in.the Brazil neglect foreigner indiscriminately.
 People neglect foreigners indiscriminately in Brazil.’

One can see that locative impersonals in BP pattern differently from Finnish with respect to binding, control and the licensing of agent-oriented adverbs. If the right analysis for null impersonals in Finnish is a null pronoun, this analysis cannot be extended to BP. Yet, only some verbs in BP allow for this reading to be generated when a locative is fronted, as seen in section 2.2. This behavior of locative impersonals contrasts with impersonal sentences with an overt pronoun, indicating that the difference between locative impersonals and se-impersonals is not only a PF matter in BP.

4. Where are the locatives merged? Event external vs. event internal modifiers¹¹

A question that has been neglected in the literature about locative impersonals is the role of the locative. I have mentioned in section 2.1 that only scene-setting locative modifiers allow the arbitrary participant reading to arise. In this section, I identify a syntactic constraint in the type of locative relation that licenses this reading.

Maienborn (2001, 2003) identifies two attachment sites for locative modification in the VP domain.¹² If a locative relation is within the event, it modifies the direct object and is then

¹⁰ In principle, *seu* and related possessive forms (*sua* – *seu.FEM*; *seus* – *seu.PL*; *suas* – *seu.FEM.PL*) are ambiguous between a 2nd and a 3rd person singular reading, although the 2nd person singular reading is much more salient. In both possible readings, the sentence would still read as referring to a definite referent present in the discourse.

¹¹ I thank an anonymous reviewer for pointing out the relevance of Maienborn’s work on locatives to the phenomenon I discuss in this paper.

¹² In Maienborn (2001), a more accurate characterization of locative modifiers is given and a third type of locative is introduced, the frame setting modifier.

i. In den Anden werden Schafe vom Pfarrer auf dem Marktplatz
 In the Andes are sheep from.the priest on the marketplace
 An den Ohren gebrand.
 At the ears branded. (Maienborn 2001:199)

‘In the Andes, sheeps are marked on their ears by the priest in the marketplace’.

- *In den Anden*: restricts the overall proposition; -> *frame setting modifier*
- *Auf dem Marktplatz*: where the whole event took place -> *event external modifier*
- *An den Ohren*: location where the brand is placed -> *event internal modifier*

identified as an event internal modifier. If a locative relation locates the whole event, it is identified as an event external modifier. (35) and (36) are examples of these two locative relations situated in the VP area.

(35) Event internal modifier: locative relation within the event
Eva signed the contract on a separate sheet of paper. (Maienborn 2003:476)

(36) Event external modifier: location for the whole event
Eva signed the contract in the office. (Maienborn 2003:477)

Note that the same locative can evoke the two different readings in some cases, as in (37), adapted from Maienborn (2003).

(37) Angela and Bardo made an appointment in the museum.
External reading: the event of making an appointment takes place in the museum. It might be an appointment for going to the movies.
Internal reading: The modifier specifies the location of the appointed event.

These differences in interpretation correlate to a difference in the target of attachment of these locative expressions. Event-external locative modifiers attach to VP, whereas event-internal locative modifiers attach to V. The attachment sites of these locative expressions are exemplified in (38).

(38) subject > **event-external locative modifier** > > direct object > **event-internal locative modifier** > V (Maienborn 2003:485)

The attachment site of the event-external locative modifier can tell something about the structure of locative impersonals. As I argue that locative PPs are merged in the specifier of Voice in locative impersonals, only verbs in which the external argument is the arbitrary participant will form locative impersonals. This is why only transitive stage-level verbs form locative impersonals (cf. section 2.2). I come back to this issue in section 5.

In the next section, I demonstrate that the locatives in BP locative impersonals are event external modifiers.

4.1 Applying the difference between event external and event internal modifiers to locative impersonals.

In this section, I apply some tests to show that locative PPs in locative impersonals are indeed event external modifiers (39) and (40) indicate that the arbitrary human reading does not arise if event internal modifiers are used. The locative *na folha separada* ‘On a separate sheet of paper’ in (39) indicates the location of the signature, but not where the event of signing the contract took place. In the same way, the locative *no computador* ‘on the computer’ in (40) indicates the location of the text (the text was being typed on a computer), but not the place where the typing of the text took place.

Frame setting-modifiers do not have any restriction regarding kind of eventualities. They are argued to be attached to one of the projections associated to the CP layer. Maienborn also shows that they usually can be interpreted as epistemic adverbs. For a detailed description, the reader is referred to Maienborn (2001).

Locative impersonals with locative internal modifiers.

- (39) ?Na folha separada assina o contrato.
 in.the sheet separate sign the contract.
 Intended: ‘On a separate sheet of paper, one signs the contract.’

- (40) ?No computador digita o texto.
 in.the computer type the text.
 Intended: ‘One types the text on the computer.’

(39) and (40) are awkward, but could be licensed in a context in which someone narrates what a definite person is doing. In other words, in the presence of internal modifiers the arbitrary human reading does not arise.

(41) exemplifies this once more. The arbitrary participant reading is available in the presence of ‘*na casa da Maria*’ ‘At Mary’s house’, an event-external modifier since it modifies the whole event of selling fruits. Observe that an internal event modifier *no palito* ‘in the stick’ does not change or modify this reading.

- (41) Na casa da Maria vende fruta (no palito).
 in.the house of.the Mary sell fruit (in.the stick).
 ‘One sells fruit sticks at Mary’s house.’

I conclude that only an event external modifier can give rise to an arbitrary human reading and this relates to other characteristic of locative impersonals I have observed, namely the selection of transitive stage level verbs.

Up to now we have observed several properties of BP locative impersonals that can be summarized as follows: only locative PPs that are external locative modifiers in combination with transitive stage level verbs give rise to this reading. Also, the locative PP and the external argument of the transitive stage level verb must be in complementary distribution.

5. The proposal in a nutshell

In this section, I outline my proposal. So far, I have discarded locative inversion and *null pronoun* analyses, since they cannot account for the entirety of the data. I have also claimed that the locative is merged in the specifier of Voice in BP, since only transitive stage level verbs allow the arbitrary human reading to be generated in the presence of the locative. Furthermore, the attachment site of this locative, outside vP, lends credence to the idea that it is merged as an external argument.

5.1 Locatives and existential force

It is widely established that locatives have existential force. so they can close variables. To mention just one example, in Greek and Spanish, unergatives do not license bare nouns, which I will assume that are not existentially closed (cf Alexiadou 2007), cf. (42a), (43a). Those sentences improve in the presence of a preverbal locative, cf. (42b), (43b).

- (42) a. ??Corren chicos. *Spanish*
 run boys.
 b. Aqui corren chicos.
 here run boys.
 ‘Boys run here.’ (Alexiadou 2007:3)
- (43) a. *epezan pedhia. *Greek*
 were.playing children.NOM
 ‘Children were playing.’
 b. edo pezun pedhia.
 here play-3PL children.
 ‘Children play here.’ (Alexiadou 2007:3)

According to Borer (2010), cases in which locatives license post-verbal bare nouns and indefinites should not be analyzed as instances of locatives existentially closing DPs, but, rather, closing the event variable on vPs. More specifically, Borer argues that, in the absence of definite expressions (strong DPs and pronouns), which are argued to be inherently existentially closed, the locative binds the locus of existential closure (e), which, in turn, binds the DP. See the representation adapted below:

- (44) \exists locative e¹³ [vP V DP] (Borer 2010:336, adapted)

Something that supports this line of analysis is the fact that perfect aspect improves a sentence in the same way a locative does, at least in Greek. Alexiadou (2007:3) points out that ‘VS orders with imperfective aspect are marked [in the relevant class], while VS orders with perfective aspect are much better’.

- (45) a. Dulepsan kseni ergates
 worked.prf.3PL foreign workers.
 b. ??Dulevan kseni ergates.
 worked.3PL foreign workers. (Alexiadou 2007:3)
 ‘Foreign workers worked.’

Recall that the perfective aspect (or past tense, for that matter) is a source of existential closure (Carlson 1995). This is because the event has an episodic reading in perfective aspect, therefore the participants are known. If both locatives and perfective aspect have the same impact in licensing the bare nouns in a language, it can be seen as empirical evidence for the claim that locatives apply existential closure.

An important remark is in order here. There is an important difference between locative inversion and locative impersonals: whereas the data in (42b) and (43b) suggest that the locative closes the event variable in locative inversion, an arbitrary participant reading arises in locative impersonals. This indicates that the locative existentially closes the external argument variable

¹³ In Borer’s formulation, the locative is binding Asp-Q, a projection above VP and is somehow related to transitivity/intransitivity properties (quantity telic are either unaccusatives or a subclass of transitives; quantity atelic are either unergatives or another subclass of transitives). For my proposal here, it suffices to say that the locative is binding the event variable, which is the locus of existential closure. This event variable is located in the vP area (Diesing 1992; Kratzer 1995).

in the latter construction. With the loss of impersonal morphology, BP has resorted to an alternative way to express an arbitrary human reading. As locatives contribute to existential meaning, this was the chosen element.

6. Tense and locative impersonals

The proposed analysis explains the existence of locative impersonals in BP. However, I suggest that independent facts tell us that we can go a little further to understand the nature of locative impersonals in BP. BP has other resources to derive the impersonal meaning, as shown in (46).

- (46) Nego/ O cara/ você_{arb} sempre faz essas coisas.
 black/ the guy/ you_{arb} always do these stuff
 ‘One always does this stuff.’

Therefore, if the language has other DPs to express an arbitrary participant reading, as shown in (46), employing a locative to derive such meaning might tell us about some other characteristic of BP, and other languages in which this strategy is commonly employed.

6.1 Richness of tense in BP

Cyrino (2013) shows that BP has lost the contrast between some temporal values (past, present, future). In some cases, it has led to analyticization (i.e. periphrastic future); in other cases, a former temporal value (past, in this case) is employed for aspectual distinctions, as can be seen from examples below.

In (47a), the person still lives well. Likewise, (47b) is appropriate if the person utters the sentence at the very moment s/he notices the addressee’s blouse. Therefore, in both cases, despite the presence of past morphology, these sentences can be interpreted as referring to the present. Both examples were taken from Cyrino (2013:312).

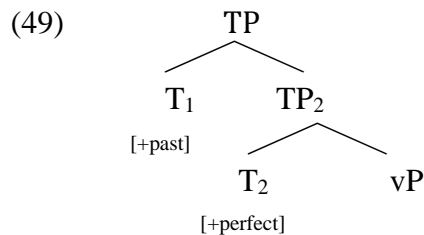
- (47) a. Eu estou feliz porque eu vivi muito bem todos estes
 I am happy because I lived very well all these
 anos.
 years.
 ‘I am happy because I have lived very well all these years.’
 b. Eu adorei sua blusa!
 I loved your blouse.
 ‘I love your blouse.’

(48) is ambiguous. This is an appropriate sentence either if the party is over or if the party is not over.

- (48) Só faltou cerveja nesta festa!
 Only lacked beer in.this party!
 ‘Only beer is missing in this party/Only beer was missing in this party.’

(Cyrino 2013: 313)

Following Giorgi and Pianesi (1997) (see also Demirdache and Uribe-Etxebarria (2014)), Cyrino (2013) assumes two projections for tense. T_1 locates the traditional information for T, namely it is related to the utterance time; T_2 locates the information about grammatical aspect. In some languages, the verb moves to T_1 , therefore the morphology encodes properties of the utterance time, while in others it only moves to T_2 and the morphology encodes aspectual properties.



As the examples in (47) and (48) demonstrate, the past morpheme has a broad use in BP. More specifically, in the examples at hand, the past morpheme is not composed by [+past, +perfect], but only [+perfect]. It indicates that the verb in BP moves to T_2 . In other words, when past morphology encodes aspectual information, it is generated in T_2 , where grammatical aspect interpretation is generated

If this is right, a question remains: how is the utterance time expressed if the former temporal morphology fails to encode utterance time distinctions? (47) and (48) shows us that the event can be interpreted as anchored in the present time even though the verb morphology is past. This opens up the possibility that BP uses values for INFL that do not match the verb morphology. As I argue that external locative modifiers are external arguments in locative impersonals, it can be the case that the value of INFL in locative impersonals allows a locative to be merged as an external argument. In the next section, I briefly introduce Ritter and Wiltschko's (2014) proposal about INFL.

4.2 The Absence of tense? Underspecified tense?

Ritter and Wiltschko (2014) argue that tense is just one option to encode the reference time in the languages of the world. In other words, tense is one of the values that INFL can have. Data from Halkomelem (50) exemplify that.

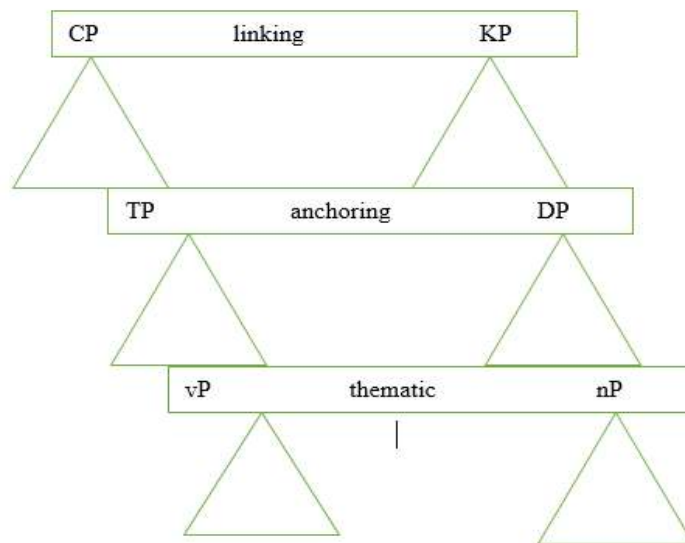
Contrastive meaning of an utterance is built with different locative auxiliaries. *Í* is a proximative auxiliary; *lí* is a distal auxiliary. Observe that the relevant distinction in this language is the location of the participant. Present and past seem not to be a relevant distinction since both (50a) or (50b) can correspond to present or past utterances.

- (50) a. *í* *qw'eyílex* *tútl'ò*
 PROX dance he
 'He is/was dancing [here]'
- b. *lí* *qw'eyílex* *tútl'ò*
 DIST dance he
 'He is/was dancing [there].'

(Ritter and Wiltschko 2014:1341)

(50) shows that the category that connects the event to the utterance is specified for location rather than for tense in this language. Assuming this is right, the authors argue that all languages share the same set of universal categories (CP, IP, vP, etc.), but they will employ different elements to instantiate these universal categories (The universal spine in (51)). The way categories will be instantiated in each language depends on the substantive content available for each language.

(51)



(adapted from Ritter and Wiltschko 2014:1334)

As DPs and INFL serve the purpose of anchoring the event, the DP marking in the languages will differ depending on the type of INFL these languages have, as shown in Table 2. Hence, Ritter and Wiltschko's approach give us an understanding why the locative is the external argument in locative impersonals. A locative relation is licensed as an argument in BP locative impersonals because INFL is specified for location rather than tense in this context.

Content of m-valuation	DP-marking
INFL _{tense}	DP _{tense} =case
INFL _{location}	DP _{location} =location marking
INFL _{participant}	DP _{participant} =person marking

Table 2: INFL and DP relation

(Ritter and Wiltschko 2014:1377)

By introducing Ritter and Wiltschko's (2014) hypothesis about the INFL, I do not mean to say that BP INFL is invariably specified with location features. Rather, I contend that location is one possible specification of INFL in BP in non-referential 3rd person. In the next section, I provide additional evidence for the assumption that locative impersonals in BP reflect a change in T.

6.2 Tense and locative impersonals

The distribution of event external modifiers suggests these elements close the external argument variable in these events. There is one more fact that suggests this and has been already pointed out by Avelar & Cyrino (2008). The authors note that the ungrammaticality of (53a) can be explained by the requirement of a nominal to satisfy EPP. In locative impersonals, the nominal entitled to satisfy EPP is the locative PP, as the grammaticality of (52b) indicates.

- (52) a. *Parece *naquela loja* vender bastante sapato. (Avelar & Cyrino 2008:63)
 Seem in.that store sell.INF a.lot shoe.
 b. *Naquela loja* parece vender bastante sapato. (Avelar & Cyrino 2008:63)
 In.that store seem sell.INF a.lot shoe.
 ‘One sells a lot of shoes in that store.’

The question would then be what the features in Tense in BP are that license the locative in Spec, TP.¹⁴ Avelar (2009) considers that T in BP is defective in having just the feature [person]. The locative PP would presumably be specified for 3rd person as well, satisfying the features of T.

This hypothesis is related to the empirical observation that it is possible to employ the same form of the verb when referring to all pronominal persons, but the 1st singular one in some BP varieties. The paradigm Table 3 illustrates this.

(53)

Eu	I	Canto	sing.1sg
Você/tu	You/you	Canta	sing.default
Ele	He	Canta	
A gente/nós	We/we	Canta	
Vocês	You.pl	Canta	
Eles	They	Canta	

Table 3: simplified verbal paradigm in BP

However, the paradigm in (53) does not give us evidence that the feature [person] is present in T. The fact that 1^{sg} person triggers a different inflection does not warrant that this feature is invariably present in T regardless to the pronominal person.

Thus, I would like to argue, instead, that INFL in BP can have a default value, i.e. without phi-features. Hence, the features in such category would **semantically** contribute to connecting the event to the utterance time. As the specification of BP INFL can be default sometimes, INFL has the sole purpose of semantically anchoring the event. This amounts to say that there are no phi-features that enter into an agree relation with the external argument in locative impersonals.

One piece of evidence that points to this conclusion is the case assignment in locatives in the sentences under study. As the sentences throughout the text have exemplified, adverbial locatives are usually headed by prepositions, which are independent case assigners.

¹⁴ I use T(ense) for the INFL category in this section, because this is the nomenclature the authors cited in this section employ. Nevertheless, I maintain that in contexts where non referential 3rd is employed in BP, the INFL category seems to be specified for location rather than Tense.

The fact that locatives in the relevant sentences are headed by preposition suggests that T cannot attribute case in at least some non-referential 3rd person constructions in BP, so a preposition is needed to assign an inherent case to the subject. If T in BP had the phi-features to enter into an agree relation with the DP, this preposition would not be necessary.

7. Conclusion

In this paper, I have developed an approach to locative impersonals in BP. In section 1, I have defined impersonals and locative impersonals. I have argued that locative impersonals is a subtype of null impersonals, i.e. impersonals without overt morphology found in partial pro-drop languages. In section 2 and 3, I have presented some previous approaches to null impersonals and commented on their inadequacies for BP data. As a locative is compulsory in BP locative impersonals, I have explored the properties of the locatives licensed in locative impersonals in section 4. Section 5 exemplifies that locatives can close variables and section 6 argues for another specification of INFL in locative impersonals.

In sum, I have argued that locative impersonals emerge from several factors. The loss of impersonal morphology has led the language to develop alternative ways to build an impersonal event. The inability of T to provide case in some contexts made PP locatives suitable for occupying the position of external argument in BP impersonals.

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BE able to and the categorization of modal markers in English

A corpus-based study

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The aim of this paper is to investigate the role of BE X TO structures in English via the analysis of the quasi-modal BE ABLE TO. Based on previous accounts of the marker and its comparison with modal auxiliary CAN, defining characteristics are identified and contrasted with the description of other BE X TO structures such as BE ALLOWED TO and BE LIKELY TO. Consequently, the availability of non-finite forms along with property attribution and goal orientation stand out as unifying properties of the BE X TO quasi-modal category, which occupies a singular place within the modal system of English.

1. Introduction

Understood as a semantic category embracing a range of notions that ‘all involve some kind of “non-factuality”’ (Collins 2009:11), modality forms a rich system in English and one that has extensively been dealt with in the literature (see for instance Coates 1983; Palmer 1990). Most of the time however, the accounts have concentrated on the central modal auxiliaries and, except in recent years, little has been said about other modal markers such as quasi-modal periphrastic expressions, e.g. BE ABLE TO, BE LIKELY TO, BE BOUND TO, BE SUPPOSED TO. The very denominations of such expressions have varied a lot, including in reference grammars such as Quirk et al. (1985), Biber et al. (1999) and Huddleston & Pullum (2002), where they have alternately been referred to as ‘semi-auxiliaries’ or ‘marginal modals’, ‘relatively fixed expressions with meanings similar to that of the modal auxiliaries’ and ‘lexical modals’.¹ This actually shows the lack of consensus prevailing today over the status to be attributed to this set of expressions whose boundaries are not clear-cut. Indeed, structures like those mentioned above have modal meanings which are also found in modal auxiliaries but present on the other hand different degrees of grammaticalization (see Westney 1995:36-7), which does not facilitate their characterization as a homogeneous category. Yet, as pointed out by Krug (2000:257), expressions such as BE EXPECTED TO, BE DUE TO, BE ALLOWED TO and others do seem to constitute a subclass as they all contain the verb BE followed by an adjective or past participle taking *to*-infinitive complementation. Thus, the

¹ The term ‘quasi-modal’ will be used throughout this paper to refer to those modal expressions, in line with Collins (2009:15).

way these structures operate and the place they occupy in the modal paradigm deserve to be further investigated and this is what this paper sets out to do.

The issue of the categorization of modal markers in English will be approached via a case-study of BE ABLE TO and its relation to both modal auxiliary CAN and other BE X TO structures. Indeed, even though BE ABLE TO is one of the most studied BE X TO structures (see for instance Facchinetti 2000; Aijmer 2004), its modal characterization still needs to be refined because the semantics of the marker remains elusive. Moreover, its uses may have evolved in recent years given the changes experienced by the modal system as a whole (see Mair & Leech 2006). Working in the unifying framework of the Theory of Enunciative Operations (see Culioli 1990), I will provide a comprehensive analysis of the semantic, syntactic and pragmatic features of the structure based on the survey of a 40-million-word corpus comprised of the 2009 year of publication of the British newspaper *The Independent*.²

2. Previous accounts of the structure

As noted by Aijmer (2004) and Facchinetti (2000), studies on BE ABLE TO have mostly focused on a comparison of the quasi-modal with CAN, the two markers being presented as near synonyms with BE ABLE TO a minor variant of CAN in certain contexts. We will briefly review the arguments given for such a characterization in the literature before comparing them with examples taken from the *Independent* corpus in sections 3 and 4.

2.1. Suppletive use

Both Quirk et al. (1985) and Facchinetti (2000) insist on the strong syntactic complementarity obtaining between BE ABLE TO and CAN. This so-called ‘suppletive’ use is an argument for the inclusion of BE ABLE TO in the category of quasi-modals as it allows the structure to ‘fill slots in a modal verb paradigm’ (Quirk et al. 1985:144), and is confirmed by the high and relatively stable frequency of non-finite uses, which represent about 60% of all uses of the marker in the 1961-93 British English corpora analysed by Facchinetti (2000:119-23). Yet, given the increasing use of some quasi-modals as opposed to corresponding modals shown by Mair & Leech (2006) and the phenomenon of grammaticalization undergone by quasi-modal expressions described by Krug (2000), there may have been an evolution in the distribution of the marker in more recent years, which the present study will allow us to check.

The predominance of the suppletive use of BE ABLE TO has often caused its semantic differentiation from CAN to be backgrounded, but a distinction is still made between the two as far as actuality and objectivity are concerned.

2.2. Actuality

Quirk et al. (1985:232) evoke the emphasis put on the ‘fulfilment of the action’ by BE ABLE TO in past assertive contexts, where *could* has a potential meaning only. This opposition is also phrased in terms of ‘actuality’ v. ‘non-actuality’ (see Facchinetti 2000:124), and is attributed

² The corpus was collected by Catherine Collin (University of Nantes) in digital form. The data was then extracted using a Python command-line tool as well as the concordancer *CasualConc* (© 2008-2015 Yasu Imao).

by Aijmer (2004:73) to the grammaticalization of the quasi-modal into an aspectual marker, the meaning being derived ‘from participant-internal ability to participant-internal actuality in certain contexts’. Context certainly seems crucial for this interpretation to develop, meaning that it can hardly be considered a core value of the marker. Furthermore, as indirectly highlighted by Aijmer (2004), attributing an ‘actual’ meaning to BE ABLE TO is problematic insofar as it would exclude it from the modal category altogether since the latter is characterized by ‘non-factuality’ (Collins 2009:11). The exact origin of such an interpretation thus needs to be ascertained.

2.3. Objectivity

Another characteristic of BE ABLE TO that is often discussed in the literature (see Facchinetti 2000:125; Collins 2009:29-30) is its ‘objective’ nature, as opposed to the ‘subjectivity’ expressed by CAN. This is mostly presented as a characteristic of the quasi-modal category which allows its differentiation as a whole from modal auxiliaries. Yet, as shown by Westney (1995 quoted in Collins 2009:29), this distinction sometimes proves problematic when compared with corpus uses since quasi-modals can also be used ‘subjectively’. The problem actually seems to reside in the definition given to the notion of ‘objectivity’ as opposed to ‘subjectivity’, which is not always very clear and which tends to differ between authors. Consequently, this characterization deserves further investigation, especially in light of Perkins’ claim (1983:68) that ‘all modal expressions which incorporate the verb BE express objective modality, the objectivity being a function of the fact that the modality itself is actually asserted’, a statement which noticeably establishes a direct link between the morpho-syntactic and semantico-pragmatic properties of the marker.

3. BE ABLE TO and the modal auxiliary CAN

In what follows, I compare the elements highlighted in the previous section with the analysis of the *Independent* (2009) corpus presented earlier, providing both quantitative and qualitative data on authentic uses of the marker.

3.1. Syntactic complementarity

	Non-finite forms of BE <i>able to</i>			Present tense forms of BE <i>able to</i>			Past tense forms of BE <i>able to</i>		All forms of BE <i>able to</i>
	be	been	being	am	are	is	was	were	
Number of tokens	4429	980	587	24	388	232	793	501	7934
	5996			644			1294		
Frequency	55.82%	12.35%	7.40%	0.30%	4.89%	2.92%	9.99%	6.31%	100%
	75.57%			8.12%			16.31%		

Table 1. *Distribution of the occurrences of BE able to in The Independent (2009)*

The syntactic complementarity between BE ABLE TO and CAN discussed in 2.1. appears very clearly in Table 1 where we can see that the non-finite uses of BE ABLE TO account for more than 75% of the uses of the marker. This figure is significantly higher than the overall percentage given by Facchinetti (2000) for her multi-register corpora³, but it is comparable to the frequency she gives for the Press section of her corpora, which is about 73% for Lancaster-Oslo/Bergen (LOB 1961) and 81% for Freiburg-Lancaster-Oslo/Bergen (FLOB 1991), as shown in Table 2.

	LOB (1961)				FLOB (1991)			
	Non-finite	Present tense	Past tense	Total	Non-finite	Present tense	Past tense	Total
Number of tokens	22	1	7	30	34	1	7	42
Frequency	73.33%	3.33%	23.33%	100%	80.95%	2.38%	16.67%	100%

Table 2. *Distribution of BE able to in the Press section of the LOB (1961) and FLOB (1991) corpora, adapted from Facchinetti (2000)*

Thus, a few observations can be made on this set of frequencies. First, there is a specificity of newspaper discourse regarding the uses of BE ABLE TO, which is even more frequent in non-finite forms in this particular register than in general British English. Second, the frequencies within the newspaper corpora are not that homogenous either. This may be explained in part by the much smaller size of the LOB and FLOB corpora compared to *The Independent* (2009), but may also have to do with the sampling process and composition of LOB and FLOB. The *Independent* (2009) corpus is characterized by a form of coherence and unity which cannot exist in (F)LOB because it is made up of a variety of sources. On the other hand, a single newspaper is not necessarily representative of all newspaper discourse, which might explain the variation between the two sets of corpora. Furthermore, it is worth noting that *The Independent* did not exist at the time of elaboration of the LOB corpus in 1961 but did in 1991 when FLOB was created, so that there are samples of *The Independent* in the latter but not in the former. Thus, although LOB and FLOB were designed so as to be comparable, there are still differences in the sources of the texts sampled in each which might also explain the variation in the frequency of non-finite forms of BE ABLE TO. Finally, the hypothesis of an evolution in the uses of the marker over time in journalistic discourse is not supported by enough evidence, and would require comparing *The Independent* (2009) to another year of publication of the same newspaper to be reassessed, which is beyond the scope of this study.

Saying that there is syntactic complementarity between BE ABLE TO and CAN, however, does not necessarily lead to describing this use of the quasi-modal as suppletive. Such a description would suggest that there is a clear alternation between the two markers, with no possible choice between two competing forms, while also implying that the two markers at stake fulfill the same function and are basically interchangeable. It is true that CAN does not have any non-finite forms, but in some cases, a choice does seem possible if we allow what

³ Facchinetti's study is mostly based on the Lancaster-Oslo/Bergen (LOB) and Freiburg-Lancaster-Oslo/Bergen (FLOB) corpora. LOB and FLOB were designed to be comparable corpora of British English, both totalling one million words and offering samples of various registers (e.g. press, imaginative writing, religion or scientific writing) but with textual material published respectively in 1961 and 1991. For more information see LOB (<http://clu.uni.no/icame/lob/lob-dir.htm>) and FLOB (<http://clu.uni.no/icame/manuals/FLOB/INDEX.HTM>) manuals.

precedes the non-finite form of BE ABLE TO to be taken into account. For instance, the sequence *will be able to*, which is often interpreted as a future ‘concrete’ possibility, can sometimes be replaced with CAN without any changes in temporal reference. The following utterance is an example of such cases.

- (1) “It’s a great honour to come back to my ‘family’,” said the former Pakistan Test bowler. “It will be nice to see all my friends again and I hope I **will be able to** take my performances from the field into the dressing room. // “When you have a passion for something, you allow yourself to give your best – and I have the passion and desire for coaching.”⁴

In (1), *be able to* cannot directly be replaced with *can* given that the sequence **will can* is unacceptable. Yet, *will be able to* can be replaced with *can* with minimal loss on the referential plane (1’).

- (1’) “It will be nice to see all my friends again and I hope I **can** take my performances from the field into the dressing room.

This is because *will* primarily marks future projection in a context where future time reference is already implied via *hope* in the main clause, along with *will* in the coordinated clause. This does not mean that the two alternatives are equivalent, as the presence or absence of *will* necessarily involves differences in terms of modal positioning.⁵ Quite to the contrary, it indicates that the use of *will be able to* v. *can* results from a choice by the speaker, depending on the point of view he/she wants to convey. In fact, whatever the context, it could be argued that there is always a choice between BE ABLE TO and CAN, given that another turn of phrase is always possible. It should thus be emphasized that the complementarity shown by the two markers on a syntactic level is reflected on a notional level, and is not the sign of interchangeability. We will explore the semantics and pragmatics of both markers in greater depth in the following sections.

3.2. Goal orientation

According to the data extracted from *The Independent* (2009), past tense occurrences of BE ABLE TO constitute the most frequent finite use of the marker, which as for non-finite uses seems to be linked to a sharp contrast with CAN, as evoked in section 2.2. Example (2) provides an illustration of this usage.

⁴ All examples are from *The Independent* (2009). Double slashes in examples signal a paragraph break in the original.

⁵ The absence of equivalence between *will be able to* and *can* is also linked to the type of possibility expressed by BE ABLE TO on the one hand, and by CAN on the other hand, and to the operating mode of each marker, as we shall see further on. Here, the goal is merely to show that the choice of a marker along with a syntactic configuration does not necessarily derive from external referential or propositional constraints.

- (2) They asked 13 ear, throat and mouth (otolaryngology) residents in Vancouver to each flip a coin 300 times to see if they could bring up heads. // All of the participants achieved more heads than tails, with 7 of the 13 coming up with “significantly more heads” than tails, said the study published in the current December 7 issue of the Canadian Medical Association Journal (CMAJ). // One of the participants **was able to** achieve heads 68 percent of the time.

In (2), we have a case of the quasi-modal denoting ‘actuality’, i.e. the syntactic subject had the ability to validate the predicate and he/she did, as indicated by the assertion in the previous sentence. Aijmer (2004:72) suggests that this interpretation is the result of ‘pragmatic inferences’ which have been conventionalized. It seems reasonable indeed to describe ability as a property that can be attributed to a subject only if the subject is known to have realised the predicate under consideration at least once. When the situation associated with the predicative relation is unique—as is the case here—then there is only one possibility for verification, which means that the event actually took place. This shows, however, that the ‘actual’ character of the event is not expressed by the quasi-modal marker itself, but most likely results from the interaction between BE ABLE TO, the past tense, and contextual factors such as the type of situation referred to in the utterance, i.e. specific or generic. In fact, the study of corpus data reveals that such an interpretation does not arise in generic contexts, as shown by example (3).

- (3) In the 1960s, “pirate” radio stations really did live up to their name. Due to a loophole in the legal system, stations **were able to** broadcast from international waters – in this case, ships in the North Sea – to listeners in Britain and Europe. Richard Curtis's latest comedy film, *The Boat That Rocked*, is about that era of pirate radio: it tells the story of an offshore station that conquered the airwaves, and stars Phillip Seymour Hoffman, Bill Nighy, Rhys Ifans and Kenneth Branagh.

In this utterance, the syntactic subject *stations* is indefinite and generic and, along with the time adverbial *in the 1960s*, thus suggests the existence of a class of occurrences of the predicative relation <stations – broadcast...>. In this context, *were able to* is not interpreted as referring to a single event which would actually have taken place but merely evokes the possibility for the subject to validate the predicate in a broad past situation. It is therefore possible to paraphrase with *could* (3’).

- (3’) Due to a loophole in the legal system, stations **could** broadcast from international waters – in this case, ships in the North Sea – to listeners in Britain and Europe.

It is worth noting, however, that this use of the quasi-modal is rather rare as *could* seems to be preferred to *was/were able to* in most cases. This is probably because as opposed to BE ABLE TO, CAN is intrinsically linked to the construction of a class of occurrences (see Gilbert 2003:779), which explains in turn the relative⁶ incompatibility of the modal auxiliary with specific contexts naturally favouring an ‘actual’ reading of the utterance in the past.

⁶ CAN is sometimes found in specific contexts when the utterance is non-assertive, e.g. *Nadal raced to a 5-2 lead when Federer's backhand let him down repeatedly. // And staring down the barrel of defeat and with hopes of a record-equalling 14th major title slipping away, Federer fought off three championship points, but **could** not do it for a fourth time.* It could be argued that negation, or interrogative inversion, makes the marker

The etymology of ABLE and CAN offers another element of explanation concerning the different behaviour of the two markers in the past. According to the *Oxford English Dictionary (OED)*, ABLE comes from Latin *habilis* via French: ‘easy to handle, easily dealt with, suitable, fit for a purpose’, from *habēre* ‘to hold’. All those dimensions point to the relational nature of the notion /able/, which tends towards an object, or ‘purpose’, as much as it qualifies its first argument. In use, this orientation towards a specific goal is actually reinforced by the *to*-infinitive complement of the adjective which marks a projection towards the validation of the predicative relation, and which interestingly also appears in other quasi-modal expressions that receive an ‘actual’ interpretation in the past, e.g. HAVE TO. In the words of Coates (1983:127 quoted in Facchinetti 2000:124), all this confers to BE ABLE TO a ‘dynamic’ character which is not found in CAN, from Old Germanic *kunnan* ‘to know, know how, be mentally or intellectually able’, which is as a result much more stative (*know*, *be*) and abstract (*mentally*, *intellectually*) in meaning. This fundamental difference might help to explain why BE ABLE TO sometimes appears in contexts where the event it qualifies is understood to have taken place, when CAN does not. Yet, it also confirms that BE ABLE TO never expresses ‘actuality’ as such but rather a projection towards a goal, which is *a priori* virtual and requires specific contextual parameters to be actualized. As a consequence, the ‘actual’ interpretation, which only arises in specific, past contexts, cannot be considered a stable property of the marker and does not disqualify it as a (quasi)modal marker. However, the fact that BE ABLE TO can occur in contexts where the validation of the predicative relation is inferred is a strong argument for positing the existence of a modal continuum in the uses of the marker.

3.3. Property attribution and expression of point of view

The idea of a continuum of modal degrees leads us back to the notion of ‘objectivity’ discussed in section 2.3. If this notion is understood as referring to a marker being used to qualify a proposition independently from the speaker’s judgement, then the following utterance could be considered as an example of the ‘objective’ use of BE ABLE TO.

- (4) Close links with Oxford University mean that students **are able to** attend Oxford university lectures and use its libraries, as well as joining its student societies.

In (4), the relation between the subject and the predicate is modified by *are able to* which attributes a property to the subject via the linking construction of the verb BE. This property seems ‘objective’ because it is presented in the context of the utterance as the consequence of *close links with Oxford University* via the verb *mean*, so that it is not actually based on the speaker’s subjective opinion. Yet, this ‘objectivity’ remains when replacing *are able to* with *can*, which is also acceptable here (4’).

- (4’) Close links with Oxford University mean that students **can** attend Oxford university lectures and use its libraries, as well as joining its student societies.

This means that the ‘objective’ effect does not indeed depend on which (quasi)modal marker is used, but rather seems to be caused only by context. It could be argued that the tendency for

indifferent to the type of reference (i.e. specific or generic) because it blocks the validation of the predicative relation either way.

BE ABLE TO to appear in such contexts is proof of its ‘objective’ nature. As alluded to by Perkins (1983, see section 2.3), that statement is sustained by the operating mode of the marker, which is truly integrated to the predication by means of the predicative operator BE X TO that allows the syntactic subject to be located relative to the predicate, while explicitly specifying the nature of this relationship. This is not the case with modal auxiliaries like CAN, which remain ‘maximally unspecified’ (see Collins 2009:30 quoting Westney 1995:54). Yet, we can see that this interpretation of the notion of ‘objectivity’ differs from the one proposed before: saying that the structure is ‘objective’ as a construction does not mean that the content of the modal predication is necessarily objective as well. Example (5) seems indeed to contradict the idea that BE ABLE TO does not involve the speaker’s modal judgement.

- (5) The UK-wide policy was officially confirmed by the Scottish Government today ahead of a similar announcement in England, expected later. // Scottish Health Secretary Nicola Sturgeon said: “I **am able to** announce today that the next group in the population that will be vaccinated, or offered vaccination, is children aged over six months and under five years.”

In this utterance, the quasi-modal predicate bears on a verb of speech (*announce*) which is followed by a *that*-complement clause specifying the content of the speech-act and is as such used in a performative way. As a result, the predicative relation is in fact actualized in context. Yet, the use of BE ABLE TO marks a choice on the part of the speaker not to assert the qualified relation, but rather to distance him/herself from it. In emphasizing the ‘attitude’ of the speaker regarding the propositional content of the utterance (see the definition of modality in Palmer 1990:2), the quasi-modal thus fulfils a crucial modal function, which shows that it is in fact a marker of point of view, and as such can hardly be considered ‘objective’.

When contrasted with assertion—as it is here and as it also was in example (2)—BE ABLE TO also points to the presupposition that what is said or done is or was not such an easy thing to say or do, which signals another form of evaluation, or appreciation, of the predicative relation on the part of the speaker.⁷ CAN is sometimes used in similar contexts, but while the idea of having to overcome difficulties in order to validate the predicative relation is also present with the modal, the interpretation is that of a general concrete possibility which could be phrased as ‘it is possible (for X) to say/do Y’. The quasi-modal on the other hand clearly puts the emphasis on the subject which is presented as an agent⁸, who is in control of the outcome, which is particularly important in the first person since the syntactic subject is identified with the speaker. This means that the speaker does not envisage the predicative relation in the same way when modalizing it with CAN or BE ABLE TO, which confirms the status of the latter as an expression of the speaker’s point of view.

In the end, it seems that the specificity of BE ABLE TO resides not so much in its being more objective than CAN but in its blurring the distinction between objectivity and subjectivity: a BE ABLE TO evaluation is presented as objective by the speaker because of the way it is predicated, but it is in fact always the trace of some form of modal judgement. Going back to the idea of a modal continuum, the inherent tension between objectivity and subjectivity exemplified by the marker would situate the majority of its uses in the middle range of this

⁷ This presupposition also plays an important part in the argumentative uses of the marker, which often occurs in such sequences, e.g. in conditional clauses.

⁸ See Westney (1995:28) for a discussion of this characteristic of BE ABLE TO. After reviewing Coates’ (1983) and Palmer’s (1990) positions, he concludes that there is ‘a cline of availability for uses of *be able to* in senses possible for *can*’, depending on ‘the ease with which subjects [...] can be treated as agent-like entities’.

continuum, while contextual factors would allow it to be used in more—as in (5)—or less—as in (4)—subjective/modal ways.

To conclude this section, what makes a quasi-modal expression such as BE ABLE TO fundamentally different from a modal auxiliary like CAN can be summarized as follows.

- i) BE ABLE TO has a full set of both finite and non-finite forms;
- ii) BE ABLE TO is the trace of a locating operation and as such it attributes a property to the first argument relative to the predicate, which is the object of a projection.

The question remains, however, as to whether these criteria specifically characterize BE ABLE TO or actually apply to the BE X TO quasi-modal category as a whole—which is the issue addressed in section 4.

4. BE ABLE TO and other BE X TO structures

Given that BE X TO structures are comprised of a great variety of expressions and that it is impossible to give a full account of all of them, I have selected two structures to shed some light on the characteristics identified in the previous sections for BE ABLE TO.

The first one is BE ALLOWED TO, which seemed interesting because it shares with BE ABLE TO affinities with the modal CAN, not in the ability sense, but in its deontic uses, i.e. permission. On the other hand, it also differs from BE ABLE TO, in that ALLOWED is not adjectival but participial, so that the structure as a whole can be regarded as a passive construction of the verb ALLOW.

The second one is BE LIKELY TO, which seems very different from BE ABLE TO from a notional point of view, but which is the second most widely used adjectival BE X TO construction, especially so in newspaper discourse. Moreover, the apparently very different type of modality expressed by BE LIKELY TO, i.e. epistemic modality with an evidential basis yielding a ‘probable’ value, is linked to the idea of suitability—a secondary sense of the adjective LIKELY—which echoes the etymology of ABLE.

4.1. Syntactic distribution of BE X TO structures

Like BE ABLE TO, both structures are found in finite and non-finite forms, which is a property of the verb BE that they have in common. There is a sharp difference, however, in the distribution of BE ALLOWED TO and BE LIKELY TO, as shown by the frequencies given in the two tables on the next page. While BE ABLE TO occurs three times out of four in non-finite forms and twice as much in the past as in the present tense, the two structures under study here allow for those results to be put into perspective. In Table 3, we can see that BE ALLOWED TO shares some characteristics with BE ABLE TO: even though it occurs almost as much in the present as in the past, non-finite forms still represent the majority of its uses. BE LIKELY TO, however, has a completely different distributive pattern since Table 4 shows that it is used close to 90% of the time in the present tense, while non-finite uses represent just over 1% of its occurrences.

	Non-finite forms of BE <i>allowed to</i>			Present tense forms of BE <i>allowed to</i>			Past tense forms of BE <i>allowed to</i>		All forms of BE <i>allowed to</i>
	be	been	being	am	are	is	was	were	
Number of tokens	800	187	115	3	173	126	226	139	1769
	1102			302			365		
Frequency	45.22%	10.57%	6.50%	0.17%	9.78%	7.12%	12.78%	7.86%	100%
	62.30%			17.07%			20.63%		

Table 3. *Distribution of the occurrences of BE allowed to in The Independent (2009)*

	Non-finite forms of BE <i>likely to</i>			Present tense forms of BE <i>likely to</i>			Past tense forms of BE <i>likely to</i>		All forms of BE <i>likely to</i>
	be	been	being	am	are	is	was	were	
Number of tokens	47	2	1	2	1224	2392	292	155	4115
	50			3618			447		
Frequency	1.14%	0.05%	0.02%	0.05%	29.74%	58.13%	7.10%	3.77%	100%
	1.22%			87.92%			10.86%		

Table 4. *Distribution of the occurrences of BE likely to in The Independent (2009)*

One of the reasons for this discrepancy between the frequencies observed for BE ABLE/ALLOWED TO on the one hand and BE LIKELY TO on the other might be found in the relation of the two sets of markers with the modal auxiliaries. Indeed, as mentioned before, both BE ABLE TO and BE ALLOWED TO are possible paraphrases for CAN in two of its uses, i.e. ability and permission, which means that they might both be used in non-finite contexts when CAN is not available—even if they are not strictly equivalent to the modal auxiliary⁹—which might in turn explain the high frequency of non-finite occurrences of both markers. On the contrary, according to Westney (1995:36, drawing on Palmer 1990 and Quirk et al. 1985), BE LIKELY TO is not directly related to any modal auxiliary, although the degree of probability it expresses can be considered rather close to that expressed by *should* (see Quirk et al. 1985:236). This seems to confirm the syntactic complementarity involved in the occurrence of non-finite forms of a quasi-modal marker.

Yet, the very need for non-finite expression of a modal notion is dependent on another factor which might also explain in part the quasi-absence of non-finite occurrences of BE LIKELY TO. Indeed, non-finite forms of modal expressions occur for a large part in modal sequences, that is to say following and/or preceding other modal markers. In such sequences, epistemic markers such as BE LIKELY TO tend to appear before markers of root modality like BE ABLE TO: while *is likely to be able to* is unproblematic in the abstract, **is able to be likely to* is unacceptable—most probably because a concrete possibility bearing on the probability

⁹ The lack of equivalence between modals and quasi-modals is even more salient with BE ALLOWED TO than with BE ABLE TO since the deontic force which characterizes CAN in its permission uses necessarily disappears, or is at least redefined, in a non-finite context either because the subject and addressee is not overtly expressed or because there is a hiatus between the time of uttering and the time of events.

of an event can hardly be envisaged. Given that the marker that comes first in the sequence is in a finite form, it is therefore not surprising that BE LIKELY TO should present so few occurrences in a non-finite form. This hypothesis actually seems to be confirmed by other quasi-modal markers such as BE BELIEVED TO, BE THOUGHT TO, or BE DUE TO, which are much less frequent in non-finite forms than other expressions such as BE ASKED TO, BE MADE TO, or BE FORCED TO. All quasi-modals certainly do not fall neatly into these two categories, but the trend seems strong enough to suggest modality type as a factor for explaining the syntactic distribution of those markers.

4.2. Goal orientation and relation to actuality

Both BE ALLOWED TO and BE LIKELY TO show goal orientation because this is a property of the *to*-infinitive complementation that they share with BE ABLE TO. Moreover, this abstract projection of the predicate is reflected in the semantics of the two markers. With BE LIKELY TO, it is paralleled by a probability judgement, while BE ALLOWED TO expresses approval or the absence of resistance to the actualization of the predicative relation. It should be emphasized, however, that this correspondence between the notion expressed by X and the projection implied by the *to*-infinitive is not always found in BE X TO structures, as shown by the negative¹⁰ counterparts of BE ABLE TO and BE LIKELY TO, i.e. BE UNABLE TO and BE UNLIKELY TO. Nevertheless, this does not contradict the idea that the predicate is the object of a form of projection. Indeed, as part of the predicative relation, it is represented as incomplete and therefore in tension, while being the object of an evaluation carried out from a detached position and supposed to bridge the gap between the two members of the predicative relation. The link between the syntactic subject and the predicate is then recreated via the attribution of the property X—which is in fact secondary as far as the operating mode of the structure is concerned (see Rivière 1983 on lexis-cleaving).

This type of orientation, which thus appears as a stable property of BE X TO structures, does not seem to be a sufficient condition for such constructions to gain an ‘actual’ interpretation in specific past contexts, as shown by the following example.

- (6) Under Kyoto, the rich industrialised countries agreed to cut their carbon emissions by fixed amounts by 2012, but the developing nations were not required to make any cuts at all. They **were allowed to** carry on with business as usual.

In (6), the *were allowed to* predication is understood as a reformulation of the previous sentence where *were not required to* highlights the same idea, albeit from an opposite perspective. Consequently, the focus of the whole utterance is the absence of anything preventing the validation of the predicative relation <they – carry on with business as usual>. That is to say that what matters is that they were *allowed* to carry on, as opposed to being *forced* not to. This, however, does not necessarily mean that the predicative relation was validated, i.e. that they *chose* to carry on. BE ALLOWED TO simply states that nothing prevents *p*, i.e. the positive value, which does not mean that it excludes *p'*, i.e. the negative value—so that permission does not behave like ability in this respect, perhaps because the idea of

¹⁰ Negated BE X TO structures such as BE *not* LIKELY/ABLE TO are not taken into account here because the negation is not part of the structure itself in those cases, so that it does not bear on the notion expressed by X but on the predication as a whole—which makes a difference as far as the construction of meaning is concerned, even though the resulting interpretation may be similar.

verification is irrelevant to the former notion. Yet, example (7) shows that BE ALLOWED TO is still compatible with the predicative relation being validated, provided that the source of the ‘actual’ interpretation is directly found in the context, which needs to be explicit enough for this interpretation to develop.

- (7) Peter Dawson, acting president of the International Golf Federation, had to go on the defensive after American IOC member Anita DeFrantz questioned why golf clubs such as Augusta **were allowed to** be male only.

Here, it is the presupposition marked by the interrogative adverb *why* that influences the reading of the utterance. In this particular case—which is not unique—there seems in fact to be a shift from the presupposition that the validation of the predicative relation <golf clubs such as Augusta – be male only> was indeed *allowed* to the actual validation of the relation.¹¹ This might be seen as an argument supporting the extra-predicative status of the modal expression which, despite its apparent integration to the predication, actually belongs to another level of construction of the utterance, i.e. the enunciative level, where the pre-existing predicative relation is modalized.

If we now turn to BE LIKELY TO in (8), we will see that actuality cannot be inferred either from the marker or the context, which is due to the epistemic value of the quasi-modal.

- (8) Announcing the Walker Review yesterday, Mr Darling indicated that some staff at a bank bailed out by the taxpayer **were likely to** receive some bonuses, amid mounting pressure for all payments to be halted.

Indeed, contrary to expressions of root modality like BE ABLE TO or BE ALLOWED TO, BE LIKELY TO inherently expresses a degree of uncertainty concerning the validation of the predicative relation. In this utterance, <some staff [...] – receive some bonuses> is thus merely described as probable in the past, from which we cannot logically infer that the event occurred.

Moreover, as is often the case with BE LIKELY TO, the past tense on BE does not express past time relative to the assessor, i.e. the source of points of view, but is the consequence of the reported speech situation introduced by *Mr Darling indicated that*, so that the modal evaluation marked by BE LIKELY TO took place in the past, as signaled by the temporal adverb *yesterday*, but the event referred to at that time was, and most probably is, not past. This means that the referential relation between the notion expressed by X and the event denoted by the predicative relation can be radically different depending on the structure. With dynamic BE ABLE TO, the time of X—ability—is the same as the time of events. With deontic BE ALLOWED TO, the time of X—‘allowing’—and the time of events are ordered, meaning that the permission or enabling necessarily occurs prior to the (potential) event, since it is a prerequisite for the occurrence of the event, and the two are usually contiguous—even though there may be a time lapse between them if specified by a temporal marker in the context. Finally, with epistemic BE LIKELY TO, the time of X—likelihood—and the time of events are

¹¹ It could be argued that the restrictive adverb *only* (see Culioli 2004) also plays a role here because *male only* entails *not female*. It must be emphasized however that *were allowed to be [not female]* can be considered more or less equivalent to *were allowed not to be female* but certainly not to *were not allowed to be female*. Moreover, it is worth noting that the ‘actual’ interpretation of the utterance remains if *only* is deleted. This means that the emergence of this interpretation is not a matter of polarity but rather of a shift in presupposition indeed—even though the restriction might be seen as a facilitating factor in this case.

disconnected: they may of course coincide, but the probability judgement may also be past and the event non-past, or vice versa—which probably also explains why the tense form of the quasi-modal has no impact on the interpretation of the actuality of the predicative relation.

4.3. Property attribution as a defining characteristic

Finally, we have seen that what characterizes BE ABLE TO as opposed to CAN is that while expressing a point of view as any modal auxiliary, it does so via the attribution of a property to the subject. As this characteristic is linked to the verb BE¹², it would seem reasonable to suggest that it is shared by all quasi-modal markers, including BE LIKELY TO and BE ALLOWED TO. Yet, we may wonder whether the epistemic character of BE LIKELY TO on the one hand, and the passive structure of BE ALLOWED TO on the other hand are compatible with such a characterization.

In various theoretical frameworks including the Theory of Enunciative Operations (see Bouscaren 1993), epistemic modality is indeed described as concerned with the relation between the speaker and the predicative relation as a whole, as opposed to root modality which is concerned with the relation between the subject and the predicate. From those definitions, it would follow that epistemic markers cannot modalize the relation between the subject and the predicate. And yet, the operating mode of BE LIKELY TO seems to contradict this idea. As evoked in the introduction, one aspect of quasi-modals is that they are not in fact fully set or grammaticalized expressions in that the contribution of each part to the whole is still discernible. This means that to a certain extent, BE LIKELY TO can be described as BE + LIKELY + TO. Thus, as an adjective functioning as a subject complement, LIKELY does attribute a property to the subject of BE—even if on another level it also qualifies the predicative relation as a whole. This shows that because of their particular structure, BE X TO quasi-modals tend to blur the boundary between root and epistemic modality.

With BE ALLOWED TO, the problem resides in the nature of ALLOWED. If the role of an adjective is indeed to modify a noun via the attribution of a property to that noun, a verb does not have the same function. And yet, past participles are special in this respect, since it is widely recognized that there is a gradient between participial adjectives and verbal participles, especially when considered relative to the passive construction (see for instance Aarts 2007:178-179). It is thus worth noting that in the case of BE ALLOWED TO—as for other BE –EN TO structures—the agent is usually not expressed, as is indeed the case in (6) and (7). In those two examples, what matters is not who allowed or even the process itself, but rather the result of this process, and even if it might be more dynamic than the property expressed by an adjective—although it is not necessarily the case judging from ABLE—that result still is a property. The fact that ALLOWED—as many other past participles—is actually sometimes used as an adjective in attributive position (see *Oxford English Dictionary* 2013) is proof of that. And yet, it is also true that, whatever the context, an agentive *by*-phrase can always be recreated with BE –EN TO structures, as shown in (6') by the glosses of example (6).

¹² Whether BE functions as a copula or a primary auxiliary, it can be argued that it is a locating operator which always attributes a property to the subject, namely that of being located relative to what follows—so that I do not explicitly differentiate between those two uses of the marker, although its function is indeed correlated with the characterisation of X.

- (6') a. They **were allowed** [by other countries] **to** carry on business as usual.
LONG PASSIVE
b. [Other countries] **allowed** [them] **to** carry on business as usual.
ACTIVE

Admittedly, the choice of a short passive is significant and not equivalent to the long passive precisely because the agent is left unexpressed, but implicit reference still remains, and with it the underlying presence of a modal source which is absent from BE *ADJ* TO structures themselves—albeit necessarily present on another level. In the end, although property attribution can indeed be considered a defining characteristic of BE X TO structures, it should be noted that the nature of this property along with the mode of attribution may vary.

5. Conclusion

This study has shown that the syntactic properties of quasi-modal BE X TO structures are key to understanding the place of those markers in the modal system of English. First, quasi-modals have non-finite forms, making them available in all contexts, contrary to modal auxiliaries. Second, their syntactic properties have a great impact on their semantic and pragmatic functions, since they allow a ‘subjective’ modal evaluation to be presented in an ‘objective’ light. In the end, the comparison between BE *ABLE* TO and CAN on the one hand, and between BE *ABLE* TO and other BE X TO structures on the other hand has demonstrated that BE X TO quasi-modals differ from central modals in a number of ways—syntactic distribution, goal orientation, property attribution—which are strong arguments in favour of the existence of a coherent sub-category of quasi-modal markers within the wider semantic domain of modality. Within this sub-category, there is some variation, however, which partly mirrors the variation found in the central modal category via the distinction between epistemicity and root modality, but also seems to redefine this opposition. This, along with the subtle differences observed between adjectival and participial constructions, raises questions concerning the nature of the point of view expressed by BE X TO structures—a crucial issue which deserves further investigation, especially in newspaper discourse.

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Conveying ignorance

Ignorance inferences with superlative numeral modifiers

Jon Ander Mendia

This paper investigates the inferences of ignorance that come with superlative numerals, like *at least n* and *at most n*. It argues that these are better understood as primary implicatures that are derived in a neo-Gricean framework together with a standard epistemic logic. In doing so, the paper supports the view of superlative numerals first advanced by Büring (2007) and further elaborated by Schwarz (2013), where the ignorance inferences that they convey are equal to those of a disjunctive expression, of the form *exactly n or more/less than n*.

1. Introduction

Superlative Modifiers (SMs henceforth) like *at most* and *at least* often convey that the speaker is uncertain about some exact value (Geurts and Nouwen 2007; Nouwen 2010):

- (1) a. #I have at most two daughters.
- b. #I have at least five fingers.

The examples in (1) are odd. The epistemic competence commonly assumed when we talk about progeny or our own body is at odds with the presence of SMs and their incompatibility with full knowledge. The resulting effect has been dubbed the ‘epistemic effect’ of SMs: It is triggered by the fact that SMs convey an inference of ignorance (II henceforth) on the speaker as to what the exact amount is. The contrast with (2), where no speaker knowledge is assumed, is clear:

- (2) a. Bill has at most two daughters.
- b. That caterpillar has at least twenty legs.

That SMs trigger IIs is uncontroversial. The controversy is about how exactly IIs arise and whether this is the fruit of the semantic properties of SMs (Geurts and Nouwen 2007, Nouwen 2010) or whether it is the result of a pragmatic process (Büring 2007, Schwarz 2013, 2014, Coppock and Brochhagen 2013b, Mayr 2013, Nouwen 2015, Kennedy 2015). In addition, more

surprisingly perhaps, the literature is lacking in a debate about what the exact form of these IIs is. Given a sentence containing an SM, how much can be inferred about what the speaker is ignorant about? Despite the efforts devoted to craft a theory of SMs that accounts for all their relevant semantic and pragmatic properties, this question has not yet been thoroughly scrutinized. As a consequence, there is some unclarity with respect to what exactly these IIs have to be. Clarifying this question is important not just because we want a descriptively adequate theory of SMs, but also because carefully defining the form of these IIs provides further criteria for evaluating theories of SMs.

Different formulations of IIs may make different predictions with respect to what can be inferred about what the speaker is ignorant about. For instance, consider the following sentences:

- (3) a. At least three boys left. [Mayr 2013:158]
 b. Bill is at least an assistant professor. [Coppock and Brochhagen 2013b:10]

About (3a), Mayr says that it ‘seems to have the ignorance inference that for any number *n* larger than three, the speaker fails to believe that *n*–many boys left’. Similarly, Coppock and Brochhagen suggest that the meaning of (3b) ‘can be expressed as a disjunction over the answers that are at least as strong: “John is an assistant, associate, or full professor”’. In this paper, I argue that these characterizations of IIs cannot be right. Describing IIs in this way is misleading, because it seems that the IIs of SMs should be about *any number larger than three* in (3a), or about a disjunction of every rank above *assistant professor* in (3b). In particular, I argue that the IIs we attribute to SMs should not be characterized as a list of disjunctive statements, but as a disjunction of the form advocated by Büring (2007), and defended by Schwarz (2013):

- (4) a. $\llbracket(3a)\rrbracket \rightsquigarrow$ *the speaker doesn’t know whether exactly three or more than three boys left*
 b. $\llbracket(3b)\rrbracket \rightsquigarrow$ *the speaker doesn’t know whether John is an assistant professor or some higher rank*

Schematically, we can summarize both views as follows –for (3a):

- (5) a. [*assistant professor*] or [*associate professor*] or [*full professor*]
 b. [*assistant professor*] or [*more than an assistant professor*]

One may complain that, at first glance, the difference between (5a) and (5b) is trivial. I show that, if we take the form of these two formulations seriously, they make different predictions about the kind of inferences that are available about what the speaker is ignorant about, and hence about what the amount of information that is compatible with an utterance containing an SM is. Formulations like (5a) predict that every single disjunct is an epistemic possibility compatible with all the speaker knows (in this case, the speaker is predicted to believe that every rank above *assistant professor* is a possible rank for Bill). However, this characterization is not empirically adequate, since the speaker could felicitously utter (3b) even if she knew that Bill cannot be an associate professor. It is useful, then, to be careful about the distinction between what the exact IIs of SMs are, on the one hand, and what kind of situations they are compatible with, on the other.

Thus, the first task is to clarify what the exact form of the IIs that come with SMs are, and what they tell us about the speaker’s epistemic state after she uttered a sentence containing an

SM. In order to do so, I use the behavior of disjunction and its IIs as a benchmark to analyze the IIs of SMs. The next step is to show how we can better account for these IIs. In this paper I will focus exclusively on Superlative Modified Numerals (SMNs henceforth), and so I refer the reader to Mendia (2015) for discussion of a possible way to extend the analysis to other cases.

2. What it means to be ignorant about something

To properly talk about IIs, we first need to know what it means to be ignorant about something. A good starting point is to look at the behavior of disjunctions and move later to the connection with SMs. As it is well known, disjunctions can convey an II that the speaker does not know which of the disjuncts is true. Consider:

(6) Bill read Tintin or Asterix.

Upon hearing a sentence like (6), the addressee may draw a number of conclusions. Assuming the speaker is correct, she knows that Bill read Tintin or Asterix, which by itself is consistent with the possibility that Bill read both. Because the speaker does not specify which comic Bill read, the addressee may draw an inference that the speaker does not know which comic Bill read. This is precisely the type of IIs that this discussion will center on. Presumably, then, the existence of this kind of IIs is responsible for the oddness of texts where a disjunction is followed by a statement resolving the question as to what disjunct is true:

(7) Bill read Tintin or Asterix, #*{namely/concretely}* he read Asterix.

Let us be more specific about what it means to be ignorant. Assume that K and P stand for the familiar epistemic certainty and possibility operators, such that $K_S\phi$ means *the speaker S knows that ϕ* and $P_S\phi$ means that *ϕ is compatible with all S knows*. According to the properties that Hintikka (1962) ascribed to them, both operators K and P are interdefinable, since $K\phi \leftrightarrow \neg P\neg\phi$ and $P\phi \leftrightarrow \neg K\neg\phi$.

For concreteness, I follow Hintikka's (1962) epistemic logic, also used by Gazdar (1979). The semantics of this logic are defined by a pair $\langle \mathcal{W}, \mathcal{R} \rangle$, a *frame*, where \mathcal{W} is a non-empty set of possible worlds and \mathcal{R} is an accessibility relation between worlds, such that for $w_0, w_1 \in \mathcal{W}$, $w_0 \mathcal{R} w_1$ means that the world w_1 is accessible from w_0 (i.e., that the truths of w_1 are live possibilities for w_0). Frames are used to construct models by defining an interpretation function v such that, for every world $w \in \mathcal{W}$, v specifies the truth value of all propositions in w . The accessibility relation \mathcal{R} is reflexive (8f) and transitive (8g). A model \mathcal{M} is then a triple $\langle \mathcal{W}, \mathcal{R}, v \rangle$, where the truth of a formula with respect to a model \mathcal{M} and a world w is recursively defined in the usual way, in (8a)–(8e). The logic described here corresponds to the KT4 system, which enriches the propositional calculus described above with the set of axioms in (8h)–(8j).¹

- (8) a. For some proposition p , if $v(w, p)$ in \mathcal{M} then $\mathcal{M}, w \models p$
- b. $\mathcal{M}, w \models \neg p$ iff $\mathcal{M}, w \not\models p$
- c. $\mathcal{M}, w \models (p \wedge q)$ iff $\mathcal{M}, w \models p$ and $\mathcal{M}, w \models q$

¹Whether KT4 is the most adequate logic to model knowledge and belief is a matter subject to philosophical debate; it is the system that Hintikka (1962) settled for, but see Hendricks and Symons (2014) for discussion.

- d. $\mathcal{M}, w \models Kp$ iff for every $w' \in \mathcal{W}$, if wRw' then $\mathcal{M}, w' \models p$
- e. $\mathcal{M}, w \models Pp$ iff for some element $w' \in \mathcal{W}$, wRw' and $\mathcal{M}, w' \models p$
- f. R is REFLEXIVE iff for all $w \in \mathcal{W}$, wRw
- g. R is TRANSITIVE iff $(wRw' \wedge w'Rw'') \rightarrow wRw''$, for all $w, w', w'' \in \mathcal{W}$
- h. Axiom K: $K(p \rightarrow q) \rightarrow (Kp \rightarrow Kq)$ [Distribution Axiom]
- i. Axiom T: $Kp \rightarrow p$ [Reflexivity Axiom]
- j. Axiom 4: $Kp \rightarrow KKp$ [Positive Introspection]

In this system, the following equivalences follow: $K\neg\phi \equiv \neg P\phi$ and $\neg K\phi \equiv P\neg\phi$. Then, to be ignorant about a proposition ϕ is expressed as follows:²

$$(9) \quad \neg K[\phi] \wedge \neg K\neg[\phi] \equiv P[\phi] \wedge P\neg[\phi]$$

(9) shows the technical notion of *ignorance* that I shall refer to. I will take it that to be ignorant about ϕ is a stronger notion than the mere lack of knowledge about ϕ . By *being ignorant about* ϕ I refer to a mental (epistemic) state of some agent in which she is unsure about the truth of ϕ . Crucially, in order to be ignorant about ϕ it is necessary that the agent consider both ϕ and $\neg\phi$ live possibilities compatible with her knowledge. It follows that not only does the agent not know the truth of ϕ , she also does not know the truth of $\neg\phi$. Hintikka (1962:12–15) illustrates this difference by alluding to the contrast between *knowing that* ϕ and *knowing whether* ϕ :

- (10) a. The speaker S does not know that ϕ : $\neg K_S\phi$
- b. The speaker S does not know whether ϕ : $\neg K_S\neg\phi \wedge \neg K_S\phi$

The distinction between (10a) and (10b) is in accordance with the intuition that when we are ignorant about whether ϕ , we consider both ϕ and $\neg\phi$ to be epistemic possibilities; I take this for granted in this paper. Sometimes I will use the following notational convention, where $I_S[\phi]$ means that *the speaker is ignorant about whether* ϕ :³

- (11) a. $I_S[\phi] \equiv \neg K_S[\phi] \wedge \neg K_S\neg[\phi]$
- b. $I_S[\phi] \equiv P_S[\phi] \wedge P_S\neg[\phi]$

We turn now to the question of how to derive IIs of this form for disjunctive statements. Gazdar (1979), putting together insights from both Hintikka's (1962) epistemic logic and H.P. Grice's theory of language use (see Grice 1989), argued that they can be derived as clausal quantity implicatures. The formal principles responsible for IIs that I present in this paper also rely on Hintikka's epistemic logic and on Gricean reasoning, but the implementation will be a different one.⁴ Assume, then, that we are dealing with a cooperative speaker and that some version of the Maxims of Quality are at work (Grice 1989).

²I use square brackets '[''] to enclose propositions, so that ϕ is a variable (that may itself stand for a proposition), and $[\phi]$ is the proposition that ϕ .

³I will use $P[\phi]$ and $\neg K\neg[\phi]$ interchangeably, as well as $\neg K[\phi]$ and $P\neg[\phi]$, the choice depending on what expression is more intuitive on a case to case basis.

⁴Gazdar (1979:59) derives IIs by applying a function f such that, for any two propositions ψ and ϕ , $f([\phi]) = \{x : x \in \{P[\psi], P\neg[\psi]\}\}$, such that $[\phi] \rightsquigarrow I[\psi]$ iff (i) $[\psi] \rightarrow [\phi]$, (ii) $[\phi] \nrightarrow [\psi]$ and (iii) $[\phi] \nrightarrow \neg[\psi]$. Thus, a sentence $[\phi]$ implicates ignorance about whether $[\psi]$, only if $[\psi]$ entails $[\phi]$, but neither $[\psi]$ nor $\neg[\psi]$ is entailed by $[\phi]$. All Gazdar (1979) needs to derive an II is a relation of asymmetric entailment between two propositions. The method presented in this paper is no different in this sense, but it will benefit from the more general neo-Gricean framework.

(12) MAXIMS OF QUALITY

- a. Do not say what you believe to be false.
- b. Do not say what you do not have evidence for.

The Maxims of Quality can be related to the operators K and P by Hintikka's (1962:79) principle of EPISTEMIC IMPLICATION, whereby utterance of a sentence ϕ by a speaker S commits S to the knowledge of ϕ : ϕ implicates ψ if $K[\phi \wedge \neg\psi]$ is inconsistent.⁵ When a cooperative speaker S is following the Maxims of Quality, the addressee is allowed to infer that the utterance of ϕ by S implicates that $K_S\phi$. This inference is sometimes also referred to as a Quality Implicature. In order to derive IIs, however, we need some notion of *strength*. For concreteness, assume the following characterization of the Maxim of Quantity.

(13) MAXIM OF QUANTITY

If two propositions $[\phi]$ and $[\psi]$ are such that (i) the denotation of $[\phi]$ asymmetrically entails $[\psi]$ (i.e., $[\phi] \rightarrow [\psi] \wedge \neg([\psi] \rightarrow [\phi])$), (ii) $[\phi]$ and $[\psi]$ are relevant, and (iii) the speaker believes both $[\phi]$ and $[\psi]$ to be true, the speaker should choose $[\phi]$ over $[\psi]$.

The Maxim of Quantity ensures that, given a number of true and relevant alternatives to the proposition that has been uttered, if a speaker is being cooperative, she should choose the semantically strongest alternative over the rest. In view of this definition of the Maxim of Quantity, it is useful to define the notion of Stronger Alternative (SA): An SA ψ of a proposition ϕ is an alternative proposition that asymmetrically entails ϕ : ψ is an SA of ϕ iff $\psi \rightarrow \phi$ and $\phi \nrightarrow \psi$. The set of SAs of a proposition ϕ is expressed as $SA(\phi)$. According to the Maxim of Quantity, if we are to be cooperative, we have to provide the semantically strongest relevant and true proposition we can. Following the terminology in Sauerland (2004), we now define the weakest form of inference, a Primary Implicature. In addition, we also define the Implicature Base, the set of propositions resulting from conjoining the Quality Implicature with its Primary Implicatures (Schwarz 2013).

(14) PRIMARY IMPLICATURE:

The inference that $\neg K\psi$, for an SA ψ .

(15) IMPLICATURE BASE:

The set consisting of the Quality Implicature together with all its Primary Implicatures.

The motivation for drawing a Primary Implicature is provided by Gricean reasoning. Consider (6) again: *Bill read Tintin or Asterix*. As I mentioned above, (6) conveys the II that the speaker does not know which of the comics Bill read. The reasoning proceeds as follows: Assume that the speaker is being cooperative. This means that she is observing the Maxims of Quality and the Maxim of Quantity. Upon hearing (6) (represented as $[T \vee A]$), the addressee can conclude, then, that the speaker thinks that this much is true. Thus, by the principle of EPISTEMIC IMPLICATION, she concludes that $K_S[T \vee A]$. $[T \vee A]$ has at least two stronger alternatives, the individual disjuncts $[T]$ and $[A]$. This follows from the Maxim of Quantity: $[T] \in SA([T \vee A])$, since $[T]$ is relevant and $[T] \rightarrow [T \vee A]$, but $[T \vee A] \nrightarrow [T]$.⁶ The same reasoning applies also to $[A]$. Following

⁵This notion of 'implication' is closer to that of 'entailment' and it is not the one that I will use when talking about implications in general.

⁶I will gloss over what happens when we factor in SAs that are formed by means of substituting scalar items that belong to the same Horn-Set. In the case at hand, the SA $[T \wedge A]$ does not play a role in deriving the IIs about each particular disjunct.

the Maxim of Quantity, the addressee concludes that if the speaker did not utter any of the *SAs*, it must be because she did not have evidence enough, or maybe she did not know. Therefore, she infers the Primary Implicatures that $\neg K_S[T]$ and $\neg K_S[A]$. (16) below summarizes the relevant propositions:

- (16) a. ASSERTION: $[(6)] = [T \vee A]$
 b. EPISTEMIC IMPLICATION: $K_S[T \vee A]$
 c. $SA([T \vee A]) = \{[T], [A]\}$
 d. PRIMARY IMPLICATURES: $\neg K_S[T] \wedge \neg K_S[A]$
 e. IMPLICATURE BASE: $K_S[T \vee A] \wedge \neg K_S[T] \wedge \neg K_S[A]$

The Implicature Base contains all the information that the addressee may be able to deduce from the speakers utterance without any further assumptions. In particular, according to (16e), the addressee can conclude that the speaker knows that Bill read either Tintin or Asterix, that it is not the case that she knows that Bill read Tintin and it is not the case that she knows that Bill read Asterix. These are not quite yet the IIs we want. The last step to derive the right IIs from (16e) involves deriving that each disjunct is an epistemic possibility by the speaker, i.e., $P_S[T]$ and $P_S[A]$.⁷ Luckily, the task is trivial: Given the properties of the operators K and P defined above, $P_S[T]$ and $P_S[A]$ are in fact entailed by the Implicature Base.

- (17) a. $K[T \vee A] \wedge \neg K[T] \wedge \neg K[A] \rightarrow P[T] \wedge P[A]$
 b. *Proof.* Assume that $\neg P[T]$. Since $P[T]$ is equivalent to $\neg K\neg[T]$, then $\neg P[T]$ is equivalent to $\neg\neg K\neg[T]$, which can be reduced to $K\neg[T]$ by double negative. But $K\neg[T]$ cannot be, since it contradicts the Primary Implicature in the premise. Thus, it must be the case that $\neg K\neg[T]$, which is equivalent to $P[T]$. (The same proof holds *mutatis mutandi* for $P[A]$.)

The Implicature Base alone provides all the necessary pieces to derive that the epistemic possibility of every disjunct is a must.⁸ It follows, too, that knowledge about the truth of any of the particular disjuncts should not be allowed, as we saw above in (7). In this case, this happens because both $K_S[T]$ and $K_S\neg[T]$ contradict the II that $I_S[T]$ –similarly for $K_S[A]$ and $K_S\neg[A]$.

The upshot of this discussion is that the choice of what counts as an *SA* is important: Given the right choice of *SAs*, IIs may be entailed by the Implicature Base. This is especially relevant when we consider disjunctions with multiple disjuncts.

- (18) Bill read Tintin, Asterix or Conan.

Like (6), (18) may also convey that the speaker is uncertain as to which one of the three comics Bill read. What is important is that, just as before, all three comics must be considered epistemic possibilities by the speaker, otherwise the sentence is odd, as the following examples show.

⁷Recall that $P_S[T]$ is equivalent to $\neg K_S\neg[T]$ and the latter, together with the Primary Implicature $\neg K_S[T]$ constitutes the II that we are after, $\neg K_S\neg[T] \wedge \neg K_S[T]$ or $I_S[T]$.

⁸This is why I ignored the *SA* $[T \wedge A]$ above: Because even after adding a Primary Implicature like $\neg K_S[T \wedge A]$, the Implicature Base in (16e) does not entail that $P_S[T \wedge A]$, and so no II can be derived about $[T \wedge A]$. This may not be a bad thing; implicatures associated with the conjunctive alternative to disjunctive statements can sometimes be strengthened to $K_S\neg[T \wedge A]$ and so constitute a Secondary Implicature (or Scalar Implicature), which are out of the scope of this paper. This is not to say that (6) is incompatible with the speaker's ignorance as to whether Bill read both comics. However, it should be clear that the model developed in this paper predicts that the addressee cannot draw an II about whether $K_S[T \wedge A]$.

(19) Bill read Tintin, Asterix or Conan, #but he didn't read {Tintin/Asterix/Conan}.

Suppose that we want to derive the IIs conveyed by (19) exactly as before. The addressee would have to conclude first that the speaker is being cooperative, and so her utterance carries the EPISTEMIC IMPLICATION that $K_S[T \vee A \vee C]$. Since each individual disjunct asymmetrically entails the assertion, she derives the Primary Implicature that $\neg K_S[\phi]$ for every $[\phi] \in SA([T \vee A \vee C])$ which, together with the assertion, forms the Implicature Base.

- (20) a. ASSERTION: $[(18)] = [T \vee A \vee C]$
 b. EPISTEMIC IMPLICATION: $K[T \vee A \vee C]$
 c. $SA([T \vee A \vee C]) = \{[T], [A], [C]\}$
 d. PRIMARY IMPLICATURES: $\neg K[T] \wedge \neg K[A] \wedge \neg K[C]$
 e. IMPLICATURE BASE: $K[T \vee A \vee C] \wedge \neg K[T] \wedge \neg K[A] \wedge \neg K[C]$

As before, the only SAs that the system has access to are the individual disjuncts $[T]$, $[A]$ and $[C]$. However, in this case, the Implicature Base in (20e) does not entail the right kind of IIs. In particular, (20e) does not entail that every individual disjunct is an epistemic possibility for the speaker: $P[\phi]$, for all $[\phi] \in SA([T \vee A \vee C])$. The problem is that unlike in the case of (6) above the entailment pattern $[Implicature\ Base \rightarrow IIs]$ is not a logical truth. This can be demonstrated by constructing a model where taking the Implicature Base as a premise, the epistemic possibility of some individual disjunct does not follow. (21) below provides such a counter-model for $P[A]$: In (21) the Implicature Base (20e) is true in w_0 , but it is not the case that $P[A]$ in w_0 . Similar models can be constructed to show that neither $P[A]$ nor $P[C]$ are logical consequences of the Implicature Base in (20e).

- (21) Counter-model for $K[T \vee A \vee C] \wedge \neg K[T] \wedge \neg K[A] \wedge \neg K[C] \rightarrow P[A]$ (where $w_0 \mathcal{R} w_1, w_2, w_3$)
 w_0 : $[T], \neg[A], \neg[C]$
 w_1 : $[C], \neg[A], \neg[T]$
 w_2 : $[T], \neg[A], \neg[C]$
 w_3 : $[T], \neg[A], \neg[C]$

As shown by Alonso-Ovalle (2006), a solution to this situation can be provided by including 'sub-domain' alternatives. In the case of disjunction, sub-domain alternatives are alternatives formed by smaller disjunctions each of whose individual disjuncts are part of the assertion (see also Chierchia 2013). Given the definition of SAs in terms of asymmetric entailment, sub-domain alternatives of multiple disjuncts constitute all SAs. In the case of (18), the revised set of SAs, Primary Implicatures and Implicature Base is as in (22):

- (22) a. $SA([T \vee A \vee C]) = \{[T \vee A], [T \vee C], [A \vee C], [T], [A], [C]\}$
 b. PRIMARY IMPLICATURES:
 $\neg K[T \vee A] \wedge \neg K[T \vee C] \wedge \neg K[A \vee C] \wedge \neg K[T] \wedge \neg K[A] \wedge \neg K[C]$
 c. IMPLICATURE BASE:
 $K[T \vee A \vee C] \wedge \neg K[T \vee A] \wedge \neg K[T \vee C] \wedge \neg K[A \vee C] \wedge \neg K[T] \wedge \neg K[A] \wedge \neg K[C]$

All the shorter disjuncts can be derived as Primary Implicatures, since for any two propositions $[d_1 \vee d_2]$ and $[d_1 \vee d_2 \vee d_3]$, $[d_1 \vee d_2] \rightarrow [d_1 \vee d_2 \vee d_3]$, but $[d_1 \vee d_2 \vee d_3] \nrightarrow [d_1 \vee d_2]$. With

the addition of these sub-domain SAs, the revised Implicature Base in (22c) entails that every individual disjunct is an epistemic possibility.

$$(23) \quad a. \quad \left. \begin{array}{l} K[T \vee A \vee C] \\ \neg K[T \vee A] \\ \neg K[T \vee C] \\ \neg K[A \vee C] \\ \neg K[T] \wedge \neg K[A] \wedge \neg K[C] \end{array} \right\} \wedge \wedge \wedge \wedge \wedge \rightarrow P[T] \wedge P[A] \wedge P[C]$$

- b. *Proof.* Assume that $\neg P[T]$. This is equivalent to $K\neg[T]$. Together with the EPISTEMIC IMPLICATION of the assertion, we have that $K[T \vee A \vee C] \wedge K\neg[T] \rightarrow K[A \vee C]$. However, the consequence $K[A \vee C]$ contradicts the premise that $\neg K[A \vee C]$, and so it cannot be the case that $\neg P[T]$. (Similar for $[A]$ and $[C]$.)

Similar proofs can be constructed for disjunctions with more than three disjuncts. Thus, IIs of disjunctive statements can be derived by relying on independently needed formal principles, which provide the two necessary —and sufficient— ingredients to derive IIs about each particular disjunct: A suitable epistemic logic and the assumption that SAs are established by asymmetric entailment relations.⁹ The question now is whether the same system can be extended to SMs. Before turning into *how* to derive the IIs of SMs, however, we first need to decide *what* exactly is the form of the IIs that come with SMs.

3. Characterizing ignorance with SMNs

The last section showed the exact nature of IIs introduced by disjunction together with one way to derive them. The next step is to assess to which extent the IIs that have been associated with SMs resemble the IIs associated with disjunctions. As mentioned above, the focus will be solely on the case of Superlative Modified Numerals, or SMNs for short.

- (24) a. At least four friends came to the party.
b. At most four friends went to swim.

Upon hearing the sentences in (24), an addressee may infer that the speaker does not know exactly how many friends were involved in either activity. This uncertainty can be understood in a variety of ways. As advanced in §1, one can find two main views in the literature about what exactly the IIs of a sentence like (24a) are, summarized below:

- (25) a. OPTION 1: For any number n such that $n \geq 4$, the speaker is ignorant about whether or not exactly n friends came to the party.
b. OPTION 2: The speaker is ignorant about whether or not exactly 4 or more than 4 friends came to the party.

⁹This contrast with Gazdar's (1979) way of deriving IIs. In his system, IIs are derived by means of a function that computes clausal quantity implicatures, that only applies to a specific set of propositions that meet a particular criteria (see footnote 2). His system aims to cover a broader range of data than just IIs with disjunction, and so this is not the place for a thorough comparison. But it is worth noting that, under the light of disjunction alone, there is no need to resort to a more complex mechanism.

IIs like (25a) are explicitly mentioned by Mayr (2013:158),¹⁰ whereas IIs like (24b) were first argued for Büring (2007). Both approaches make different predictions. For instance, assuming a reduced domain of 8 friends, an II like (25a) explicitly states that the speaker is ignorant about whether exactly four, five, six, seven or eight friends came to the party. What OPTION 1 is saying is that the addressee is entitled to infer that the speaker does not know whether exactly six friends came to the party, for instance. This is not so in the case of OPTION 2: All the addressee can infer from the speaker's statement in (25b) is that she knows that either exactly four or more than four friends came; but nothing more can be inferred —i.e., there cannot be any specific inference about whether exactly six friends came to the party.

The task now is to decide which one of OPTION 1 and OPTION 2 better characterizes the IIs that come with SMs. The rest of this section is devoted to show that OPTION 2 is more adequate.

3.1. Partial ignorance

The first piece of evidence that IIs of SMs are like by OPTION 2 is that sentences containing SMs need not convey ignorance with respect to any a number above (for *at least*) or below (for *at most*) the one that is mentioned. Consider:

- (26) **Situation:** *Two commentators are talking on TV about a classic basketball game of the 90's. They are commenting on the amount of points that were scored in that game on triples. A commentator says: Michael Jordan scored at least 30 points.*

Both commentators know that triples are three-point field goals in basketball, in contrast to the two points awarded for easier shots. They assume, too, that they are targeting an audience that is well versed in the rules of basketball, and so this information is shared by every agent in the conversation, active or passive. In this situation, the commentator's utterance is perfectly acceptable. This is an instance of PARTIAL IGNORANCE: the addressee *A* cannot draw an inference that the speaker *S* is completely ignorant, since *A* knows that *S* does know something —namely, that quantities of scores that are not tuples of three are not allowable options. Similar examples can be constructed for *at most* too.

PARTIAL IGNORANCE speaks in favor of OPTION 2 over OPTION 1: The latter would predict an II such that for any number *n* above 30, the speaker is ignorant about whether Michael Jordan scored *n* points. But this is too strong an inference. OPTION 2, on the other hand, is compatible with those 'gaps' in the possibilities that the speaker is considering, and a knowledgeable enough addressee will not derive the II that the speaker is ignorant as to whether, e.g., Michael Jordan scored 31 points.¹¹

Another manifestation of the same property can be traced down to examples where an SMN

¹⁰Geurts and Nouwen (2007:558) and Coppock and Brochhagen (2013b:10) also suggest that these are the right IIs for SMs that modify elements that participate in non-entailing scales. I will not consider these cases in this paper, and so I refer the reader to Mendia (2015) for further discussion.

¹¹An anonymous reviewer suggests the following alternative to rescue OPTION 1: It could be that the points in the scale that stand in conflict with real-world knowledge can be rejected. The suggestion is an interesting one and deserves more attention than the little I can offer here. At first glance, however, a reason why I still would prefer OPTION 2 is the following. Suppose that if a Primary Implicature contradicts some statement in the Common Ground, it is automatically rejected. If that were the case we would need a theory of *when* exactly Common Ground information can override a Primary Implicature. For instance, we would have to know why IIs of disjunction can never be overridden by the Common Ground (see §2 above), and why secondary (scalar) implicatures can never be overridden (see Magri 2009). By contrast, no such explanation is necessary if we accept that SMs convey PARTIAL IGNORANCE.

is used in situations where the bounds denoted by the SMN are not fixed. This is to say that *at most* is compatible with a flexible lower bound, and *at least* is compatible with a flexible upper bound. Consider the following example (from Nouwen 2015):

- (27) **Situation:** *Bill does not remember the password of his WIFI network. The only thing he remembers is that the password is between six and ten characters long.*
- a. The password is at least six characters long.
 - b. The password is at most ten characters long.

In the situation above, Bill can utter both (27a) and (27b) felicitously, even though his epistemic state excludes some of the values that in principle could be available. Moreover, the speaker can utter both sentences without bringing attention to any misleading implicatures. To this respect, SMNs differ radically from disjunction in their behavior. As discussed earlier, disjunction always requires TOTAL IGNORANCE: In a disjunctive statement, the addressee draws the inference that, for all the speaker knows, every disjunct constitutes an epistemic possibility. That is, upon hearing a sentence like (18) above –repeated below–, the addressee will invariably draw the inference that the speaker does not know exactly what comic Bill read.

- (18) Bill read Tintin, Asterix or Conan.

This suggests that there is something fundamentally different between SMs and disjunctions. Both constructions allow for IIs, albeit of a different nature: Only SMNs are compatible with some knowledge (hence the term PARTIAL IGNORANCE). In (18), the speaker mentioned three options that are in accordance with her knowledge. Due to the assumption that the speaker is cooperative, and therefore that she is following the Maxim of Quantity, the addressee assumes that there is no true stronger statement that she could have uttered instead of (18). Here we could also invoke the third statement of the Maxim of Manner, BREVITY: *Be brief, avoid unnecessary prolixity*. If the addressee assumes that the speaker is being cooperative and following the Maxims of Quality, Quantity and Manner, there is no reason she should have mentioned three disjuncts in (18) if she knew that any one of them was not a plausible option.

3.2. Assertibility vs. verifiability

It is important to be careful about the distinction between (i) what amount of speaker knowledge SMNs require so that they can be used felicitously and (ii) what kind of IIs they are compatible with. The first correspond to the *assertibility* conditions, or to what a speaker *must* know and what the speaker *must not* know in order to use an SMN. The second correspond to the *verifiability* conditions of sentences with SMNs, or what kind of information (scenarios) are compatible with the use of SMNs.

As before, it is useful to compare the behavior of SMNs with disjunction. Suppose, following Hintikka (1962) and Gazdar (1979) among others, that a cooperative speaker will felicitously utter a proposition ϕ if, minimally, she knows/believes that the assertion conveyed by ϕ is true, or she has enough grounds to believe so. Suppose that ϕ is of the form $[\psi \vee \chi]$. In that case, what does it mean to know or to have evidence enough for $[\psi \vee \chi]$? The minimal assertibility conditions for disjunction seem to be essentially modal: They require that the speaker considers

that both ψ and χ are possibly (but not certainly) true. Zimmermann (2000), following this lead, proposed that disjunctive sentences are interpreted as a conjunction of different epistemic possibilities, such that $[\psi \vee \chi]$ is interpreted as $\Diamond[\psi] \wedge \Diamond[\chi]$. Thus, asserting ϕ requires that ϕ is true, whereas asserting $[\psi \vee \chi]$ requires both that $[\psi \vee \chi]$ is true and that each of $[\psi]$ and $[\chi]$ is possibly true. This intuition seems to be essentially correct, as suggested by (28).

(28) Bill ate an apple or a pear, #but I know that he didn't eat an apple.

Surely, (28) is not a logical contradiction, but it is still not felicitous. The same contrast is found with SMNs too.

- (29) a. Bill ate at least two apples, #but I know that he didn't eat two.
b. Bill ate at most two apples, #but I know that he didn't eat two.

The standard analysis of SMNs in terms of Generalized Quantifiers predicts that (29a) should be truth-conditionally equivalent to the same sentence with *more than one*. This analysis is agnostic as to what the assertibility conditions of SMNs are, and whether they are the same of equivalent expressions, like in the case of *more than one*. It is obvious, however, that both constructions are not assertible in the same set of circumstances, since *Bill ate more than one apple* is compatible with a follow-up like *but I know that he didn't eat two*.¹²

What (29a) suggests is that part of what the speaker must know in order to felicitously utter a sentence with an SMN is that the number that is mentioned and that the SMN is modifying must be a possibility. However, this is not enough as a description of the assertibility conditions of SMNs. Consider:

- (30) Bill ate at least two apples...
a. #but I know that he didn't eat more than two.
b. #and there is no number above two such that he could have eaten that number of apples.
c. but I know that he didn't eat {three/four/three or four/between three or six/...}.
- (31) Bill ate at most six apples...
a. #but I know that he didn't eat fewer than six.
b. #and there is no number below six such that he could have eaten that number of apples.
c. but I know that he didn't eat {five/four/three or four/between two or five/...}.

The examples in (30c)/(31c) are not surprising, given that SMNs convey only PARTIAL IGNORANCE, and so the speaker need not consider each larger or smaller number other than the one modified by the SMN to be a possibility. All these varied scenarios provide contexts that can verify an utterance with an SMN.

¹²The standard theory, as first presented in Barwise and Cooper (1981), captures the property of SMs that they denote lower (*at least*) and upper (*at most*) bounds: $\llbracket \text{at most } n \rrbracket = \lambda A. \lambda B. |A \cap B| \leq n$ and $\llbracket \text{at least } n \rrbracket = \lambda A. \lambda B. |A \cap B| \geq n$. A sentence of the form *at least n A's B* is false if less than *n A's B*. Similarly, a sentence of the form *at most n A's B* is false whenever more than *n A's B*.

The examples in (30a)/(30b) and (31a)/(31b) are the interesting ones. Just like (29), sentences with SMNs seem to be infelicitous if the speaker is certain that no value beyond/below the modified one is a possibility. For an example like *Bill ate at least two apples* this means that the speaker knows that some number of apples beyond two is a possibility, but she need not know anything else. She could, of course, as the continuations in (30c)/(30c) show, but all she *must* know is that there is some number above two for which it may be true that Bill ate that many apples. Again, these results favor OPTION 2 over OPTION 1 in (25) above: The IIs that cannot be challenged are precisely those advocated by OPTION 2.

What matters when uttering a sentence with an SMN is that there must be at least two possibilities that the speaker has to consider to be true: *exactly n* and *more than n* in the case of *at least n*, and *exactly n* and *fewer than n* for *at most n*. We can now summarize the assertibility conditions of SMNs as follows (cf. Cohen and Krifka 2014, Spychalska 2016):¹³

- (32) ASSERTIBILITY CONDITIONS OF *at least n*: A proposition ϕ of the form AT LEAST n As B is assertible by a speaker S iff:
- a. $[= n]$ is compatible with all S knows,
 - b. $[> n]$ is compatible with all S knows, and
 - c. it is not the case that $[< n]$.
- (33) ASSERTIBILITY CONDITIONS OF *at most n*: A proposition ϕ of the form AT MOST n As B is assertible by a speaker S iff:
- a. $[= n]$ is compatible with all S knows,
 - b. $[< n]$ is compatible with all S knows, and
 - c. it is not the case that $[> n]$.

To have explicit and well-defined assertibility conditions is useful to assess how well theories of SMNs behave with respect to the IIs they predict. Thus, the assertibility conditions in (32) and (33) can be straightforwardly represented by means of formulae in epistemic logic:

- (34) a. $[\geq n]$ is assertible by a speaker S iff $K_S[\geq n] \wedge P_S[= n] \wedge P_S[> n] \wedge K_S\neg[< n]$
 b. $[\leq n]$ is assertible by a speaker S iff $K_S[\leq n] \wedge P_S[= n] \wedge P_S[< n] \wedge K_S\neg[> n]$

These assertibility conditions correspond to what the epistemic state of a cooperative speaker has to be like so that a sentence with an SMN can be uttered felicitously. To this respect, the assertibility conditions of SMNs are fully parallel to those of disjunction, where each disjunct is required to be possibly true, and it is required not to be certainly true by the speaker. What the speaker knows for certain amounts to what sentences with SMNs assert: $K_S\neg[< n]$ and $K_S[\geq n]$ for *at least*, and $K_S\neg[> n]$ and $K_S[\leq n]$ for *at most*, according to the standard semantic analysis (Barwise and Cooper 1981; see footnote 12). The IIs that are derived correspond exactly to OPTION 2 in (25), as proposed by Büring (2007) for *at least*, and cannot be as in OPTION 1, as mentioned by Mayr (2013) and Coppock and Brochhagen (2013b), and also considered by Geurts and Nouwen (2007). A corollary of admitting that OPTION 2 is the right one is that IIs are derived by pragmatic means, just like those that come with disjunction.

¹³Here and throughout the paper I will use the following abbreviations: Numbers enclosed in square brackets '[]' stand for a proposition containing that number, such that $[= 2]$ stands for *Bill has exactly 2 children*. Similarly, I will use $[\leq 2]$, $[\geq 2]$, $[< 2]$ and $[> 2]$ for propositions containing the expressions *at most 2*, *at least 2*, *less than 2* and *more than 2*.

3.3. IIs as implicatures

A quick look at the basic tests for implicatures seems to support the view that IIs are implicatures: They are both cancelable and reinforceable.

(35) CANCELABILITY:

Bill has four kids. Yesterday he saw a sign at a supermarket: ‘Huge sales and discounts for parents. To qualify, you must have at least three kids.’ After reading it, Bill reasoned as follows: ‘I qualify, I have at least three kids. In fact, I have four.’¹⁴

(36) REINFORCEABILITY:

Bill has at least three kids, but I have no idea how many exactly.

A further argument that IIs are implicatures is provided by an observation in Grice (1975), who pointed out –referring to disjunctive sentences– that IIs may be canceled when it is known by all the participants in the conversation that the speaker is not being maximally informative. These are cases where the speaker is not expected to provide all the relevant information that is available to her, in whichever form. The reason is the following: Usually, it is taken to be Common Ground that participants in a conversation obey the Maxim of Quantity. The Maxim of Quantity is a cooperative principle stating, roughly, that the speaker is expected to convey all the information she has available, that is, she is expected to provide the strongest relevant statement she is able to. IIs arise as a direct consequence of this mutual agreement. Put it otherwise: in the absence of the assumption that the speaker is following the Maxim of Quantity, speakers are not expected to be maximally informative, and so there could be stronger relevant propositions that they could have remained silent about, while still being cooperative. As it turns out, in situations where it is Common Ground that the speaker is not obeying the Maxim of Quantity, IIs are not present. Grice (1989:44–45) discusses the case of disjunction:

‘I can say to my children at some stage in a treasure hunt, “The prize is either in the garden or in the attic. I know that because I know where I put it, but I’m not going to tell you.” Or I could just say (in the same situation) “The prize is either in the garden or in the attic”, and the situation would be sufficient to apprise the children the fact that my reason for accepting the disjunction is that I know a particular disjunct to be true.’

The treasure hunt scenario illustrates that the cancelation of the II is contingent upon knowing whether the different agents in the conversation have agreed on obeying the Maxim of Quantity or not. Consider now the following scenario (inspired by Fox 2014):

(37) **Situation:** *In a TV game show, utterances by the host are presupposed to disobey the Maxim of Quantity. The contestant has won the biggest prize, which consists of one of two options: She either takes \$5000 in cash or she takes an envelope with an amount of cash unknown to her, but that the audience and the host already know. The contestant has to gamble. At some point, the host decides to give a hint that will help the contestant*

¹⁴Same with disjunction: In some cases disjunction does not trigger an II, even in plain non-modal contexts. The following example is from Chierchia (2013), adapted from von Stechow and Gillies (2010): *We lost a ball. John is telling us that it is not in Box A. We saw it land in Box A or Box B; thus, the ball must be in Box B.* It seems that in the context above the inference that the speaker does not know what of the disjuncts is true has to be defeasible to make a coherent discourse.

to assess her chances of picking the most profitable choice. Of course, the hint is such that it only provides part of the information available to the host, and this is common understanding for both the contestant and the audience. In this case, the host says: The envelope contains at least \$3000.

Deactivating the Maxim of Quantity as in (37) makes the hint provided by the host appropriate even though he knows the exact quantity that the envelope contains. In addition, it precludes the contestant from drawing the inference that the host does not know how much money it contains. In fact, the contestant can be confident that the hint is true precisely because she takes the host to be an authority on the matter.

In sum, the fact that IIs depend on the shared knowledge that participants in the conversation are obeying the Maxim of Quantity strongly suggests that they are implicative in nature. This conclusion is further supported by the fact that they are cancelable and reinforceable.

4. Deriving ignorance with SMNs

This is where we stand: We have seen that IIs are pragmatic inferences that can be drawn from utterances containing SMNs, very much like disjunction. These IIs are better described in terms of a disjunctive statement of the form *exactly n or more/less than n* (which corresponds to OPTION 2 in (25) above). Like disjunction, both of these disjuncts are inferred to be epistemic possibilities for the speaker. But, unlike disjunction, drawing these inferences of SMNs does not result in TOTAL IGNORANCE, but in PARTIAL IGNORANCE.

And this is where we go: The next step is to explain how to derive the correct IIs. To do so, I first introduce Schwarz (2013, 2014) account which, together with the epistemic logic introduced above, derives the IIs of SMNs argued for in the previous section.

4.1. Taking stock

4.1.1. Buring's (2007) idea

The starting point is Buring (2007) who, building on Krifka (1999), proposed what many consider the best account to IIs of *at least* (although not for *at most*; we turn to this question later).¹⁵ The general idea is to account of IIs with *at least* from general, neo-Gricean pragmatic principles, just as we did with disjunction above. In order to do so, Buring (2007) provided a syncategorematic definition of *at least*:

$$(38) \quad \textit{at least } n \textit{ A's B} \stackrel{\text{def}}{=} \textit{exactly } n \textit{ P Q or more than } n \textit{ P Q}$$

In (38) above ' $\stackrel{\text{def}}{=}$ ' should be read *is interpreted as*. This definition captures directly the assertibility conditions of *at least* introduced in §3.2. The advantage of making this move is twofold: It not only captures the fact that the assertibility conditions of disjunctive sentences and *at least* are the same, but it allows to calculate implicatures following the same reasoning introduced above for disjunction:

¹⁵See Cummins and Katsos (2010), Biezma (2013), Schwarz (2013, 2014), Cohen and Krifka (2014), Penka (2014), Spychalska (2016) and Kennedy (2015), a.o.

(39) *Bill read at least two books*

- a. ASSERTION: $[= 2] \vee [> 2]$
- b. EPISTEMIC IMPLICATION: $K_S([= 2] \vee [> 2])$
- c. $SA([= 2] \vee [> 2]) = \{[= 2], [> 2]\}$
- d. PRIMARY IMPLICATURES: $\neg K_S[= 2] \wedge \neg K_S[> 2]$
- e. IMPLICATURE BASE: $K_S([= 2] \vee [> 2]) \wedge \neg K_S[= 2] \wedge \neg K_S[> 2]$

Under the assumption that the speaker is cooperative, the fact that she did not utter any of the stronger alternatives prompts the addressee to conclude that the speaker does not have evidence or is uncertain about them. Moreover, it happens to be the case that the assertion together with the Primary Implicatures entail that the speaker considers each of the stronger alternatives a possibility, $P_S[= 2] \wedge P_S[> 2]$ (see the proof in (17) for details). Together with the Implicature Base, this provides amounts to the right kind of IIs: $I_S[= 2] \wedge I_S[> 2]$.

4.1.2. A conceptual worry

The main criticism of Büring's (2007) so-called disjunctive approach is purely conceptual. Even if we concede the descriptive adequacy of (38), how do we get from an SMN to a disjunctive statement? At what level is *at least n* equivalent to *exactly n or more than n*? The complaint in the literature is that the semantic equality between SMNs and the disjunction in (38) is unwarranted (see e.g., Geurts and Nouwen 2007, Coppock and Brochhagen 2013b), and, in fact, that is ultimately the reason why Büring's (2007) treatment is syncategorematic. The criticism goes as follows: The disjunctive operator *or* in (38) is part of the meta-language of the meaning of a proposition containing an SMN. Sentences containing SMNs are not disjunctions on the surface level, and nobody has suggested a syntactic transformation to turn SMNs in disjunctions at LF. Moreover, the only empirical motivation for such transformation is, to date, the fact that IIs can be drawn from SMNs, and in the absence of more evidence, the argument supporting the motivation for such operation would be circular. Thus, it is not likely that such complex transformation exists.

One may assume then that having *or* in the meta-language is sufficient to assure that SMNs will behave like disjunctions at some level. However, this reasoning does not come along either. As Coppock and Brochhagen (2013b) discuss, the fact that some proposition ϕ may be described as a disjunction in the meta-language does not seem to clarify the question as to why we can then draw implicatures from this disjunction. The reasoning would be like this: if a speaker *S* utters expression ϕ , such that the meta-language description of ϕ contains a disjunctive symbol, then *S* considers each disjunct of the meta-language description of ϕ to be possible. There is an obvious problem with this: the reasoning assumes speaker's knowledge (conscious of unconscious) of the meta-language description that semanticists use to describe the meaning of ϕ . But this is rather implausible, how could they know?

A second, maybe more natural option is to assume that SMNs are not disjunctive statements. But if we give up (38), we need to replace it with some other calculus that will successfully derive IIs of SMNs, without taking SMNs to be disjunctions at any level.

4.2. Analysis

4.2.1. Choosing the right alternatives

The upshot of the previous discussion is that a syncategorematic definition for *at least* lacks some explanatory grip. Schwarz (2013, 2014) provides a neo-Gricean account of IIs of *at least* that (i) aims to capture its right properties, and (ii) does so by operating within a standard set of neo-Gricean assumptions. His goal, ultimately, is to motivate the existence of a pair alternatives that will correspond to each of the disjuncts in Buring's (2007) definition of *at least* in (38). Such pair of alternatives would allow us to derive the correct IIs and to get rid of *at least*'s syncategorematic meaning. Schwarz's (2013) idea, also considered by Mayr (2013), is to consider more than one Horn-Set from which relevant propositional alternatives can be determined. Following the neo-Gricean practice, the set of alternative meanings $Alt(\phi)$ for an assertion ϕ is formed by the semantic meanings of syntactic structures obtained by substituting one or more scale-mates in the syntactic structure of ϕ with members of its Horn-Set (definition from Sauerland 2004):

- (40) $Alt(\phi) = \{\psi: \psi \text{ is derivable from } \phi \text{ by successive replacement of scalar items with members of their Horn-Set}\}$

Schwarz leaves the alternative generation algorithm as in (40), and so $Alt(\phi)$ for any assertion ϕ is calculated by the usual Gricean substitution method. The following two relevant Horn-Sets in (41a) and (41b) are considered:

- (41) a. Horn-Set₁: $\{at\ least, exactly\}$
 b. Horn-Set₂: $\{1, 2, 3, 4, \dots\}$

With these two Horn-Sets, the set of SAs in (42b) for an assertion (42a) is derived. As before, the Primary Implicatures (42c) can be drawn by negating the SAs under the assumption that the speaker is cooperative, and so she is following the Maxim of Quantity.

- (42) a. ASSERTION: $[\geq 3]$ (e.g., *at least three boys left*)
 b. $SA([\geq 3]) = \{[\geq 4], [\geq 5], [\geq 6], \dots, [= 3], [= 4], [= 5], \dots\}$
 c. PRIMARY IMPLICATURES:
 $\neg K_S[\geq 4] \wedge \neg K_S[\geq 5] \wedge \dots \wedge \neg K_S[= 3] \wedge \neg K_S[= 4] \wedge \neg K_S[= 5] \dots$
 d. IMPLICATURE BASE:
 $K_S[\geq 3] \wedge \neg K_S[\geq 4] \wedge \neg K_S[= i], \text{ for all } i > 2$

It suffices to include only the negation of the weakest Primary Implicature from the set of SAs in (42b) corresponding to the *at least* alternatives, $\neg K_S[\geq 4]$ in this case. This is so because $\neg K_S[\geq 4]$ is in fact stronger than the rest of *at least* alternatives since it entails $\neg K_S[\geq i]$ for any $i > 4$. The *exactly* alternatives are non-monotonic, and so all of them must be factored in. Despite the size of the set of SAs, the Implicature Base in (42d) only entails that two of them are epistemic possibilities: $[= 3]$ and $[\geq 4]$. This can be shown to be a general consequence of the assumptions we have made about the epistemic properties of SMNs. We need to prove three things: (i) that (42d) entails $P[= 3]$, (ii) that (42d) entails $P[\geq 4]$, (iii) and that there is no n such that $(42d) \rightarrow P[= n]$, for all $n > 3$. I will show that this is the case by proving that this

particular example under discussion follows from the general case. First we check that (42d) entails $P[= 3]$.

- (43) a. $K[\geq i] \wedge \neg K[\geq i + 1] \wedge \neg K[= i] \rightarrow P[= i]$ for all $i \in \mathbb{N}$
 b. *Proof.* Assume that $i = 3$ and suppose that $\neg P[= 3]$. This is equivalent to $K\neg[= 3]$. Assuming that $K\neg[= 3]$ entails that $K[\geq 4]$ is true, since otherwise the premise $K[\geq 3]$ would be false: $K\neg[= 3] \wedge K\neg[\geq 4] \wedge K[\geq 3] \equiv \perp$. However, $K[\geq 4]$ contradicts the premise that $\neg K[\geq 4]$, and we conclude that $\neg\neg P[= 3]$, which is equivalent to $P[= 3]$.

Thus, when uttering a sentence of the form $SMN n P Q$, the addressee will invariably infer that *exactly* $n P Q$ is an epistemic possibility for the speaker. The reason is that $P[= i]$ is logically entailed by the Implicature Base –which is, in turn, well motivated under neo-Gricean principles. Next, we check that (42d) $\rightarrow P[\geq 4]$:

- (44) a. $K[\geq i] \wedge \neg K[\geq i + 1] \wedge \neg K[= i] \rightarrow P[\geq i + 1]$ for all $i \in \mathbb{N}$
 b. *Proof.* Assume that $i = 3$ and suppose that $\neg P[\geq 4]$. This is equivalent to $K\neg[\geq 4]$. $K\neg[\geq 4]$ entails that $K[= 3]$, otherwise the premise $K[\geq 3]$ would be false. However, $K[= 3]$ contradicts the premise that $\neg K[= 3]$ and so it cannot be that $K\neg[\geq 4]$. It follows that $\neg K\neg[\geq 4]$, which is equivalent to $P[\geq 4]$.

The last step is to show that it is not the case that (42d) $\rightarrow P[= j]$, for all j such that $j > i$. If that were the case, the system would derive TOTAL IGNORANCE instead of PARTIAL IGNORANCE about every value j , which, as we argued above, does not capture the right kind of IIs. In fact, it is the case that $P[= j]$ and $P\neg[= j]$ are contingent and logically independent from the Implicature Base. For instance, in the current case, $\neg P[= 4]$ does not contradict any premises nor entails the contradiction of any of them: $K[\geq 3] \wedge \neg K[\geq 4] \wedge \neg K[= 3] \wedge \neg P[= 4]$ may or may not be true, depending on the model, but it is neither a contradiction nor a logical truth. Similarly for $K[\geq 3] \wedge \neg K[\geq 4] \wedge \neg K[= 3] \wedge P[= 4]$. Notice also that no reference to the notion of symmetry is needed here (see Schwarz and Shimoyama 2011 and Mayr 2013 for discussion).

4.2.2. Results

These are the right kind of IIs. Let us see why. Imagine that (42a) is uttered in a situation where the speaker is uncertain about whether three, five or six boys left, but she knows that exactly four did not leave, and she knows that neither fewer than three nor more than six boys left. In this case, the epistemic state of the speaker S and the assertibility conditions of (42a) are as follows:

- (45) a. *Epistemic State of S wrt. to (42a):*
 $K_S[\geq 3] \wedge K_S\neg[< 3] \wedge I_S[= 3] \wedge K_S\neg[= 4] \wedge I_S[= 5] \wedge I_S[= 6] \wedge K_S\neg[> 6]$
 b. *Assertibility conditions of (42a):*
 $K_S[\geq 3] \wedge K_S\neg[< 3] \wedge P_S[= 3] \wedge P_S[> 3]$

For one, (45a) meets the assertibility conditions defined in (32) above because the speaker considers both three and more than three to be epistemic possibilities compatible with all she knows (in addition to knowing that no number below three is a possibility), and it is the case that $P_S[= 3] \wedge P_S[> 3] \wedge \neg P_S[< 3]$. The assertibility conditions are compatible with the speaker's

knowledge that four boys did not leave: $K_S \neg [= 4] \wedge I_S [> 4] \wedge I_S [= 3]$. In fact, the epistemic state of S entails the assertibility conditions of (42a).

These are not, of course, the IIs that the addressee can draw from (42a): In no way could the addressee guess from (42a) that the speaker knows that four boys did not leave; all this example shows is that (42a) is a felicitous sentence in this context. But suppose instead, for completeness, that both speaker and addressee know that four boys did not leave. The epistemic state of the speaker remains the same, whereas we can describe the epistemic state of the addressee as $K_A \neg [= 4] \wedge I_A [i]$, for some $i \in \{3, 5, 6\}$. After hearing (42a) the IIs that the addressee can draw are exactly the same as the ones in (42d) above; in other words, the knowledge that four boys did not leave does not interfere with the exact form of the IIs that the addressee is allowed to draw.

4.2.3. No closure under disjunction!

Throughout the paper we have proceeded in parallel comparing the properties of IIs that come with SMNs and disjunction. Here I discuss where the two constructions diverge. The difference is revealed when we consider disjunctions with multiple disjuncts. Recall that, as Alonso-Ovalle (2006) pointed out, in order to derive the right inferences with bigger disjunctions, we need to consider all the smaller disjuncts formed by using two or more of the disjuncts that participate in the original disjunction (see discussion in §2). The calculation I have introduced above shows that in the case of SMNs, this is not the case: We derive the right kind of IIs by looking exclusively at the Implicature Base formed by (i) the Quality Inference and (ii) the Primary Implicatures. In fact, the only alternatives that turn out to be of logical interest –i.e., those that have the power to contradict information in the Implicature Base– are the alternatives that correspond to the material that has been explicitly mentioned: for *at least* n , we have that $[= n]$ and $[\geq n + 1]$ are sufficient to derive the right IIs.

But not only is it unnecessary that we consider sub-domain alternatives like the ones required by disjunction, it is obligatory that we do not consider them. The reason is that, even though the meaning of a sentence containing an SMN can be expressed with a multiple disjunction, the IIs that come with SMNs and multiple disjunctions are crucially different. For the sake of the argument, suppose that in order to derive the right IIs for SMNs, we have to find a set of *SAs* whose union carves out the space delimited by the assertion (that is, a set of *symmetric* alternatives; cf. Schwarz 2013; Mayr 2013). Thus, for instance, for an assertion like (42a), we have that the union of the *SAs* $[= 3] \vee [\geq 4]$ exhausts the space of the assertion: Because $[= 3]$ and $[\geq 4]$ are mutually exclusive, one of them must be true. Then, the right IIs are derived by reasoning specifically about the disjunct $[= 3] \vee [\geq 4]$, in a way parallel to the one introduced above.

The appeal of this procedure is that it relies on more or less well-understood facts about disjunction. The problem is that there are more sets of *SAs* that also carve out the meaning of $[\geq 3]$. For instance, the disjunction $([= 3] \vee [= 4] \vee [\geq 5])$ also covers the meaning of $[\geq 3]$: One of the three disjuncts must be true. The same is true of the multiple disjunct $([= 3] \vee [= 4] \vee [= 5] \vee [\geq 6])$, where one of the four disjunct must be true. And so on.

Schwarz (2013) and Mayr (2013) derive IIs of SMNs by appealing to these sets of symmetric alternatives. By positing *SAs* that cover the meaning of the assertions they manage to provide a suitable disjunctive statement that, after a Gricean reasoning process, delivers the right IIs. Pushing this rationale further, there is no reason why we could not say the same about cases with multiple disjunction, since (i) they also cover the meaning of the assertion, and (ii) they

are also amenable to Gricean reasoning.

As a case study, consider the aforementioned disjunct $([= 3] \vee [= 4] \vee [\geq 5])$ as an SA of the assertion in (42a). If we apply exactly the same reasoning as with disjunction, we get the following set of SAs:

- (46) a. **STRONGER ALTERNATIVES:**
- $$\left\{ \begin{array}{l} ([= 3] \vee [= 4] \vee [\geq 5]), \\ ([= 3] \vee [= 4]), ([= 3] \vee [\geq 5]), ([= 4] \vee [\geq 5]), \\ [= 3], [= 4], [\geq 5] \end{array} \right\}$$
- b. **PRIMARY IMPLICATURES:**
- $$\left\{ \begin{array}{l} \neg K([= 3] \vee [= 4] \vee [\geq 5]) \\ \neg K([= 3] \vee [= 4]) \wedge \neg K([= 3] \vee [\geq 5]) \wedge \neg K([= 4] \vee [\geq 5]) \\ \neg K[= 3] \wedge \neg K[= 4] \wedge \neg K[\geq 5] \end{array} \right\} \wedge$$
- c. **IMPLICATURE BASE:**
- $$\left\{ \begin{array}{l} K[\geq 3] \\ \neg K([= 3] \vee [= 4] \vee [\geq 5]) \\ \neg K([= 3] \vee [= 4]) \wedge \neg K([= 3] \vee [\geq 5]) \wedge \neg K([= 4] \vee [\geq 5]) \\ \neg K[= 3] \wedge \neg K[= 4] \wedge \neg K[\geq 5] \end{array} \right\} \wedge$$

The problem is visible now: the new Implicature Base entails that, for all the speaker knows, $[= 4]$ is a live possibility for her. To see why, suppose that $\neg P[= 4]$ or, equivalently, $K\neg[= 4]$. This entails the truth of $K([= 3] \vee [\geq 5])$, since, excluded $[= 4]$ as an epistemic possibility, either $[= 3]$ or $[\geq 5]$ must be true. But of course, that $K([= 3] \vee [\geq 5])$ contradicts the premise that $\neg K([= 3] \vee [\geq 5])$ in the Implicature Base, and so we must conclude that $P[= 4]$ is a logical truth that follows from (46c). Applying this reasoning recursively to all the possible disjuncts that (i) constitute SAs and (ii) cover the meaning of the assertion, we derive an inference of TOTAL IGNORANCE, precisely the kind of II that we want to avoid.

The calculus defended in this paper does not run into this problem, because symmetry is created only for the two relevant SAs for which an II can be derived. Thus, the only disjunction that covers the meaning of the assertion is the one corresponding to the material that has been linguistically mentioned. However, by relying solely on the notion of symmetric alternatives that cover the meaning of the assertion we get the wrong IIs. So, in order to make sure that we do not generate unattested IIs, we must neglect SAs formed by multiple disjuncts.

The conclusion is that the criteria to choose the right alternatives for SMNs cannot be simply to find a ‘symmetric’ disjunctive statement –i.e., a disjunction of mutually exclusive alternatives that, together, exhaust the meaning of the assertion– because there may be a variety ways to do so with multiple disjuncts. Despite the possible equivalence between SMNs and disjunctions with multiple disjuncts, SMNs cannot be taken to be disjunctions at any level. The difference between disjunction and SMNs is simply that SMNs behave like simple disjunctions with two disjuncts, and so no sub-domain alternatives can be invoked. The IIs that we derive here are simply a function of basic epistemic logic and a neo-Gricean reasoning process. By providing the right source in terms of Horn-Sets for the substitution algorithm to apply, and a basic notion of SA in terms of asymmetric entailment, these ingredients suffice to derive the right IIs.

4.3. The case of *at most*

Although Schwarz (2013) does not talk about *at most n*, an extension of this account, limited to the derivation of IIs, goes as follows. The Horn-Sets that we have to consider now are the following two:

- (47) a. Horn-Set₁: {*at most, exactly*}
 b. Horn-Set₂: {1, 2, 3, 4, ...}

The substitution mechanism remains the same as the one considered before in (40). An important difference is that with *at most* the logical entailment pattern of the alternatives is reversed with respect to the ones in (41). With *at most*, the SAs that we need to consider correspond to those values that are less or equal than the value mentioned in the assertion.¹⁶

- (48) a. ASSERTION: $[\leq 3]$ (e.g., *at most three boys left*)
 b. SA($[\leq 3]$) = $\{[\leq 2], [\leq 1], [= 3], [= 2], [= 1]\}$
 c. PRIMARY IMPLICATURES: $\neg K_S[\leq 2] \wedge \neg K_S[= 3] \wedge \neg K_S[= 2] \wedge \neg K_S[= 1]$
 d. IMPLICATURE BASE: $K_S[\leq 3] \wedge \neg K_S[\leq 2] \wedge \neg K_S[= 3] \wedge \neg K_S[= 2] \wedge \neg K_S[= 1]$

As before, the Implicature Base in (48d) entails that both SAs $[= 3]$ and $[\leq 2]$ constitute live epistemic possibilities compatible with all the speaker knows. We have seen the proof many times: Suppose that $\neg P[= 3]$. This is equivalent to $K\neg[= 3]$. Together with $K[\leq 3]$, $K\neg[= 3]$ entails that $K[\leq 2]$ is true, but this contradicts the premise that $\neg K[\leq 2]$, and so we conclude that $P[= 3]$. Assume now that $\neg P[\leq 2]$. This is equivalent to $K\neg[\geq 2]$, which, together with $K[\leq 3]$ entails that $K[= 3]$ must be true. This conclusion contradicts the Primary Implicature that $\neg K[= 3]$, and we must conclude that $P[\leq 2]$.

There are no surprises in the derivation, and the IIs that we derive are exactly as desired. For instance, suppose that (48a) is uttered in a situation where the speaker is uncertain about whether one or three boys left, but she knows that it is not the case that exactly two boys left and she knows that neither less than one nor more than three boys left. In this case, the epistemic state of the speaker *S* and the assertibility conditions of (48a) are the following:

- (49) a. *Epistemic State of S wrt. to (48a)*:
 $K_S[\leq 3] \wedge K_S\neg[> 3] \wedge I_S[= 3] \wedge K_S\neg[= 2] \wedge I_S[= 1] \wedge K_S\neg[> 1]$
 b. *Assertibility conditions of (48a)*:
 $K_S[\leq 3] \wedge K_S\neg[> 3] \wedge P_S[= 3] \wedge P_S[< 3]$

The assertibility conditions for *at most* defined earlier in (33) are met: The speaker considers both three and less than three to be epistemic possibilities compatible with all she knows, in addition to knowing that no value above three is a possibility. These assertibility conditions are compatible with the speaker's epistemic state, in particular with the knowledge that exactly two boys did not leave.

¹⁶For simplicity, I have excluded the proposition corresponding to the number 0.

5. Comparison to other approaches

In this section, I will compare how the approach advocated for in this paper fares when compared to other accounts of SMNs. The focus will be solely on the derivation of IIs, so I will set aside other considerations, such as the behavior of superlatives in embedded contexts. For reasons of space, I will only discuss two of the most influential proposals in the literature. The goal is to show that paying attention to IIs provides a further tool to assess the adequacy of more general theories of SMs. And, as we will see, the kind of IIs that we expect with SMNs cannot be easily captured following those proposals.

5.1. Geurts and Nouwen (2007)

A well-known proposal is Geurts and Nouwen's (2007) modal analysis, where *at least n* is suggested to mean *certainly n and possibly more*. The focus of their paper is on the interaction between superlatives and modal verbs, and so they do not focus on the IIs predicted by their proposal. Only in Geurts et al. (2010:134) they point out that IIs may be derived pragmatically, since *possible* may imply *not certain*, very much in line with the account defended here. In fact, given their lexical entries for SMNs, the IIs they predict are exactly the ones we have defended here:

- (50) a. $\llbracket \text{At least } n \text{ A's are B} \rrbracket = \Box \exists x[A(x) \wedge |x| = n \wedge B(x)] \wedge \Diamond \exists x[A(x) \wedge |x| > n \wedge B(x)]$
 b. $\llbracket \text{At most } n \text{ A's are B} \rrbracket = \Diamond \exists x[A(x) \wedge |x| = n \wedge B(x)] \wedge \neg \Diamond \exists x[A(x) \wedge |x| > n \wedge B(x)]$

The interesting consequence of their analysis is that it is not tenable if one considers non-entailing scales, as the authors themselves acknowledge.

- (51) a. Sue won at least a bronze medal.
 b. $\llbracket (51a) \rrbracket = \Box \exists x[\text{win}(S, x) \wedge BM(x)] \wedge \Diamond \exists x[\text{win}(S, x) \wedge x \triangleright BM]$

If we apply the lexical entry (50a) to (51b) the result is a contradiction: It is necessary that Sue won a bronze medal, and it is possible that Sue won some other more valuable metal. For this reason, they have to provide a second lexical entry for non-entailing scales.

- (52) a. Given a proposition α and a set of alternative propositions of α , $[\alpha]_A$ ordered according to some salient order \leq of alternatives,
 $\llbracket \text{AT LEAST } \alpha \rrbracket = \exists \beta[\alpha \leq \beta \wedge \Box \beta] \wedge \exists \gamma[\alpha \leq \gamma \wedge \Diamond \gamma]$.
 b. $\Box[\text{win}(S, \text{bronze}) \vee \text{win}(S, \text{silver}) \vee \text{win}(S, \text{gold})] \wedge \Diamond[\text{win}(S, \text{silver}) \vee \text{win}(S, \text{gold})]$

The interpretation of (51a) is now as in (52b). The problem with (52b) is that it predicts the wrong kind of IIs. As it is familiar from the literature on Free Choice disjunction, statements of the form $\Box(p \vee q)$ trigger the inference that every disjunct must be a possibility:

- (53) a. You must write a paper or a review $\Box(p \vee r)$
 b. $\llbracket (53a) \rrbracket \rightsquigarrow \text{you can write a paper or you can write a review.}$ $\Diamond p \wedge \Diamond r$

This inference is very difficult to cancel, if not impossible. Thus, including a disjunctive statement as part of the semantic import of superlatives makes it equivalent in the relevant respect to a disjunction like (53b). As a consequence, we expect that after hearing a sentence like (51a), the addressee will infer that Betty could have won any of the three medals.

- (54) a. $\Box[\text{win}(S, \text{bronze}) \vee \text{win}(S, \text{silver}) \vee \text{win}(S, \text{gold})]$
 b. $\llbracket(54a)\rrbracket \rightsquigarrow \Diamond[\text{win}(S, \text{bronze}) \wedge \text{win}(S, \text{silver}) \wedge \text{win}(S, \text{gold})]$

Given the semantics in (52b) and the truth conditions in (54a), (54b) is an inference that goes through independently of the epistemic state of the agents involved in the conversation. Notice, however, that (51a) is felicitous in situations where the speaker knows that Sue could not have won the gold medal: For instance, the speaker may know that Betty won the race and that Sue and Mary were the next ones crossing the finish line, but she ignores in what order. This is a situation of PARTIAL IGNORANCE. For these cases, Geurts and Nouwen (2007) wrongly predict that the addressee will always draw the inference that Sue may have won the gold medal. This strongly contrasts with the case of disjunction: (55b) contradicts the statement that $\neg\Diamond[\text{win}(S, \text{gold})]$ and so the sentence is bad. However, this is not a problem for (55a).

- (55) Sue didn't win the gold medal,
 a. but she won at least the bronze medal.
 b. #but she won the bronze, silver or gold medal.

If Geurts and Nouwen (2007) are right, one would still have to explain why (55b) is not an acceptable follow up to the previous sentence, since both (55a) and (55b) denote a statement of the form $\Box(\text{bronze} \vee \text{silver} \vee \text{gold})$. Although this argument alone may not be fatal for Geurts and Nouwen's (2007) approach, they certainly predict the wrong inferences about what it can be inferred about what the speaker knows after she uttered a sentence containing an SM.¹⁷

5.2. Coppock and Brochhagen (2013b)

Couched in the framework of inquisitive semantics, Coppock and Brochhagen (2013b) develop an account on which superlative modifiers, rather than being disjunctive themselves, share with disjunction the property of being *interactive*, that is, the property that they denote more than one possibility. In inquisitive semantics, denotations are represented as sets of possible worlds (possibilities) corresponding to the set of possible answers to the QuD. For instance, the sentence *at least three boys came* can denote the possibilities that three boys came, that four boys came, etc. In this case, $\llbracket\text{at least three boys left}\rrbracket$ denotes the set $\{p_n | n \geq 3\}$. This set is then further constrained by the *information state* of the speaker, the set of epistemically accessible worlds for a speaker. This feature makes Coppock and Brochhagen's (2013b) account compatible with PARTIAL IGNORANCE: If the addressee knows that five boys did not come, then he will factor out worlds where the possibility of five boys coming is alive.

The first thing to notice about this account is that the authors do not provide any independent evidence for the claim that superlative modifiers are interactive –i.e., for the claim that they

¹⁷Rather than as a criticism, these remarks on Geurts and Nouwen (2007) should be taken as a reminder that we may learn a great deal about SMs just by looking at the IIs they convey. I refer the reader to Mendia (2015) for further discussion of IIs with superlatives that go beyond the numeral case.

denote at least two epistemic possibilities. In turn, Schwarz (2013, 2014), and therefore this paper too, have a clear advantage over both Büring's (2007) and Coppock and Brochhagen's (2013b) proposals in that the pragmatic properties that disjunction and SMs share can be derived from well-motivated independent principles that are already present in the theory.

Second, what seems to be a good feature of this approach, the ability to derive PARTIAL IGNORANCE, is too permissive, once we consider other properties of IIs. Assume, for example, that I know that no more than three boys came, but I do not know how many exactly. In this context, the sentence *at least four boys came* is pragmatically infelicitous, since it conveys that it is possible that exactly four boys came. Coppock and Brochhagen (2013b) do not predict this oddness: in this context, *at most three boys left* and *at most four boys left* have the same denotation. All *at most* needs in order to be felicitous is that there be at least two different possibilities in its denotation that are candidates to be the actual world. In this case, both sentences meet this criterion since for all the speaker knows, it could be that three, two or one boys left.

The main problem is that it is not specified which possibilities should *at most* denote: As long as there are two, the sentence is predicted to be felicitous, and it will denote those possibilities that are compatible with the speaker's information state. In the example at hand, both sentences *at most {three/four} boys left* will denote the same set of possibilities, and so they are predicted to be equivalent. In short, *SM n A's B* does not entail that *exactly n A's B* is an epistemic possibility for the speaker, which is one of the three conditions that makes an SM assertible (see §3.2). In Coppock and Brochhagen (2013a), the authors propose an additional pragmatic principle, the Maxim of Depictive Sincerity, which amounts to say, roughly, that if a speaker "highlights" a possibility, then she considers that possibility compatible with her own knowledge. In the case of SMs, they further assume that *SM n A's B* highlights *exactly n A's B*. In the account defended in this paper, we can dispense with this extra pragmatic principle and rely on a better understood neo-Gricean reasoning process.

6. Conclusions

The main conclusion of the paper is that IIs that come with disjuncts and SMNs must be derived by considering different sets of alternative propositions. In the case of multiple disjuncts, every possible disjunction of at least two disjuncts from the original disjunction have to be considered (Alonso-Ovalle 2006). In the case of SMNs, on the other hand, the only alternatives that matter are the alternatives that have been explicitly mentioned, as originally argued by Büring (2007).

The upshot is that we should care about the kind of IIs that we want SMNs to come with. We should not be misguided by different but seemingly equivalent formulations of what the inferences exactly are: For instance, the fact that SMNs can be equivalent to a disjunction with multiple disjuncts should not be taken as evidence that we can draw inferences from the latter. Different formulations of exactly what IIs SMs come with may lead to different predictions. In this paper, I compared two such predictions and concluded that IIs of SMNs are better characterized after Büring's (2007) proposed meaning for SMNs. In addition, I attempted to show that we do not need to assume a conventionalized meaning or a syncategorematic treatment of SMNs, unlike Büring (2007). Instead, I argued that we can account for the appropriate IIs by carefully choosing the right pieces from other relatively well-studied phenomena and putting them together in the right way. Concretely, IIs that come with SMNs can be accounted for in a purely neo-Gricean framework, using the double Horn-Set method first advanced in Schwarz

(2013) and Mayr (2013). The rest follows from the properties of Hintikka's (1962) epistemic operators K and P and a basic epistemic logic.

It is an open question whether this approach can be extended to cover other cases of superlatives, like the propositional case and non-entailing scales. In Mendia (2015) I show that similar IIs arise with superlative modifiers modifying all sorts of constituents. I also tried to make a case for understanding superlative modifiers as focus sensitivity operators, in Krifka's (1999) vein. If it turns out that a focus-sensitivity approach is tenable, the next step is to explore its consequences for embedding contexts like negation and overt modal operators.

Acknowledgements

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A Phrasal Spell-Out account of denominals in English and Romanian

Adina Camelia Bleotu

The aim of this paper is to provide an account of denominal verbs in English and Romanian in a phrasal spell-out framework (Pantcheva 2011, Starke 2009, 2011), arguing that a single item spells out various terminals: *dance*, for instance, spells out <init, Proc, N>, and *shelve* spells out <init, Proc, Path, Place, N>. Such an analysis does not need to resort to silent items. Moreover, it can capture very well the difference between denominals in English and Romanian, where denominal verbs are constituted of a root and a verbal affix.

1. Aim

The aim of this paper is to provide a novel approach to denominal verbs (DVs) whose form is identical to that of the noun, such as *to dance*, *to corral* (*the horses*), *to hammer* (*the metal*) inter alia in English, and to denominals whose form is different from that of the noun, such as *a dansa* ‘to dance’, *a adăposti* ‘to shelter’ or *a ciomăgi un om* ‘to club a person’ in Romanian¹. The traditional approach to denominals in the literature has been the conflation or incorporation account (Hale & Keyser 1998, 2002), which considers denominals to be derived either via movement of noun roots into v/P or via merge (conflation). Incorporation/movement accounts often resort to null or silent items (such as *DO dance*, *PUT the books ON the shelf*). While such an approach is semantically rich and it manages to account for the data in English quite well, it fails to capture the transparent compositionality of denominal verbs in Romance, namely, the fact that a verb such as *dansa* ‘dance’ in Romanian can be decomposed into the root *dans* and the verbal affix *-a*.

Given these considerations, I will try to capture the Romance data in a different framework, namely, a phrasal spell-out approach according to which a single item can spell out a syntactic structure encompassing several nodes (Starke 2009, 2011). An important remark is in order here, however: the purpose of this paper is not to summarize all the

¹ The reason I have chosen to investigate Romanian is related to the fact that I am a native speaker of Romanian. Romanian falls into the Romance pattern, deriving denominals by attaching a verbal suffix to the root, just like Italian, for instance. In this sense, it is different from English, where the denominal and the noun have the same form.

accounts that can be provided for denominals and compare phrasal spell-out to them², but, rather, to present phrasal spell-out and to examine to what extent it manages to account for denominal verbs.

The paper is structured as follows: after discussing the concept of denominal verb, I present the traditional approach (the incorporation/conflation account), then I move on to Phrasal Spell-Out. Subsequently I present the analyses I use (Ramchand 2008b, Pantcheva 2011) and propose my own account of denominal verbs in the Phrasal Spell-Out framework. I mainly focus on Theme and Location denominals (denominals derived from nominal roots/nouns with the Theme/Location semantic role), the most frequent and discussed verbs of the denominal class.

2. The concept of denominal verb

The subject of this paper is “denominal verbs”. Although several terms have been used in the literature (noun-incorporating verb, verb derived from a noun, denominal verb), I have chosen to use the term *denominal verb*, as it does not express commitment to a particular analysis.

A denominal verb can be loosely defined as a verb derived from a nominal root or a bare noun (N). A denominal verb is not a verb derived from a noun determined by articles or by adjectives (**lovelysmile*, **asmile*), so the fundamental issue is whether it is derived from a bare noun or a root, and if from a root, whether from a categorial root or a naked root. Given the semantic role of the root (e.g. Location: *corral the horses*) and the existence of pseudoresultatives which seem to modify the root (e.g. *She sliced the onion thin*, meaning the slices are thin, not the onion) (Levinson 2007), I will argue that, if we are dealing with a root, it is a nominal root, but that it can well also be a noun.

This ambiguity is further supported by phonology. In the case of English, the noun from which the verb is derived and the nominal root have the same form (*dance*), as do the verb and the noun. In Romanian, however, the verb and the bare noun/nominal root have a different form, and a verbal affix of the form *-a* (for the first declension), *-ea* (for the second declension), *-e* (for the third declension), or *-i/î* (for the fourth declension) is attached to the root. The denominal *urî* ‘hate’, for instance, is derived from the root *ur-*; the bare noun also has a different form *ură* ‘hatred’. Even if it could be argued that this is evidence in favour of the view that both the verb and the noun are derived from a common root, another equally valid option would be to argue the verb derives from a bare noun, but the vowel at the end of the bare noun gets cancelled. In other words, not even phonological arguments seem to weigh the decision in one clear direction.

For Kiparsky (1997), denominals may be derived either from nominal roots or bare nouns. The fact that one can only chain with a chain, but one can hammer with a shoe instead of a hammer is taken as evidence that *chain* is derived from a noun, while *hammer* is derived from a root. However, in a metaphorical sense, one can also chain someone with love, so an interesting question is whether that could be taken to support the idea that *chain* is root-derived. Moreover, the data could be interpreted in a different way: the fact that one can only chain with a chain, but one can hammer with a shoe instead of a hammer could be interpreted as suggesting that certain verbs are derived from *OBJECT TYPE hammer* (something bigger than a noun, not smaller),

² Such an enterprise would be lengthier, and, in fact, I have undertaken it as part of my PhD thesis “Towards a Theory of Denominals in English and Romanian” (Bleotu 2015). For reasons of space, however, discussing Phrasal Spell-Out in comparison with Distributed Morphology or Spanning, for that matter, falls beyond the scope of this paper.

while others such as *chain* are derived from bare nouns (thus embracing the view that verbs are not derived from roots).

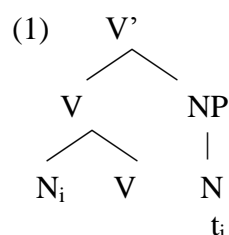
Hence, all that can be said both for Romanian and English is that the denominal verb is derived either from a nominal root or a bare noun (N), but not from a naked root or a DP.

3. The incorporation account

Probably the most important issue relates to capturing the mismatch between semantics (argument structure), syntax and form. In other words, the question would be how is it a verb like *shelve the books* more or less means something like *put the books on the shelf/ shelves*, how is it there is only one word *shelve* for so many terminals. While syntactic approaches resort to *incorporation/conflation*, morphological approaches resort to Fusion (Distributed Morphology), or Phrasal Spell-Out (Nanosyntax).

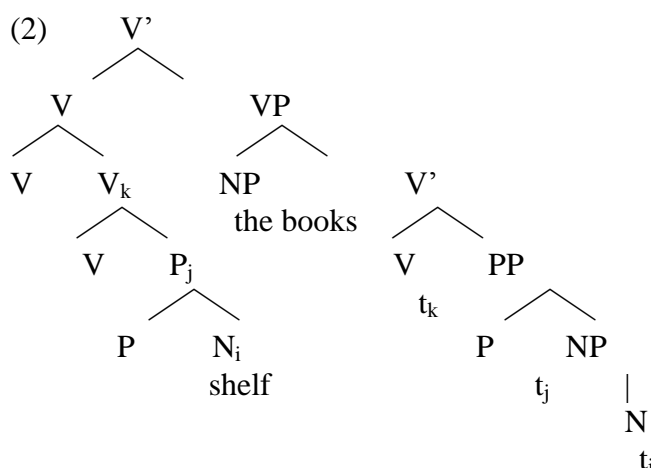
In a lexical syntactic framework (Hale & Keyser 1993, 2002), each lexical head projects its category and the lexicon is derived syntactically. Denominals, for instance, are analyzed as being derived from nouns. Hale & Keyser (1993, 2002) focus on (i) unergative verbs, and (ii) location and locatum verbs, and start by providing an incorporation (movement) account only to shift later to a conflation (merge) account.

In the case of (1) unergative verbs such as *laugh*, *dance*, the head N of the NP governed by the V is adjoined to the latter.



It moves in accordance with the Head Movement Constraint (Travis 1984, Baker 1988), which says that X^0 may only move into the Y^0 that properly governs it.

An incorporation account can also be provided in the case of location verbs (such as *shelve* in *shelve the books*, *corral* in *corral the horses*, *box* in *box the apples*), and locatum verbs (i.e. verbs involving a Locatum, a displaced Theme, such as *saddle* in *saddle the horse* or *hobble* in *hobble the mule*). Following the intuition that a sentence such as *She shelved the books* can be paraphrased as *She put the books on the shelves*, Hale & Keyser (1993, 2002) put forth a structure which includes a vP layer, a VP layer, a PP layer and N, embracing the idea that there is no article in the formation of denominals at I-syntax, and that the verb and the preposition are null. It is not clear from their analysis whether this verb would be something like PUT, or if, actually, we are dealing with a verb CAUSE (the upper V) and a verb BE (the lower V), as in the lexical paraphrase 'CAUSE the books to BE on the shelf'. The N *shelf* moves to the prepositional head governing it, then the P+ N complex moves to the verbal head governing it, and then, the V+ [N+P] complex moves further up to the V head (2).



A similar analysis is provided for locatum verbs like *saddle* (in *saddle the horse*), paraphrased as *provide the horse with a saddle*.

While Hale & Keyser (1993, 2003) start by providing an incorporation (movement) account, in the end, they reject it in favour of conflation (merge). Incorporation is defined as the syntactic process conforming to the Head Movement Constraint and the Empty Category Principle, through which words are formed by attaching the head of a complement to the head of its syntactic governor (Baker 1988). However, although it seems to account for the formation of the denominal verb *dance*, it is unable to explain the compatibility with an overt DP in complement position, as in *They are dancing a Sligo jig* (Hale & Keyser 2002: 49). Since movement would leave a trace, incorporation cannot explain how a DP can occupy a position already occupied by a trace, Hale & Keyser (2002) try instead to generalize conflation as the process that best explains the formation of denominal (and deadjectival) verbs. Conflation is a concomitant of Merge (Hale & Keyser 1998, 2002), and it is defined as “the process of copying the p-signature of the complement into the p-signature of the head, where the latter is ‘defective’” (Hale & Keyser 2002: 63). The fundamental aspect of conflation is that it does not imply head movement, as incorporation does³. Conflation may involve one or two steps. In the case of the verb *laugh*, only one step is involved: copying the full phonological matrix of the noun *laugh* into the empty one corresponding to the verb. In the case of the verbs *shelf* or *saddle*, two steps are involved: first, the full phonological matrix of the noun {*shelf/saddle*} is copied into the empty one corresponding to the preposition. Secondly, the now saturated phonological matrix of the preposition is conflated with the unsaturated matrix of the external verb.

Interestingly, according to Hale & Keyser (1999), conflation has a lexical nature, and denominal verbs must be listed in the lexicon as well, although their formation has a syntactic character (Hale & Keyser 1999: 453). This is often neglected by readers of Hale & Keyser (1999): even Levinson (2007:3) and Harley (2008:3), for instance, assume that denominal verbs are not listed in the lexicon according to Hale & Keyser (1999).

There are several problems faced by the incorporation/conflation account. From a theory-internal point of view, it cannot account for instrumental verbs or for the impossibility of *to*

³ There are other differences between incorporation and conflation. While government is not sufficient to constrain conflation, it is implied by it. Incorporation under government is possible, as the bare noun *calf* (SpecP) is governed by V, but not conflation (**He calved the corral*), for which there is a *strict complementation* requirement.

garden the water (*to put water in the garden), in contrast to the possible form *to water the garden*. From the semantic perspective, it fails to capture the meaning of verbs (Mateu 2002). Kiparsky (1997), in fact, argued that there is a Canonical Use Constraint which is responsible for the meaning of words, according to which an action is named after an object, it involves a canonical use of the object, so the meaning cannot be captured by lexical syntax. In the case of instrumental denominal verbs, for instance, this principle constrains the meaning to a large extent: *to tape* cannot refer to ad hoc uses of tape, such as using tape to strangle someone (*tape a person*). Harley (2008) later tried to derive the CUC (the Canonical Use Constraint) from the properties of bare nouns in English (where bare Ns have generic readings).

In order to account for the meaning of denominals, the incorporation/conflation account resorts to null/silent items such as DO, CAUSE, BE, PUT. However, even if this renders the account semantically rich, it has the disadvantage of positing extra material. Moreover, the incorporation/conflation account fails to give adequate consideration to languages other than English, not paying enough attention to the fact that the general form of a denominal verb is not just N (as in English), but N + Verbal Affix. In Romanian, for instance, one can find the verb *dansa* ‘dance’, which is decomposable into the root *dans* and the verbal suffix *-a*. For this reason, I will try to account for denominal verbs using a different framework. There are several options which open up for testing as possible frameworks in which to account for the data: Distributed Morphology, Phrasal Spell-Out or Spanning. In this paper, I opt for Phrasal Spell-Out and show that it can also account for denominal verbs: a single item (‘dance’, ‘shelve’, ‘hammer’) spells out a large syntactic structure corresponding to ‘DO dance’, ‘PUT ON shelf’, ‘DO WITH hammer’. It falls beyond the scope of this paper to elaborate upon DM or spanning, and the implicit claim is definitely not that Phrasal Spell-Out is better than DM or spanning. In Distributed Morphology (Halle & Marantz 1993, 1994, Harley & Noyer 1999), the mismatch between the number of morphemes constituting a given expression, and the number of terminals in its underlying syntax is accounted for through the operation of Fusion taking place after syntax and before spell-out (fusion operates between the terminals heads, where lexical items are inserted). In Spanning (Brody 2000, Adger 2010, Svenonius 2012, 2014, Ramchand 2014), words spell out spans (i.e. complement sequences of heads in an extended projection), and the innovative aspect is that the same label is used for both X and XP. Phrasal Spell-Out differs from Distributed Morphology, as it resorts to phrasal spell-out as a mechanism of lexicalization, instead of Fusion, but it also differs from Spanning as it allows for the X-Bar format. Accounts of denominals are possible in both DM and Spanning. However, for reasons of space, in this paper, I only look at Phrasal Spell-Out and test its explanatory capacity in the analysis of denominals.

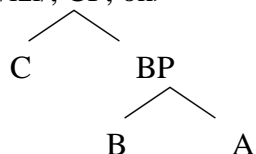
4. Phrasal Spell-Out

The *nanosyntactic* framework, currently in development at the University of Tromsø (Starke 2009, 2011; Caha 2009; Pantcheva 2011) assumes that one lexical item can lexicalize multiple terminals. The terminology (“nano”) is used to indicate that syntactic terminals are very small, and, moreover, they are smaller than lexical items (words or morphemes). In consequence, morphemes will span several terminals, they will correspond to an entire subtree rather than corresponding to a terminal.

4.1. The lexicon

The lexicon is postsyntactic, it contains subtrees, i.e. syntactic trees, paired with phonological and conceptual information. Lexical entries have the form <phonological information, syntactic tree, conceptual information>, as one can see in example (3), with the imaginary item *izi* (with the meaning “on”).

- (3) *izi* ⇔ </izi/, CP, on>



Spellout becomes an operation matching the tree constructed by syntax to the (sub-)trees stored inside lexical entries.

4.2. Spell-Out

Every feature must be lexicalized at the end of every cycle, in accordance with Cyclic Exhaustive Lexicalization (Pantcheva 2011: 115), and lexicalization happens bottom-to-top, right-to-left. At each cycle, if several lexical items match the root node, the candidate with the least unused nodes wins (The Elsewhere Principle, Minimize Junk (Starke 2009)). The most specific item is favoured: *mice*, for instance, will win over *mouses* (*mice* > **mouses*). An essential idea about nanosyntax is Phrasal Spell-Out (4), an idea originating from generative semantics, first proposed by McCawley (1968).

- (4) *Phrasal Spell-out*
Lexical insertion can target phrasal nodes.

Unlike Distributed Morphology, which makes use of the *Subset Principle*, allowing items to be underspecified when inserted, nanosyntax makes use of the *Superset Principle* (5).

- (5) *Superset Principle*
A lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node.

Nanosyntax allows for an elegant approach to syncretism (Starke 2002). One can account for the fact that *-ed* is syncretic between an active and a passive reading (*He fold-ed the sheets*, *The sheets were fold-ed*) by arguing that a passive is a “crippled” version of the active (it lacks the vP layer in the passive). In accordance with the *Biggest Wins* (Starke 2009), the theorem in (6) can be formulated.

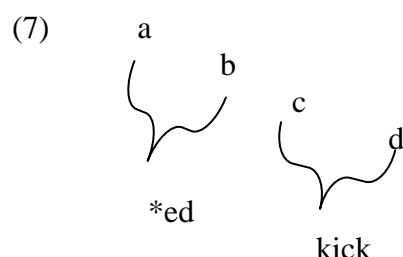
- (6) The lexical item corresponding to the biggest subtree wins. (Theorem)

Thus, if *flied* and *flew* compete, *flew* wins over *flied*. It spells out the entire tree [V past] with a single lexical item, blocking the regular counterpart **flied*. This happens because direct lexicalization is preferable over lexicalization by inheritance.

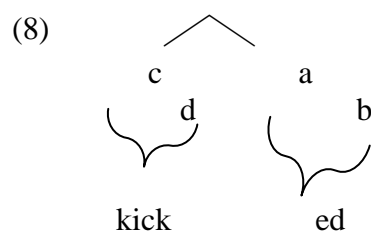
Nanosyntax is also successful in accounting for idioms such as *kick the bucket*, embracing the view that the entire constituent is simply stored in a lexical entry. This accounts for the difference in meaning between the literal *kick the bucket* and the idiomatic *kick the bucket*. *Bucket* has to be visible to the next computational cycle (*kick the bucket*), so syntax must have access to prior lexical choices (Computational System=>Lexicon=>Computational System) (Starke 2011: 7).

4.3. Movement

As for movement, it happens because one has to create a configuration adequate for spell-out (7).



In (8), *kick* has to undergo an evacuation movement so that the tree can spell-out:



The Superset Principle ignores traces, so it is possible to spell out. Also, direct lexicalization with movement is preferred over lexicalization by inheritance (*flew* > **flied*).

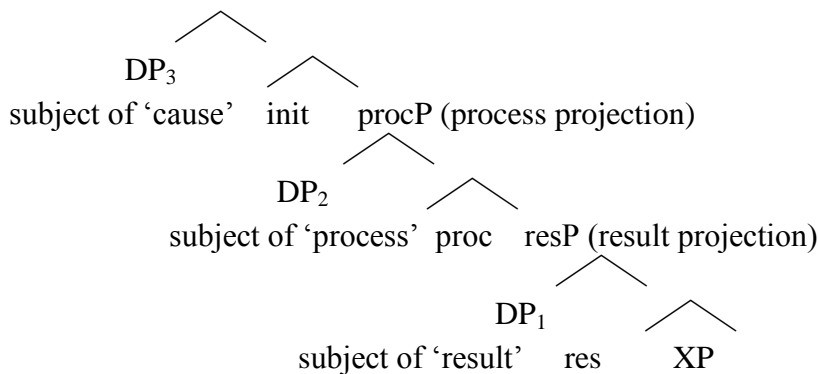
I would like to propose that Phrasal Spell-Out can account for denominal verbs as well: a single item ('dance', 'shelve', 'hammer') spells out a large syntactic structure corresponding to 'DO dance', 'PUT ON shelf', or 'DO WITH hammer'. In my analysis of denominal verbs, I apply phrasal spell-out to representations that combine Ramchand's (2008b) decomposition of verbs with Pantcheva's decomposition of prepositions (Pantcheva 2011), decompositions compatible in principle with several frameworks. In what follows, I present these decompositions, and then my own analysis, opting for phrasal spell-out for reasons of economy and elegance.

5. Ramchand's Analysis (2008b)

In her first phase syntax for verbs, Ramchand (2008b) tries to account for the behaviour of verbs in terms of purely syntactic or categorical features. In the decomposition of verbal meaning, Ramchand introduces primitives such as: (i) initiator ('an entity whose properties/behavior are responsible for the eventuality coming into existence' (Ramchand

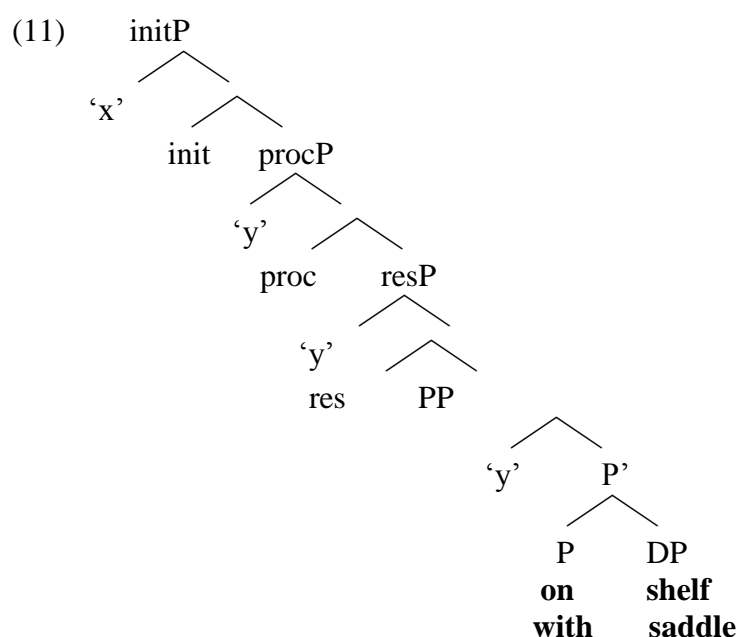
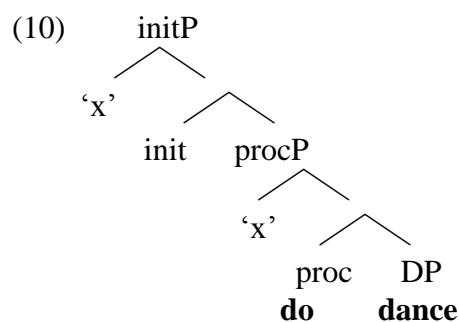
2008b: 24)), (ii) undergoer (“argument that is interpreted as undergoing the change asserted by a dynamic verb”) (Ramchand 2008b: 27), (iii) resultee (“direct argument related to a result state”) (Ramchand 2008b: 33), (iv) path (the trajectory covered by the undergoer), (v) rheme (the object of stative verbs). These primitives represent the basic semantic roles of verbs, accounting for secondary verb features such as ‘causality’ and ‘telicity’. Ramchand distinguishes three subevents in the event-structure: (1) a causing subevent, (2) a process-denoting subevent, and (3) a subevent corresponding to result state. There are three projections corresponding to these subevents: (i) an initiation phrase (initP), whose subject is the INITIATOR, (ii) a process phrase (procP), whose subject is an UNDERGOER, and (iii) a result phrase (resP), whose subject is the RESULTEE (9).

(9) initP (causing projection)



The procP may select the resP as its complement (though this is not obligatory), while the initP selects the procP.

In Ramchand's system, nouns can have complex semantic roles e.g. in *The diamond sparkled*, *the diamond* has a combined semantic role, it is an undergoer-initiator. A single verb may identify more than one subevent e.g. in *Ariel entered the room*, the verb *enter* identifies the initiation subevent, the process subevent, and the result subevent). The relevant verb classes in first phase syntax are [*init*, *proc*] verbs (*push*, *eat*, *run*), [*init*, *proc*, *res*] verbs (*throw*, *enter*, *arrive*, *give*), [*proc*] verbs (*melt*), [*proc*, *res*] verbs (*break*), [*init*, *proc*, *N*] verbs (*dance*), [*init*, *proc*, *A*] verbs (*dry*). Ramchand's classification is similar to Aktionstart classifications (Vendler 1967, Verkuyl 1993), but there is a principled distinction between event-building and temporal interpretation. [*Init*, *proc*] verbs, for example, do not only include activity verbs, but also accomplishments, those accomplishments which embody duration and boundedness (such as *eat an apple*). Unlike Hale & Keyser (1993), who argue that the crucial distinction is between deadjectivals and denominals, or between location verbs and manner verbs, for Ramchand (2008b), the crucial distinction is between conflation into the *res* head and conflation into the *proc* head (rhematic material being incorporated from complement position into the head: RHEMES of process, RHEMES of result), as seen in (10) and (11).



Given that the PP expresses a result, I bring a little but important modification to Ramchand's analysis, namely, representing just the PP in the tree, in order to avoid redundancy.

6. Pantcheva's Analysis (2011)

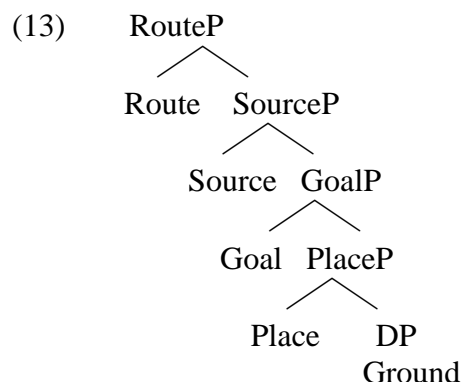
Starting from evidence from Persian prepositions, Pantcheva (2011) decomposes prepositions. The tradition goes back to Jackendoff (1983), who argued that the P head must be decomposed into PATH and PLACE. This is in accordance with semantics and also with morphological facts: in languages where distinctive morphology for path and place is found, the place morpheme is always closer to the root than path morphology (Svenonius 2007).

Ramchand (2008b) shows that PathPs can be the complement of a *proc* head in the verbal decomposition (12).

- (12) a. Lisa danced to the supermarket.
 b. Lisa danced into the room.
 c. Lisa danced towards the monument.
 d. Lisa danced in the room.

When the PathP complement is bounded, the event is also bounded, resulting in a goal-of-motion reading (12 a, b).

Pantcheva (2011) splits the (transitional) PathP into several heads which are hierarchically ordered (Route, Source, Goal). While Place indicates a spatial region, Goal indicates a transition to the spatial region, Source reverses the orientation of the GoalP in its complement position, and Route indicates a second transition in the SourceP (13).



Locative constructions are formed by adding PlaceP to a DP, a Goal Path is built by adding the Goal head to a locative construction, a Source Path is constructed by adding the Source head to a Goal structure, a Route Path takes the Source Path as its complement. This provides a pleasing account of syncretisms, in the case of the preposition ON, for instance, which can express both Location and Goal. Pantcheva's (2011) decomposition of the spatial prepositional layer has proved to be particularly useful in the analysis I propose for denominal verbs expressing location.

7. Analysis of denominal verbs

In what follows, I present my own analysis of Theme and Location denominal verbs in English and Romanian. Denominal verbs can also be formed from nominal roots/nouns bearing other thematic roles, such as Locatum, i.e. displaced Theme, as in *to saddle the horse* (paraphrasable as 'to fasten the horse with a saddle'), Instrument, as in *to hammer* (paraphrasable as 'to hit with hammer'), Pseudo-Agent (actually, Manner, as *spy* is not really an Agent), as in *to spy* (paraphrasable as 'to act like a spy'). However, due to space restrictions, I have chosen to focus on Theme and Location denominals, while I have dealt with the other types in my doctoral dissertation (Bleotu 2015). Importantly, Theme and Location denominals are the most common among denominals and they have been lengthily discussed in the previous literature (Hale & Keyser 1997, 1998, 2002).

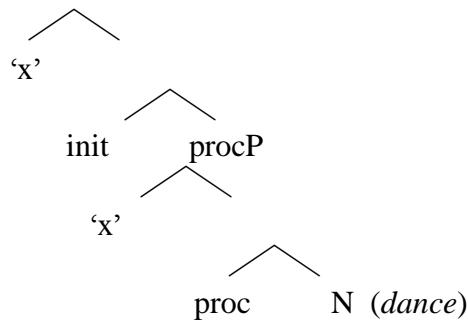
7.1. Analysis of Theme verbs

I first look at Theme verbs in English, and then I move to Romanian.

7.1.1. Analysis of Theme verbs in English

In the case of the denominal verb *dance*, I propose the structure in (14).

(14) $\text{initP} = \text{dance}$



The basic idea would be that, in this case, *dance* spells-out three terminals: [N], [Proc, N], [init [Proc, N]]. The question is whether we are dealing with the same item *dance* and how many items the lexicon should store. Is it the case that it should store two items *dance*: one spelling out N and the other spelling out [init [Proc, N]], hence, a nominal *dance*₁, and a denominal *dance*₂? Or is it the case that the lexicon stores a single item *dance*, which can lexicalize both the noun and the verb? While a view where only one single lexical item is stored might prove more economical, it is not clear it would be able to account for data from other languages than English.

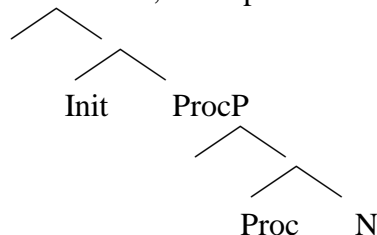
An important remark is in order here, namely, that, in a phrasal spell-out framework, if one adopts such a view where only the N is stored, and the verb is derived through lexicalization by inheritance, then one cannot resort to silent elements within the structure, because they would have to show up in the lexicalization by inheritance. Silent items are only compatible with a view where there is a verbal item in the lexicon, the verb *dance* overwriting the silent item+ N combination (*DO dance*).

Several possibilities open up: one (A) or two lexical entries (B). I will address them in turn.

A. One lexical entry

If one adopts the view that there is a single lexical entry, this lexical entry could be the noun or the verb. If it is the noun, then the verb results by means of lexicalization by inheritance (and the analysis becomes more in the spirit of Distributed Morphology). If it is the verb, then the verbal form can lexicalize the nominal form too via the Superset Principle, according to which a lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node (15).

(15) *dance* ⇔ < /dans/, InitP, conceptual meaning >

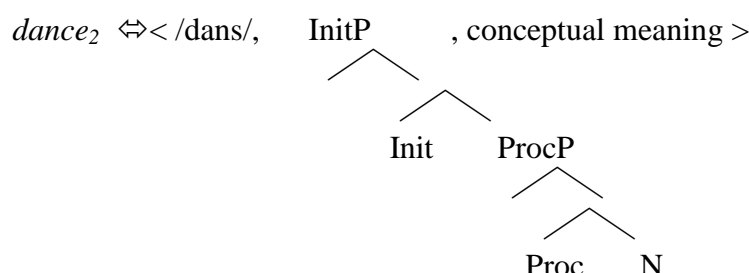


In both cases, silent items are impossible. Interestingly, in English, it is possible to store only the verb in English, unlike in Romanian where *dansa* (the verb) is not an adequate lexicalization of N (*dans*). Adopting such a view in English creates a clear contrast with Romanian, where one must also store the noun.

B. Two lexical entries

However, one may embrace the idea that there are two lexical entries (16).

(16) $dance_1 \Leftrightarrow \langle /dans/, N, \text{conceptual meaning} \rangle$



Then it could be the case that there are no silent items (a), or that there are (b):

- (a) there are no silent elements under the heads Proc, Init
- (b)
 - (i) there are silent elements under the heads Proc, Init (lexicalizing heads)
 - (ii) there are silent elements that lexicalize ProcP, InitP (lexicalizing phrases)

(a) No silent elements

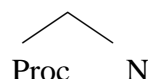
If one assumes there are no silent items (a), nothing is inserted under Init or Proc, and *dance* lexicalizes ProcP, and then initP. In other words, the lexicalization is as follows (17).

(17) Cycle 1

Inspect node N, insert $dance_1$

Cycle 2

- a. Merge Proc and N

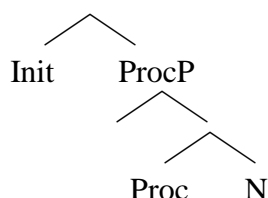


- b. Inspect Proc, insert nothing under it
- c. Lexicalize ProcP as $dance_2$: ProcP may be lexicalized in two ways: by inheritance or directly. Direct lexicalization is preferred over lexicalization by inheritance. However, in this case, $dance_2$ is not a perfect match for ProcP, as it contains an additional Init, and, so, according to the Minimize Junk Condition, it is not the ideal solution, but it is nevertheless inserted, for lack of a better option.

- d. Merge the Subject with ProcP, lexicalize the subject, the Subject moves further up in the tree, it leaves a trace, but traces are ignored by lexicalization. Lexicalize ProcP as *dance*₂.

Cycle 3

- a. Merge Init and ProcP



- b. Inspect Init, insert nothing
 c. Lexicalize InitP as *dance*₂ through direct lexicalization: *dance*₂ is a perfect match in this case
 d. Merge the Subject with ProcP, move the subject further up, lexicalize InitP as *dance*₂

The only problematic aspect of this approach is related to the absence of the item *dance* lexicalizing only the ProcP. It is not clear why there is no syncretism to be found in real language between [Proc, N] and [init [Proc, N]], or between [N] and [Proc, N]. A possible answer would be to argue that *dance* as a ProcP is a lexicalization by inheritance, not a direct lexicalization. It seems to be the case the verbal domain is more particular, as it never lexicalizes the middle, just the extremes (InitP, N, but not ProcP, in this case).

(b) Silent elements

Silent elements can lexicalize heads or phrases.

(i) Silent elements lexicalizing heads

If one embraces the idea that there are silent items (b), one could argue that, in the case of the verb *dance*, there is a single silent element *DO* (*DO dance*) or there are two (*CAUSE DO*), as in (18).

- (18) *DO* ⇔ </Ø/, Proc, conceptual meaning >
CAUSE ⇔ </Ø/, Init, conceptual meaning>

If one assumes the silent item *DO* is inserted, the following step is the lexicalization of the ProcP. ProcP can be lexicalized in two ways, either by inheritance (as *DO dance*₁), or through direct lexicalization (as *dance*₂). In this case, however, the item *dance*₂ contains some additional structure, so, according to the Minimize Junk Principle, it is not a perfect match for ProcP. If one chooses direct lexicalization by an imperfect item over lexicalization by inheritance, the analysis faces a serious problem, namely, *dance*₂ can never be used solely as the Spell-Out of ProcP. The syncretism is between InitP and N, not between ProcP and N. If one chooses lexicalization by inheritance, the result of lexicalization is *DO dance*₁. At the

next step, Init and ProcP are merged. Node Init is inspected, silent *CAUSE* is inserted. The following step is the lexicalization of InitP, which can be done in two ways: either through lexicalization by inheritance or direct lexicalization. Since, in this case, there is a perfect match, *dance₂* will be chosen, and the result of the lexicalization will be *dance₂*.

In the above lexicalization, specifiers do not pose problems. The noun occupying the specifier position in ProcP moves out for spell-out reasons: first, it moves to Spec Init, and then moves out of this position for spell-out reasons.

The problem with this approach (silent items lexicalizing heads) is that the system allows for both terminal spell-out and phrasal spell-out, and it is difficult to decide between the two⁴. In addition, postulating silent elements which lexicalize the heads of the projections InitP and ProcP (*CAUSE*, *DO*) is to a certain extent redundant, taking into consideration the fact that the causative meaning and the event meaning are already expressed by the projections (i.e. features which project).

(ii) *Silent elements lexicalizing phrases*

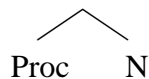
If one tries to remove the problem of the competition between terminal spell-out and phrasal spell-out, embracing the idea that (ii) silent items in fact lexicalize phrases, one obtains the order of operations in (19).

(19) Cycle 1

Inspect node N, insert *dance₁*

Cycle 2

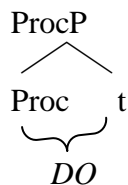
a. Merge Proc and N



b. Inspect Proc, insert nothing under it

c. Move N

d. Lexicalize ProcP as *DO*

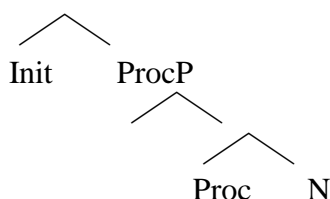


⁴ Ramchand (2008a) argues that one can provide an underassociation account in such case, saying that the verb *dance* can be used to lexicalize the noun. While this account works very well for English, it will not do to say that *dansa* in Romanian can underassociate to lexicalize the N *dans*.

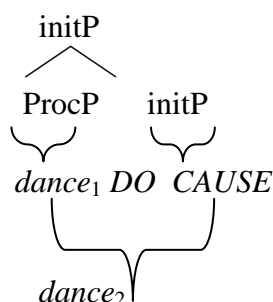
- e. Merge N and ProcP, Lexicalize ProcP as *dance*₁ DO by inheritance rather than directly, as *dance*₁ is not a perfect match (in this way, one captures the fact that there is no verb *dance*₂ which lexicalizes only ProcP)
- f. Merge the Subject and ProcP, move it further up in the tree

Cycle 3

- a. Merge Init and ProcP



- b. Inspect Init, insert nothing
- c. Move ProcP, leave a trace behind
- d. Lexicalize InitP as CAUSE
- e. Lexicalize InitP as *dance*₂ through direct lexicalization: *dance*₂ is a perfect match in this case



- f. Merge the Subject with initP

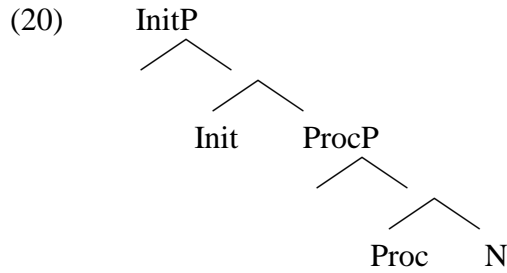
Although possible, this analysis has the disadvantage of using redundant silent lexical items, basically duplicating the information expressed in the projections.

Out of the analyses presented so far, the least problematic is (i), i.e. the one where there are no silent items. Whereas (ii) and (iii) can be considered redundant, (i) does not have this problem. Nevertheless, there is no actual item ProcP *dance*₂, which is problematic, as one would expect such a form to exist if one relies on the Superset Principle.

In any case, the account that seems to explain the formation of the denominal *dance* best is the one where there are no silent items.

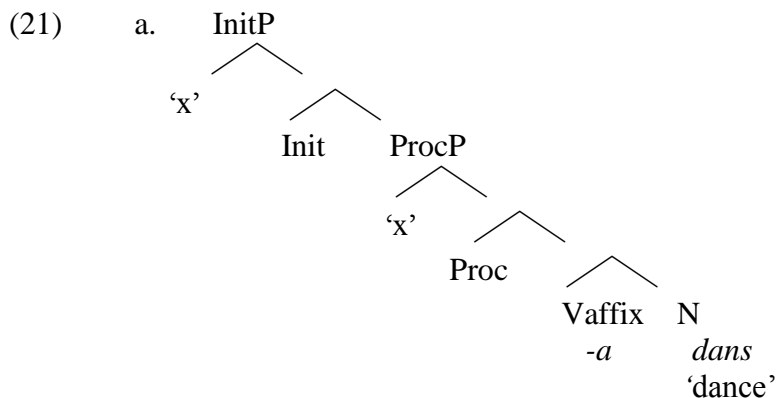
7.1.2. Analysis of Theme denominals in Romanian

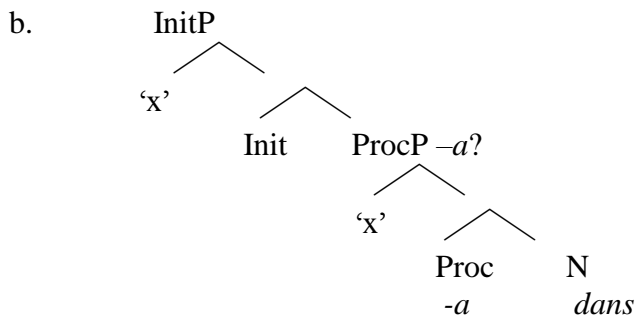
I will now investigate whether this analysis can account for the data in Romanian (20).



If one assumes the lexicon contains only one lexical entry, the N *dans*, the account becomes problematic. While no problems ensue in English, as ProcP can lexicalize by inheritance as *dance*, and so can Init, in the case of Romanian, however, there seems to be a problem, because one has to get from *dans* to *dansa*. A very important question would be where to place the thematic vowel indicating the verbal declension (in this case, *-a*, but it can have several forms *-a* for the first declension, *-ea* for the second declension, *-e* for the third declension, *-i/-î* for the fourth declension). Its placement depends upon its meaning. According to Kiparsky (1973), it has lost its initial meaning, and is now semantically empty, while, according to Grundt (1978), it is an inflectional marker and its meaning is retrievable. In the case of nouns, the meaning of the suffix would be definiteness, just as in Sanskrit or Basque, while in the case of verbs, 'the theme vowel is unaccounted for. A simple explanation offers itself, namely, that the verb agreed with its subject noun not only in person and number but also in definiteness, although other explanations may be possible' (Grundt 1976: 32).

One option would be to create a special verbal affix projection that N combines with before it merges with Proc, and argue that it encodes verbiness information. Another option would be to place it under Proc or ProcP, although, given the fact that Proc(P) is missing in stative verbs (Ramchand 2008), for instance, this might be taken to suggest that this declension would carry an ambiguous semantic meaning (being processual in some cases, non processual in others). If one considers that the verbal affix spells out Proc, then this would introduce terminal spell in a system which relies on phrasal spell-out. If one considers the verbal affix the lexicalization of ProcP, this would make N move out of its position to the Specifier of ProcP, and then once again in the case of initP (21).





If one assumes the lexicon stores the noun, then *dans* will fuse with *-a*, resulting in *dansa*, in a similar way to the Fusion operation present in Distributed Morphology, occurring between terminal heads. Unlike Init and Proc (which have specifiers and take complements), it could be assumed that the verbal affix and the N do not project. Such a view would basically imply that the lexicon only stores nouns and verbal affixes which it combines so as to derive denominal verbs, and it does this by means of a syntactic module which is able to generate the desired results.

Another possibility would be to assume verbs are also stored. This might be a necessary move if one considers how unpredictable the combination between nouns and verbal affixes is (there is no clear means to determine why a certain verbal affix occurs after a certain root).

In conclusion, it seems to be the case that the same phrasal spell-out analysis can be provided for Theme denominals in English and Romanian, the only difference being that, while English has a null verbal affix, Romanian has a phonologically visible affix which has to be stored separately (along with the noun and, possibly, the verb).

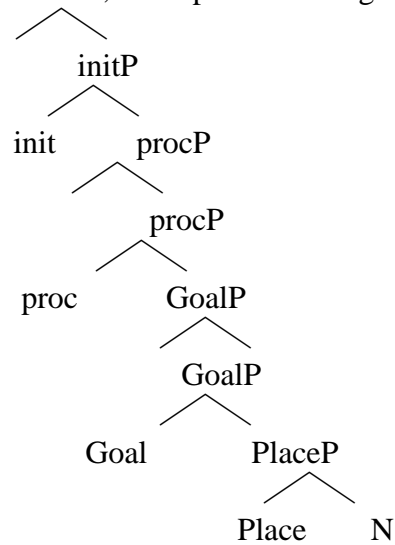
7.2. Analysis of Location denominal Verbs

A similar analysis can be provided in the case of denominal verbs denoting Location.

7.2.1. Analysis of Location denominals in English

If one wants to use silent items, then one is forced to postulate both a verbal item *corral* and a nominal item *corral* in the lexicon, as, otherwise, the silent items would have to show up in the resulting item (22).

- (22) *corral*₁ ⇔ </ko'rəl/, N, conceptual meaning>
*corral*₂ ⇔ </ko'rəl/, initP, conceptual meaning>



Several silent items can be inserted (only the preposition *IN*, the preposition *IN* and the verb *PUT*, *CAUSE*, *DO*, and *IN*), depending upon how semantically rich one desires the representation to be.

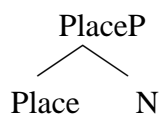
The lexicalization goes as follows (23).

(23) Cycle 1

Inspect Node N, insert *corral*

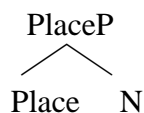
Cycle 2

- a. Merge Place and N

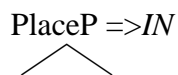


- b. Lexicalization round

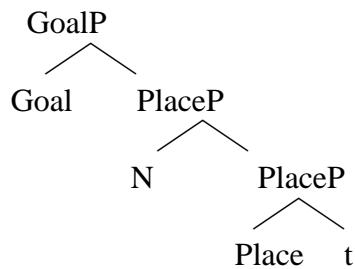
- i. Inspect node Place, insert nothing
 ii.



- iii. Inspect node PlaceP, insert null *IN* at node PlaceP, mark N for extraction

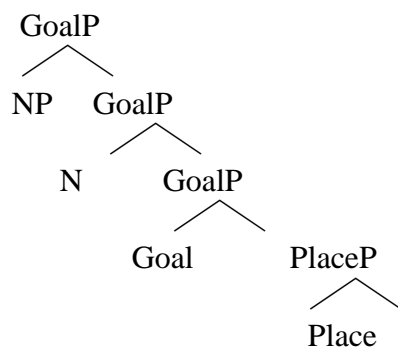
Cycle 3

- a. Merge Goal and Place

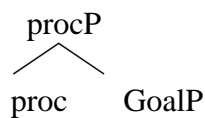


- b. lexicalization round

Inspect Goal, insert nothing. Move N. Lexicalize GoalP as *IN*
 Merge N. Lexicalize GoalP as *corral IN*.
 Merge *the horses*.

Cycle 4

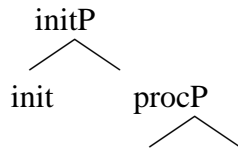
- a. Merge proc and Goal



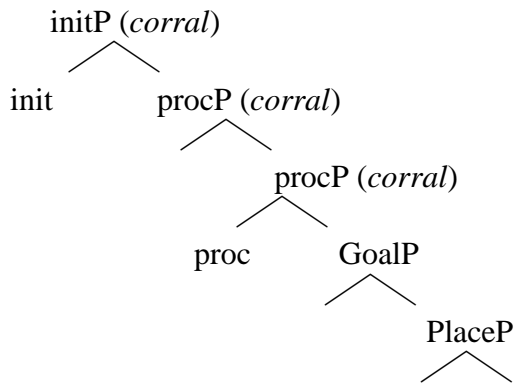
- b. Lexicalize procP as *corral*
 c. Merge y and procP, Lexicalize y (*the horses*), move it, procP is lexicalized as *corral*

Cycle 5

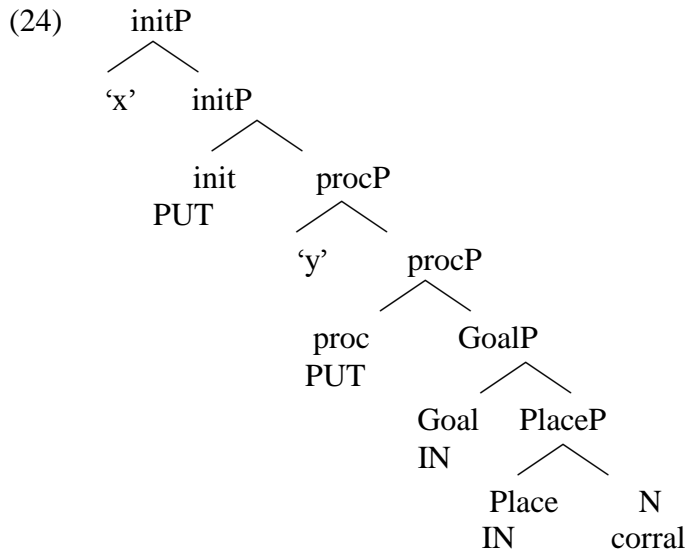
- a. Merge init and proc.



b. Lexicalize initP as *corral*



In the analysis in (23), I only make use of the silent preposition *IN*. However, it is possible to also use other silent items, such as *PUT*. If a silent verb such as *PUT* is inserted as the terminal spell-out of the heads *Proc* or *Init*, this gives rise to a mixed approach, where terminal spell-out and phrasal spell-out are used. Unfortunately, in such a case, it becomes hard to establish whether a silent element like *IN* should be the terminal spell-out of the head *Place*, or the phrasal spell-out of *PlaceP* (24). In other words, what is the decision procedure for terminal spell-out or phrasal spell-out as the means of lexicalization?

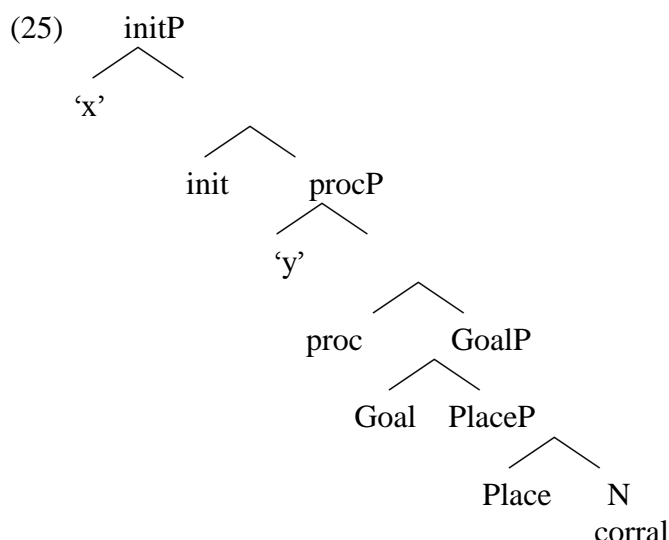


Another option would have been to consider the verb *PUT* as the direct lexicalization of *ProcP* and *InitP*. However, this gives rise to another problem, namely, the fact that *InitP* is once lexicalized by *PUT*, and later on, it must be lexicalized by *corral*.

Moreover, one could make use of the verbs *CAUSE* and *DO* rather than resort to the verb *PUT*, and lexicalize them by means of terminal spell-out or phrasal spell-out. Such a

representation, however, has the disadvantage of being redundant, expressing lexically elements that are already present in the structure.

The representation making use only of the preposition *IN* resorts to fewer silent elements, and is not redundant. However, introducing silent item eliminates the motivation for phrasal spell-out, namely, to lexicalize several nodes by one single item. Moreover, it is not economical to use two items in the lexicon when one could use only one. In conclusion, an account not resorting to silent items seems to be much better⁵ (25).



Several options open up. One option would be (a) storing just the verbal item, which means that a single item *corral* spells out N, PlaceP, GoalP, ProcP, InitP, but, for some reason, there is no actual PlaceP/ GoalP/ ProcP item *corral*. Another option would be (b) storing both the verbal item and the nominal item. N will be lexicalized as *corral*₁, InitP will be lexicalized as *corral*₂. PlaceP, GoalP, ProcP will also be spelled out as *corral*₂, but no ProcP *corral* or GoalP/ PlaceP *corral* is found in the language. Another option would be (c) storing only the nominal item, and lexicalizing everything by inheritance. All options are available for English.

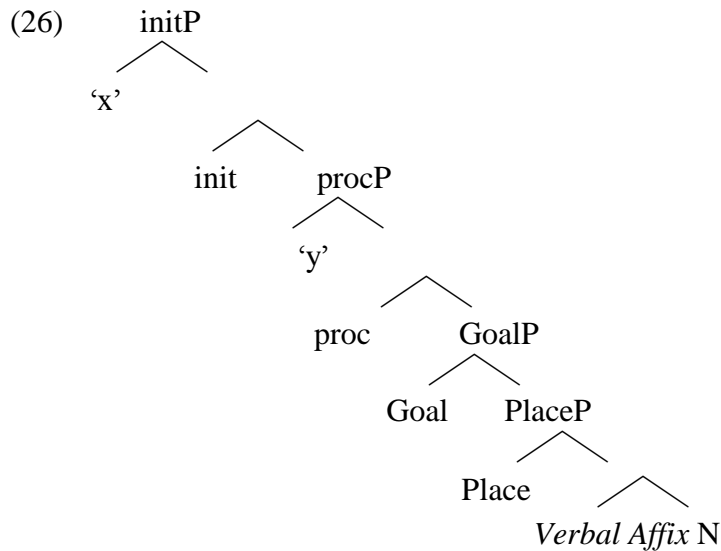
7.2.2. Analysis of Location denominals in Romanian

In Romanian, the verb presents an additional verbal affix indicating the verbal declension. While the first option works for English, as the verb and the noun have the same form, it does not work for Romanian, as the verb presents an additional verbal affix indicating the verbal declension. Storing just one single item would create a clear contrast between English and Romanian (English would store the verb, while Romanian would be forced to store the noun also). Storing both the verbal and the nominal item is a possibility, but it has the serious disadvantage of storing as a single item a decomposable item such as *adăposti* (shelter+ verbal suffix), for instance. On the other hand, storing only the nominal item would make the

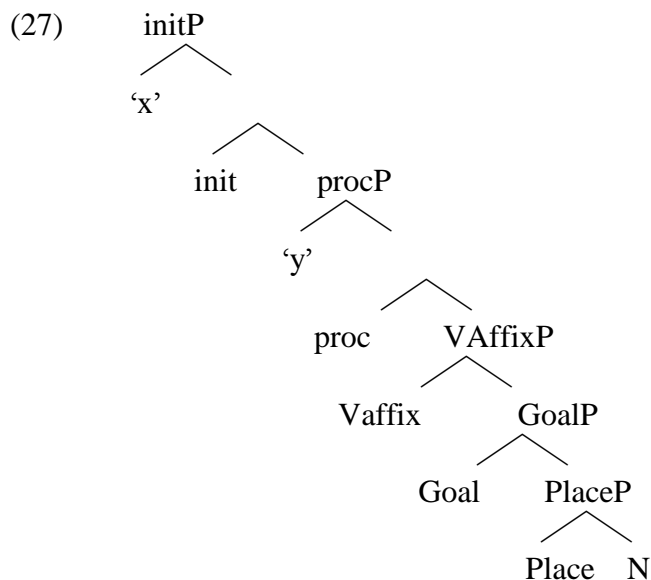
⁵ The only way to allow for a single lexical entry and, at the same time, to allow for silent items would be the underassociation account (Ramchand 2008b), arguing that the verb *corral* can be used to spell out the N *corral* if the features [init, proc, Goal, Place] of the verb unify with the information provided by the preposition *IN* and the information provided by the *PUT* by means of Agree. However, such a view is problematic for Romanian, where the verb and the noun have a different form.

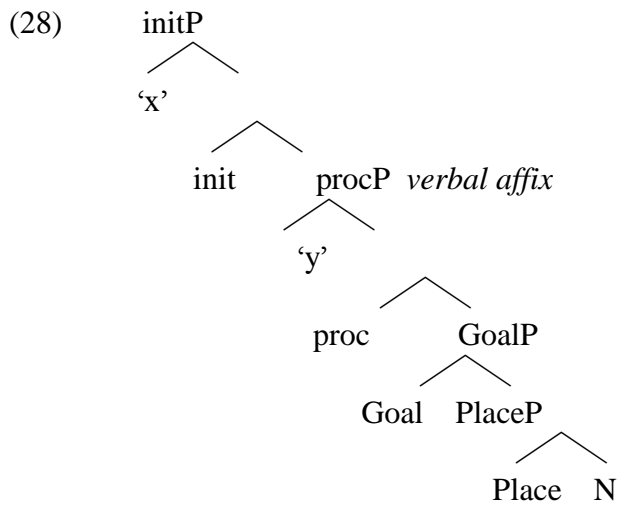
analysis more in the spirit of distributed morphology, arguing that the noun and the verbal affix fuse.

In the analysis of *dansa*, I argued that it was possible to place the verbal affix either under a Vaffix(P) or under Proc(P). The same can be argued here, although, fusing the N and the verbal affix before PlaceP would lead to having something verbal combine with a preposition (26).



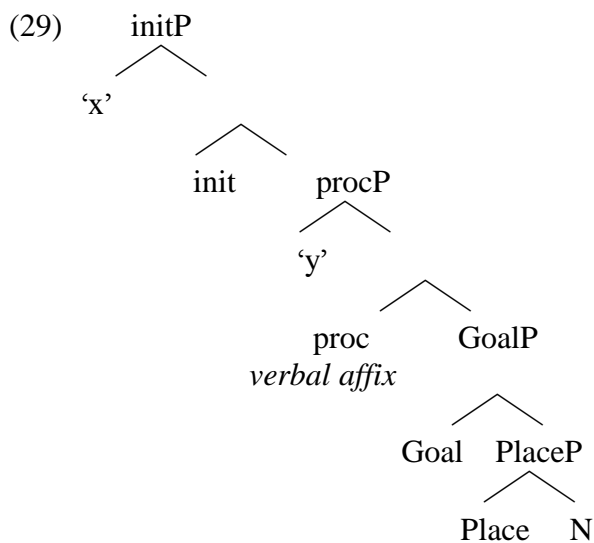
One could place VAffix above GoalP, before ProcP (27). The other option would be to consider it the lexicalization of ProcP (27). The problem would be deciding whether it has a processual meaning or not.





In this case, one must necessarily assume there is either an operation of Fusion between ProcP and <GoalP, PlaceP, N> (if one assumes the verbal affix is the lexicalization of ProcP), or that ProcP can lexicalize twice (once as the verbal affix, once as the verb, given that, in order to lexicalize ProcP, GoalP must move out of its position). Another option is that the verbal affix is inserted in a terminal node position (Proc), and ProcP is lexicalized by inheritance. This, however, would introduce terminal spell-out in a framework relying on phrasal spell-out.

While in a DM account, there would be fusion between the terminal nodes/ heads (N fuses with Place, then they fuse with Goal, then with Proc, realized as the verbal affix, then with Init), in nanosyntax, one must resort to various operations to achieve the desired result (as phrasal spell-out operates on phrases rather than heads). It seems to be the case that, as the structure of the verbs becomes more complex, nanosyntax becomes more inadequate, as it is forced to resort to operations or movements (to allow for the lexicalization of an XP), which make it less economical, as well as less elegant. A nanosyntactic analysis is not impossible, it is, however, costly from the point of view of the system. In contrast, DM would simply fuse the heads (Place, Goal, proc, init), as one can see in (29).



Although applying phrasal spell-out to Romanian Location verbs proves to be more costly from the point of view of the system, compared to English, it is still viable.

8. Comments and final remarks

Apart from Theme verbs and Location verbs, a Phrasal Spell-Out approach can also account for Locatum verbs (such as *saddle*), which it decomposes as InitP, ProcP, PP [+possessive]), taking into account the fact that *saddle the horse* is paraphrasable as 'provide the horse with a saddle'.

It can account for instrumental verbs such as 'hammer' or 'a ciomăgi (un om)' 'to club (a person)' which are decomposed as InitP, ProcP, PP [+instrument] 'hit with hammer', where the preposition has an instrument meaning. An alternative decomposition could be InitP, ProcP, N 'use hammer', taking N to be a direct object, therefore, an obligatory constituent.

It can account for pseudo-agentive verbs (like 'spy', 'spiona') if one assumes it is not the case that the agentive noun is derived from the verb. Such verbs may be decomposed as InitP, ProcP, PP [+comparison] 'act like spy', where the preposition has a comparative meaning. This seems to be on the right track given the meaning of such verbs, encoding a manner component.

A serious issue, however, is the behaviour of denominals in combination with PathPs and complex resultatives within a language and crosslinguistically. It seems to be the case that accounting for 'Linda danced into the room' in a Phrasal Spell-Out framework would render the system too complicated, as a lot of movement operations are needed. While nanosyntax works well for small portions of structure, it becomes uneconomical for big chunks.

In conclusion, Phrasal Spell-Out coupled with the absence of silent items in the representation can be argued to be a possible account for the formation of denominal verbs in English and Romanian. In this paper, I looked at one representative example of a Theme denominal and a Location denominal in English and Romanian, which I have decomposed in first phase syntax (Ramchand 2008), but the analysis also works for denominals derived from nouns with other theta-roles, and has the advantage that it accounts for the difference in morphology between the two languages, namely the presence of a verbal affix in Romanian versus its apparent absence in English.

Acknowledgements

The current work is part of my PhD project at University Ca' Foscari, Venice, which I have now concluded, and in which I investigated the capability of various theories (Distributed Morphology, Nanosyntax, Phrasal Spell-Out) to account for denominal verbs in English and Romanian. I am greatly indebted to Professor Alessandra Giorgi, my PhD supervisor, who helped me with valuable suggestions. I am also very thankful for the period spent at Tromsø, as I had the wonderful opportunity to meet Gillian Ramchand and benefit from her comments. Professor Alexandra Cornilescu has helped me tremendously with her insight into the matter of denominals. Finally, I also thank the audience of ConSOLE XXIII for all the insightful questions. All errors are, of course, my own.

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Preschoolers' interpretation of the focus particle *csak* 'only' in Hungarian

Lilla Pintér

The paper reports on two experiments in which I tested whether Hungarian children can process the exhaustivity of sentences containing the focus particle *csak* 'only'. In line with previous studies concerning the interpretation of focus particles in different languages, I found that preschoolers at around the age of 5 are able to access the exhaustive meaning component of these constructions, though they are occasionally uncertain about which constituent they should associate this reading with. Interestingly, contrary to German-speaking children, they tend to expect the subject to be the focused constituent.

1. Introduction

The aim of this study is to experimentally investigate how Hungarian preschoolers interpret sentences containing the focus particle *csak* 'only'. Thus, I address the following research questions: 1) Do Hungarian preschoolers have access to the exhaustive meaning of these utterances? 2) Do they associate this reading with the same constituent as adult native speakers? I carried out two experiments to answer these questions. Firstly, I conducted a sentence–picture verification task, and secondly a forced-choice picture-selection task.

In addition to the work on the development of *only* in English (Crain et al. 1994, Gualmini et al. 2003, Paterson et al. 2003, 2005/2006, Hackl et al. 2015, among others), there are some recent studies on the acquisition of focus particles in other languages, e.g., *nur* in German (Müller 2010, Müller et al. 2011a,b, Berger & Höhle 2012) or *zhiyou* in Mandarin Chinese (Notley et al. 2009, Zhou & Crain 2010, Hu & Li 2014), which are claimed to behave similarly to their English counterpart. Although the semantics of the focus particle *csak* 'only' in Hungarian appears to be essentially the same as the ones in the languages just mentioned, it actually requires a different syntactic structure. As the focus of the sentence always occurs in the pre-verbal position, parsers not only have prosodic cues to identify the associate of the particle, but they can also make use of the word order. Therefore, it is reasonable to assume that the acquisition of the adultlike interpretation of *csak* will also be different to some extent.

The paper is structured as follows: section 2 presents the semantic properties of sentences with *csak* 'only'. Section 3 outlines the results of previous research regarding the acquisition of the interpretation of focus particles in different languages. Section 4 is dedicated to the two experiments I conducted, whereas section 5 summarizes the conclusions.

2. The meaning of the focus particle *csak* 'only'

Szabolcsi (1994) claims that the exhaustive meaning expressed by the particle *csak* 'only' is associated with the focused constituent of the sentence, similarly to the case of *only* in English. It is also true in both cases that the focused element must be in the scope of the focus operator. However, there is a major difference between the two languages with respect to focus marking. In English, as pinpointed by Jackendoff (1972), the focus within the c-command domain of the particle *only* is marked by stress; thus sentences like (1) yield three possible interpretations depending on the stress pattern, as illustrated in (2 a–c). However, in Hungarian, it is not only the prosody that changes the meaning of the sentence. As it can be seen in (3 a–c), there are also three different word orders, since the focused constituent always moves into the position immediately preceding the tensed verb.¹

(1) John only introduced Bill to Sue. (Gualmini et al. 2003:88)

(2) a. John only INTRODUCED Bill to Sue.
'The only thing that John did is introducing Bill to Sue.'

b. John only introduced BILL to Sue.
'The only person that John introduced to Sue is Bill.'

c. John only introduced Bill TO SUE.
'The only person to whom John introduced Bill is Sue.'

(3) a. John csak BE-MUTAT-T-A Sue-nak Bill-t.
John only PRT-introduce-PST-3SG Sue-DAT Bill-ACC
'The only thing that John did is introducing Bill to Sue.'

b. John csak BILL-T mutat-t-a be Sue-nak.
John only Bill-ACC introduce-PST-3SG PRT Sue-DAT
'The only person that John introduced to Sue is Bill.'

c. John csak SUE-NAK mutat-t-a be Bill-t.
John only Sue-DAT introduce-PST-3SG PRT Bill-ACC
'The only person to whom John introduced Bill is Sue.'

It is also important to mention that the particle *csak* does not necessarily occur in the position preceding the focused element. Although this is the canonical word order (4a), the particle can also appear in a post-verbal position, like in the case of (4b). Note, however, that the focus is still the constituent in the pre-verbal position; therefore this sentence is not ambiguous either.

(4) a. Csak MARI süt-ött sütemény-t.
only Mary bake-PST cake-ACC
'Only Mary was baking a cake.'

b. MARI süt-ött csak sütemény-t.
Mary bake-PST only cake-ACC
'Only Mary was baking a cake.'
* 'Mary was baking only a cake.'

¹ It is a well attested fact that in Hungarian the constituent called identificational focus undergoes syntactic movement from its base-generated position to the specifier of the focus projection, and thus verbal particles such as *be* in (3) appear in a post-verbal position in these cases. For a detailed discussion see É. Kiss (1998).

Examples like (4b) suggest that the particle *csak* does not form one constituent with the focused element in contrast with pre-subject *only* in English (as shown by the ungrammatical reading). It is, however, adjoined to the focus projection, and just like sentential adverbials or distributive quantifiers such as *mindenki* ‘everyone’, it can be attached from the right and thus appear in a post-verbal surface position.

The fact that, in Hungarian, focusing is also marked by syntactic means in addition to prosodic highlighting is crucial, since as the results of the experiments conducted by Gualmini et al. (2003) revealed, children at around the age of 5 cannot rely on prosodic cues when interpreting sentences containing *only*. While in the case of languages similar to English, the investigation of the interpretation of focus particles is also relevant to the problem of resolving ambiguity (first discussed by Crain et al. 1994), in the case of Hungarian, the acquisition of the particle *csak* is independent of the available strategies of disambiguation.

According to the analysis of Horn (1969), in the case of sentences containing the focus particle *only* in English, there are two meaning components, namely a presupposed one and an asserted one, as illustrated by (5).

- (5) Only Muriel voted for Hubert.
 Presupposition: Muriel voted for Hubert.
 Assertion: No one other than Muriel voted for Hubert. (Horn 1969:98)

Horn (1996) later modifies his theory by assuming that the positive meaning component of the sentence is in fact an existential presupposition. Thus, we only presuppose that *someone voted for Hubert* and that it is an entailment calculated from the two meaning components that *Muriel voted for Hubert*. Alternatively, van Rooij & Schulz (2007) propose that the positive contribution *Muriel voted for Hubert* (which is also called the prejacent of *only*) is merely a conversational implicature, while Beaver & Clark (2008) and Roberts (2011) discuss it as a backgrounded entailment. However, it has never been a source of a debate that in the case of sentences with focus particles the negative contribution (i.e., the component which expresses exhaustivity) is asserted², and this is the only relevant issue in the present study.

Kenesei (1986, 1989) and Szabolcsi (1994) provide a similar analysis with respect to the meaning of *csak* ‘only’.

- (6) Csak Péter alszik.
 only Peter sleep-3SG
 ‘Only Péter is sleeping.’ (Kenesei 1989:134)

Thus, in the case of (6), the assertion is that *No one other than Peter is sleeping*. It is also presupposed that *Peter is sleeping*. As Kenesei (1986, 1989) points out, the truth-conditions of this positive meaning component are not affected by the presence or absence of negation, which also strengthen the assumption that it is a presupposition.

Considering the fact that the exhaustive meaning component is asserted (or proffered) in the case of sentences containing a focus particle, it is reasonable to predict that children at around the age of 5 are able to process it. In Hungarian, where identificational focus is also marked syntactically, it is also likely that the adultlike association with the focused constituent is easier and therefore earlier acquired than in the case of languages like English.

² Roberts (2011) tends to call it *proffered content* instead of *asserted content* in order to emphasize that it can also be asked or suggested not only asserted.

3. Previous experiments regarding the interpretation of focus particles

The interpretation of sentences containing focus particles has been the subject of several acquisition studies in the past two decades. The fact that children might assign a different meaning to these constructions compared to adult native speakers was revealed by the work of Crain et al. (1994). They found that preschoolers tend to associate the exhaustivity of the focus particle with the verb phrase irrespective of its surface position. For instance, if they were presented with the sentence under (7), the majority of children would not judge this statement as false if someone else was holding a flag too, while they did reject it if the cat was also doing something else besides holding a flag.

- (7) Only the cat is holding a flag. (Crain et al. 1994:460)

Crain et al. (1994) hypothesize that the high proportion of non-adultlike responses (55%) is in line with a previous finding according to which in case of structural ambiguities, for example in the case of sentences like (8), young children and adults do not apply the same strategy.

- (8) The big elephant is the only one eating peanuts.
 'The only thing eating peanuts is the big elephant.'
 'The only elephant eating peanuts is the big elephant.' (Crain et al. 1994:448)

When testing the interpretation of such constructions, they also found robust differences between the response patterns of the two age groups: whereas preschoolers accepted the sentence under (8) as true only in those cases in which nobody else was eating peanuts, adult native speakers strongly preferred the second reading which allows everyone to eat peanuts except the other elephants.³ As concluded by Crain et al. (1994), these findings can be explained by assuming that language learners attempt to choose the most restricted interpretation, i.e., the one that is only true under the narrowest range of circumstances, as opposed to adult parsers who tend to select the reading which makes the fewest restrictions in order to avoid unnecessary commitments. If it is indeed the case that preschoolers predominantly prefer the so-called "maximal commitment" reading, then it is not surprising that they do not obey syntactic restrictions on the scope of the focus particle but that they are VP-oriented even in the case of sentences like (7).

Paterson et al. (2003) argue against this analysis on the basis of the results of three experiments in which they compared the interpretation of sentences containing focus particles in different syntactic positions (9a, 9b) with that of sentences without focus particles (9c).

- (9) a. The fireman is only holding a hose.
 b. Only the fireman is holding a hose.
 c. The fireman is holding a hose. (Paterson et al. 2003:270)

Crucially, their results appear to suggest the view that English-speaking children interpret sentences with and without *only* as having the same meaning. In each experiment, they found that the most frequent error type was the ignorance of the contrastive information expressed

³ It is important to mention that the authors did not use the same experimental design when testing the two age groups. While children were asked to judge the truth-value of the sentences with respect to the presented pictures, adult speakers only got the test sentences in written form, and their task was to describe one context in which the sentence is true and one in which it is not.

by the particle, not the non-adultlike association with focus. Therefore, Paterson et al. (2003) propose that young children fail to instantiate an explicit set of the alternatives of the focused constituent while mentally representing the meaning of the sentence containing a focus particle.

In a later study, Paterson et al. (2005/2006) investigate sentences in which the particle occurs in the pre-verbal position (10). Thus, the exhaustivity of *only* can be associated with either the verb or the direct object.

- (10) The woman is (only) walking a dog. (Paterson et al. 2005/2006:264)

This time their findings are in line with those of Crain et al. (1994). Hence, even the youngest participants were able to differentiate between sentences with and without *only*, and in the case of sentences with a particle they preferred the more restricted verb-oriented interpretation. Moreover, in this study, even the majority of adult participants associated the particle with the verb. Therefore, Paterson et al. (2005./2006) conclude that both preschoolers and adults tend to favor the maximally informative reading of the sentences.

In order to test the previous hypotheses in two typologically distinct languages, Notley et al. (2009) compared children's interpretation of the particle *only* in English with that of the particle *zhiyou* in Mandarin Chinese. In the case of English, they followed two children's developmental progress from the age of 2. The findings clearly refute Paterson et al.'s theory (2003), since the participants were able to construct the set of the alternatives of the focused element at the age of 2;5 and 2;9, respectively. Interestingly, by the time they had achieved this level, they consistently started to associate the particle *only* with the verb phrase regardless of its syntactic position. This corresponds to the previous results of Crain et al. (1994), as well as to the responses of Mandarin Chinese speaking preschoolers whose task was to judge sentences such as (11).

- (11) Zhiyou zhu xiansheng nadao-le yinse yingbi.
 only pig sir get-ASP silver coin
 'Only Mr. Pig got a silver coin.' (Notley et al. 2009:259)

Example (11) was presented in an "adult-true" condition where it was indeed only Mr. Pig who got a silver coin; however, it was not the only thing he got, since he won a gold coin as well. Preschoolers, as predicted by Crain et al. (1994), rejected this statement 90% of the time, arguing that Mr. Pig also got a gold coin. Thus, Notley et al. (2009) conclude that, in contrast with adults, young children tend to treat focus operators as sentential adverbials which c-command both the subject NP and the VP and can therefore be associated with each one of them.

This assumption was supported by the work of Zhou & Crain (2010), in which the previous findings concerning the Mandarin Chinese *zhiyou*-constructions were compared to the results of a new experiment investigating the role of negation in pre-verbal position (12).

- (12) Zhiyou bai gou meiyou pa-shang da shu.
 only white dog not climb-up big tree
 'Only the white dog didn't climb up the big tree.' (Zhou & Crain 2010:987)

The prediction of Zhou & Crain (2010) was that the intervention of another operator between the pre-subject focus operator and the verb phrase would block their non-adultlike association, as illustrated by Figure 1.

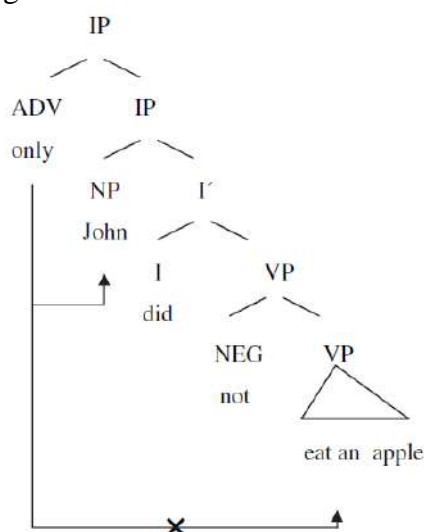


Figure 1. Zhou & Crain 2010:984, example (39b)

The results confirmed the hypothesis, given that in case of sentences with pre-verbal negation, none of the participants associated the exhaustivity of the particle *zhíyou* with the verb phrase. According to Zhou & Crain (2010), it is not entirely surprising that children expect the focus particle to take sentential scope and to be associated with the verb phrase, since several adverbs of quantification, such as *sometimes*, *usually* or *interestingly*, tend to behave like that. After realizing that, in the case of sentences like (11), the focus operator and the subject noun phrase form one constituent, they overwrite the former erroneous generalization and the mistake of VP-orientation does not occur anymore.

Müller et al. (2011a,b) investigate children's interpretation of the particle *nur* 'only' in German, and Müller et al. (2011a) conclude that there are three stages of the development. Between the non-focus-sensitive level (stage 1) and the adultlike performance (stage 3) there is a stage at which children can access the exhaustive reading of the pre-object particle but not that of the pre-subject one. As a reason, Müller et al. (2011a) propose that young children classify the subject as topic and the object as focus, therefore sentences like (13a,b), where the subject is focused, are highly confusing for them.

- (13) a. Eine Gitarre hat nur die Maus.
 a guitar has only the mouse
 'Only the mouse has a guitar.'
- b. Nur die Maus hat eine Gitarre.
 only the mouse has a guitar
 'Only the mouse has a guitar.'

(Müller et al. 2011a:170)

Crucially, as Müller (2010) points it out, the interpretation of sentences with canonical (13b) and non-canonical word order (13a) do not differ significantly, which supports the assumption that it is not the scope assignment but the subject status of the focused constituent that is problematic for young children. Müller et al. (2011b) also provide an alternative explanation to the results of Paterson et al. (2003). After replicating the study with German-speaking

children, they argue that it is the lack of the verbal context that plays a major role in the case of this task. When they did not present the sentences in an out-of-the-blue context, but did add a short description of the pictures, children gave significantly more adultlike responses.

In a recently published study, Hackl et al. (2015) investigate the role of Question–Answer Congruence in the case of sentences containing the particle *only*. The basic assumption was that the source of children’s difficulties in the original study of Crain et al. (1994) and also in several other works was that the test sentences were presented as answers to the question “What happened?”. Crucially, Hackl et al. (2015) found that children at around the age of 5 can interpret both pre-subject *only* and pre-verbal *only* in an adultlike fashion if the test sentence is a congruent answer to the preceding question, i.e., if the focused constituent of the answer corresponds to the *wh*-element of the question (14a – A1, 14b – A2).

- (14) a. Q: Who is holding a flag?
 A1: Only THE CAT_F is holding a flag.
 A2: *The cat is only holding A FLAG_F.
- b. Q: What is the cat holding?
 A1: *Only THE CAT_F is holding a flag.
 A2: The cat is only holding A FLAG_F. (Hackl et al. 2015:206)

Moreover, the results of the incongruent condition of the experiment suggest that young children rely on this Question–Answer Congruence more than the syntactic position of the particle when determining the constituent they associate *only* with. For example in the case of (14a), they tend to interpret the answer A2 as “THE CAT_F is only holding a flag.” As opposed to this, adult speakers attempt to obey syntactic constraints even if the sentence is infelicitous.

In sum, previous studies found that young children tend to have difficulties with the acquisition of the adultlike interpretation of focus particles, typically in the case of pre-subject particles. It was proposed to be a consequence of the use of a non-adultlike strategy of disambiguation (Crain et al. 1994, Paterson et al. 2005/2006), the misanalysis of the scope of the particle (Notley et al. 2009, Zhou and Crain 2010) and the incorrect generalization of the topic status of the subject (Müller 2010, Müller et al. 2011a). There are also studies that managed to point out certain methodological problems of the previous works (e.g. Müller et al. 2011b, Hackl et al. 2015). Nevertheless, the assumption that preschoolers are unable to mentally represent the contrast set of the alternatives (Paterson et al. 2003) was ruled out based on the findings of several experiments from different languages (Notley et al. 2009, Zhou & Crain 2010, Müller 2011b, among others).

4. Experiments

In the following section, I present the results of two experiments conducted with Hungarian preschoolers that may contribute to the previously discussed findings concerning the acquisition of the adultlike interpretation of focus particles. Taking the particularities of sentences with *csak* ‘only’ into account as well, I posed the following research questions.

1. Can children at around the age of 5 process the exhaustive meaning component of sentences with the particle *csak*?
2. If so, can they also associate this exhaustivity with the prosodically and syntactically marked focused constituent within the scope of the particle?

3. Does the presence of a verbal particle, whose inverse position is an additional syntactic marker of focusing, make the association with focus easier?
4. Is there any difference between the interpretation of focused subjects and objects, as predicted by studies investigating English, German and Mandarin Chinese?

4.1. Experiment 1

Since preschoolers' interpretation of the focus particle *csak* 'only' had not been tested before, I decided to use one of the most widely accepted experimental methods, the sentence–picture verification task. However, instead of the commonly used binary truth-value judgment, participants were asked to respond by a more sensitive three-point scale.⁴ The idea of creating a Likert scale that can also be used by young children was put forth by Katsos & Bishop (2011), who investigated the acquisition of scalar implicatures. Their method was also adopted by Balázs & Babarczy (2014), who managed to test 4-year-olds' interpretation of the Hungarian pre-verbal focus this way. In the studies of Katsos & Bishop (2011) and Balázs & Babarczy (2014), the three-point scale consisted of differently sized strawberries. However, I assume that three smiley faces (a sad, a straight and a happy face) represent the values of the scale better, since the small strawberry, which is supposed to mean that the sentence does not match the picture, is also a reward.

Considering the research questions, in Experiment 1, I tested the sentences with *csak* 'only' in four conditions. In addition to the two control conditions, there was a critical condition which intended to measure the presence or absence of the exhaustive reading, and another one that showed which constituent participants associate exhaustivity with.

4.1.1. Participants

15 Hungarian speaking children (6 girls and 9 boys, mean age: 5 years 11 months) participated in the experiment. The control group consisted of 15 adult native speakers (7 women and 8 men, mean age: 37 years 5 months).

4.1.2. Materials and design

I conducted a sentence–picture verification task in which every test sentence contained the focus particle *csak* 'only', and it was the type of the picture that was varied. There were four conditions differing in the type of pictures, each of them represented by 8 sentence–picture pairs.

Control conditions:

- (i) *exhaustive condition*: the sentence is exhaustively true of the presented picture
- (ii) *false condition*: the sentence is false of the presented picture

⁴ I decided not to use a binary judgment as this research is part of a series of experiments in which I compare the interpretation of different focus constructions in Hungarian by using the same design and material, and in the case of certain constructions, especially in the case of structural focus without the particle *csak* where exhaustivity is claimed to be a presupposition, it would not be suitable for pointing out the presence or absence of the exhaustive interpretation. So the condition in which I expect participants to choose the middle option of the three-point scale is the non-exhaustive condition of the experiment testing sentences containing structural focus, not one of the conditions discussed in the present study.

Critical conditions:

- (iii) *non-exhaustive condition*: the sentence is not exhaustively true of the presented picture
- (iv) *exhaustive condition with a distractor*: the sentence is exhaustively true of the presented picture, but there is an additional distractor in the picture that can have an effect on the judgment of the sentence if the participant associates the exhaustive meaning with the wrong constituent

The test trials are illustrated by the sentence under (15) and the pictures in Figure 2.

- (15) Csak A NYUSZI emel-t-e fel a zászló-t.
 only the rabbit raise-PAST-3SG PRT the flag-ACC
 ‘Only the rabbit has raised the flag.’

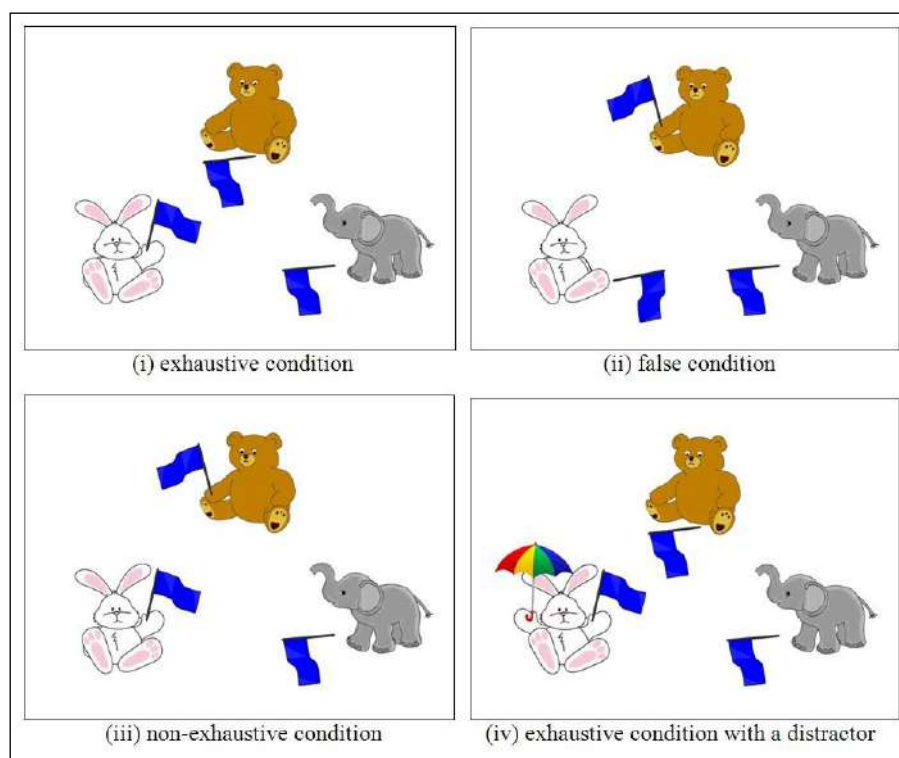


Figure 2. The four test conditions

Although each test item contained the particle *csak*, I tested four different sentence types, as illustrated in (16–19). The focused constituent was the subject in one half of the test sentences (16, 17), and the object in the other half (18, 19). Test sentences can also be divided into two groups with respect to the presence (16, 18) or absence (17, 19) of the verbal particle, the syntactic position of which is an important cue of focusing. Thus, it is also possible to analyze the role of these features in the interpretation of the sentences with focus particles.

- (16) Csak A NYUSZI emel-t-e fel a zászló-t. subject focus,
 only the rabbit raise-PAST-3SG PRT the flag-ACC verb with particle
 ‘Only the rabbit has raised the flag.’
- (17) Csak A KISLÁNY sétáltat-ja a kutyá-t. subject focus,
 only the girl walk-3SG the dog-ACC verb without particle
 ‘Only the girl is walking the dog.’

- (18) A teknős csak A HÁZ-AT színez-t-e ki. object focus,
 the turtle only the house-ACC colour-PAST-3SG PRT verb with particle
 'The turtle has coloured only the house.'
- (19) A maci csak A SZÁNKÓ-T húz-za. object focus,
 the bear only the sled-ACC pull-3SG verb without particle
 'The bear is pulling only the sled.'

It is also important to note that I only tested the interpretation of utterances with canonical word order, i.e., sentences in which the focus particle *csak* immediately precedes the focused constituent.

In addition to the 32 test items, there were also 4 familiarization items and 24 filler items. Because of the large number of items, I divided them into two lists, which were administered to the children on two separate occasions. One half of the participants received the A list first and the B list second. The other half received them in the opposite order.

4.1.3. Procedure

Participants were tested individually by using a Toshiba Satellite L500–1EP notebook (screen size: 15.6"). Pairs of the auditory and visual stimuli, i.e., the recorded sentences and the pictures, were presented in a randomized order, using the SR Research Experiment Builder software.⁵ There were short familiarization phases at the beginning of each session, in order to ensure that participants understood the task itself and could correctly respond by using the scale. Crucially, I used sad, straight and happy smiley faces to differentiate between the options of 'false', 'in-between' and 'true' (Figure 3).



Figure 3. Smiley faces used as a three-point scale in Experiment 1

When testing young children, the smiley faces were printed on cards and it was the experimenter who recorded their choice in the computer, whereas adults were asked to press the buttons with smiley stickers on them.

4.1.4. Results

As the three response types⁶ form an ordinal scale, I analyzed the data by using non-parametric tests.⁷ For the same reason, I always calculated the median as the average value of the eight responses given in one condition by one participant. In addition to the rank-tests of these median values, I also analyzed the proportion of the response types in each condition.

Firstly, let us take a look at the results of the group of preschoolers, more accurately at the average values of their scores in the four conditions.

⁵ Auditory stimuli were recorded by using TASCAM US-144mkII equipment.

⁶ Henceforth, the responses are represented by numbers: 1 – sad face, 2 – straight face, 3 – happy face.

⁷ For the statistical analyses is used the software R (<http://www.R-project.org>).

Condition	Average scores of preschoolers															Median	SD
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
<i>exhaustive</i>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0
<i>false</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	0.258
<i>non-exhaustive</i>	1	1	1	1	2	2.5	1	1	1	1	1	1	1	2	3	1	0.667
<i>exhaustive plus distractor</i>	3	3	3	3	3	3	3	2.5	3	3	3	3	3	1	3	3	0.523

Table 1. Average scores given by preschoolers in different conditions

In the case of the two control conditions, children responded exactly as predicted. In the *exhaustive condition*, the median of the eight responses was 3 in the case of each participant, so the group's median value is also 3. In the *false condition* the median of the group is 1, with a low standard deviation of 0.258, so preschoolers correctly rejected the sentence by giving a sad face in these cases. Considering the first critical condition, i.e., the case of *non-exhaustive* pictures, I found that the median of the eight responses given in this condition is also 1 in the case of the majority of children; however, there is a participant whose average score is 3, so it is not surprising that we have the highest standard deviation ($SD = 0.667$) here. The sentences were mostly accepted in the *exhaustive plus distractor condition*, just like in the *exhaustive* one, but the standard deviation was quite high ($SD = 0.523$) in this condition as well.

After comparing the average scores given by preschoolers in the different conditions with 6 Wilcoxon signed-rank tests, it can be seen clearly how they interpret sentences containing the particle *csak* 'only'. Most importantly, I found that the scores given in the *non-exhaustive condition* differ significantly from those given in the *exhaustive* ($V=105$, $p < 0.001$) and in the *exhaustive plus distractor* ($V=102.5$, $p < 0.001$) conditions; however, they do not differ significantly from the scores given in the *false condition* ($V=10$, $p = 0.08897$). The scores of the *exhaustive plus distractor condition* differ not only from those of the *non-exhaustive* one but also from those of the *false condition* ($V=105$, $p < 0.001$); as opposed to this, there is no significant difference in case of the comparison with the *exhaustive condition* ($V=3$, $p = 0.3711$). Finally, in line with the predictions, the scores given in the two control conditions differ significantly from each other ($V=120$, $p < 0.001$).

In addition to the average scores, it is also reasonable to analyze the proportion of the response types, i.e., the ratio of the sad, straight and happy faces chosen by preschoolers.

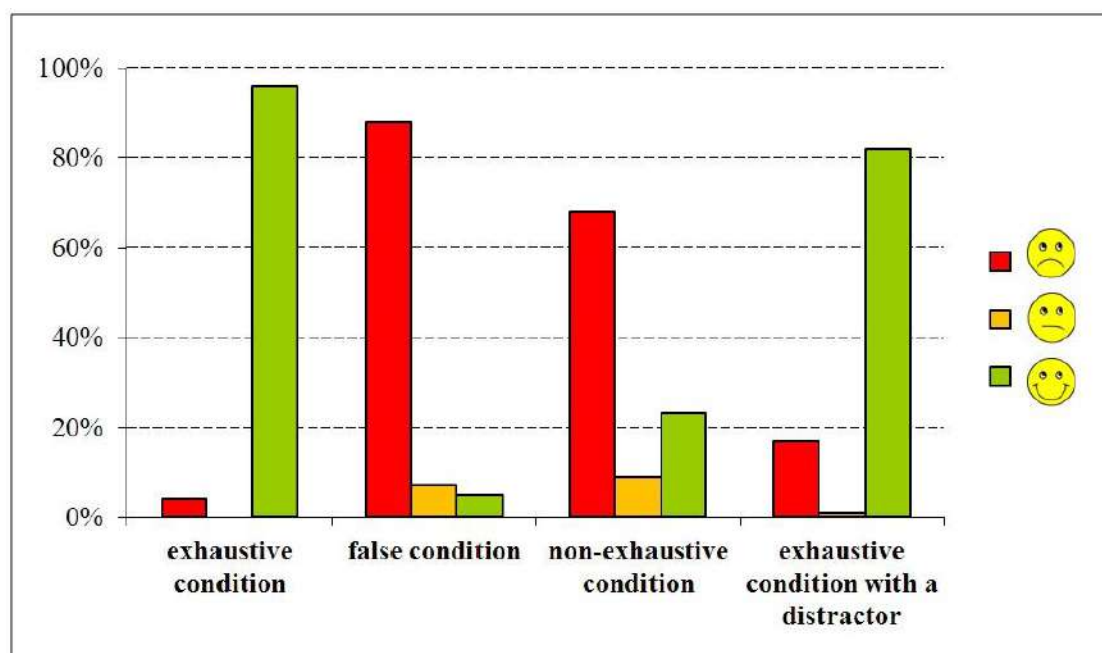


Figure 4. Proportion of response types in the group of preschoolers

According to the Friedman ANOVA test, the frequency of the response types differ significantly between the four conditions ($\chi^2(3) = 234.075$, $p < 2.2e-16$). The *post hoc* tests also confirm the results of the analysis of the average scores: the difference is significant between the pairs of the conditions, except in the case of the *non-exhaustive* and the *false* conditions, and in the case of the *exhaustive* and the *exhaustive plus distractor* conditions.

In order to find out whether the different features of the test sentences have an effect on the interpretation, I compared the proportion of response types given in the case of various sentence types. In the *non-exhaustive* critical condition, neither the presence of the verbal particle ($\chi^2(2) = 1.4559$, $p = 0.4829$), nor the type of the focus ($\chi^2(2) = 0.1767$, $p = 0.9154$) has a significant effect, according to the chi-square tests (Figure 5).

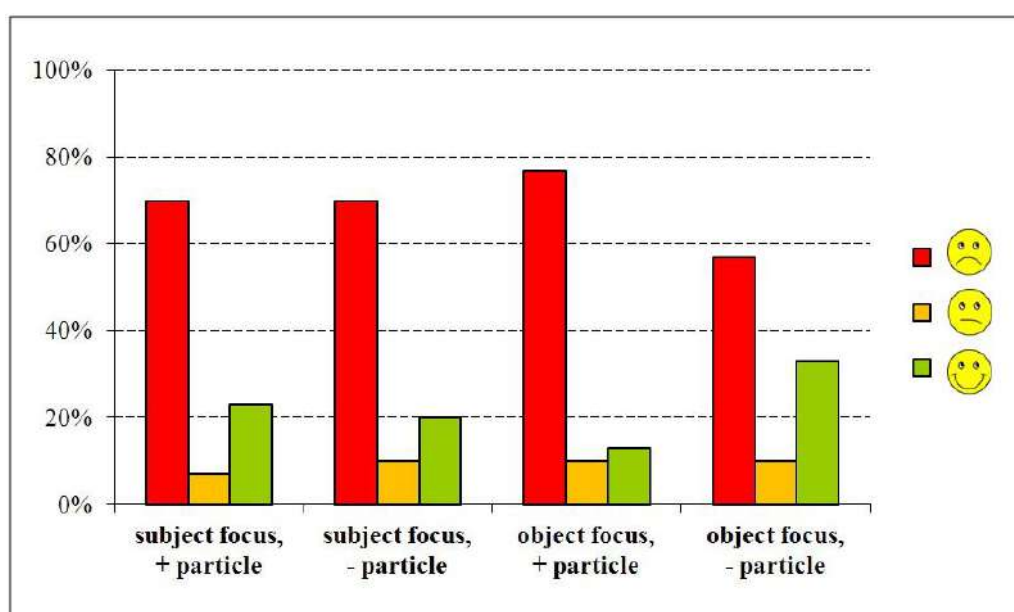


Figure 5. Proportion of response types in the *non-exhaustive* condition

As opposed to this, in the *exhaustive plus distractor* critical condition, this is only true for the presence of the verbal particle ($\chi^2(2) = 1.8909$, $p = 0.3885$), whereas the subject or object role of the focused constituent appears to affect the interpretation significantly ($\chi^2(2) = 13.0727$, $p < 0.01$). More precisely, if children rejected the sentences with *csak* ‘only’ in the *exhaustive plus distractor* condition, they typically did so in the case of focused objects (Figure 6).

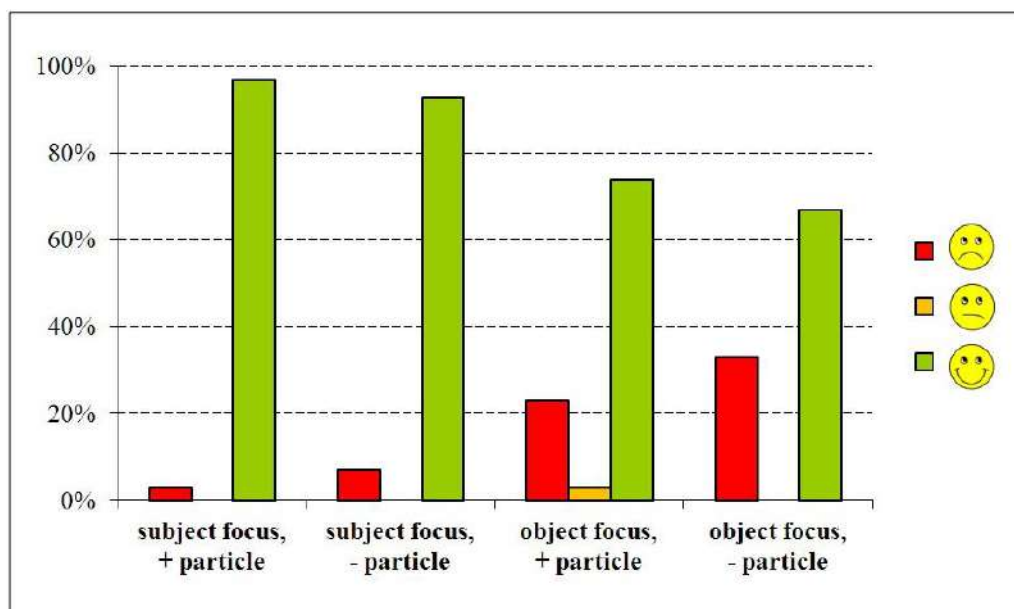


Figure 6. Proportion of response types in the *exhaustive plus distractor* condition

Turning to the results of the adult control group, the overall average scores of both the control conditions and the critical conditions are the same as those in the group of preschoolers. Although the standard deviations were higher in the critical conditions than in the control ones, these values are still relatively low.

Condition	Average scores of adult participants															Median	SD
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
<i>exhaustive</i>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0
<i>false</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
<i>non-exhaustive</i>	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0.352
<i>exhaustive plus distractor</i>	3	3	3	2.5	3	3	3	3	3	3	3	3	3	3	3	3	0.129

Table 2. Average scores given by adult participants in different conditions

The outcomes of the 6 Wilcoxon signed-rank tests comparing adult’s average scores reveal the same relations between the paired conditions. Not only do the scores given in the *exhaustive* and *false* control conditions differ significantly ($V=120$, $p < 0.001$), but this was the case between the *exhaustive* and *non-exhaustive* ($V=120$, $p < 0.001$), the *non-exhaustive* and the *exhaustive plus distractor* ($V=120$, $p < 0.001$), and the *false* and the *exhaustive plus distractor* ($V=120$, $p < 0.001$) conditions. However, the observed difference is not significant between the *false* and *non-exhaustive* ($V=0$, $p = 0.3458$), and the *exhaustive* and *exhaustive*

plus distractor ($V=1$, $p = 1$) conditions. It is also important that in this age group, none of the sentence types affected the interpretation of the critical pictures significantly.

Finally, after comparing the results of preschoolers with those of the adult control group, no significant difference between the two age groups were found in any of the conditions, according to the Wilcoxon rank-sum test. Note that in the case of the *non-exhaustive* ($W=129.5$, $p = 0.3263$) and the *exhaustive plus distractor* ($W=104.5$, $p = 0.5501$) critical conditions, these findings suggest that preschoolers interpret sentences with the focus particle *csak* 'only' in an adultlike fashion.

4.1.5. Discussion

In this section, let us review the findings of Experiment 1 and draw some conclusions. As the results of the control conditions are exactly as predicted, I am only focusing on the responses given in the two critical conditions.

First of all, the fact that the scores participants gave in the *non-exhaustive condition* do not differ significantly from those given in the *false condition* indicates that the fulfillment of the requirement of exhaustivity and the truth of the presuppositional content are equally necessary. With respect to the example under (15), this means that both children and adults chose the sad smiley face both in the case of the picture where the rabbit and the bear raise a flag (iii) and where the bunny does not raise the flag at all (ii). Moreover, this is true in the case of each sentence type, i.e., neither the grammatical role of the focused constituent, nor the presence or absence of the verbal particle affects the interpretation of this picture type.

Considering the second critical condition, the analysis of the average scores suggests that the incorrect association of the exhaustivity of *csak* 'only' was infrequent in both age groups. However, it is not the case that Hungarian preschoolers can always associate the exhaustivity of the focus particle with the same constituent as adult speakers. As was revealed by the comparison of the sentence types sharing the same features, the grammatical role of the focused element has a significant effect on the interpretation of the pictures in the *exhaustive plus distractor condition*. These findings suggest that for preschoolers the association with focus is harder in case of an object focus than in case of a subject focus. Nevertheless, it is also important to mention that in the case of sentences with subject focus or object focus, the word order of the sentence was different as well, since the focused subjects were always in a sentence-initial position, while the focused objects were in a non-sentence initial position (as in the examples 16–19). Therefore, it is crucial to conduct another experiment in which the word order of the sentence is controlled as well, so that it will be possible to tell whether it is indeed the grammatical role of the focus that is responsible for the mistakes of preschoolers.

The conclusion drawn from Experiment 1 is that, in line with the prediction based on previous studies, Hungarian children at around the age of 5 are able to process the exhaustive meaning component of the sentences containing the particle *csak* 'only' in an adultlike fashion. Although the mistake of the incorrect association of the exhaustive reading was not common in the group of preschoolers, almost all of these errors are related to the sentences containing an object focus. This necessitated conducting Experiment 2 as a follow-up study.

4.2. Experiment 2

The aim of Experiment 2 is to answer the question raised in the discussion of Experiment 1 by comparing the interpretation of four different sentences types in which the grammatical role of the focus and the word order are varied.

This time, I conducted a forced-choice picture-selection task, where, in each trial, participants were presented one sentence and four pictures simultaneously, and they were asked to put the picture(s) for which the sentence is true into a green box and the picture(s) for which it is not true into a red box.

This method is drawn from the work done by Paterson et al. (2003, 2005/2006), where participants were helped in identifying the contrast set of the focused constituent by seeing all the alternative picture types together. However, I decided to design the experiment as a forced-choice task, not as a free-choice one, since, as Paterson et al. (2005/2006) also admitted, in case of a free-choice task, it is possible that children only choose the picture that best matches the meaning of the sentence and they do not take any other pictures into consideration. With the forced-choice method, I can avoid this because the trials do not end until the participants make a decision in the case of each picture presented.

4.2.1. Participants

20 preschoolers (9 girls and 11 boys) participated in this experiment. They were, however, approximately one year younger than the participants of Experiment 1: this time I tested children between the ages of 4;6 and 5;2 (with a mean age of 4 years 11 months), since I assumed that the correct association of the exhaustive meaning of the focus particle would be harder for them, and their mistakes could reveal the source of the problem.

4.2.2. Materials and design

With respect to the sentence types, there were two independent variables: the grammatical function of the focus and the word order. Both variables had two values: subject focus or object focus, and word order with sentence-initial focus (SVO/OVS) or word order with non-sentence-initial focus (OSV/SOV), respectively. Thus, the two variables gave rise to the following four conditions, illustrated by the examples under (20–23).⁸

- | | |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| (20) <u>Csak A MACI</u> húz-za a szánkó-t.
only the bear pull-3SG the sled-ACC
'Only the bear is pulling the sled.' | Condition 1: Subject focus, <u>S</u> VO |
| (21) A szánkó-t <u>csak A MACI</u> húz-za.
the sled-ACC only the bear pull-3SG
'Only the bear is pulling the sled.' | Condition 2: Subject focus, <u>O</u> <u>S</u> V |
| (22) <u>Csak A SZÁNKÓ-T</u> húz-za a maci.
only the sled-ACC pull-3SG the bear
'The bear is pulling only the sled.' | Condition 3: Object focus, <u>O</u> V <u>S</u> |

⁸ As the presence or absence of the verbal particle did not have a significant effect in Experiment 1, this time I only used sentences without verbal particles.

- (23) A maci csak A SZÁNKÓ-T húz-za.
 the bear only the sled-ACC pull-3SG
 'The bear is pulling only the sled.'

Condition 4: Object focus, SOV

There were 2 items in each condition, which resulted in 8 test trials, and there were also 8 filler trials. In case of the filler trials, the number of the pictures supposed to be judged as true was controlled: in 4 trials the half of the pictures matched the meaning of the sentence, in 2 trials three of them, while in 2 trial only one of them. Thus, the ratio of the 'true' and 'false' choices was not obvious in the case of the test trials, either.

The picture types of the test trials were the same as those of Experiment 1, however, this time the different types were presented simultaneously on separate cards (Figure 7).

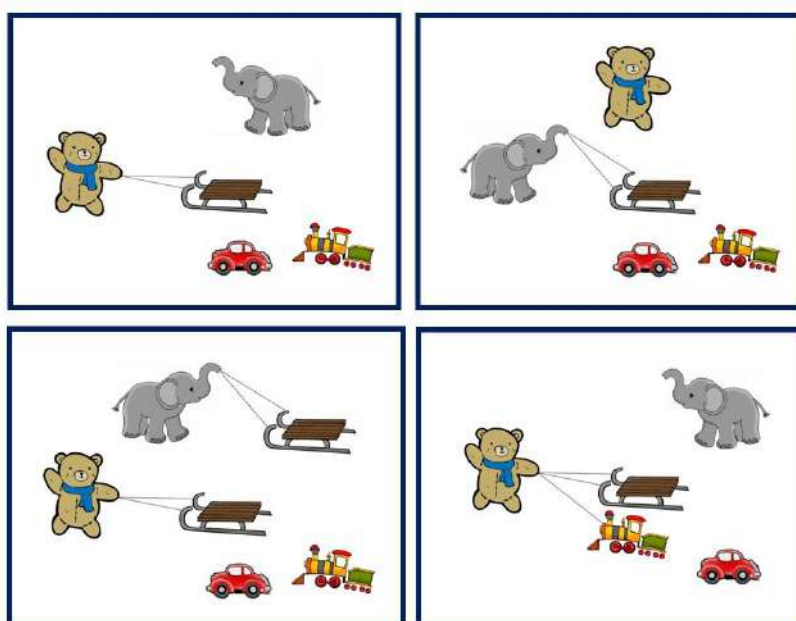


Figure 7. The four cards presented simultaneously in Experiment 2

The position of the different picture types was controlled as well, in order to rule out the possibility that children create a strategy based on the location of the cards.

4.2.3. Procedure

The participants were individually tested; however, this time two experimenters were available for assistance. One of them described the task and recorded the responses, while the other one played a puppet in the form of a hedgehog. The child then had to teach the meaning of the sentences to the puppet by sorting out the cards into the two boxes. The 16 trials were presented in a pseudo-randomized order, and it took approximately 15 minutes for a child to complete the task.

4.2.4. Results

In this experiment, the crucial data is the ratio of the 'true' and 'false' decisions, especially in the case of the critical pictures, i.e., in the *non-exhaustive* and in the *exhaustive plus distractor* types. When performing a chi-square test on these critical picture types, I first compared the results of the four conditions which differed individually in the characteristics of test

sentences. I then contrasted the pairs of conditions sharing one of the properties (sentences with subject focus versus object focus, and sentences with different word orders).

With respect to the *non-exhaustive* pictures, the results show that there is a significant difference between the interpretations of the four sentence types: $\chi^2(3) = 17.1925$, $p < 0.001$.⁹ As Figure 8 shows, the ratio of the rejections, i.e., the exhaustive interpretations, was 82.5% in the case of the sentences with subject focus and SVO word order, 75% in the subject focus, OSV word order condition, 65% in the object focus, OVS word order condition, and only 57.5% in case of the object focus, SOV sentence type. The individual comparison revealed that there is a significant difference between the results of subject focus SVO and object focus OVS sentences ($\chi^2(1) = 6.5717$, $p < 0.05$), between those of the subject focus OSV and object focus SOV sentences ($\chi^2(1) = 6.4396$, $p < 0.05$), and most robustly in the case of subject focus SVO and object focus SOV sentences ($\chi^2(1) = 13.5865$, $p < 0.001$).¹⁰

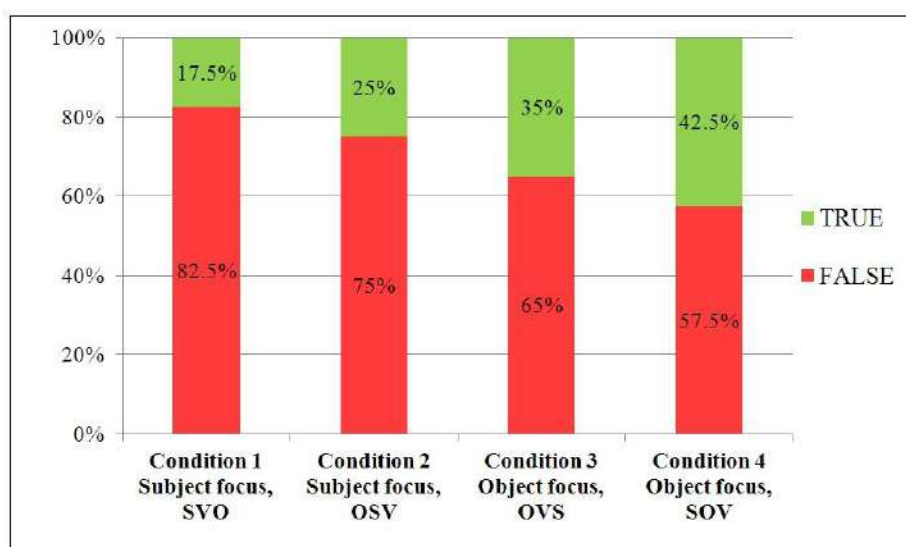


Figure 8.

The distribution of responses given in the case of the non-exhaustive picture type

When I grouped the responses for subject focus (Condition 1 and 2) and compared them to object focus (Condition 3 and 4), I found that sentences with subject focus were interpreted exhaustively in significantly more cases than sentences with object focus ($\chi^2(1) = 6.881$, $p < 0.01$). In contrast, there was no significant difference between the interpretation of sentence types containing sentence-initial *csak* 'only' (Condition 1 and 3) and non-sentence-initial *csak* 'only' (Condition 2 and 4): $\chi^2(1) = 1.1667$, $p = 0.2801$.

In the case of the picture type *exhaustive plus distractor*, the sentence type did not have any significant effect on the exhaustive interpretation: $\chi^2(3) = 7.24$, $p = 0.06463$. Moreover, neither the type of the focus ($\chi^2(1) = 2.4537$, $p = 0.1172$), nor the word order ($\chi^2(1) = 0$, $p = 1$) had an effect. The individual comparisons revealed one difference though: the results of the subject focus SVO condition differed significantly from those of the object focus OVS condition ($\chi^2(1) = 4.9154$, $p < 0.05$). The latter condition, as can be seen in Figure 9, was the one in which the ratio of the incorrect (false) answers was the highest: here, the pictures with the distractor were rejected in 80% of the cases.

⁹ Because of the low sample sizes, I always applied Yates's continuity correction in case of chi-square tests.

¹⁰ The significant difference between the sentence types subject focus SVO and object focus SOV is particularly surprising, given the fact that they did not differ in the non-exhaustive condition of Experiment 1, where only these two types were tested.

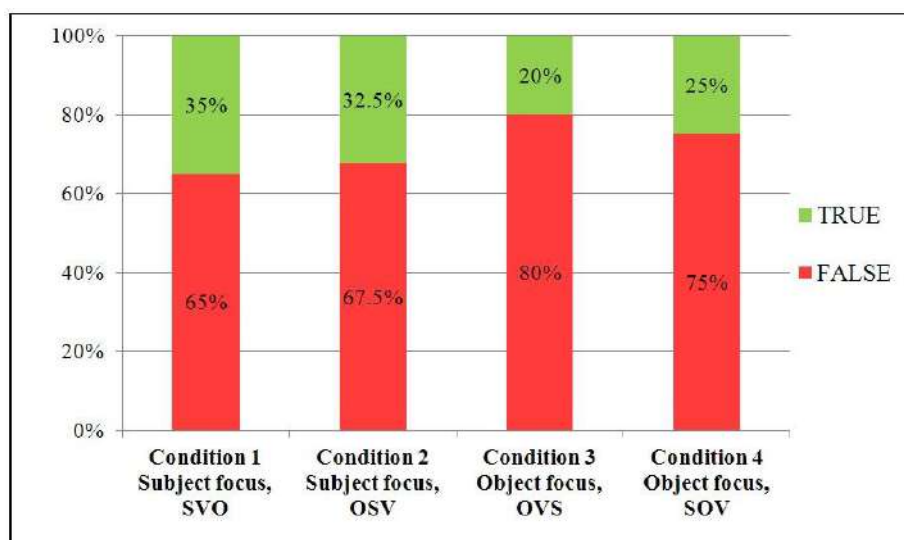


Figure 9.

The distribution of responses given in the case of the *exhaustive plus distractor* picture type

However, within each condition, the distribution of the responses is unexpected in the case of this picture type, especially in comparison with the results of Experiment 1, where preschoolers mostly gave a happy smiley face to the puppet despite the presence of the distractor in the picture. This is probably due to the different experimental design, but it is also possible that the age of the participants plays a major role.

4.2.5. Discussion

In order to explain the findings of Experiment 2, let us discuss the response patterns of the different picture types together. Considering the frequency of rejections in both of the critical conditions, the conclusion is that there were more correct responses in the case of sentences with a focused subject: they were rejected in 82.5% (SVO) and 75% (OSV) of the time in the case of *non-exhaustive* pictures, and they were accepted in 35% (SVO) and 32.5% (OSV) of the time in the case of the *exhaustive plus distractor* type. In contrast, sentences in which the focused constituent was the object were rejected only in 65% (OVS) and 57.5% (SOV) of the time with respect to *non-exhaustive* pictures, and they were only accepted in 20% (OVS) and 25% (SOV) of the time in the case of the *exhaustive plus distractor* type. Interestingly, sentences with object focus were interpreted exhaustively more frequently in the case of the *exhaustive plus distractor* picture types (80%, 75%) than in the case of the *non-exhaustive* type (65%, 57.5%), which clearly indicates that preschoolers associate the exhaustivity of the particle *csak* 'only' with the subject, rather than with the object. This is in line with the findings of Experiment 1; however, here, this finding is much more robust, and it is obviously not the word order of the sentences that affects the exhaustive interpretation, since this variable does not have a significant effect in any of the conditions.

Nevertheless, the remarkable difference between the results of the two experiments can be due to a task effect. Note that 9 children out of the 20 (45%) rejected all the pictures but for the *exhaustive* one. This indicates that, in spite of the forced-choice method, one cannot exclude the possibility that they search for the one picture that gives the best description of the uttered sentence, and then they put all the other cards into the red box.

Alternatively, it is also possible that it is not the type of sentences but the type of pictures that is being misinterpreted by young children. Considering the picture conditions in Figure 2 and Figure 7, it can be seen that the *non-exhaustive* picture type of sentences with subject focus is similar to the *exhaustive plus distractor* type of sentences with object focus: there are two agents performing two separate actions, e.g. a bear and an elephant is pulling a sled. On the other hand, the *exhaustive plus distractor* pictures of sentences containing subject focus is just like the *non-exhaustive* picture type of object focus sentences, as in both cases one agent is performing two actions, e.g. the bear is pulling a sled and a train. Adopting the hypothesis of É. Kiss et al. (2013), according to which children tend to choose pictures that are easier to segment into identical sub-events, one could propose that the adultlike interpretation of the former pictures in which there are two clearly separate events is more frequent. However, this is only true in the case of the *non-exhaustive* scenarios where these pictures are presented together with sentences containing subject focus (see Figure 8). Yet it is undoubtedly true that the responses given in the case of one kind of picture are quite similar. This can be seen in the case of Condition 1–2 in Figure 8 and Condition 3–4 in Figure 9, as well as in the case of Condition 3–4 in Figure 8 and Condition 1–2 in Figure 9. Thus, we cannot rule out the possibility that in the event of seeing two active agents in a given situation, preschoolers tend to associate the exhaustivity of the focus particle with the subject, irrespective of the actual focus of the presented sentence.

5. Conclusion

To conclude the results of the study, I come back to the research questions posed earlier.

Firstly, the experimental findings proved that Hungarian preschoolers do have access to the exhaustivity expressed by the particle *csak* ‘only’. This is in line with the claim by Kenesei (1986, 1989) and Szabolcsi (1994), according to which this meaning component is asserted and therefore easy to acquire. Hungarian children’s data also support the hypotheses of Notley et al. (2009) and Müller et al. (2011a,b), according to which preschoolers at around the age of 4 can mentally represent the contrast set of the focused constituent, in contrast to the assumption by Paterson et al. (2003).

However, questions concerning the association of the exhaustive meaning with the focused constituent cannot be answered so straightforwardly. While the results of Experiment 1 suggested that Hungarian preschoolers do not have problems with finding the right element to be the associate of *csak*; younger children in Experiment 2 performed poorly when judging pictures from the *exhaustive plus distractor* type. Interestingly, the problem of VP-orientation discussed by Crain et al. (1994), Notley et al. (2009) and Zhou & Crain (2010) did not occur, which can, however, be due to the different structure of the Hungarian focus constructions. I can also not confirm the hypothesis of Müller et al. (2011a,b), since, as opposed to the results of German-speaking children, Hungarian preschoolers unexpectedly prefer the subject focus reading and not the object focus reading. The possibility of the influence of the different word orders of these sentences was ruled out in Experiment 2. Finally, as opposed to the predictions, the presence of the verbal particle signifying syntactic reordering does not seem to support the adultlike association with focus. Even if this is the case, the results of the present study do not refute the hypothesis that syntactic focus marking in Hungarian does help parsers and thus also language learners to find the associate of the focus particle, since the tendency to misinterpret these sentences is rather weak, especially compared to the cases of the English *only* or the Mandarin Chinese *zhiyou* particles.

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Lexical innovations in the speech of adolescents in Oslo, Norway:
How far can multilingual environments impact on language practices?

Sarah Harchaoui

Based on a series of examples from the UPUS-Project (*Linguistic Development in Urban Environments*), this paper provides an overview of the main innovative lexical forms, e.g. neologisms, use of slang, loan words especially from non-European languages, in the speech of adolescents living in Oslo, Norway and determines in which communicative settings they have appeared. Recent studies (cf. Drange 2002; Johannessen 2008) have identified two linguistic ‘varieties’, one of which is located in the Eastern parts of the city and is affected by multilingual environments. I argue that the multilingual dimension is both decisive for predicting the forms innovation takes and for justifying the motivations of speakers to innovate in their speech.

1. Introduction

Since the late 1990s, sociolinguistics has shown great interest in the linguistic practices or styles¹ occurring in culturally and linguistically diverse urban areas, not only in English-speaking cities but also in capital cities in Scandinavia (cf. Nortier & Svendsen 2015: 5). The Oslo case study is, in this regard, particularly relevant to analyze in demographic terms since Oslo represents the fastest growing city in Europe (cf. Urban Europe 2014) where much of the country’s growth is due to immigration.

The empirical material in this paper is drawn from the UPUS-Project, the purpose of which was to a) study linguistic practices among adolescents in multilingual and multicultural communities of practice in Oslo, and b) discuss a possible identification of one or more new varieties of Norwegian which might be traced to influences from a multilingual environment. The corpus consists of video-recorded interviews and peer-group conversational data from adolescents all born and raised in Oslo, living in either of the areas Old Oslo or Southern Nordstrand (both located in the Eastern parts of the city), with an immigrant population of 34% and 44%, respectively. According to the results of UPUS’s initial works (cf. Svendsen & Røyneland 2008; Quist & Svendsen 2010), a specific way of speaking Norwegian, better

¹ The issue of labelling linguistic practices among adolescents depends on the respective research approach. Two basic approaches have been adopted in current research. Through the variety-oriented approach, terms derived from –lect such as ‘dialect’, ‘sociolect’ (cf. Kotsinas 1988) or ‘multiethnolect’ (cf. Clyne 2000; Quist 2000; Svendsen & Røyneland 2008) are frequently used. From the practice-oriented approach, terms such as ‘multi-ethnic youth language’ (cf. Aarsæther 2010), ‘late modern urban speech style’ (cf. Møller 2009) or ‘multi-ethnic urban heteroglossia’ (cf. Rampton 2011) are preferred.

known as *multiethnolectal style* has been confirmed and located in the Eastern parts of the city, which is mainly made up of third world immigrants and their descendants. Non-European borrowing and innovative verb placement are features, which are regularly put forward to describe this speech style (cf. Opsahl & Nistov 2010).

The above-mentioned facts have led me to focus on the speech style developed in the Eastern parts of Oslo essentially because it is spoken in urban areas where multilingualism is very high, and its situation is unique with respect to the rest of the country. I also rely on the practice-oriented approach to analyzing the current phenomenon as a speech style because the notion carries the idea of a social meaning according to the definition of style given by Eckert (2001:123) as “a clustering of linguistic resources, and an association of that clustering with social meaning”.

This paper aims to discuss the impact of multilingual environments on contemporary language practices among adolescents in Oslo and to consider the motivations of the speakers who use these specific features. The first section reviews the main innovative lexical forms and pinpoints the specificity of the speech style located in the Eastern parts of the town. With its two recording modes, the UPUS-Project has allowed us to see behavioral differences among adolescents and determine specific communicative settings in which innovative forms occurs. The second section is devoted to social meaning and assumes that speakers resort to innovative language features in order to show solidarity towards a new urban reality tinged with multilingualism.

2. Overview of most common lexical innovations

During the past 30 years, an increasing number of Anglo-American and Scandinavian studies (cf. Andersson & Trudgill 1990; Kotsinas *et al.* 1997; Stenström *et al.* 2002; Aasheim 1995; Eckert 1997, 2001; Drange 2002; Hasund 2006a; Jørgensen & Quist 2008; Johannessen 2008) have correlated youth language with novelty, creativity and innovation. In the case of Norwegian, this correlation does not only concern the lexicon but also morphological, syntactic and phonetic features (cf. Quist & Svendsen 2010), as well as the interface between pragmatics and grammar (cf. Opsahl 2009, Harchaoui 2015b). Beyond the saliency of some lexical forms that sound and appear innovative to a community of speakers, it would be interesting to raise the question as to whether adolescents are really more prone to inventing new words and phrases or whether they rather recycle and adapt literary and stylistic devices to new circumstances of their everyday life.

In the following section, I argue that most lexical forms in teenage speech can be analyzed as neologisms and come from the slang tradition whereas real innovative features (such as non-European loan words) seem to result from multilingual urban environments where speakers grow up.

2.1. Around the concept of neologism

2.1.1. An act of innovation

According to Pruvost & Sablayrolles (2003:3), the concept of neologism consists of creating a new word or adding a new meaning to an existing word in a language. Neologisms are recognizable because they are caught up in a process of entering common use while the entire linguistic community has not yet accepted them. Starobová (2010: 170) explains that the process of neologism can be divided into three stages: (i) its strict creation, (ii) its resurgence after the feeling of novelty has disappeared, and (iii) its integration to the language. However, Sablayrolles (2006:141), who has investigated corpus-based semantic neology in

contemporary French, points out three key obstacles when identifying neologisms. The nature of lexical units (*logos*) should be questioned, as well as the notion of novelty (*neos*). When and to what extent should a lexical form be considered as new? At least, what criteria should be used to determine when a lexical unit becomes a neologism?

Sablayrolles (2006:142) argues that no satisfactory answer has yet been brought forth because “the innovative nature of neologisms varies by scope and rapidity of its spread. The timelife of a neologism is variable (but can still be evaluated through human lifespan and human memory abilities) and its evaluation is therefore as much, if not more, of the intuitive mind”.²

Fagyal (2004: 51), who has investigated linguistic practices of adolescents in working-class neighbourhoods in Paris, considers that the innovative nature of a lexical unit should only be determined by the manner in which the linguistic community perceives it. She defines lexical innovations as the “use of lexical unit which may or may not be attested by the linguistic community [...] but of which the signifier, the signified or both are regarded as new by the group of young people who use it”³ and adds that the act of innovation is rather motivated insofar as the lexical unit is perceived as innovative by the group rather than by etymology or by its generally accepted meaning. In that sense, Sablayrolles’ notion of neologism can be compared with Fagyal’s lexical innovation.

2.1.2. *Typology of neologisms*

In his article “Néologismes: une typologie des typologies”, Sablayrolles (2006) establishes a ranking of the main typologies that have been used in French works on neologisms. This includes a dichotomous model that I have selected to analyze lexical innovations in the Oslo case study. Cases which belong to formal neologism (*néologie formelle*) are considered separately from semantic neologism (*néologie sémantique*). The issue of borrowing will be discussed in the following section.

Sablayrolles (1996:26) defines cases of formal neology as “the creation of a signifier which has never been attested in previous states of the language regardless of denominations adopted in specific ranking” whereas cases of semantic neology consist of “a new meaning for a lexical unit whose signifier already existed with another signified”.⁴

2.1.3. *Empirical data*

2.1.3.1. *Formal neologism*

The UPUS-Project, as well as previous studies on teenage speech in Norway (cf. NoTa, UNO), have provided many instances of formal neologism. To achieve innovation, speakers use literary devices in order to change word forms attested in Norwegian, i.e. the Bokmål Reference Dictionary, *Bokmålsordboka*. Below are some examples provided from peer-conversations in the UPUS-Project that reflect the most valued strategies among adolescents.

² Sablayrolles (2006:142): “C’est que le statut de “néologisme” est variable en fonction de l’ampleur et de la rapidité de la diffusion du néologisme. La durée est donc variable (mais toujours mesurable à l’aune de la durée de la vie humaine et des capacités mémorielles de l’homme) et son appréciation relève donc autant, sinon plus, de l’esprit de finesse [...]”

³ Fagyal (2004: 51): “Le terme ‘innovation lexicale’ référerait donc à l’usage d’une unité lexicale attestée ou non dans la communauté linguistique [...], mais dont le signifiant, le signifié ou les deux sont perçus comme une nouveauté dans le groupe des jeunes qui l’emploie.”

⁴ Sablayrolles (1996:26): “Les typologies dichotomiques distinguent la néologie formelle (i.e. la création d’un signifiant non attesté dans un état immédiatement antérieur de la langue, quelle que soit la dénomination adoptée dans tel ou tel classement) et la néologie sémantique (i.e. un nouveau sens pour une lexie dont le signifiant existait déjà avec un autre signifié).”

Numbers at the beginning of sentences refer to speakers, in line with rules of confidentiality of juveniles in Norway.

a) Prefixation in *drit-*

Substantive *drit*, which literally means ‘shit’, ‘crap’ in Norwegian, is often used as a prefix and can be combined with both positive and pejorative adjectives in order to enhance the semantic content of the adjective. However, prefixation in *drit-* does not carry neutral connotations and could be moved closer to slang (Hasund 2006a: 63; 1-2).

- (1) 001 *ja men sikkert barne- (.) barnebarnet deres har*
 yes but sure_{ADV} child- grandchild_{DEF} their has
kanskje en dritgod venn som er (.) utlending jo
 maybe a **drit**.good_{ADJ} friend which is foreigner
 ‘Yes but surely ... their grandchild has maybe a very good friend which is foreigner, obviously’

- (2) 002 *fordi det er så mye og det er så*
 because there is so much and there is so
d- kjedelig stoff (.) dritkjedelig stoff
 d- boring stoff **drit**.boring_{ADJ} stuff
 ‘Because there is so much and there is so boring stuff, very boring stuff’

Hasund (2006a: 63), who has conducted previous research in teenage speech (1998-2006) in Norway, notes that speakers concurrently used prefixes such as ‘fuckings’, ‘giga’, ‘mega’ or ‘ultra’ in this period. As far as I can tell, none of them have been found in the UPUS-project. This indicates that speakers who live in the Eastern parts of Oslo have since stopped using them.

b) Truncation

Cases of truncation in the form of removal of one or several syllables at the beginning or end of a word (i.e. apocope or apheresis) have been found in the UPUS-project. This can be illustrated briefly by examples (3) and (4), where *serri* ‘serious’ is the truncated form for *seriøst*, lit. ‘serious’, ‘seriously’, and *digg* ‘good’, the truncated form of *diggbart*, a slang form for *deilig*, *godt*, lit. ‘delicious’, ‘good’ in Norwegian.

- (3) 012 *det er serri M16 har fa- faen meg sagt det*
 it is serious M16 has fa- fucking me said it
 ‘It is serious, M16 has damn said it to me’

- (4) 035 *det er litt digg da (.) og så er*
 it is a little bit good then and then is
det ikke så jævla lang vei til skolen liksom
 it not so damn long way to school-_{DEF} like
 ‘It is quite good then and after all it is not like so damn far to the school’

c) Truncation and suffixation in *-is*

After being truncated, lexical units are often suffixed with *-is*. In example (5), *fjortis* consists of the truncation of *fjortenåring* ('14 year-old') and suffixation in *-is*. As for example (6), *kompis* consists of truncation of *kompanjong* 'comrade, mate' and of suffixation in *-is*.

- (5) 002 *lø* *altså* *jeg* *føler* *meg* *skikkelig* ***fjortis*** *altså*
 no-LOANWORD thus I feel me properly 14 year-old thus
 'No, well, I feel like I really was 14 years old'

- (6) 003 *for eksempel* *(.)* *en* ***kompis*** *av* *meg* *skjønner*
 for example a mate of me you know
hva jeg mener *det* *er* *alle* *bruker* *det*
 what I mean it is all use it
 'For example, one of my comrades, you know what I mean, everybody uses it (the word)'

Tryti (1984: 51-53), who published the first global summary of slang words used in Oslo from the 1930s to the 1980s, reports that suffixation with *-is* in Norwegian has been borrowed from Swedish. For instance, *tjenis* (or *kjenis* and *kjens*), which literally means 'good day', comes from the Swedish form *tjänis*. However, the suffix *-is* can also find its origin in Latin and English (*laddis*, cf. ladies; *mablis*, cf. marbles). However, Tryti (1984: 51-53) claims that this suffix *-is* has become so productive in Norwegian that many words have been created with no Swedish counterparts. Moreover, its popularity can be explained by the fact that *-is* is easily combinable with all sort of lexical and morphological units (adjectives, substantives, proper names) and can be used to qualify all kind of persons both positively or negatively.

Even if lexical units suffixed with *-is* (e.g. 6) are nowadays commonly used and attested in Norwegian, some of them still have a connotation which is not neutral and is not accepted by the entire linguistic community. In that sense, such lexical units can be analyzed as neologisms according to Sablayrolles (2006).

2.1.3.2. Semantic neologism

Based on diverse material (UNO, *Slangordboka* 2005, 2006), Hasund (2006b: 43-46) has collected significant instances of semantic neologisms in teenage talk in Norway. Semantic neologism consists of adding a meaning to an existing word or using it in unexpected contexts. These processes involve essentially metaphor, puns and irony (Table 1).

Lexical units found in the material		Semantic extents	
Norwegian form	Translation	New meaning in Norwegian	Translation
apoteket	‘pharmacy’	vinmonopolet	‘liquor store’
fossiler	‘fossils’	foreldre	‘parents’
kinderegg	"Kinder Surprise", chocolate egg containing a small toy	brun utenpå, blond inni	‘brown on the outside, blonde inside’
pottet	‘potato’	nordmann	‘native Norwegian’
konge	‘king’	bra	‘good’
einstein	‘Einstein as proper name’	dum	‘foolish’

Table 1: Instances of semantic neologisms in teenage talk, Norway

Interestingly, the UPUS-project provides few instances of semantic extensions of existing Norwegian lexical units in comparison with previous studies. Only one occurrence of *pottet* ‘potato’ has been found. In addition, the neuter form *døvt* from the adjective *døv* ‘deaf’ occurred three times with a pejorative sense, whereas the neutral form *fett* from the adjective *fet* ‘fat’ occurred four times. Its meaning is close to *konge* ‘king’ and designates something positive as shown in example (7).

- (7) 002 *ja* (.) *jeg har lyst til å se roma* (.) *det ser*
yes i want to see Roma it looks
jævlig fett ut altså det
damn fat like actually it
‘Yes. I am tempted to see Roma. It really looks like amazing actually’

Taken together, these findings suggest that neologisms represent an important part of lexical innovations in teenage speech in Norway. Yet, they may not be considered specific to the speech style in the Eastern parts of Oslo. Among the previously mentioned examples, some have been identified as close to slang (Tryti 1984, Hasund 2006b).⁵ Because slang is defined as “peculiar to a particular group” (cf. Webster’s International Dictionary, 2015), my next point is dedicated to the use of slang as an adolescent practice.

2.2. Adolescent slang lexicon

2.2.1. Definition

According to the Cambridge Dictionary (2015), the concept of slang covers “words and expressions that are used by small groups of people and that are not easily understood by other people”. Similarly, the Merriam Dictionary (2015) defines slang as “words that are not considered part of the standard vocabulary of a language and that are used very informally in speech especially by a particular group of people”. In short, slang is a group-related language usage (i.e. a social phenomenon) typical of informal situations and spoken language. Besides,

⁵ The specificity of a neologism lies in the fact that speakers who use and do not use (the entire community of speakers) the lexical unit perceive it as innovative/unique. This perception of novelty can also be coupled with slang that is to say that the lexical unit carries non-neutral connotation.

it only concerns lexical units that are hence regarded as below the neutral stylistic level. Since adolescents can be regarded as a whole, I refer to the term *adolescent slang lexicon* first suggested by Labov (1992:341).

More broadly, the difficulty of defining slang comes from the ambivalence and subjectivity of the notion. Hasund demonstrates in her book *Slang* (2006:11-12) that speakers of all ages rely on their sociocultural and linguistic background to delimit lexical units, which belong to slang. Their perceptions also fluctuate depending on time factors. Lexical units can thus evolve over time and become ordinary element of a language.

To date, several studies have revealed a correlation between slang and creativity, as claimed by Andersson & Trudgill (1990:78, 84) “creativity is an essential aspect of slang, to a greater degree than with other types of language use”. Andersson & Trudgill (1990:84) add “the use of slang is conscious, with the user being aware of the form of expression, as well as the content”. This perspective indicates that slang is not only a way to attract attention or to color daily speech, but rather that it is a stylistic practice with a social bearing.

2.2.2. *Slang and adolescents*

Peer groups involved in the UPUS-project regularly use slang as shown by examples (1, 2, 5, 6). In addition to prefixation in *drit-* and suffixation in *-is*, Hasund (2006b:76, 91) mentions vulgarity and swearing as typical for adolescent slang in Norway before 2006. Most of the collected ‘bad words’ are related to taboos which during adolescence correspond to a) the opposite gender (breasts, sexual organ), b) relationships and sexuality (flirting), and c) forbidden phenomena (alcohol, drugs, theft, fights).

In order to validate the assumption upon which adolescents from the Eastern parts of Oslo also use vulgarity and swearing at the time of the UPUS-project, I compared the terms Hasund collected with data from UPUS. To achieve it, I used the X-tag function, which, at the time of the codification of the corpus, was associated with all lexical forms that did not appear in the Bokmål Reference Dictionary. By selecting the X-tag function, I have isolated non-standard lexical forms that occurred in the UPUS-project.

The single most striking observation to emerge from the data comparison is that 144 out of a total of 233 X-tag words in the UPUS-project were borrowed from Arabic. The results obtained are set out in Table 2.

Transcription according to Norwegian phonetic	Origin	Translation	Topic
-----------------------------------------------	--------	-------------	-------

rules			
<i>Sjpa</i>	Berber	Good	Express Approval
<i>Lø</i> <i>Bejsti</i>	Arabic/Kurdish Unknown	sth. negativ Bad, idiot	Express Disapproval
<i>Bæhmen</i> <i>Kæbe</i>	Unknown Arabic / Berber	Kamerat Lit. prostitute girl	Speak about Other
<i>Tæsje</i> <i>Avor</i> <i>Sjofe</i> <i>Baosj</i> <i>Floser</i> <i>Gærro</i>	Unknown Berber Arabic Arabic Arabic Arabic	Theft To run away/leave quickly To look Police Money Tobacco, hashish	Taboo
<i>Wolla</i> <i>Kåran</i>	Arabic Arabic	I swear by Allah The Coran	Express Involvement

Table 2: Most salient X-tag words in the UPUS-project

The terms have been summarized under four different topics that partially cover topics highlighted by Hasund:

- a) express approval or disapproval
- b) mention the Other in the broad sense of the term
- c) talk about forbidden phenomena
- d) express personal involvement

Interestingly, adolescents from the Eastern parts of Oslo prefer Arabic loanwords when talking about legal or moral prohibitions in order to encrypt exchanges between peers. This implies that speakers are aware of the inaccessibility of these terms to the majority of speakers. Moreover, adolescents from the Eastern parts of Oslo often refer to Muslim culture, even if they are not Muslim (cf. Opsahl 2009). The use of *wolla* in order to attest the veracity of statements or personal involvement in the exchange is widespread among adolescents from the Eastern parts of the city (cf. Harchaoui 2015b). With regard to previous empirical material (cf. the NoTa-project - Norwegian Spoken Language Corpus, the Oslo part/ *Norsk Talespråkskorpus, Oslodelen*) and UNO - Corpus of Teenagers and language contact in Scandinavia, see 2.3.1), I consider that non-European borrowings constitute a real lexical innovation contrary to cases of semantic neology or slang.

2.3. Loan words

2.3.1. Disparate practices in the city

Aasheim (1995) published a pioneering work dedicated to a new language variety identified among adolescent peer groups living in Oslo. The title of her thesis "Norwegian-Kebab": influence of foreign languages on teenage speech in Oslo (in Norwegian "Kebabnorsk":

framandspråkleg påverknad på ungdomsspråket i Oslo) highlights the crucial place of both English and non-European borrowings in Norwegian contemporary practices. Non-European borrowings actually refer to languages brought by recent immigration, such as Berber, Arabic, Turkish, Punjabi and Urdu. It is incidentally after this cultural aspect that the "Norwegian-Kebab" was named. The term 'kebab' explicitly refers to eating habits introduced in Norway by non-Western immigrant populations. The "Norwegian-Kebab" variety described by Aasheim (1997:238) is thus novel because of the regular use of "words that are borrowed from languages far from Norwegian".⁶ By 'far', Aasheim indeed implies languages which do not belong to the Indo-European family or which belong to it but whose lexicon is far from Germanic and Scandinavian branches (i.e. Pashto).

It should however be noted that in Aasheim's study case, only 60% of respondents have Norwegian as their mother tongue (1997:236), in contrast to the UPUS-project (100%). This fact led Aasheim to consider the variety as "a mixture between common Oslo-slang, pidgin and a form of argot, where rebellion against parents and the "established community" is central".⁷ In this case, non-European borrowings are compared with creative lexical processes involved in the formation of pidgins, in that "if a foreign speaker does not find a word in Norwegian, then the word in question will almost automatically be replaced by a word of the native language or a language mastered by the speaker in question".⁸ In this study, all respondents are native speakers of Norwegian (Svendsen & Røyneland 2008: 67). I argue that even if non-European loan words have been found in the UPUS material, they cannot result from code switching/mixing situations, nor cannot result from code switching/mixing situations, or from pidginization with regard to speakers' proficiency in languages other than Norwegian, as well as with the frequency of words use.⁹ The phenomenon could rather be brought closer to poly-languaging¹⁰ (Jørgensen et al. 2011; Ritzau 2015).

Aasheim's pioneering findings (1995) remain relevant on the one hand because they attest new language practices marked by a diversification of lexical roots, and on the other hand because the results clearly point out non-European loanwords as typical for the Eastern parts of Oslo.

Similar results have been provided by the NoTa-project (Norwegian Spoken Language Corpus, the Oslo part/ *Norsk Talespråkskorpus, Oslodelen*) conducted between 2004 and 2006. It consists of interviews and conversational data from 62 respondents aged 16 to 25, all born and raised in Oslo and surrounding areas. Unlike the UPUS-project, NoTa does not target multiethnic areas. I use this additional material as a baseline in order to pinpoint the specificity of the Eastern variety/speech style. Results from NoTa support a bipartite teenage talk depending on areas in Oslo (varieties vary according to areas and social backgrounds). Since the Industrial Revolution, the Western neighbourhoods (e.g. *St. Hanshaugen, Frogner*,

⁶ Aasheim (1997:238) "*De ordene som er lånt inn fra språk som ligger langt fra norsk*"

⁷ Aasheim (1997: 238) "*Kebab-norsk ser ut til å være en blanding av vanlig osloslang, pidgin og en form for argot, hvor opprør mot foreldre og « det etablert samfunn » står sentralt*"

⁸ Aasheim (1997: 238) "*Der et sannsynlig, at om en fremmedspråklig ikke kommer på et ord i norsk, så vil et ord fra morsmålet eller et annet språk han behersker, nesten automatisk erstatte dette*"

⁹ The 56 adolescents involved in the UPUS-Project were between the ages of 13 to 19 and came all from Old Oslo (located in the inner city) and Southern Nordstrand (located in the peripheral region). Both belong to the Eastern parts of the city that for almost four decades have been known for their cultural and linguistic diversity. Old Oslo and Southern Nordstrand had a migrant population of approximately 35% at the period when data were collected. The adolescents have various backgrounds. Some have Norwegian-born parents and some have foreign-born parents. The majority consider Norwegian to be their mother tongue, either as their sole mother tongue or in addition to another language (see Svendsen 2009).

¹⁰ Ritzau (2015: 660) defines polylinguaging as "the phenomenon that speakers employ linguistic resources at their disposal which are associated with different "languages", including the cases in which the speakers know only few features associated with a given "language"".

Ullern, Vestre Aker, Nordre Aker and Nordstrand) have enjoyed a higher socio-economic status, which has enhanced their reputation. The West side of Oslo is also known to generally have fewer immigrant groups that mainly come from the Nordic countries, the European Union and North America (cf. *SSB*, Statistics Norway).

According to Hasund (2006b:18-19), adolescents growing up in those areas predominantly borrow words from English, Spanish or German, which result from “cultural contact”, i.e. indirect contact from one language to another via cultural and linguistic influence conveyed by literature, music, art or the fashion industry. As described by Johansson & Graedler (2002:270), English creates a stylistic effect “by which the speaker implicitly refers to the Anglo-American popular culture knowledge of his/her interlocutor, that emphasizes and reinforces his/her message”. Moreover, European loanwords seem to be found in other major cities in Norway such as Bergen, Tromsø and Kristiansand.

On the contrary, the Eastern parts of Oslo (e.g. Gamle Oslo, Grünerløkka, Sagene, Bjerke, Grorud, Stovner, Alna, Østensjø and Southern Nordstrand) are described as multiethnic areas and have provided for conditions that are more unfavourable than in the rest of the city. Statistics Norway, which annually publishes official statistics about Norwegian society, reported that Southern Nordstrand comprised 44% immigrant population at the time of the UPUS-project. Based on empirical material from NoTa’s corpus, Opsahl, Røyneland & Svendsen (2008:33) have compared the lexicon of the Western and the Eastern varieties. It can be seen from the data in Table 3 that among a total of 663 lexical forms, 245 examples fall within the Norwegian slang group, 353 are categorized as borrowings from English while the remaining come from other languages, including non-(Indo-)European languages (Berber, Arabic) and Indo-European languages other than Norwegian and English.¹¹

	Female speakers from Eastern areas (16)	Female speakers from Western areas (14)	Male speakers from Eastern areas (13)	Male speakers from Western areas (18)	Total
Slang (Norwegian)	32	72	99	42	245
English loan words	31	68	147	107	353
Other Languages loan words	5	3	53	4	65

Table 3: Occurrences of slang and loan words in NoTa among adolescents under 26 (In number, *T* = 663)

¹¹ Opsahl, Røyneland & Svendsen (2008:33)

	Female speakers from Eastern areas (16)	Female speakers from Western areas (14)	Male speakers from Eastern areas (13)	Male speakers from Western areas (18)	Total
Slang (Norwegian)	4,80%	10,70%	15,00%	6,30%	36,8%
English loanwords	4,70%	10,30%	22,00%	16,20%	53,2%
Other Languages Loan words	0,80%	0,60%	8,00%	0,60%	10%

Table 4: Occurrences of slang and loan words in NoTa among adolescents under 26 (In percent, T = 100%)

Together these results indicate that male adolescents from the Eastern areas in Oslo are the most innovative speakers since a) they resort more frequently to Norwegian slang, b) they also borrow more from English. But the most striking difference concerns borrowings from other languages where once again male adolescents from the Eastern areas borrowed 53 words from other languages whereas speakers from the Western parts only did it 4 times. According to Hasund (2006b: 18-19), words borrowed by adolescents from the Eastern parts of Oslo would be caused by a language contact situation resulting from a prolonged cohabitation of several languages. Despite multiethnicity and multilingualism, which have reigned in the Eastern parts of Oslo, I argue that the present situation is far from that described by Weinreich (1968) because both respondents in the NoTa and UPUS-projects are fully competent in Norwegian¹². Their use of other languages loan words does not result from a lack of linguistic competence.

In order to follow how language practices have developed over time in the Eastern parts of Oslo, the next section presents the findings of my research across UPUS, focusing on non-European loanwords.

2.3.2. Non-European loan words

As noted above, non-European words in NoTa's material represent 9.8% of all lexical forms (65 out of a total of 663) and in the great majority of cases (81.5%) they were produced by male adolescents from Eastern parts of Oslo (53 out of a total of 65). This seems to confirm the assumption that non-European words are a specific feature of language use in the multiethnic areas of Oslo (see Svendsen, 2008). Through the X-tag function within informal situations (conversations among friends), I found 26 lexical forms (N=400) that were borrowed from Arabic, equivalent to 6.5% of all X-tags. They consist of a dozen units that are repeatedly occurring and could be summarized as follows:

¹² See Svendsen & Røyneland (2008:67) where they take Anders as an example. "Anders (...) claims to be a multiethnolectal user, and has also been identified as such by other adolescents in a perception task. Anders is raised bilingually in Norwegian and Arabic (...) He reports to have better productive and receptive competence in Norwegian which he identifies as his first language and his "mother tongue"."

- *sjpa* ‘good’ / *dritsjpa* ‘very good’
- *taz* ‘joke’ / *drittaz* ‘very joke’
- *sjmø* ‘bad’ / *dritsjmø* ‘very bad’
- *tasja* ‘theft’
- *kæbe* ‘girl’
- *volla-språk* ‘wallah language’, *wallah* ‘I swear by Allah’
- *jallanorsk* ‘jalla Norwegian’

When it comes to the UPUS-project, I identified 149 Arabic loan words (N=233 X-tags). These results indicate that the number of non-European borrowings has seriously increased over one year, and moreover that teenage speakers from the Eastern areas have broadened the use of some lexical units. Interestingly, the denomination *wallah* ‘[I swear] by Allah’ transcribed as *wolla* in the UPUS project occurred 113 times (N=149) in informal situations. Beyond the corroborative value of the term, adolescents who are not Arabic speakers seem to multiply the use of *wolla* as an intensifier, a discourse marker or, in extreme cases, as an adjective or a noun when there are Norwegian counterparts such as *sverg*, *jeg sverger* and *helt ærlig* ‘swear’, ‘I swear’ and ‘quite honestly’ (see Harchaoui 2015b). The use of *wolla* may thereby be linked to the multiethnolectal speech style where the term has become an emblematic word.

Before I reach the symbolic use of *wolla*, I would like to provide some stretches of peer conversations from the UPUS-project, which illustrate how non-European loanwords, are used in discourse and integrated to Norwegian language practices (8-9).

- (8) 003 *lø* *jeg var med hva heter hun* (.) *lø* *jeg har alltid vært*
 NO-ARABIC I was with what is her name NO-ARABIC I have always been
litt sånn brutal ikke sant
 little like brutal not true
 ‘No, I was with what is her name. No, I have always been a bit like brutal, right?’

- (9) 009 *lø* *det er ikke* (.) (.) *det er ikke våre penger* (latter)
 NO-ARABIC it is not it is not our money (laughter)
 ‘No, it is not our money’

Examples (8) and (9) are good illustrations of the use of *lø* which in these contexts means ‘no’. *Lø* is directly borrowed from Arabic and functions as an interjection. However, loanwords can undergo morphological integration as shown by my next example. To briefly situate the context, respondent number 012 was waiting in the recording room, pointing at the screen of the camera. On the video, he said to an adult who was off-camera that he must first be videotaped and also asked if the camera had started filming. Right after, he commented that all (the adults) are bad (10).

- (10) 012 *la meg bare bli filma først de hører oss* (.) *lø*
 let me just be videotaped first they hear us NO-ARABIC
altså alle sammen er løe
 so all together are NO-ARABIC.PL
 ‘Let me just be videotaped first. Do they hear us? No! So all together are bad’

The first mention of *lø* refers to the interjection ‘no’ where the next instance *lø-e* carries an adjectival function and is inflected according to Norwegian adjective patterns, where plural adjectives end with *-e*.

As shown by example (11), inflection of non-Europeans loanwords is also possible with nouns. The following conversation took place between respondents 009 and 010 who were talking about their plans for the next day. The conversation starts when adolescent 010 suggested 009 joining him to go downtown but the latter felt annoyed by the fact that he had to work that day.

- (011) 010 *skal møte mæba mi*
 shall meet mæb.DEF.SG.FEM my.FEM
 'I am going to meet my girl'
- 009 *(latter)*
 (laughter)
- 010 *(latter) vær med bli med da*
 (laughter) be with be.PROG with then
 'Join us then'
- 009 *lø jeg jobber hva faen jeg orker ikke det tuller der*
 NO-ARABIC I work whatever the hell I can.stand not this joke there
 'No! I work whatever the hell I can't stand this joke there'
- 009 *jeg har jobb faen*
 I have work damned
- 010 *ja ok da*
 yes ok then
- 009 *(latter) jeg går og deler ut brosjyrer møter*
 (laughter) I walk and hand out brochures meet
- 009 *bare mæber bare vær så god*
 just mæbe.IND.PL just be so good
 'I just walk and hand out brochures, I just meet some girls, just you're welcome'
- 010 *faen det er flaut herregud*
 damned it is embarrassing my goodness
- 009 *det var en gang jeg møte den mæba*
 It was one time I met this mæb.DEF.SG.FEM
- 009 *hun gikk med faren sin*
 she walked with father her
 'Once upon a time I met this girl, she was walking with her father'

Both respondents use the loan word *mæbe* to refer to the substantive *jente* 'girl'. At line 1, *mæbe* is inflected for definiteness and feminine according to Norwegian morphology and ends with *-a*. It is followed by the possessive pronoun *mi* 'my' which is also inflected in singular feminine. In line 6, the speaker is talking about girls in general and uses *mæbe* as an indefinite plural which takes the *-er* ending in Norwegian. Finally, at line 9, the term occurs preceded by *den* which indicates that the person spoken about is distant in time or in space. According to Norwegian, the substantive is also inflected in singular feminine definite (*-a* ending).

Instances of borrowed verb inflection have been found in another conversation between respondents 009 and 010 (12). In this peer conversation, adolescent 010 gives standard Norwegian counterparts to some expressions in Norwegian-kebab (see 2.3.1.).

- (12) 010 *røyker du*
 smoke you
 'Do you smoke ?'
 009 *hva heter det igjen*
 what calls it again
 'What is it called again?'
 010 *kif-*
 009 ***kifer*** *du*
 kif.PRES you
 'Do you smoke ?'

The question *kifer du* corresponds to *røyker du* in Norwegian 'do you smoke'. Interestingly, adolescent 009 conjugated the Arabic root *kif* in the present tense by adding *-er*, the common inflexion for present tense in Norwegian.

2.3.3. A question of context

As pointed out in the introduction to this paper, the UPUS-project comes in two recording modes: peer conversations on the one hand and video-recorded interviews on the other. During the interviews, adolescents talk about lexical items that characterize the multiethnolectal speech style. In example (13), the interviewer asks respondent 021 about a specific way of speaking among Norwegian adolescents in multiethnic areas. Here is the answer.

- (13) 021 *de sier sånn derre (.) istedenfor å si (.) altså*
 they say like instead of to say then
å så bra så sier de å så sjpa
 oh so good so say they oh so good.ARABIC
 'They say like instead of saying 'oh so good' so they say 'oh so sjpa'
 INT *ja sier du det eller*
 yes say you it or
 'Yes. Do you also say it?'
 021 *ja når jeg tuller så sier jeg det men ikke når*
 yes when I joke so say jeg it but not when
jeg snakker med sånn voksne som deg da sier jeg ikke
 I talk with some adults like you so say I not
å det var sjpa liksom ikke sånn
 oh it was good.ARABIC somehow not like
 'Yes when I am joking so I say it, but not when I am talking to adults like you.
 There, I do not say 'oh it was sjpa', not in this way'

Respondent 021 also explains in which communicative situation she uses non-European loan words. Moreover, she highlights the process through which this speech style has occurred (14).

- (14) 021 *det merker jeg også selv* (.) *når jeg snakker med*
 it notice I too self when I talk with
søsteren sier jeg hele tiden ja ja liksom liksom
 sister.DEF say I all time yes yes like like
hun står sånn her ikke sant
 she stands that.way here not true
 ‘I notice it myself too. When I talk to my sister, I say all the time ‘yes, yes, like, like’. She stands like that, right.’

ja og så sier vi (.) *for eksempel se på den*
 yes and then say we for example look at this
kæba der det er liksom se på den dama
 lady.ARABIC there it is like look at this lady
guttene sier ikke sant
 boy.DEF.PL say not true

‘Yes and then, we say for example ‘look at this kæba there’ it is the same as ‘look at this lady’ the boys (usually) say, right’

- INT *ja ja*
 yes yes
 021 *istedenfor å si se på den dama så bare*
 instead of to say look at this lady so just
sier du det sånn (.) *så bare begynner du*
 say you it like so just begin you
å veksle ut ord og det sånn (.) *da kaller du det*
 to change word and it like then call you it
Holmlia-språk
 Holmlia language

‘Instead of saying ‘look at this woman’ so you just say it like that. So you just begin to change the word and this so you call it the language of Holmlia’

- INT *ja hvor kommer de orda fra*
 yes where come the words from
 ‘Yes. Where do these words come from?’

- 021 *jeg vet egentlig jeg tror for eksempel kæbe så*
 I know really I think for example lady.ARABIC so
tror jeg det kommer fra sånn arabisk eller noe sånn
 think I it comes from like Arabic or something like
(.)du bare (.) *putter det inn*
 you just put it in
 ‘I really know.. I think for example *kæbe*, so, I think it comes from like Arabic or something like... You just put it in’

This stretch is highly relevant for my analysis because the adolescent reveals that the use of Arabic loan words such as *kæbe* is common among male speakers in Holmlia, a multiethnic suburb in the Eastern parts of Oslo. Moreover, respondent 021 confirms that speakers who use ‘the language of Holmlia’ (implying the multiethnolectal style) *just* (in Norwegian “bare”) replace loan words with other Norwegian words.

Another interview including respondent 002 illustrates the attitude of speakers towards non-Europeans borrowings (15).

(15) INT *kan du gi eksempel på ord og uttrykk fra*
 can you give example of word and expression from
språkbruken der eller språket
 language use.DEF there or language.DEF
 'Can you give example of words or expressions from the language use there or from the language?'

002 *i hvert fall det jeg ikke liker er sånn uttrykk sånn*
 in any case it I not like is like expression such as
lø og sjå og wolla og sånn det
 no.ARABIC and good.ARABIC and swear by god.ARABIC and like it
 'In any case, what I don't like, is expressions such as lø and sjpa and wolla, and things like that'

INT *men det er eksempel på uttrykk fra*
 but it is example of expression from
det språket du tenker
 this language you think
 'But do you think there are examples of expressions from this language?'

002 *ja (.) men det blir veldig mye brukt på norsk da*
 yes but it becomes very much used in Norwegian then
 'Yes. In addition, there are frequently used in Norwegian'

Comparing the two recording modes, it can be seen that adolescents react differently to borrowing depending on the communicative setting. In peer conversations, loan words are used in discourse and are, in some cases, totally or partially inflected according to Norwegian grammatical rules. On the contrary, during interviews, speakers talk about loan words but never use them. Moreover, they distance themselves from this process, and tend to deny or reject it (i.e. 'the boys say', 'what I don't like'). Yet, these results suggest that Arabic words are the first feature pointed out when describing the language use of Eastern parts of Oslo, and that speakers are aware of using loan words in specific situations (i.e. 'I notice it myself', 'when I joke', 'not when I am talking to adults'). From a language use perspective, self-awareness attitudes can thus be interpreted as an ability of the speakers to choose to resort to linguistic features depending non-linguistic settings. This idea has been supported by Opsahl & Nistov (2010) who demonstrated that the violation of the V2 constraint¹³ occurred more frequently during peer conversations whereas speakers resort to the XVS-structure in formal situations.

Having determined in which communicative settings non-European loan words have appeared, the question of motivations still remains unanswered. The last section of this paper

¹³ Among syntactic features, the multiethnolectal style can be characterized by occurrence of XSV order in contexts where standard Norwegian has verbal inversion. This process is usually called 'violation of the V2 constraint'. Norwegian, like other Germanic languages is a V2 language, constraining the appearance of the finite verb to the second position in declarative main clauses. Apart from SVO, which is the canonical word order, itself exhibiting V2, XVS word order is obligatory where X is a topicalized element, V the finite verb and S the subject. Opsahl & Nistov (2010) analyzed all declarative main clauses introduced by a nonsubject in the UPUS-Project and found out that a total number of 194 instances of XSV-structure was found, constituting 22% of the total number of declarative main clauses with a nonsubject as the clause-initial element. In the peer conversations the proportion of XSV is as high as 38% whereas in the interviews the proportion is 12%. Opsahl & Nistov (2010: 58-59) claimed that violation of the V2 constraint is characteristic of language use in peer conversations and more broadly a structural aspect of language use in youth in-group settings.

takes into account the multilingual dimension in order to explain why speakers use other languages in their speech.

3. *From lexical innovation to social meaning*

3.1. *Micro perspective*

More recent research into youth language has correlated language use and identity. As claimed by Hasund (2006a: 34), “while belonging to different linguistic communities, we are also individuals. But also our individual identity has a social or collective side, and is linked to our linguistic interactions with others. Through language we can express who we are or want to be. Through linguistic feedback from others, we also learn how we are perceived, which affects our own perception of ourselves”.¹⁴ Moreover, sociolinguists generally agree that adolescence is the life stage in which language change is most clearly visible (Kerswill 1996).

Relative to adolescent slang lexicon, Hasund (2006b: 4) adds that slang is the most common adolescent practice and offers youngsters a way to play with words, which better reflects their personality. Considering all of these lines of evidence, lexical features such as loan words seem to have several functions in my case study.

Firstly, speakers can estimate that the language from which a word is borrowed has greater prestige than the dominant language (Norwegian). Tryti (1984:91) gives the example of the English word *girlsa* used instead of the Norwegian *jentene* ‘the girls’: “the point (...) [is] not only that one will express ‘a young person in feminine plural’. By using *girlsa*, the speaker conveys that he/she is young, cool, trendy, funny, urban, international, language conscious, ironic, creative, norm-breaking and expressive”.¹⁵

Then, during the life stage of adolescence, speech innovations contribute to express values that the speakers deem prestigious¹⁶ but they also indicate that speakers want to be perceived positively inside the peer-group. However, the results I have provided show that English is not specific to the Eastern parts of Oslo.

If we consider the non-European roots of loan words found in the speech style of adolescents from the Eastern parts of Oslo, I argue that innovation can be used in order to encrypt the message delivered and to strengthen the unity and cohesion of the community. Non-European loan words are promoted when speakers talk about legal and moral prohibitions (cf. 2.3.1.) because they are aware of the inaccessibility of the terms by the majority. This implies that speakers not only innovate in order to perform but rather to develop cryptic practices. Hasund (2006a: 35) explains that in this case, “their individual speech is adapted to the social community, moreover, that the speech helps to determine this

¹⁴ “Men også vår individuelle identitet har en sosial eller kollektiv side, og henger sammen med vår språklige samhandling med andre. Gjennom språket kan vi uttrykke hvem vi er eller ønsker å være. Gjennom språklige tilbakemeldinger fra andre lærer vi også hvordan vi blir oppfattet, noe som igjen påvirker vår egen oppfatning av oss selv”.

¹⁵ “Poenget (...) ikke bare at man vil uttrykke ‘ungt menneske av hunkjønn, flertal’. Ved å bruke *girlsa* kan den som snakker i tillegg formidle at hun er ung, kul, trendy, morsom, urban, internasjonal, språkbevisst, ironisk, kreativ, normbrytende og ekspressiv”.

¹⁶ Hasund (2006a: 35) “Om man tilpasser språket sitt ved å nærme seg samtalepartnerens stil (konvergerer) eller fjerne seg fra den (divergerer), kan best forklares ut fra sosialpsykologiske prinsipper, som i korthet går ut på at det er større sjanse for at man tilpasser språket sitt dersom det er knyttet noe positivt å gjøre det”. (If one adapts his/her language by approaching the speech style of his/her interlocutor (converge) or by removing from it (diverge), it can best be explained by social psychological principles, which briefly are that there is a greater chance that convergence appears if language is related to something positive).

community". The multiethnic dimension of the Eastern areas widens the scope of language available for borrowing form. Based on the notion of *bricolage*¹⁷ (see Levi-Strauss 1971, Hedbige 1979), I argue that individual resources can be combined with other resources in order to construct a more complex meaningful entity.

An interesting question should then be: what kind of positive values do speakers from the Eastern parts associate with the use of non-European loanwords that lead them to promote Arabic words instead of English or Norwegian ones? Moreover, how could the multiethnic dimension impact their speech and disseminate a more complex identity?

3.2. Macro perspective

Furthermore the UPUS-project has provided instances where speakers define their identity in relation to the locality and to the multiethnic dimension of the Eastern parts of Oslo in order to contrast themselves with adolescents from Western areas that they consider being pretentious and superficial. This can be illustrated by Line (Quist & Svendsen, 2010:117-118), an adolescent who was interviewed in the UPUS-project. Both of her parents are from Norwegian backgrounds. In the following conversation, she affirms her pride in coming from the Eastern parts of Oslo and openly criticizes the speakers from the Western areas (16).

- (16) INT *hva synes du om den språkformen i forhold til andre utgaver av norsk?*
 'What do you think about this language form compared to other versions of Norwegian?'
 Line *jeg synes den er mye bedre enn sånn vestkant*
 'I think it's much better than the form from the Westside'
 INT *hvordan er vestkant?*
 'How is the Westside?'
 Line ***jålete***
 '**Posh**'
 Line *sånn skikkelig sånn *knekker håndleddet* (.) homospråk*
 'Like really like *cracking knuckles* homo language'
 Line *selv om jeg ikke har noe imot homser altså*
 'Although I do not have anything against gays'
 INT *nei*
 'No'
 Line *men det blir bare litt sånn rart*
 'But it just gets a little weird'
 INT *så du kunne ikke tenke deg å (.) snakke vestkant*
 'So you could not imagine.. talking Westside'
 Line *nei *rister på hodet**
 'No' *shakes head *
 INT *det sier jo litt om hvem du er også hvordan du snakker, gjør det ikke*
 'The way you speak tells about who you are, does'nt it?'

¹⁷ Hedbige (1979:104) "Together, object meaning constitutes a sign, and, within any cultures, such signs are assembled, repeatedly, into characteristic forms of discourse. However, when the bricoleur re-locates the significant object to a different position within that discourse, using the same overall repertoire of signs, or when that object is placed within a different total ensemble, a new discourse is constituted, a different message conveyed".

- Line *jo når du snakker hvis xxx snakker vestkantdialekt skjønner man du er fra vestkanten (.) snakker du østkant (.) dialekt så kommer du fra østkanten på en måte*
 ‘Yes. When you talk if xxx talk the Westside dialect, so one realizes you are from the Western areas.. if you talk the Eastside.. dialect so you come from the Eastern parts, in a way’
- INT *men er du stolt av å komme fra*
 ‘But are you proud to come from where you are?’
- Line *ja*
 ‘yes’
- INT *østkanten?*
 ‘the Eastside’
- Line *jeg er kjempestolt*
 ‘I am very proud’
- INT *ja nettopp*
 ‘Yes, exactly’
- Line *østkanten er det beste*
 ‘Eastside is the best’

Another interview (17) offers a broader perspective to connect the multiethnolectal style (labelled Kebab-Norwegian in the excerpt) with the expression of the status of minority adolescents. Svendsen & Røyneland (2008:69) describe Anders in these terms: “Anders [...] claims to be a multiethnolectal user, and has also been identified as such by other adolescents in a perception task. Anders is raised bilingually in Norwegian and Arabic [...]. He reports to have better productive and receptive competence in Norwegian, which he identifies as his first language and his “mother tongue”. Thus, Norwegian may be classified as his dominant language”.

- (17) INT *hvilket navn har det*
 ‘What name does it have?’
- Anders *jeg kaller det på en måte jeg har ikke noe navn for det jeg har b- jeg f- ser på det som en refleksjon av mangfold og felleskap*
 ‘I call it in a way I don’t have any name for it. I have b- I f- look at it as a reflection of diversity and togetherness’
- INT *Men avisene mediene bruker uttrykket kebab-norsk hva syns du om det ?*
 But eh the newspapers the media use the term Kebab-Norwegian what do you think about that?
- Anders *ja jeg helt ærlig (.) det er noe dem har sagt de jeg ser ikke jeg har aldri (.) eneste jeg sier **det her er vår dialekt** (.) **jeg trenger ikke å si kebabnorsk eller** (.)*
 Yes I honestly (.) that is something they have said they I I don’t look I have never (.) only thing I say is this is our dialect (.) I don’t need to say Kebab-Norwegian or (.)
- INT *Og hvem er vi hvem er vår (.) dialekt hvem er vi ?*
 ‘and who are we who is our (.) dialect who are we ?’
- Anders ***det er minoriteten***
 ‘it is the minority’
- INT *ehmm (.) minoritetsungdom*
 ‘minority adolescents’

- Anders *ja*
 ‘yes’
 INT *men du sa også at det var eh (.) andre ungdommer med norsk bakgrunn*
 ‘but you also said that there were eh (.) other adolescents with Norwegian
 background’
 Anders *(.) ja*
 ‘yes’

During the interview, Anders shows a “reflective view on this spoken variety” and “connects the dialect to a “generalized” minority; the minority’s dialect. The fact that he uses the term ‘dialect’ is interesting and may be seen in connection to the special position dialects have in Norway” (cf. Røyneland, 2008; cf. Svendsen & Røyneland, 2008: 70). More interestingly, Anders confirms that adolescents with a Norwegian background also use the speech style.

These results match my argument that adolescents search for social meaning through language that is to say they attempt to negotiate their identity and find a place in the social context according to Le Page & Tabouret-Keller’s (1985:14) notion of acts of identity “in which people reveal both their personal identity and their search for social roles”. This idea is also confirmed by Eckert (1997:52) who claims “adolescents are the linguistic movers and shakers, at least in western industrialized societies, and, as such, a prime source of information about linguistic change and the role of language in social practice.”

In the Oslo study case, it now seems obvious that speakers’ use of specific lexical units expresses their belonging to areas, which have become the symbol of “a late-modern urban, multiethnic reality” (Opsahl, 2009:239). Recently, Madsen (2015:3) put forward this idea when analyzing a similar phenomenon into Danish environments. She explains besides that “at a first order indexical¹⁸ stage, linguistic signs such as vocabulary from Turkish, Kurdish and Arabic combined with non-standard grammar and non-standard prosody could index second-language speakers of Danish and thereby speakers with an immigrant background. More recently, however, these signs have become enregistered¹⁹ as a contemporary speech style associated with urban youth, cultural diversity and toughness more generally”.

4. Concluding remarks

The evidence from this study suggests that non-Europeans loan words constitute the most innovative part of the lexicon in the speech of adolescents from the Eastern parts of Oslo, not only because of their linguistic features but also because of their indexical field. The UPUS-Project has enhanced our understanding of contemporary speech practices in Norway taking into account the social dimension. It has also shown how language can serve speakers to express solidarity toward a new multilingual urbanity.

Further research should also be conducted in order to determine the relevance of the age-specific feature of these speech practices in order to pursue the study of Rampton (2011) on contemporary urban vernaculars through similar examples in other European countries.

¹⁸ According to Eckert (2008: 454) “the meanings of variables are not precise or fixed but rather constitute a field of potential meanings – an indexical field, or constellation of ideologically related meanings, any one of which can be activated in the situated use of the variable. The field is fluid, and each new activation has the potential to change the field by building on ideological connections”.

¹⁹ Based on Agha’s definition of enregisterment (2007: 81) “processes and practices whereby performable signs become recognized (and regrouped) as belonging to distinct, differentially valorized semiotic registers by a population”.

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Syntactic Interaction in Resumption

Timo Klein

This paper explores the feasibility of a novel movement approach to resumption in relativization contexts. Previous analyses which often rely on *base generation* to create both the RP and operator independently suffer from certain look-ahead and backtracking issues which run counter to Minimalist tenets. The basic claim here is that a novel movement (or stranding) approach to grammatical resumption is able to derive crosslinguistic distribution patterns of gaps/resumptives via the interaction of primitive, independently necessary operations. Within a Minimalist, phase-based framework, *Agree*, *Move*, and *Merge* are ordered in transparent ways to account for gaps or resumptives in certain extraction positions.

1. Introduction: grammatical resumption in relativization

Resumption is the term for a syntactic configuration in which an \bar{A} -chain terminates in a pronoun instead of a gap. A pronoun in its resumptive use does not formally differ from the regular set of pronouns of each language (McCloskey 2006), but this strategy is deemed ungrammatical or at least deviant in many languages, e.g. English¹, but fully grammatical in others, e.g. Yiddish, as in (1) below:

- (1) der man vos ikh hob **im** gezen
 the man that I have **him** seen
 ‘the man that I saw’(I. Gottesman, p.c.)

Resumption can occur in different \bar{A} -constructions (e.g. topicalization, questions), but the focus of the present proposal is put on relativization, which has received the most attention in the literature to date and thus serves as a good basis for crosslinguistic analysis. Within relativization contexts, extractions from (embedded) subject and object positions are investigated in detail in both the existing literature on resumption and based on data provided

¹*This is the woman that Peter saw **her**.

by native speakers, because these positions exhibit some interesting variation with respect to the distribution of gaps and resumptive pronouns (RPs) – see the Irish examples below. Other possible extraction positions, like prepositional objects or positions inside islands, often exclusively host RPs and will be addressed in separation from the main analysis. Another distinction is crucial here: RPs sometimes present a more acceptable alternative to a gap in island contexts or with a certain level of embedding, as in (2).

- (2) This is the girl that Peter said that John thinks that Bob likes (**?her**).

This kind of resumption has been dubbed *intrusive* in the literature (cf. Sells 1984) and is viewed as a post-syntactic strategy to overcome processing limitations. Intrusive RPs can improve judgments but rarely restore full grammaticality (Alexopoulou & Keller 2005, 2007). Alexopoulou (2009) argues for a possible grammaticalization process which could turn intrusive resumption into a fully licit strategy; however, as long as relevant examples are judged deviant by the literature and informants, they will be treated as intrusive and not yet encoded in the grammatical competence of a native speaker. Thus, the proposal presented here will only consider cases of *grammatical* resumption. Some languages use the RP strategy (sometimes alongside the gap strategy) without a drop in acceptability. Wherever RPs can occur, they are deemed grammatical, in both non-island and island contexts, as in the Lebanese Arabic examples below (*nRP* denotes the phonetically null version of the RP):

- (3) *Lebanese Arabic, embedded subject relativization, RP* (Aoun 2000:17)
 l-mʕallme ʔaaSaSit l-walad yalli laila ʔaalit **nRP** ɣazzaʔ
 the-teacher punished.3SG.F the-boy that Laila said.3SG.F **nRP** tore.up.3SG.M
 l-kteeb
 the-book
 ‘The teacher punished the boy that Laila said tore up the book.’
- (4) *Lebanese Arabic, wh-island relativization, RP* (Aoun 2000:17)
 l-mʕallme ʔaaSaSit l-walad yalli laila btaʕrif miin **nRP** Darab
 the-teacher punished.3SG.F the-boy that Laila know.3SG.F who **nRP** hit.3SG.M
 ‘The teacher punished the boy that Laila knows whom he hit.’

Their distribution can vary, posing one of the puzzles of this work. Sometimes, they can freely alternate with gap extractions (6). Sometimes, however, RPs are the only choice (4), while other times they must not occur (5). Below, the distribution for (embedded) subjects and objects in Irish is illustrated as an example. The gap/RP sites are marked in boldface:

- (5) *Irish, subject relativization, gap* (McCloskey 2006:8)
- a. fear nár fhan ____ sa bhaile
an C.NEG.PAST remained **gap** at home
- b. *fear nár fhan **sé** sa bhaile
man C.NEG.PAST remained **he** at home
'a man that didn't stay at home'
- (6) *Irish, embedded subject relativization, gap or RP* (McCloskey 2011:78)
- a. an t-ór seo a chreid corr dhuine a raibh ____ ann
this gold C believed a-few people C was **it** there
- b. an t-ór seo ar chreid corr dhuine go raibh **sé** ann
this gold C believed a-few people C was **gap** there
'this gold that a few people believed was there'
- (7) *Irish, object relativization, gap or RP* (McCloskey 1990:18)
- a. an fear aL bhuail tú ____
the man C struck you **gap**
- b. an fear aN bhuail tú **é**
the man C struck you **him**
'the man that you struck'
- (8) *Irish, embedded embedded relativization, gap or RP* (McCloskey 2011:75)
- a. an rud a shíl mé a dúirt tú a dhéanfá ____
the thing C thought I C said you C do.COND.2SG **gap**
'the thing that I thought you said you would do'
- b. an rud ar dúirt sé go gcoinneodh sé ceilte **é**
the thing C said he C keep.COND he hidden **it**
'the thing that he said he would keep hidden'

Apparently, Irish disallows matrix subject relativization under an RP strategy, while it is an available option for the other three contexts: embedded subject, matrix object, embedded object. RPs can thus occur in a certain pattern in Irish: **GRRR**². These kinds of relativization data were gathered for 18 languages which are of the grammatically resumptive kind.

2. The data: gaps and RPs across languages

The following table lists the findings for the languages which have been investigated so far. For each language, it indicates whether a gap, an RP, or a choice between the two is licit under extraction from the respective position. All relativization data and relevant language information have been obtained from the literature, from native speaker informants, or both. Note that no difference is made between full pronouns, clitics, or null pronouns, as the exact

²Gap/RP patterns will sometimes be represented as G or RP in the four extraction positions in this order: subject / embedded subject / object / embedded object.

choice is taken to be a language specific phenomenon:

(9) *Gap/RP distribution across languages in subjects and objects*³

	Subject	Embedded Subject	Object	Embedded Object
Akan	RP	RP	RP	RP
Brazilian Portuguese	Gap	Gap/RP	Gap/RP	Gap/RP
Czech	Gap	Gap/RP	Gap/RP	Gap/RP
Ga	Gap	RP	RP	RP
Hausa	RP	RP	Gap/RP	Gap/RP
Hebrew	Gap	Gap/RP	Gap/RP	Gap/RP
Irish	Gap	Gap/RP	Gap/RP	Gap/RP
Lebanese Arabic	RP	RP	RP	RP
Mandarin Chinese	Gap/RP	Gap/RP	Gap/RP	Gap/RP
Palestinian Arabic	Gap	RP	RP	RP
Polish	Gap	RP	RP	RP
Serbo-Croatian	Gap/RP	Gap/RP	Gap/RP	Gap/RP
Spanish	Gap/RP	Gap/RP	Gap/RP	Gap/RP
Tuki	RP	RP	RP	RP
Ukrainian	Gap/RP	Gap/RP	Gap/RP	Gap/RP
Vata	RP	RP	Gap	Gap
Welsh	Gap	RP	Gap	Gap
Yiddish	Gap/RP	Gap/RP	Gap/RP	Gap/RP
Yoruba	RP	RP	Gap	Gap

This table can be boiled down further by ordering the languages according to distinctive gap/RP patterns. Five patterns emerge:

(10) *Crosslinguistic distribution of gaps and RPs under relativization*

	Sub.	e. Sub.	Obj.	e. Obj.	Languages
Pattern 1	Gap	Gap	Gap	Gap	Cz., He., Ir., MC, SC, Sp., Uk., Yi.
Pattern 2	RP	RP	RP	RP	Ak., Ha., LA, MC, SC, Sp., Tu., Uk., Yi.
Pattern 3	Gap	RP	RP	RP	Bp., Cz., Ga, He., Ir., PA, Po.
Pattern 4	Gap	RP	Gap	Gap	We.
Pattern 5	RP	RP	Gap	Gap	Ha., Tu., Va., Yo.

³The data and their respective sources: Akan: Saah (2010), S. Korsah (p.c.); Brazilian Portuguese Grolla (2005), (M.C.T. Heberlein, p.c.); Czech: Toman (1998), Šimík (2008), Šimík (p.c.); Ga: S. Korsah (p.c.); Hausa: Tuller (1986), Crysmann (2012), B. Crysmann (p.c.); Hebrew: Borer (1984), Shlonsky (1992), O. Preminger (p.c.); Irish: McCloskey (1990, 2002, 2006, 2011), McCloskey (p.c.), G. O'Neill, L. Ó Laoire (p.c.), Duffield (1991); Lebanese Arabic: Aoun (2000), D. Zeidan (p.c.); Mandarin Chinese: Pan (2015), Pan (p.c.); Palestinian Arabic: Shlonsky (1992); Polish: Bondaruk (1995), J. Zaleska (p.c.); Serbo-Croatian: Bošković (2007), Z. Puškar (p.c.); Spanish: Suñer (1998); Tuki: Biloa (1990); Ukrainian: Lavine (2003), I. Zalevska (p.c.); Vata: Koopman (1982), Asudeh (2012); Welsh: Manning (1996), Willis (2000, 2011), S. Roberts (p.c.); Yiddish: Prince (1990), I. Gottesman (p.c.); Yoruba: Adesola (2005, 2010).

Some languages are listed for more than one pattern. In order to derive cases of optionality, the language in question is assigned the smallest number of patterns necessary to derive the gap/RP choices. Since optionality requires a decision at some point in every approach, the (most economical) assumption here will be that the grammar can choose between two (or possibly more) patterns which are attested independently. Note that pattern 1 represents every non-resumptive language as well as an optional pattern for several resumptive ones. Note that completely free alternation cannot be both modeled and predicted by the same theory. The present proposal derives both gaps and RPs in a coherent, principled fashion, but the decision between both is not determined theory internally.⁴ The present paper sets out to derive these patterns in a novel way and also explain the following generalizations (among others) which can be drawn from the data above:

(11) *Resumption Generalizations*

- Logically, 16 patterns could be expected (a choice between gap/RP in four positions), but only five are attested.
- Matrix subjects: many languages disallow matrix subject RPs, even as an option.
- Objects: matrix and embedded objects behave identically. Embedding alone appears not to play a role in grammatical resumption.
- Subjects: matrix and embedded subjects do not always behave identically.
- The occurrence of object RPs seems to entail the occurrence of embedded subject RPs.
- The occurrence of embedded subject RPs does not automatically entail object RPs.

Note that the second observation reflects a traditional generalization in the resumption literature dubbed the *Highest Subject Restriction*, *HSR* (e.g. McCloskey 1990, Shlonsky 1992). It has been analyzed as a property of C which can identify its specifier as an A-position, or as a disjointness requirement defined by Principle B, but extended to \bar{A} -binding contexts. See below for an alternative view.

An analysis which aims at deriving these patterns and properties of resumption in relativization will be proposed in the next section. We will return to these generalizations once they can receive principled explanations.

3. *A novel movement analysis*

The relative operator shares semantic and syntactic information with a resumptive pronoun in the extraction position which is relevant for matching with the external head. If both

⁴This is one issue all approaches to resumption share. If there is an indication that the choice of RPs over gaps serve e.g. a semantic purpose, as in the case of restricted readings in Hebrew relative clauses (Doron 2011), maybe the decision between both derivations can be deferred there.

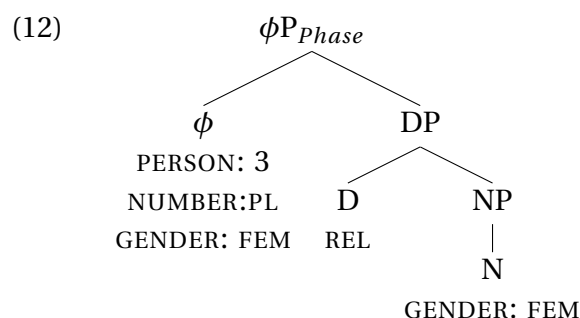
elements are inserted independently of each other (as in base generation approaches, e.g. Salzmann 2009, Rouveret 2011), a certain feature communication problem occurs. Either the resumptive needs to anticipate the form of the operator at the time it is inserted (*look-ahead*), or the operator, upon insertion, needs to have access to previous stages of the derivation (*backtracking*) in order to determine the nature of the extraction site. Both strategies pose a problem for Minimalist frameworks which assume bottom-up derivations in a strictly local fashion. Thus, successive-cyclic *Move* is the only option consistent with Minimalist tenets for relating the members of an \bar{A} -dependency, and two very prominent approaches are *copy-spellout* (Pesetsky 1998) and *resumption as stranding* (Boeckx 2003). It can either displace the entire operator-resumptive structure, or strand only the resumptive part in the extraction site. The former needs extra machinery to determine which copy of the relativized argument will be pronounced (top = overt relative operator, bottom = RP) and treats resumption essentially as a PF phenomenon. Thus, RPs should neither move or have an LF impact, contrary to fact (cf. e.g. Doron 2011; Biloa 1990; Bondaruk 1995). The latter suffers from certain, very resumption-specific assumptions (cf. Salzmann 2011) and the fact that, in order to insert a *Big DP* (operator DP and RP in one unit before the operator strands the RP) vs. a regular one (gap), look-ahead is necessary, too. Thus, this novel analysis will attempt to avoid these issues while still maintaining syntactic movement as the only connection between resumptives and their operators.

The present proposal is built on certain syntactic assumptions. A matching analysis for relative clauses is assumed (Munn 1994; Chomsky 1995; Sauerland 2003), such that the external relative head noun matches a relative operator at the edge of the relative clause in form (or semantically, if the form is null). The relevant phases are taken to be vP and CP, and the Phase Impenetrability Condition holds (PIC, Chomsky 2000). For agreement relations, a spec-head bias is assumed (Assmann et al. to appear), such that Agree between a head and a suitable goal in its specifier position is preferred over Agree with a goal in complement position. In addition, the following (maybe less common) ingredients are needed: a ϕP as a novel take on the Big DP, the notion of **antilocality** as a natural barrier for the creation of RPs, and a mechanism of **Phase Extension as Agree** in order to still strand RPs in well defined circumstances. Finally, a major role will be played by the **orders of syntactic operations** because the interactions of primitive operations such as Agree, Move, and Merge will be shown to be responsible for the distribution of gaps and RPs. Each of these assumptions will now be explained and motivated in turn.

3.1. ϕP

If the resumptive element and the operator are to be linked first and then separated by movement, they need to start out as adjacent parts of the same structure. Here, the assumption is that DP can function as an operator. This is similar to copy-spellout approaches which assume that the entire DP is present in both the extraction and operator site, but that only one receives phonetic realization; some languages (e.g. Polish) have overt relative pronouns

which function as operators. This DP is then embedded under a ϕ P head, a unit which has been independently proposed for semantic reasons by Sauerland (2008). NP contributes semantic content and presumably a gender value, while D is the locus of definiteness and, as in the case at hand, carries a REL feature, because ϕ only is the locus for ϕ material, nothing else. Lastly, ϕ takes over the phasehood status from D (cf. Chomsky 2005) and carries the remaining number and person features. It receives its missing gender value from NP, thus the structure of the argument to be relativized looks as follows⁵:



As the first step of a relativization operation, REL in the complement of ϕ is targeted for movement by an intermediate REL feature on a higher phase head (v or C)⁶. Two basic situations can arise now. Either the entire ϕ P leaves its extraction site, e.g. a direct object position, in order to successive-cyclically move first to Specv and, subsequently, to the operator position in matrix SpecCP, or only the DP part subextracts, stranding the ϕ layer. In the former case, no ϕ material is left behind, thus no RP will be inserted at PF. In the latter case, ϕ is stranded and can be computed into an RP at PF; its values are expressed as a regular pronoun of the respective language. Before stranding can occur, though, a syntactic obstacle has to be observed.

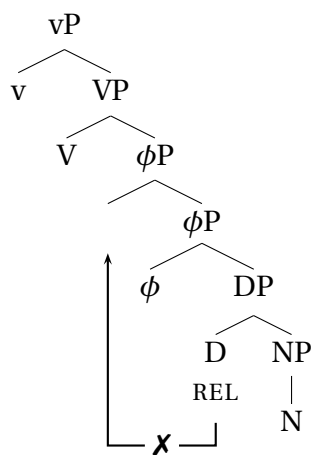
3.2. Antilocality

If DP wants to leave the ϕ domain, it first has to move to Spec ϕ P, the “escape hatch” of the phase, where it is accessible to operations triggered outside of ϕ P (due to the PIC). However, this very short movement step – complement to specifier of the same phase head – violates *Antilocality* (Bošković 1994, 1997; Grohmann 2003; Abels 2003). The step would be too short and not facilitate a formerly impossible agreement configuration. Thus, subextraction is ruled out, as in (13), and the only way for REL to reach its designated operator position is to pied-pipe its ϕ layer along (cf. the *Economy Condition*, Chomsky 1995; Heck 2008), thereby circumventing the antilocality issue (14):

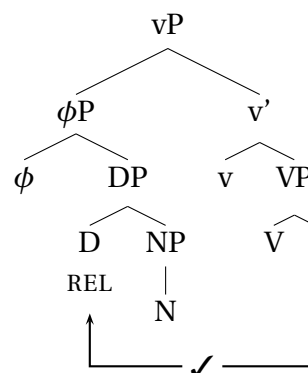
⁵Nothing appears to treat all arguments/DPs as having a ϕ layer. It is not specific to resumption; DP and ϕ will simply be realized as a single unit at PF if no stranding has occurred.

⁶Note that this is just one possible way of encoding successive-cyclic movement. The proposal is compatible with any implementation which acknowledges these steps.

(13)



(14)



This way, a resumptive could never be generated, because only a gap is ever left behind. This leads to the question of how DP_{REL} can be broken out of its phasal prison, which will be answered in the following section.

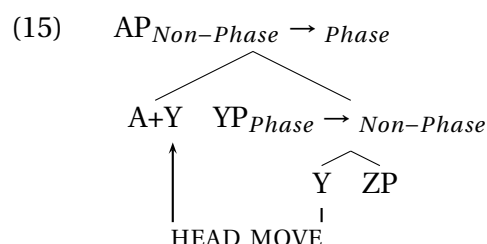
3.3. Phase extension and agree

In order to make the REL carrying DP accessible, two recent notions about the nature of phases and Agree will be invoked. First, since the phasehood status of ϕ causes the antilocality problem, maybe it can be changed. I will follow den Dikken (2006)'s notion of Phase Extension here, but the concept itself has also been proposed elsewhere (cf. Donati 1997, 2000; Hornstein & Uriagereka 2002; Gallego 2006; Alexiadou et al. 2014, among others). The core idea is that movement of one phase head upwards to the position of another one will void the lower head's phase status, thereby extending the higher head's domain to include it. I will follow the definition in (den Dikken 2006:1):

Phase Extension: Syntactic movement of the head H of a phase α up to the head X of the node β dominating α extends the phase up from α to β ; α loses its phasehood in the process, and any constituent on the edge [or in the complement⁷] of α ends up in the domain of the derived phase β as a result of Phase Extension.

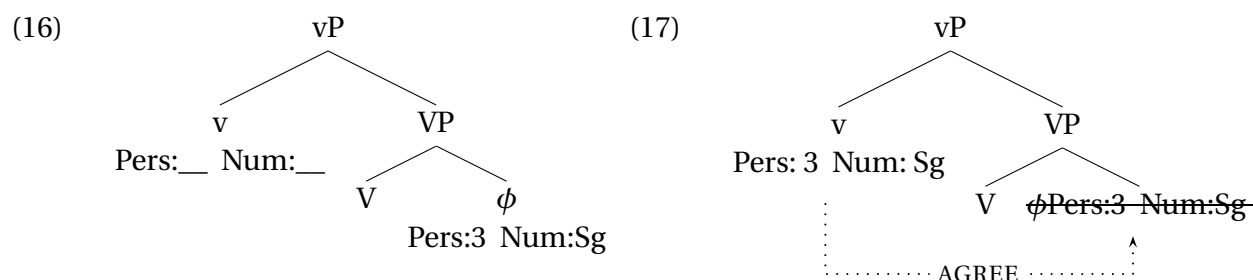
As an illustration: the head of a phase YP moves to the head of a higher (non-phase) AP . This causes YP to extend its phasehood status to AP , and A to become the new phase head:

⁷My addition; den Dikken is not concerned with the accessibility of complements here, but there appears to be no logical reason to exclude them, given that the phasehood of α has been voided.



Applied to the present proposal: if ϕ moved to v , ϕ 's phasehood would be voided, and DP would become accessible as an ordinary part of the complement of v .⁸ However, since this overt kind of head movement is not common in resumption (except for, arguably, clitic RPs), a related concept will be added: head movement as one instance of Agree.

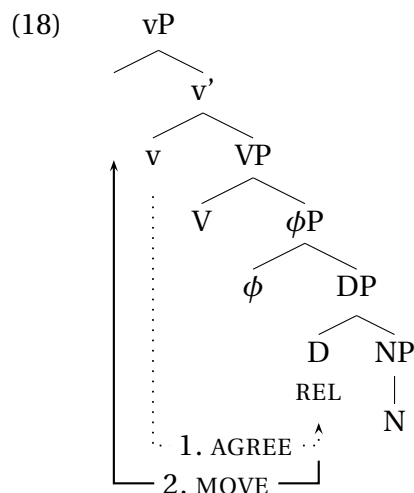
Roberts (2010) argues that head movement operations can be reanalyzed as agreement relations under certain conditions. Roberts takes clitics to be carriers of ϕ features but not case. Thus, in the scenario (16) below, ϕ 's features match v 's missing values exactly. Agree will copy ϕ 's features to v . Since identical values are present in two places now, the lower instance will go unpronounced, causing the appearance of a clitic on v (17):



Applied to the present proposal: since the ϕ P to be relativized has case⁹, it is not identical to v 's feature setup after Agree/head movement has taken place. Thus, on the one hand, Phase Extension has occurred (via Agree), while, on the other hand, ϕ will not go unpronounced and can still be realized as a resumptive. With ϕ P no longer being a phase, DP can be targeted for movement triggered by v , as in (18) below:

⁸For the application of Phase Extension, nothing hinges on v already being a phase. ϕ still loses its phasehood.

⁹Note that case assignment is assumed to occur upon merger with the assigning head; it is not dependent on prior Agree.



This way, the stranding of ϕ is facilitated, which will result in the insertion of an RP at PF.

3.4. The order of syntactic operations

As we have seen above, the decision between the gap and RP strategy depends on whether Agree takes place **before** Move or not. Agree can trigger Phase Extension only if ϕ P has not been moved yet: on the one hand, (formal) head movement cannot happen *downward* from the moved ϕ P in SpecvP to v. On the other hand, a moved item is an island for movement (Wexler & Culicover 1980), so that DP could not be subextracted on independent grounds.

In a derivational framework, two or more operations cannot simply take place at the same time. The fact that multiple operations can interact in certain ways has been discussed before (cf. Bruening 2005; Halpert 2012; Anand & Nevins 2005; Müller 2009; Assmann et al. to appear, see especially Georgi 2014, to appear, for an in-depth discussion). Here, Agree and Move interact in a transparent fashion: either Agree occurs first and, via Phase Extension, *feeds* the stranding of a resumptive, or Move occurs first and *bleeds* stranding via movement of the entire ϕ P. Simultaneous application (cf. Pullum 1979) of both operations cannot derive this interaction. We thus have to assume sequential application of operations triggered by the same phase head. Two options arise: operations can either be triggered in a random order (cf. e.g. Lakoff & Kisseberth 1972), or an order is set (cf. e.g. Williams 1974). In the former case, Agree and Move would interact transparently but unpredictably; gaps and RPs would occur at random, contrary to fact. Thus, the order has to be set, and again we are faced with two options; either grammar-internal properties require that a certain sequence of syntactic operations be set for the respective language, or the order is set extrinsically, outside of the grammar. I will assume extrinsic rule ordering, because the identification of grammar-internal reasons for each investigated language lies outside the scope of this proposal. Note that the existence of such reasons is not at all ruled out, though.

Once an order is set, it holds for each of the four extraction scenarios discussed here. Local re-ranking of operations on certain phase heads is neither assumed nor desirable, because

this would entail a decrease in the predictive power of this distribution analysis. Each phase head is “responsible” for a certain relativization position: the timing of operations is important on *v* for (embedded) object positions, while *C* decides the fate of (embedded) subject positions. If the higher phase head triggers Move before Agree, gaps occur, while RPs result if Agree applies first.¹⁰ Thus, the two operations Agree and Move give rise to two different orders, which, in turn, correlate with two distribution patterns¹¹:

- **Move > Agree:** Phase Extension cannot happen, gaps occur in every extraction position (GGGG)
- **Agree > Move:** Phase Extension is not bled, RPs occur in every extraction position (RRRR)

However, if the grammars of resumptive languages just had these two orders of operations to choose from, only non-resumptive languages and those with RPs throughout would be expected. In order to account for all patterns attested in (10), more syntactic operations are needed which can be ordered relative to each other.

3.5. Split movement and external merger

An important condition on any operation to play a role in this approach is that it be independently attested and not exclusive to resumption. Georgi (2014, to appear) investigates an interesting property of long distance dependencies: in languages in which a *C* element reflects movement through or into its specifier by certain markers, different patterns arise. The two standard cases are languages in which the affected *C*s show the same kind of marking (e.g. Irish) or none at all (e.g. Wolof). The more interesting cases are languages where only the highest *C* in a movement chain can be marked (e.g. Chamorro), or only the embedded *C*s (e.g. Wolof again). Apparently, the *C* whose specifier represents the final landing site of, an operator, reacts differently to the movement operation than lower ones. Georgi argues that this split in sensitivity should be matched by a split of the primitive operation Move into two instances, one for intermediate, successive-cyclic movement steps, and one for final movement steps which land an item in its final operator/scope/etc. position. This way, the highest *C* can show a different marking based on a slightly different operation.

If the same notion is assumed for this approach, we can now single out the highest *C* position which triggers gaps or RPs in the highest subject position in SpecvP below. *Final* Move (FM) can now apply *before* Agree for just the highest subject, but *after* Agree for all other subject and object positions (*Intermediate* Move, IM). Thus, two more patterns are made available¹²:

¹⁰This necessitates a disjunction of Agree and Move; the latter is not contingent on the former. Move is assumed to be able to target features in its domain, but checking and valuation is left to Agree.

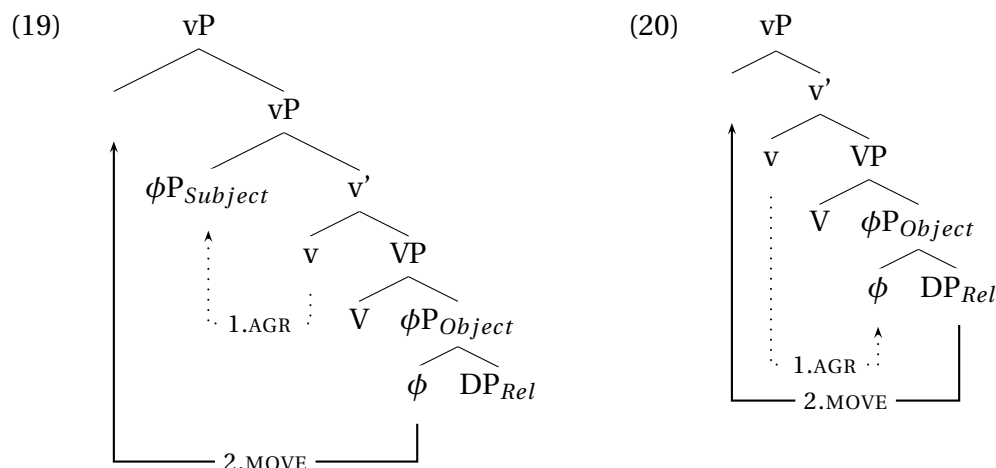
¹¹“>” translates as “is triggered/made available before”.

¹²Note that the relative order of both kinds of movement does not matter if they are adjacent in the hierarchy, as in Final Move, Intermediate Move > Agree or Agree > Final Move, Intermediate Move. This is because they cannot be triggered on the same phase head and thus do not interact in the relevant sense. See also chapter 4.

- **Final Move > Agree > Intermediate Move:** Phase Extension for all extraction positions but the highest subject (GRRR)
- **Intermediate Move > Agree > Final Move:** Phase Extension only for the highest subject position (RGGG)

The first new pattern readily accounts for languages which obey the Highest Subject Restriction. The second one represents a resumptive pattern which still needs to be attested. We still have two more attested patterns to derive (patterns 4 and 5).

The fourth and final relevant syntactic operation concerns all subject positions. Due to the Spec head bias which prefers Agree with a specifier (if both a specifier and complement are available), and since every argument is assumed to be a ϕ P, subjects can potentially interfere with v's agreement with an object ϕ P to be relativized. If the subject is present *before* Agree is triggered, it will target the subject, not the object; thus, a subject can bleed Agree for an object. As a result, Phase Extension does not happen for the object, and a gap occurs after Move takes place (19). If the subject is *not* present before Agree is triggered, it will target the object and feed ϕ stranding (20):



As can be seen, the merger of the subject plays a role within the operational hierarchy. It is labeled *External Merger*, EM and enter the group of operations relevant to resumption. If EM is ordered with respect to the other three operations, two more orders and patterns can be derived. Note that the 24 theoretically possible orders (4 positions in the hierarchy, 4 operations) only yield six distinct patterns. Firstly, only 16 patterns are logically possible, and, secondly, EM can only interfere on v heads, not Cs. Moreover, it can only interfere if ordered before Agree and Intermediate Move, because IM would bleed stranding independently:

- **EM > AGR > FM, IM:** Phase Extension happens before Move, thus RPs will occur in every position. However, EM bleeds AGR for objects, thus only subject RPs occur (RRGG).
- **FM > EM > AGR > IM:** Phase Extension happens before IM, thus all extractions except the highest subject will leave an RP. However, again, EM bleeds AGR for objects, leaving an RP only for the embedded subject (GRGG).

We now have identified 4 relevant syntactic operations which interact in 6 distinctive orders¹³: Final Move (FM), Intermediate Move (IM), Agree (AGR), and External Merger (EM). Their transparent interactions yield six distribution patterns:

- **Pattern 1** – FM,IM > AGR > EM = GGGG
- **Pattern 2** – AGR > EM > FM,IM = RRRR
- **Pattern 3** – FM > AGR > IM > EM = GRRR
- **Pattern 4** – FM > EM > AGR > IM = GRGG
- **Pattern 5** – EM > AGR > FM,IM = RRGG
- **Pattern 6** – IM > EM > AGR > FM = RGGG

Patterns 1-5 derive all patterns which are attested in the investigated languages. Pattern 6 has not been attested yet. In the following, a few sample derivations will illustrate this interaction approach in more detail.

3.6. Sample derivations

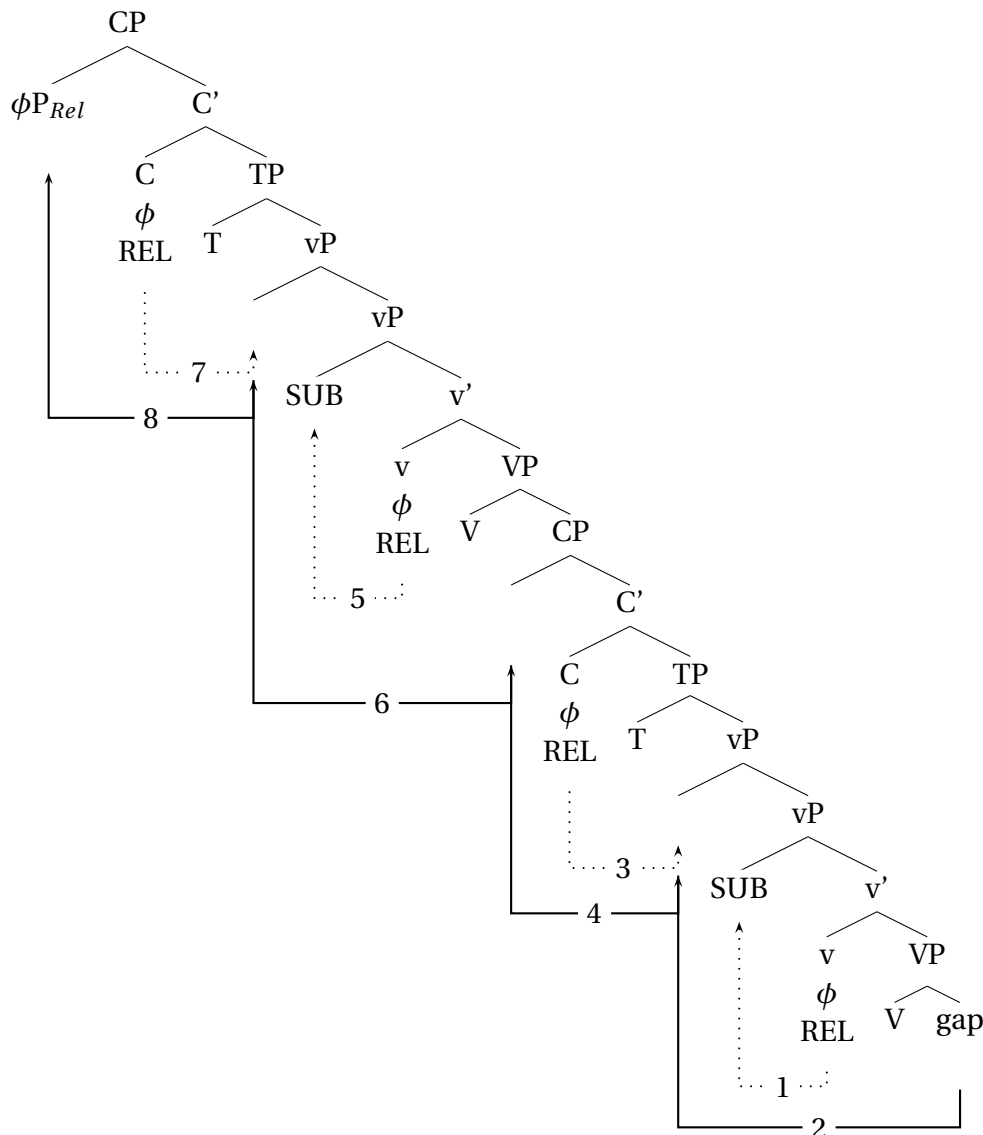
Relativization from an embedded object position under the gap strategy: Below, in (22), an object is extracted in order to become the operator in matrix SpecCP. Note that the non-phase heads T and V are included for the sake of completeness, not because they trigger any relevant operations. Yoruba shall serve as an example:

- (21) *Yoruba, embedded object relativization, gap* (Adesola 2005:90)
- a. Ewúrẹ̀ ni Olú sọ pé Adé rà ____
goat be Olu say that Ade buy **gap**
- b. *Ewúrẹ̀ ni Olú sọ pé Adé rà **a**
goat be Olu say that Ade buy **it**
'It was a goat that Olu bought, killed and ate.'

Yoruba's operational order **EM > AGR > FM > IM**, **pattern 5** leads to the occurrence of a gap in the embedded (and also non-embedded) object position:

¹³If 24 orders map onto six patterns, then each pattern has to be represented by more than one order. Here, only one order per pattern is presented as an example. See 4 for the complete list.

(22)

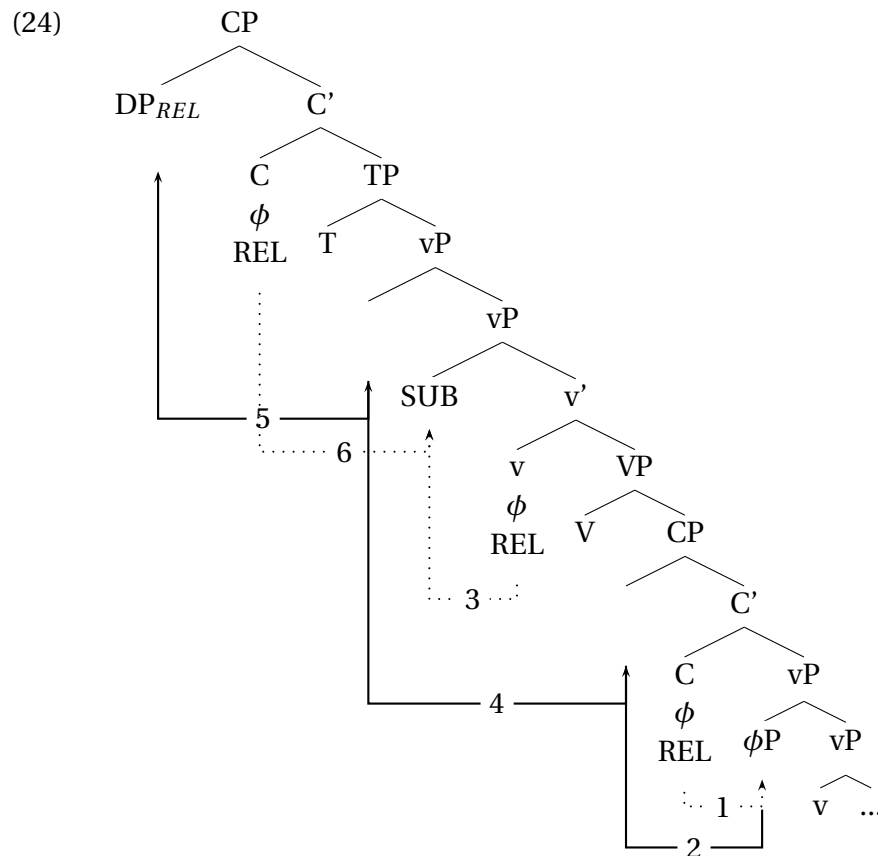


- 0:** Embedded *v* is merged. EM applies first, so both subject and object are present.
- 1:** AGR is up next. The subject interferes and is agreed with, and Phase Extension with the object does not happen.
- 2:** IM causes DP_{REL} to pied-pipe ϕP along to SpecvP. A gap is left behind.
- 3:** With *C*, the next operational cycle starts. EM is not triggered by *C*s, so AGR applies with the closest goal (the moved ϕP).
- 4:** FM is not triggered by embedded *C*. Phase Extension does not happen with the moved element in SpecvP, so IM moves the entire ϕP to *C*'s specifier, because *C* needs its REL checked.
- 5:** Next *v* cycle: EM applies first again, and AGR happens with the subject.
- 6:** IM moves ϕP from the edge of the embedded clause to SpecvP of the matrix clause.
- 7:** Final *C* cycle: AGR occurs with the moved ϕP .
- 8:** FM applies next, placing ϕP in matrix SpecCP position, its final landing site.

Relativization from an embedded subject position under the RP strategy: The same order, **EM > AGR > FM > IM**, **pattern 5**, leads to an RP in the embedded (and non-embedded) subject position. This illustrates how one extrinsically set order of operations can derive the correct distribution of both gaps and RPs within a single language:

(23) *Yoruba, embedded subject relativization, RP* (Adesola 2005:137)

- a. *Olú ati Adé ni Ojó sọ pé ____ ra iṣu
Olu and Ade be Ojo say that **gap** buy yams
- b. Olú ati Adé ni Ojó sọ pé **wón** ra iṣu
Olu and Ade be Ojo say that **they** buy yams
'It was Olu and Ade that Ojo said bought some yams.'



0: Embedded C is merged. The subject to be relativized is present in SpecvP.

1: AGR is the first operation on C. The goal is the subject ϕ P, and Phase Extension takes place. DP_{REL} , contained in ϕ P, is now accessible to operations on C.

2: IM causes DP_{REL} to extract from ϕ P. It is placed in SpecCP of the embedded clause. The ϕ P shell is left behind and can be realized by an RP at PF.

3: Matrix v cycle: V merges with CP, then v is merged. First, EM takes place. Then, AGR targets this newly merged subject.

4: IM targets DP_{REL} at the edge of the embedded clause and moves it to SpecvP of the matrix clause.

5: Final C cycle: AGR does not find suitable ϕ features on the moved subject and thus targets the matrix subject further below in its complement.

6: FM places DP_{REL} in its final landing site, matrix SpecCP.

These two derivations transfer easily to unembedded relativization contexts – the only change being fewer operations. This concludes the analysis section. In the following part, it will be shown how exactly the generalizations made in (11) can be derived.

4. Deriving the generalizations from interaction

The list of all logically possible orders of operations below shows how 24 different hierarchies map onto only six (of 16 possible) different gap/RP distribution patterns:

No.	Order	Subject	embedded Subject	Object	embedded Object	Pattern
1	F > I > A > E	G	G	G	G	Pattern 1
2	F > I > E > A	G	G	G	G	Pattern 1
3	F > E > I > A	G	G	G	G	Pattern 1
4	I > F > A > E	G	G	G	G	Pattern 1
5	I > F > E > A	G	G	G	G	Pattern 1
6	I > E > F > A	G	G	G	G	Pattern 1
7	E > F > I > A	G	G	G	G	Pattern 1
8	E > I > F > A	G	G	G	G	Pattern 1
9	A > F > I > E	R	R	R	R	Pattern 2
10	A > F > E > I	R	R	R	R	Pattern 2
11	A > E > F > I	R	R	R	R	Pattern 2
12	A > E > I > F	R	R	R	R	Pattern 2
13	A > I > F > E	R	R	R	R	Pattern 2
14	A > I > E > F	R	R	R	R	Pattern 2
15	F > A > E > I	G	R	R	R	Pattern 3
16	F > A > I > E	G	R	R	R	Pattern 3
17	E > F > A > I	G	R	G	G	Pattern 4
18	F > E > A > I	G	R	G	G	Pattern 4
19	E > A > F > I	R	R	G	G	Pattern 5
20	E > A > I > F	R	R	G	G	Pattern 5
21	I > E > A > F	R	G	G	G	Pattern 6
22	I > A > E > F	R	G	G	G	Pattern 6
23	I > A > F > E	R	G	G	G	Pattern 6
24	E > I > A > F	R	G	G	G	Pattern 6

In order to explain how this significant reduction (orders to patterns) comes about, the interactions within every order will be highlighted below. The main point is that not all operations can be triggered by (and, thus, interact on) the same phase heads, and that sometimes the relative order between two operations does not matter:

Orders 1-8: FM, IM > AGR > EM / FM, IM, EM > AGR → Pattern 1: GGGG

- *C, Subject*: Final Move bleeds Agree / Phase Extension
- *C, emb. Subject*: Intermediate Move bleeds Agree / Phase Extension
- *v, Object*: Intermediate Move bleeds Agree / Phase Extension
- *v, emb. Object*: Intermediate Move bleeds Agree / Phase Extension

Orders 9-14: AGR > FM, IM, EM → Pattern 2: RRRR

- *C, Subject*: Agree feeds Phase Extension / Final Move of DP
- *C, emb. Subject*: Agree feeds Phase Extension / Intermediate Move
- *v, Object*: Agree feeds Phase Extension / Intermediate Move
- *v, emb. Object*: Agree feeds Phase Extension / Intermediate Move

Orders 15-16: FM > AGR > IM, EM → Pattern 3: GRRR

- *C, Subject*: Final Move bleeds Agree / Phase Extension
- *C, emb. Subject*: Agree feeds Phase Extension / Intermediate Move
- *v, Object*: Agree feeds Phase Extension / Intermediate Move
- *v, emb. Object*: Agree feeds Phase Extension / Intermediate Move

Orders 17-18: FM, EM > AGR > IM → Pattern 4: GRGG

- *C, Subject*: Final Move bleeds Agree / Phase Extension
- *C, emb. Subject*: Agree feeds Phase Extension / Intermediate Move
- *v, Object*: External Merger interferes with Agree / Phase Extension
- *v, emb. Object*: External Merger interferes with Agree / Phase Extension

Orders 19-20: EM > AGR > FM, IM → Pattern 5: RRG

- *C, Subject*: Agree feeds Phase Extension / Final Move
- *C, emb. Subject*: Agree feeds Phase Extension / Intermediate Move

- *v, Object*: External Merger interferes with Agree / Phase Extension
- *v, emb. Object*: External Merger interferes with Agree / Phase Extension

Orders 21-24: IM, EM > AGR > FM / IM > AGR > EM, FM → **Pattern 6: RGGG**

- *C, Subject*: Agree feeds Phase Extension / Final Move
- *C, emb. Subject*: Intermediate Move bleeds Agree / Phase Extension
- *v, Object*: Intermediate Move bleeds Agree / Phase Extension
- *v, emb. Object*: Intermediate Move bleeds Agree / Phase Extension

All interactions are transparent and systematic. The orders rule in all five attested patterns (plus one which remains expected), and rule out the unattested ones. If we return to the generalizations made in the beginning, (11), they each receive a principled, derivational explanation:

Number of gap/RP patterns: The systematic and transparent interactions of the four relevant syntactic operations rule out most of the theoretically possible 16 patterns. In grammatically resumptive languages, it appears that RPs are not inserted solely based on the level of embedding, but on grammatical conditions.

Few matrix subject RPs: When the Highest Subject Restriction was first proposed (McCloskey 1990), and for some time after that, the pool of languages from which it was generalized was relatively small. From that point of view, it appears to be surprisingly robust in the face of all the work on resumptive languages since then. Half of the languages investigated here show this property. On the other hand, half of the languages actually allow for an RP in the highest subject position. Explanations such as the *\bar{A} -disjointness requirement* (McCloskey 1990) would thus have to be circumvented in a rather large number of cases. The present approach readily derives the HSR for the languages where it holds without the need for any further provisions. At the same time, it also explains why the restriction is not as robust as to hold completely crosslinguistically. The HSR is reflected by certain patterns (3,4) among others from which the respective grammar can choose.¹⁴

Objects: As it turns out, both matrix and embedded direct object positions behave identically when it comes to the choice between gaps and RPs. Still, it was necessary to investigate both contexts crosslinguistically in order to carve out this very fact. The explanation for this behavior lies in the nature of the syntactic operations which bring about gaps and RPs. The relevant operations for the stranding of an RP or leaving behind a gap in object positions are Agree and Intermediate Move, both of which have no means to discern matrix objects from embedded objects. Thus, none of them can be singled out and syntactically treated differently from the other. As a result, all possible patterns which show different behavior for both object contexts are ruled out.

¹⁴Admittedly, this defers the underlying “reason” for the HSR to a stage where the decision between patterns is made. Insofar, it cannot offer a natural explanation (yet), but it still has the benefit of not needing to resort to special requirements.

Subjects: Subjects, unlike objects, can show different behavior when it comes to the gap vs. RP strategy. This is because there is only one movement step for a matrix subject under relativization. Since there is a syntactic operation which specifically triggers movement into final positions (Final Move), it can be used to single out the highest subject position, while Intermediate Move is responsible for all other extraction positions first.

Object RPs = embedded subject RPs: Whenever direct objects obligatorily host a stranded RP, the embedded subject position follows suit and also hosts an RP. The explanation is similar to the one for the identical behavior of objects above. For the embedded subject, just as for both direct object contexts, the relevant interaction happens between Agree and Intermediate Move. Just as both operations cannot distinguish between matrix and embedded objects, they cannot single out the embedded subject position.

Embedded subject RPs \neq object RPs: The opposite situation does not necessarily arise; an RP in embedded subject position does not necessarily entail RPs in any direct object position. This is because External Merger only applies on v heads, not on C heads. Consequently, the merged subject can only bleed Agree (= Phase Extension) for direct objects, not any subject position. Thus, when the order is such that RPs occur in object and embedded positions, External Merger can still intervene and bring about languages which only have an RP in the embedded subject, but no object position (e.g. Welsh).

After the generalizations have been derived, a complete picture for all expected and unexpected distribution patterns can be painted. In the case of unexpected patterns, artificial languages have been chosen for the sake of exposition. They are ruled out for two main reasons: first, RPs in objects must entail RPs in embedded subjects (contra 7-8), and second, both object contexts must behave identically with respect to the relativization strategy (contra 9-16):

	S	eS	O	eO	
Pattern 1	G	G	G	G	Cz., Ge., He., Ir., MC, SC, Sp., Uk., Yi.
Pattern 2	R	R	R	R	Ak., Ha., LA, MC, SC, Sp., Tu., Uk., Yi.
Pattern 3	G	R	R	R	Cz., Ga, He., Ir., PA, Po.
Pattern 4	G	R	G	G	We.
Pattern 5	R	R	G	G	Ak., Ha., Tu., Va., Yo.
Pattern 6	R	G	G	G	? - not yet attested
Pattern 7	G	G	R	R	X
Pattern 8	R	G	R	R	X
Pattern 9	R	G	R	G	X
Pattern 10	R	G	G	R	X
Pattern 11	G	R	R	G	X
Pattern 12	G	R	G	R	X
Pattern 13	R	R	R	G	X
Pattern 14	R	R	G	R	X
Pattern 15	G	G	R	G	X
Pattern 16	G	G	G	R	X

This concludes the presentation of the core principles of the current proposal. In the final section, along with a summary, several further implications and benefits of this approach will be alluded to.

5. Outlook and conclusion

In this final chapter, a few further implications of this approach for the analysis of resumptive phenomena will be mentioned briefly.

5.1. The form of C

Two interesting observations can be made with regard to the C domain of resumptive structures (at least in relativization). First, in languages which have both inflecting relative pronouns and invariant complementizers, the occurrence of RPs strongly correlates with the occurrence of an invariant complementizer, while gaps entail a relative pronoun in SpecCP (e.g. in Czech, Polish, Serbo-Croatian, Yiddish). Other languages (can) use the invariant C for RPs as well as gaps (e.g. Akan, Hausa, Hebrew, Mandarin Chinese, Palestinian Arabic, Ukrainian, Yoruba). Since, in the present proposal, a gap is derived by moving the entire ϕ P to SpecCP, where it can be pronounced as an overt relative pronoun. An RP relativization only moves DP to SpecCP, which lacks the ϕ features to be pronounced overtly. Thus, a C element is inserted in the respective language. Cases in which the invariant C occurs with gaps can be handled by assuming language specific properties, e.g. the lack of inflecting relative pronouns. Importantly, there appear to be no cases where an overt relative pronoun is accepted together with an RP, in support of the ϕ P analysis.

Second, languages with more than one non-inflecting C element can signal the usage of the gap or RP strategy. The most prominent example is Irish which uses a C transcribed as *aL* for gaps, and *aN* for RPs¹⁵. If we assume two different elements moving through/to SpecCP (ϕ P vs. DP), then contextual insertion of the appropriate C does not seem unlikely. Note that gap-C in Irish heads every CP along a dependency chain, while RP-C is only found in the topmost CP (with *go* for embedded CPs). This could be modeled by making C sensitive to DP vs. traces of DP, for example.

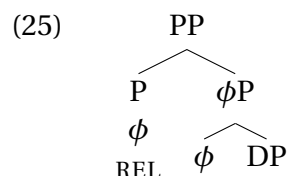
5.2. Prepositional objects

The fact that many languages obligatorily use the RP strategy when relativizing the object of a preposition (e.g. Akan, Hausa, Hebrew, Irish, Lebanese Arabic, Palestinian Arabic, Polish, Tuki, Welsh)¹⁶ can be derived within the current proposal by assuming P to be a phase head

¹⁵More intricate patterns exist (McCloskey 2002, 2006) which this approach does not currently address.

¹⁶Optional pied-piping, sometimes conditioned on properties such as [ANIMACY], can factor in and does not receive a unified analysis here.

(cf. Bošković to appear):



P can then trigger operations just like *v* and C, and facilitate RP stranding for its object. Note that PPs are simply embedded contexts for the purpose of this approach. As long as RPs in embedded contexts (subject and/or object) are derived, RPs in prepositional contexts will be derived, too. This is the case for all investigated languages, because embedded subjects allow for resumption in all attested resumptive patterns.

5.3. Islands

Notoriously, most resumptive languages allow for extractions from islands (with the exception of Mandarin Chinese and Palestinian Arabic)¹⁷. Since this approach sets out to derive the syntactic distribution of RPs, not any semantic effect, it also makes use of Move to derive island cases.

Again, the distinction into two structures can be exploited: ϕP contains a larger structure than DP, which can, arguably, be translated into more or different features. While this idea is not fully worked out as of now, the basic notion is appealing: the “bigger” ϕP cannot escape the island, while the “smaller” DP (leaving behind the offending ϕ part) can leave it via SpecIslandP. One possible implementation is the adoption of Müller (2010) who argues that certain elements can “maraud” (operator) features on C by moving to its specifier before the island operator can do so. The latter is thus not attracted by C anymore, the island will not be erected, and the derivation will not converge.

Since, within this proposal, the timing of operations plays a crucial role, such a bleeding effect can also be derived. Equipped with the respective set of features, ϕP / DP move to SpecCP inside the island. ϕP marauds features on C, while DP does not. Thus, in the latter case, the island can still be erected, and DP will still successive-cyclically move on, leaving behind an RP.

5.4. Multiple, intermediate, and moving RPs

As of now, no case of RPs in intermediate or multiple positions has come to my attention, leading to generalizations such as:

- (26) $*[\text{CP Op}_i \text{ C } [\text{TP T } [\text{VP RP}_i \text{ v } [\text{VP V RP}_i]]]]$

¹⁷Note that sometimes the type of island plays a role, and that complete sets of island data could not be obtained for every language investigated here.

This behavior is easily derived, because, if the ϕ material is stranded (=RP), it cannot be stranded a second time along the movement chain. Multiple RPs are, thus, ruled out systematically. Intermediate RPs, on the other hand, are ruled out by the independent observation that moved elements (ϕ P, in this case) are islands for extraction (Wexler & Culicover 1980). Phase Extension / stranding can only happen in base position. However, RPs can move after they are stranded (as e.g. in Hebrew). This is because movement *of* ϕ P is not prohibited after DP has been subextracted from it in base position.¹⁸

This paper has proposed an analysis for resumption in relativization based on the interaction of primitive syntactic operations (Move, Agree, Merge) and independently grounded assumptions (ordering, Phase Extension) within a Minimalist framework. Via transparent and systematic interactions of these operations, the gap/RP distribution patterns which are attested across languages can be derived. Many generalizations (including the HSR) receive a natural explanation under this approach, and additional, resumption specific mechanics need not be invoked. In addition to distribution, the analysis made certain predictions with regard to pending phenomena such as effects in the C domain, island avoidance, and RP behavior. Apart from finding an exponent of the expected pattern 6, extensions would be desirable along two dimensions: on the one hand, even more languages should be (re)visited in terms of their resumptive properties, and, on the other hand, more research should be conducted into resumption in other \bar{A} environments.

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¹⁸Note that this requires another movement feature/operation to be triggered after IM.

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The contribution of John Rupert Firth to the history of linguistics and the rejection of the phoneme theory.

Angela Senis

This article is meant to show how central Firth's particular position towards the phoneme is, in terms of constitution of the concept of phonaesthesia as a direct answer to the flaws he denounced in the phoneme. The rejection of the *phoneme theory* then led to the constitution of a whole and coherent theory of language now known under the name *Contextual theory of meaning* or even *Firthian linguistics*. It has eventually resulted in the creation of an independent school of thinking, the London School of Linguistics that has influenced many generations of British linguists.

1. Introduction

*If we regard Robins as the 'father of the History of Linguistics in Britain' today, we should perhaps call Firth the grandfather of this field of human curiosity about language and the manner in which it has been treated and used in the past 2,500 years.
(Koerner 2004:202)*

If John Rupert Firth (1890–1960) may be considered the 'grandfather of the History of Linguistics', it is all the more interesting to resort to a *mise en abyme* and apply such an approach to shed light on the idiosyncratic role he played in the acknowledgement and development of linguistics as an academic discipline. In such a respect, the phoneme theory has been a stepping stone crystalizing many of the topics Firth was concerned with. His treatment of the subject is quite emblematic of his general way of handling language and its study.

Though his two main biographies (Rebori 2002; Plug 2008) tend to show an early interest in languages, John Rupert Firth's initial academic formation was devoted to history. This aspect of his life was to have an everlasting impact on his own career as well as his students' and colleagues', the future members of what shall be known as the *London School of General Linguistics*.

Once his Master's Degree was obtained in 1913, Firth applied to the Indian Education Service (1915–1928). Though not a lectureship in history, Firth signed up for a job labelled 'Master of the Training Class for Teachers in European Schools' in Sanawar, the Punjab.

Serving in India reawakened Firth's interest in language studies. The acculturation stemming from that experience was, according to him, a necessary condition to guarantee both the objectivity and scientific character of his researches, allowing him to shed a new light on occidental linguistics:

A western scholar must de-europeanize himself, and, in view of the most universal use of English, an Englishman must de-Anglicize himself as well.
(Firth 1956a:96)

Thus, experience was also to play an important role in his conception of phonology. First, on a historical perspective, Firth perceives India as the 'home of phonetics' (Firth 1954 cited in Rebori 2002:171). Moreover, phonological features characterizing Indian languages as well as South-Eastern languages in general, such as the syllabary structure, were to play a major role in his theory.

Soon, his analysis of language met a major obstacle: a necessity to segment statements in order to better apprehend them (Firth 1930:182). This approach does not seem natural to Firth as it hampers his global contextual perception of language, but he eventually agrees on a necessity to identify and delimit constituents. Choosing a relevant unit for division proved to be a key step for Firthian linguistics though the choice of a segmentation unit was a hard task and a recurrent motive throughout his writings (Firth 1948a:147):

Strictly speaking, the grammatical method of resolving a sentence into parts is nothing but a fanciful procedure ; but it is the real fountain of all knowledge, since it led to the invention of writing.
(Firth 1937:15)

In that context, Firth came to consider different segmentations such as words, phones, sounds, as well as the *phoneme theory*:

It is not easy to determine what are the units of speech. Some would say speech sounds, others phonemes [...] The general opinion is, however, that words, not phones or phonemes or phoneme systems, are the units of speech.
(Firth 1930:182–3)

Though these considerations had at first a methodological background, we will establish that the subject turned out to be a major issue in this first half of the 20th century. Our reconstruction of Firth's own historiography of the concept of *phoneme*, scattered throughout his work, should provide the reader both with the contextual data of the time and Firth's very first impressions of the concept. We shall then discuss Firth's own acception of the phoneme in order to understand what he claims to be its limitations (its lack of universality and accuracy, its 'hypostatization' and finally the overall methodological criticism). As a consequence, we shall show that this stance eventually led to his rejection of the phoneme (both in terminology and concept), which was never to find its place in Firthian linguistics and mainly put him at odds with the global

scientific community. However, long-term consequences tend to show that it definitely fostered the phonaesthetic aspect of Firth's theory and *prosodic analysis* which was to become one of the hallmarks of the then emerging London School of General Linguistics.

2. Firth's historiography of the phoneme

According to Firth, the popularity of the phoneme was dramatically increasing among worldwide scientists of the beginning of the 20th century (Firth 1955) but Firth seems to have kept his distance. The concept was all the more important that he integrated Daniel Jones' staff in the Department of Phonetics at UCL on his return to Great-Britain (1928).

As soon as Firth's first published work, *Speech* (1930), language is tackled through a historical perspective. Therefore it seems quite logical that his investigations on the phoneme should start alongside the same methodological approach.

In a short 1934 paper entitled 'The Word Phoneme', Firth enlarges on the phoneme theory, offering thus a historiography of the concept. He dates it back to the Kazan School, to Baudouin de Courtenay and more specifically to his pupil Nikolaï Kruszewski with the publication of his *Über die Lautabwechslung* (1881¹). Firth also assigns the distinction between *sound*, *phone* and *phoneme* to Kruszewski though he does not relay the explanation himself. He then tries to establish parallels between Kruszewski's approach on the one hand and British phoneticians such as Daniel Jones and Henry Sweet on the other hand. He then expands the comparison to the main continental Schools (European and American).

This allows him to claim that the phoneme was implicitly present in the theories developed outside the Kazan School:

It [the phoneme] is implicit in Sweet's Broad Romic which dates back to about the same time as Kruszewski. It is implicit in many other orthographies.(...) Theoretically it appears in nuce in Jespersen's Lehrbuch, and also in de Saussure's Cours de linguistique générale, where something very like a complete theory appears on pp. 163-9. Similar notions can be found in the works of Sapir and Bloomfield.
(Firth 1934c:2)

Adding the Prague School and the Bloomfieldian perspectives to the viewpoints already mentioned allows him to develop a line for what he calls the *English School* (Firth 1934c:1), which was bound to become his *London School of linguistics*² a few years later. This gives an overview on the up-to-date scientific knowledge that characterizes Firth and that Robins (1961:197) describes as 'astonishingly wide'.

¹The first publication in Russian dates from 1879.

²Durand & Robinson (1974:5) point out the ambiguity linked to the existence of two *London Schools*: D. Jones' in UCL (University College London), mainly devoted to phonetics, and Firth's in SOAS (School of Oriental and African Studies), committed to linguistics in a broader way. The irreconcilable position of both scientists concerning the phoneme theory confirms the necessity of such a dichotomy. Moreover, as Jones' School pre-existed Firth's one, the necessity to thrive may have implied a competition between both men and departments best enlarged upon in Collins & Mees' *The Real Professor Higgins: The Life and Career of Daniel Jones* (1999) (cf. Jones 1955, 1957).

As a conclusion to his article, Firth gives a warning on the importance of terminology and especially on the 'phoneme' word. He concludes with what may appear as a baffling question:

The meaning of any ordinary word is subject to change without notice, but technical terms must be handled in that way. Notice must be given. A word of warning would appear to be necessary with regard to the word 'phoneme'. What does it mean?
(Firth 1934c:2)

This question is but partly rhetorical. It stands just after an overview of the different acceptations (From the Kazan, Prague, Danish and American schools) of the concept of *phoneme* and Firth thereby sheds light on the difficulty to define a word, a terminology and even a concept so widely used and, to his mind, abused. Each and every linguistic school is indeed offering its own definition of the phoneme when there is no clear consensus over any of them. On the other hand, Firth hints at this topic regularly throughout his work (Firth 1935a:21, 1948b:126,147, 1957a:220, 1955:46) as if he were really looking for the answer to his own question.

This lack of consensus is also denounced by Twaddell (1935) and Jones (1944) when the latter points out :

A striking fact emerges, namely that we find no commonly accepted definition of what a phoneme is. Possibly it is indefinable like the fundamental concepts of other sciences.
(Jones 1944:1)

3. Firth's acception of the phoneme

It is quite complicated to write about Firth's definition of the phoneme since he does not give a comprehensive, clearcut account for the phenomenon.

It may be argued that this stance is voluntary in order to avoid adding yet another definition to those already worked out by other linguists, each and every school favoring its particular acception:

One after another, phonologists and phoneticians seem to have said to themselves: 'Your phonemes are dead, long live my³ phoneme!'
(Firth 1948b:122)

However, his own students and colleagues (Robins 1961:198; Bazell et al. 1966) point out to a general lack of clarity in his published work and to the too few writings he left:

He [Firth] was not, however, it must be admitted, the clearest of writers, and one regrets the absence of a major book from him setting out in full and in detail his standpoint and his methods.
(Bazell et al. 1966:vi)

³All the emphasis in Firth's quotation are his, except explicitly mentioned otherwise.

His writings merely consist in four main publications, namely:

- *Speech*, 1930 (preliminary statements about language for a non-academic audience).
- *The Tongues of Men*, 1937 (history of languages and language sciences for a non academic audience).
- *Papers in Linguistics 1934-1951*, 1957 (Firth's compilation of his first scientific articles up to 1951).
- *Selected Papers of J. R. Firth 1952-1959*, 1968 (posthumous compilation of Firth's later articles by F. R. Palmer).

Today these publications have been edited into three volumes. The first one (dating from Peter Strevens' 1964 edition) brings together the two first booklets, *Speech* and *The Tongues of Men*. The two subsequent volume contain the thirty or so articles Firth wrote. Some of these articles were published by Firth himself in 1957, whereas the later ones where published by F. Palmer who played the role of literary executioner. Among these lasts, certain articles had never been published until then.

Therefore, the reader has to explore, pick and mingle the elements meant to reconstruct somewhat of a definition in these scarce writings. Another difficulty lies in the evolution and sometimes even contradiction certain notions may have undergone as Firth's writings extend over a span of 30 years. It dramatically increases the difficulty to reconstruct a whole coherent theory. However, we can all the same find recurrent motives from which a general definition may be induced.

As for the *phoneme* Firth's writings point to:

- a 'functional phonetic unit'

*This kind of functional phonetic unit has been termed a phoneme.
(Firth 1934a:3, 1930:171)*

- a vehicle of 'lexical and grammatical functions'

*Most of the vowel-phonemes of English, for example, can be established by such lexical and grammatical functions
(Firth 1934a:5)*

- an autonomous entity from what is called 'speech sound'

*The distribution of phonemes and phoneme variants must account for all the speech sounds used by typical speakers in careful and in rapid speech.
(Firth 1930:162-3)*

- a sum of sound variations depending on the context of the utterance

The phonetic amanuensis in striving to set on paper a collection of letters, dots, and other marks to represent exactly what he hears, may often miss the 'sound' the native speaker knows

(or feels) he is using for a particular purpose in a particular context.
(Firth 1934a:3)

The closest match to a definition has actually more to do with an illustration of the phenomenon through the Tamil language than a real definition. It is, nonetheless, quite useful in order to bring the different elements altogether:

*One of the functional units of Tamil, for example, is something which is not **p**, **t**, or **pp**, or **tt**, or even **kk**, but variously **k**, **g**, **c**, **ç**, **x**, **y** (**I.P.A.**), according to context. This kind of functional phonetic unit has been termed a phoneme. (...) As an illustration of what is meant by a phoneme, we may take the Tamil **k**-phoneme above. The alternant phones **k1**, **k2**, **k3**, **k4**, **k5**, **k6** necessarily occurs under the conditions **x1**, **x2**, **x3**, **x4**, **x5**, **x6**, which are directly observable and definable in one style of speech of a certain type of speaker from a certain place, and can therefore be represented by the sign **k**. The term 'similitude' may be applied to the relations **k1:x17**, **k2:x27**, **k3:x37**, &c., between the alternant phones and the determining conditions.*
(Firth 1934a:3–4)

As illustrated above, the context of utterance plays a fundamental role in the phonological interpretation. It may act on a personal or sociological level, or as Firth calls it, on a 'situational' one, as in the expression *context of situation* he cherishes. This central notion of *context* appears to assure the consistency of his whole theory, known as *the contextual theory of language*, linking its different aspects (phonology, morphology, syntax, etc.)

To sum up, we may say that a phoneme is thus a functional phonetic unit that may take on lexical and grammatical functions and which is made up of sound variations relying on social or situational contexts. Firth establishes a total of 45 phonemes in English:

In English we have noticed twenty-five consonant and about twenty vowel phonemes.
(Firth 1930:182)

4. Limits of the phoneme theory

Beside the lack of consensus over the definition of the phoneme, with each and every school offering an idiosyncratic vision (Firth 1934c:2, 1956a:99), Firth denounces a lack of universality, especially concerning syllabic languages. He also points out to a lack of accuracy and the 'hypostatization' of the concept while also addressing a major point of criticism regarding methodology in the language sciences.

4.1. *The lack of universality of the phoneme*

Firth points out to the discrepancy between the phoneme and syllabic languages. In this stance, his oriental influence linked both to Firth's personal experience in India and Africa, and to SOAS, where he had been teaching since 1938 is obvious. To justify his point of view, he is referring to languages such as Sanskrit (Firth 1948b:125) and Southeast Asian languages among which Chinese (Firth 1953:32) and Japanese, which he taught as a *restricted language* during World War II (Firth 1934a:125, 1950b:182). Firth also relies on the knowledge linked to the linguistic crucible characterizing SOAS with all the oriental and African languages Firth encouraged his students to learn (e.g. Arabic for T. F. Mitchell, Ethiopian languages for F. R. Palmer, Japanese for Robins, etc.). This resulted in the claim:

Those of us in the London Group who have specialized in the South-east Asian languages and in Chinese are inclined to the view that the phoneme theory, whether of the Jones, Prague or American type, is not the best approach, either in principle or in notation for the phonological analysis of these languages.
(Firth 1953:32)

He also bases his reflection on the work of Samuel Haldeman (1857) concerning the study of Chinese and more specifically its *syllabic character*. The writings of Sir William Jones (Firth 1948b:125) on the *Devanagari system* and the *Arabic alphabet* also had a major influence. His conclusion is quite sarcastic and emphasizes the difficulty, if not impossibility, to delimit and identify a phoneme:

For the Sanskritic languages an analysis of the word satisfying the demands of modern phonetics, phonology, and grammar could be presented on a syllabic basis using the Devanagari syllabic notation without the use of the phoneme concept, unless of course syllables and even words can be considered as 'phonemes'.
(Firth 1948b:125)

Firth considers the inadequacy of the phoneme concerning these languages to be a fundamental flaw. This explains the absence of this concept in his everyday analysis whatever the origin of the definition and pushes him to find, or create, an alternative.

4.2. *The lack of accuracy*

For Firth, it appears clearly that the phoneme cannot give account for certain specific characteristics of the sound, especially concerning length, tone, stress and tensivity:

Unfortunately in actual speech the substitution elements are not letters, but all manner of things we may analyse out of the living voice in action, not merely the articulation, but quite a number of general attributes or correlations associated with articulation, such as length,

tone, stress, tensity. The phoneme principles enables the transcriptionist to get down formulas for pronunciation, but lengths, tones and stresses, and such substitution elements present many difficulties, both practical and theoretical.

(Firth 1935a:21)

To palliate these deficiencies, he notes the existence of different sub-categorizations such as the *chroneme* and the *toneme* coined by Jones in 1944 (Firth 1935a:21, 1955:38):

Incidentally, Jones was one of the first to use the expression 'environment' in referring to the phoneme. In an article on chronemes and tonemes in Acta Linguistica, Volume IV, he describes phoneme variants as being 'used in particular phonetic environments'.

(Firth 1955:38)

This necessity to resort to subcategorization is for Firth but another proof of the inadequacy of the phoneme. Once again, languages such as Chinese may have fostered such an analysis because of the prevalence of tone in phonological contradistinction in that language.

4.3. *The hypostatization of the phoneme concept*

The relationship between the phoneme and the written sign is also problematic. Authors such as Graff (1935) define the phoneme as a purely phonic element with no tangible materialization:

In contrast with the phone, therefore, the phoneme is an abstraction; it represents a psychological unit embracing a number of possible phonic varieties.

(Graff 1935:93)

This quotation is to be put into perspective with Firth's criticism pointing out the immaturity of the concept as it is developed and analysed in W. F. Twaddell's *On defining the phoneme* (1935):

It is all rather like arranging a baptism before the baby is born. In the end we may have to say that a set of phonemes is a set of letters. If the forms of a language are unambiguously symbolized by a notation scheme of letters and other written signs, then the word 'phoneme' may be used to describe a constituent letter-unit of such notation scheme.

(Firth 1935a:21)

In the usage Firth describes here, the reader is confronted with what he calls a 'hypostatization' of the concept (Firth 1935a:21, 1948b:126, 147, 1951a:220, 1955:46), applying the concreteness of the letter used for its transcription, the connotation of the corresponding sign interfering in its use. Commenting on 'the general theory of the phoneme', Firth explains that the matter has to do

with both the hypostatization of the letters and the linear character of Indo-European languages, raising once again the question of segmentation :

The linearity of our written language and the separate letters, words, and sentences into which our lines of print are divided still cause a good deal of confused thinking due to the hypostatization of the symbols and their successive arrangements.
(Firth 1948a:147)

As for him, the linear sequence of written signs characteristic of Indo-European languages does not systematically coincide with phonological segmentation and is therefore partly responsible for a certain confusion linked to that hypostatization phenomenon. Once again, the growing awareness over the limitations of his mother tongue (and its study) is interwoven with his deculturation and knowledge of oriental languages. It reveals a capacity to focus on his own language without necessarily considering it a central norm from which other linguistic specificities would then be analyzed as mere deviances.

4.4. *A methodological criticism*

In Firth's point of view, the acknowledgement of characteristic recurring phonological contexts (that may concern phenomena such as recurring sequences, positions, phonic alternation...) should come first (Firth 1948a), even before the identification of phonemes. Contextualization is a fundamental analytic tool for the London School (Firth 1935a:21, 1952:19). This is true for phonology as well as any other level of analysis (syntactical, morphological, etymological, etc.) taking part in the spectrum of analysis. Firth gives a clear account of the way it should be applied to phonology:

Now take the English s-phoneme. To some phoneticians the English s is merely a hissing sound which has no variants. But the English s can occur in a large number of phonetic contexts. It may be initial, intervocalic, and final, preceded and followed by a variety of other phonemes.
(Firth 1934a:4)

Beside the immediate phonological context mentioned above, Firth alludes to a larger context transcending phonology which allows him to further assess the essentiality of the contextualization:

By contextualization is here meant, not only the recognition of the various phonetic contexts in which the phonemes occur, but the further identification of phonemes by determining their lexical and grammatical functions. Most of the vowel-phonemes of English, for example, can be established by such lexical and grammatical functions.
(Firth 1934a:5)

Firth denounces its general absence from the mainstream linguistic analysis (1934c, 1935a, 1955), raising here a major methodological question, all the more important in that it will become one of the characteristics of the London School of Linguistics.

Though Palmer writes about ‘the complete rejection by Firth of the phoneme as a satisfactory basis for phonological analysis’ (Palmer 1968:8), Robins is more moderate in his analysis and considers that this rejection was only partial, and was mainly founded on the necessity to establish a dichotomy between transcription and phonological analysis:

Firth’s opinion on the phoneme concept was simply that it was an excellent and even indispensable means to an adequate broad transcription, wherein the need to segment all the relevant phonic material was paramount, but that transcription and phonological analysis were two different things and not best served by the same methods.
(Robins 1961:197)

However, what Firth says or implies does not seem to corroborate such a nuance. In ‘The word phoneme’ (1934c), Firth does speak about an adequacy between broad transcription and the phoneme concept but rather by the implicit existence of the phoneme in the works of phoneticians such as Sweet resorting to broad transcription. This does not lead to the same implications, and most of all does not leave the door open to the acceptance or integration of the phoneme concept in his own theory. All these limits listed above eventually led to his confirming outcry:

The monosystemic analysis based on a paradigmatic technique of oppositions and phonemes with allophones has reached, even overstepped, its limits!
(Firth 1948b:137)

Regarding Firth, all the limitations listed above tend to explain why *the bell tolls* for the *phoneme theory*, to hint at the expression later used by Robins (1997) in his paper dealing with Firth’s contribution to the field of history of linguistics. This definitely led to his rejection of the concept when Daniel Jones at UCL finally decided to resort to the phoneme, devoting to the concept his famous *The phoneme: its nature and use* (Jones 1955). These two diametrically opposed views epitomized the growing schism between both London schools, justifying the existence of each of them.

5. *Consequences of the rejection of the phoneme theory*

Firth’s stance against the phoneme fostered two kinds of consequences. The short term ones consist mainly in a choice of terminological and conceptual tools as well as his overall alienation in the scientific world. The rejection of the phoneme eventually led to longer term consequences such as the development of the phonaesthetic aspect of his theory and of *Firthian prosodic analysis* which was to become the hallmark of the London School in phonology.

5.1. Short term consequences

Based upon the limits mentioned above, Firth eventually decided to discard the phoneme terminology and resort instead to the term ‘sound’:

I have purposely avoided the word ‘phoneme’ in the title of my paper, because not one of the meanings in its present wide range of application suits my purpose and ‘sound’ will do less harm.
(Firth 1948b:122)

The word *sound* is therefore supposed to be devoid of many of the flaws characterizing the phoneme. More universal, as it appears to Firth, it also wards off what was just referred to as the hypostatization of the concept since *sound* makes it clear that we have to deal with an acoustic entity. Besides, it is a direct translation of Kruszewski’s and Trubetzkoy’s German *Laut* which gives the terminology a certain legitimacy.

However categorical his opinion might appear, Firth’s statement should, nonetheless, be qualified here since he cannot banish completely the *phoneme concept* and terminology when exchanging with other scientists and seems aware of the limits of his rejection:

For my part, I would restrict the application of the term to certain features only of consonants and vowels systematically stated ad hoc for each language.
(Firth 1948b:122)

This position puts him at odds with general scientific trends, Palmer describing him as ‘a voice crying in the wilderness’ (Palmer 1968:1). However, this alienation from other scientists does not necessarily mean a less important role on the international scientific scene as Robins mentions in his obituary:

Though in academic life Firth was at the center of linguistic studies and linguistic interests in Great Britain, doctrinally he stood rather outside the stream of contemporary linguistics, both by his general approach to the subject and by the particular directions in which he sought to advance linguistic theory.
(Robins 1961:193)

Beside Firth’s ‘general approach’ and ‘the particular directions’ that characterize him, we may add to Robins’ quotation another factor to what he describes as Firth’s ‘apparent insularity’ (Robins 1961:196). It is best developed by Palmer in the autobiographical article printed in *Linguistics in Britain: personal histories* (Brown & Law 2002):

I must, however, say that I got on well with Firth and that we remained on very friendly terms right up to his death in 1960. Yet I admit that he was brusque, often to the point of rudeness, and autocratic - especially on his demand that nothing should be offered to publication without being read and approved by him.
(Palmer 2002:232)

This aspect of Firth's temper is confirmed by Honeybone in Chapman and Routledge's *Key Thinkers in Linguistics and the Philosophy of Language* (2005):

Some recognise both malign and positive aspects of Firth's influence, describing him as autocratic and impolite. He controlled what most members of the London School could publish and suppressed linguistic ideas which he disapproved of, for example, the phonology done at UCL. This aggressive attitude, coupled with the need for personal contact to perceive his inspirationalness may have contributed to the waning of interest in Firthian ideas.
(Honeybone 2005:83)

As a concrete resurgence of such behaviour may be quoted Firth's ironical denunciation of the point of view exposed by Leonard Bloomfield in *Language* (1933) and more specifically the part phonemes should play in the structure of language, deliberately mocking Bloomfield's terminology:

He used the term 'structural order' in a different sense, but nowhere finds any technical use for the word system. The index enters phoneme and phonemic, but no phonemics or phonemicize and, we may be thankful, not re-phonemicize. Strange as it may seem there are only three entries for the word structure.
(Firth 1955:38)

Beside the sarcastic tone used by Firth, this quotation shows how much the terminology of the two contemporary scientists may have differed. The phoneme theory appears as the tip of the iceberg in the process, giving us a glimpse of only more profound disagreements on the structure of language and its study, thought as definitely polysystemic by Firth (1948b:121, 1952:24, 1955:43, 1957e:200).

Pointing out what Firth considers as complete nonsense stemming from the phoneme theory, he adds:

And yet, as we shall see, it is largely the later development of the phoneme theory which has provided most of the subject matter of structural linguistics, especially in America, where linguistics is, to all intents and purposes, phonemics, with an additive morphemics, plus the supplementary amendments of morphophonemics
(Firth 1955:40)

The above quotation shows Firth's ability to play with words to imply meaning beyond their simple definition. In his view, the phoneme theory led to two major fields of study. The first one *phonemics* he denounces as irrelevant (as has been shown in this paper) and the second one, *morphemics*, he seriously compromises through his phonaesthetics approach, which implies meaning at a sub-morphemic level. The ultimate 'would be achievement' he describes, *morphophonemics* does not seem to be able to transcend the first two domains, as if getting involved in such studies definitely meant going around in circles, lacking in scientific developments and productive attitude.

As Robins puts it, 'Fortunately he [Firth] was not a recluse among scholars' (Robins 1961:199) and proof is given in the introduction to the *Selected Papers of J. R. Firth*, where Palmer relates a discussion between Bernard Bloch and Firth, anchoring both men in the contemporaneous linguistic debate. It shows how much Firth was a man of conviction, and that he is definitely willing to share and impose his ideas on other scientists:

Firth : 'The phoneme is dead.'
Bloch: 'It's got a pretty lively ghost'
 (Palmer 1968:8)

This talk is all the more relevant as both linguists are considered the authors of two of the three founding texts of auto-segmental phonology (Bloch 1948; Firth 1948b; Hockett 1955⁴). The titles of the articles in question, Bloch's 'A set of postulates for phonemic analysis' and Firth's 'Sounds and prosodies' are quite eloquent on the approach of both scientists and obviously prefigured the contrast opposing Bloch's 'phonemic' and Firth's 'sound'.

As far as auto-segmental phonology is concerned, it will be further developed by John Goldsmith in his Ph.D. thesis in 1976. It aims at representing phonological sequence by parallel linear lines (called 'tiers') describing different distinctive features, such as voice, ton, stress, length... So, finally, auto-segmental phonology is meant by Goldsmith to compensate for the lack of information conveyed by the phoneme, as denounced by Firth (1935a:21, 1953:28).

Firth's stance concerning the phoneme theory is not completely isolated since it echoes Jespersen's, whom he refers to regularly (Firth 1934c:2, 1935a:24, 1949:169, 1950b:179, 1951a:219, 1955:42, 1957b:139, 144). In *The Structure of Grammar* published in 1933, Jespersen refers to previous works:

Though I have not used the word phoneme and the new technical terms introduced by the recent "phonological" school developed especially in Prague—I think that I have done justice to the valuable theories advanced by that school, even more than in MEG [A Modern English Grammar 1909] and Lehrbuch der Phonetik, in which some of its points of view may be found in nuce.
 (Jespersen 1933:246)

⁴ The three texts alluded to are: Firth, J. R. (1948b). Sounds and prosodies. *Papers in linguistics: 1934-1951*, Oxford University Press, pp. 121–138; Hockett, C. F. (1955). International journal of american linguistics. *A manual of phonology*, Waverly Press; Bloch, B. (1948). A set of postulates for phonemic analysis. *Language* 24:1, pp. 3–46.

It is quite interesting to compare Jespersen's quotation to Firth's in 'The word phoneme' (Firth 1934c:2):

As for the "phoneme idea", quite simply it must be regarded as implicit in the work of all phoneticians and orthographists who have employed broad transcription. (...) Theoretically it appears in nuce in Jespersen's Lehrbuch.

(Firth 1934c:2, the same idea is developed again in Firth 1949:169)

Firth literally makes Jespersen's words his own, up to the latin expression *in nuce*. It can scarcely be a coincidence in so far as Firth seems very familiar with Jespersen's work and the linguist himself. This may be explained on the one hand because of Jespersen's connections with British language scientists and especially Henry Sweet whom he was a student of, and on the other hand by an epistolary relation with Firth, at least during the 1920s, letters from which Vitoria Rebori (2002:177) found traces of in the SOAS archives.

In a similar way, Firth also mentions the distrust of Hjelmslev towards the phoneme concept. Though Firth claims he does not share Hjelmslev's 'fundamental assumptions' which he relates to saussureanism, he finds his 'quasi-mathematical approach excellent in that general quality' (Firth 1957a:127). As for Jespersen, Firth often quotes and discusses Hjelmslev's positions throughout his writings (Firth 1948a:140, 1951a:217–221, 227–228, 1953:28, 1955:44–46, 1956a:101–103, 1957a:127) and more specifically that excerpt aiming at defining the language, whose fifth point specifically deals with phonemes:

(1) A language consists of a content and an expression.

(2) A language consists of a succession, or a text, and a system.

(3) Content and expression are bound up with each other through commutation.

(4) There are certain definite relations within the succession and within the system.

(5) There is not a one-to-one correspondance between content and expression, but the signs are decomposable in minor components. Such sign-components are, e.g. the so-called phonemes, which I should prefer to call taxemes of expression, and which in themselves have no content, but which can build up units provided with a content, e.g. words.

(Hjelmslev 1947:78, as argued in Firth 1951a:220, 1955:46)

Interestingly enough, Hjelmslev explains, concerning 'Structural Analysis of Language', that he developed examples for a series of lectures he gave in the University of London and whose aim was to:

Throw light upon the five fundamental features which, according to [his] definition, are involved in the basic structure of any language in the conventional sense.

(Hjelmslev 1947:78–79)

Though no evidence could be found to confirm Firth's attendance to the lectures, it is more than likely that he must have known about them and their content one way or another, all the more so as he quotes specifically that excerpt.

It seems clear that, for Hjelmslev, the phonemes or taxemes of expression are associated with the sign. He thus confirms Firth's fear concerning the ambiguity of the alphabetic sign to stand for an acoustic element.

We actually find traces of similar reaction to the phonemes in the literature. Firth often refers to Trubetzkoy and his *Grunzüge der Phonologie* (Trubetzkoy 1939). It happens that one of Trubetzkoy's letter to Roman Jakobson relates to what happened after the Second International Congress of Phonetic Sciences held in London, from July 22nd to 26th 1934 under the Presidency of Daniel Jones:

After the farewell dinner, several members of the Congress produced pieces for entertainment, the one a humorous speech, the other a comic song. Under the present circumstances, it should be noted that the word phoneme always produced unanimous bursts of laughter. Horn read a poem in Middle English of his own invention, which described the Congress and ended with the following words :

*wat is phonemes, wat is sunds
twelf men haf twelf difinitiums.*

*After that everyone quoted these lines, drawing unanimous applause.
(Letter 149, 3–4 August 1935, Trubetzkoy & Jakobson 2006:344)*

This confirms the distrust and mockery the phoneme concept might arouse but also the problem linked to the multiplicity of definitions already mentioned here.

Such a story also tends to show that Firth was not completely 'a voice crying in the wilderness' as Palmer wrote it (Palmer 1968:1) but may have found isolated echos on the international scientific scene, as has been proven by the above quotations of Jespersen, Hjelmslev and Trubetzkoy.

5.2. Long term consequences

To these short term consequences may be added longer term ones linked to Firth's conceptualization of language (through phonaesthesia) and its epistemology (prosodic analysis). Indeed, when Firth finally decided to reject the phoneme, he put forward many limitations, which he tried to make up for in his own theory of language. Its phonological aspect then aims at proposing an alternative conception of language and tools that may account for its phonological structure beyond the phoneme unit.

In the introduction to the *Selected Papers*, Palmer identifies the complete rejection of the phoneme as a catalyst for the *prosodic analysis approach*:

The starting-point for the prosody was essentially the complete rejection by Firth of the phoneme as a satisfactory basis for phonological analysis.
(Palmer 1968:8)

This seems to be confirmed by Terence D. Langendoen in his *The London School of Linguistics* (1968) though it is generally perceived as a staunch criticism on Firthian linguistics and arose a few reviews (Robins 1969; Lyons 1969) denouncing among other things the Chomskian commitment of the author:

*Actually, three stages in Firth's thinking on phonology can be distinguished. In the earliest papers in the early 1930's he propounded essentially orthodox Daniel Jones phonemics. By 1935, however, he had come to a position roughly equivalent to that of W. F. Twaddell in the latter's *On Defining the Phoneme*. Finally in 1948 he published an account of his theory of prosodic analysis, which in essence is very much like Z. S. Harris' theory of long components first expressed in 1945.*
(Langendoen 1968:5)

Despite his controversial explanation of Firth's linguistic theory, Langendoen points out to the same sequence of events as Palmer: his position concerning the phoneme is seen as the stepping stone towards the development of this own approach, namely *prosodic analysis*.

This approach is the province of the London School of Linguistics and as Robins points out, the phoneme soon became completely incompatible with the prosodic approach and therefore with the whole School:

Nor was sufficient attention paid to questions about the relations between prosodic theory and phonemic theory (or theories), and indeed the opinion gained ground that to anyone at all sympathetic to prosodic analysis the phoneme and all its works were dead and probably damned as well.
(Robins 1961:196)

Therefore, Palmer's assertion can be developed even further since this refusal of the phoneme theory to the benefit of the prosodic analysis may be seen as one of the first key steps marking the birth of Firth's London School of General Linguistics (at SOAS from 1938 on), taking its scientific independence through a definitive schism from Jones' London School of Phonetics at UCL on the central theme of the phoneme.

6. *Phonaesthetics*

Firth's handling of the so-called 'phoneme theory' is all the more interesting that it reflects his general point of view on language and its study. As for him, meaning is the main concern of the linguist:

*This could only be the case if, as I have frequently emphasized, linguistics recognizes that its principal objective is the study of meaning in its own terms (Firth, 1950, 8-14; 1951, 182-4; 1951, 118).
(Firth 1957b:145)*

Moreover, meaning must be sought 'at all levels of linguistic analysis' (Firth 1951b:192) through the context of situation. In this, the phoneme definitely failed to convince him. This explains that Firth comes to develop the concept of phonaesthetics as soon as 1930, which he defines more precisely in 'Modes of meaning':

*There is, therefore, an association of social and personal attitude in recurrent contexts of situation with certain phonological features. (...) In previous discussion of this mode of meaning, I invented a word, phonaesthetic, to describe the association of sounds and personal and social attitudes, to avoid the misleading implications of onomatopoeia and the fallacy of sound symbolism.
(Firth 1951b:194)*

To give a concrete instance, *sl-* in 'slug', 'slope', is, according to Firth, linked to a 'pejorative context of experience' and to salivation (Firth 1930:184; 1935b:44; 1956d:92). However, it must be noted that, despite his desire to depart from the phoneme, Firth eventually defines the "dark' l sound' phonaestheme that appears in words like 'wobble', 'fiddle' (in frequentative, iterative, and diminutive actions) by explicitly resorting to the phonemic terminology as soon as its designation. (1930:193).

Phonaesthetics, the study of phonaesthesia, thus gave birth to a total of 37 phonaesthemes among which 28 *chiming* ones (*bl-*, *br-*, *dr-*, *dw-*, *fl-*, *gl-*, *gr-*, *kl-*, *kr-*, *kw-*, *pl-*, *pr-*, *sh-*, *sk-*, *skr-*, *skw-*, *sl-*, *sm-*, *sn-*, *sp-*, *spl-*, *spr-*, *st-*, *str-*, *sw-*, *tr-*, *tw-*, *w-*) and 9 *rhyming* ones (*-er*, *-ick*, *-ip*, *-irl/-url*, *-isk/-isp*, *-l*, *-oop*, *-rawl*, *-ump*) thereby combining sounds with meaning on a sub-morphemic level.

Phonaesthesia definitely jeopardizes the status of the morpheme as *a minimal unit of meaning* (Bottineau 2008) as it was defined since Baudouin de Courtenay (1895:10; cf. also Bloomfield 1933:166)

Though phonaesthetics proved to be a major contribution for the London School of Linguistics, fostering future corpus studies because of its predictive nature, Firth does not quite solve here all the problems he denounced regarding the phoneme, such as its hypostatization since the phonaestheme seems as deeply linked to the graphic sign as the phoneme.

However, phonaesthesia presents the advantage of being based on the 'phonetic habits' (Firth 1930:180–188) and thus on the context of utterance and of situation.

Phonaesthesia may also be isolated both in Indo-European languages and in syllabic ones:

I have collected hundreds of examples of such sound-patterns in German, Dutch, and the Scandinavian languages and tested them in consultation with native students. Many more also from Indian and other Asiatic languages collected either during residence in Asia or from students in England.
(Firth 1935b:45)

Phonaesthesia is an important aspect of the European languages explicitly mentioned here and to which English should of course be added. This phenomenon also occurs in Asiatic languages. Among these stand out Indian languages Firth wrote a lot about (1933, 1934b, 1936, 1938, 1939, 1942, 1944, 1950a, 1956b, 1956c, 1957c) and the Japanese language (Firth 1948b:125) he taught as a *restricted language* during World War II.

7. Conclusion

Firth's questioning of principles taken for granted by early 20th century occidental linguists led people to doubt and take enough distance to envision the limitations of some widespread concepts, such as the phoneme. As Palmer writes, Firth simply made people think:

His greatest achievement was perhaps simply that of making people think again and refuse merely to accept traditional approaches to language, by, for instance, questioning the value of normative grammar and the validity for language study of the dualism of mind and body.
(Palmer 1968:1)

Besides Firth's own knowledge, his aptitude for fostering academic reflection and for encouraging both his colleagues and students is a recurring motto in all testimonies (Palmer 1968:1; Robins 1997:67). These traits seem to have contributed largely to his reputation. His academic formation in history and his experience both in India and in Africa during World War I are definitely complementary. They allowed his conception of language to transcend both his time (the 20th century) and his cultural identity (Englishman studying his own mother tongue) accounting for his own approach of both language and its epistemology. In this regard, he fulfilled his desire for de-culturation' (Reborel 2002:171). This idiosyncratic perspective led him to take up a position on significant matters such as the phoneme concept which, as has been shown in this paper, played the role of a catalyst for the development of his linguistic theory. Finally, it also had a great impact beyond the circle of Firth's department at SOAS. As a short-term consequence, the phoneme marked the rupture between Daniel Jones' approach and Firth's. On the other hand, it fulfilled the necessity for Firth to assert himself as an alternative in terms of scientific representation and academic formation for students. Moreover, it fostered the creation of the phonaestheme which appears to be, in Firth's view, an answer to the phoneme theory. *Phonaesthesia* may be analyzed as the adaptation of Firth's *contextual theory of meaning* on the phonological field, just as *collocation* and *colligation* (key notions that appear as soon as

1951b) embody the direct application of that same *contextual theory of meaning*, respectively in the lexical and grammatical spheres. This recurrent holistic scheme, initiated with the dynamics of the phonaesthetic theory as a reaction to *the phoneme theory*, would constitute the specificity of what would later be called *Firthian linguistics* in the 1960s.

Therefore in the long term, the *phoneme theory* can be argued to have fostered an idiosyncratic theory of language, a hallmark of an emerging independent school of thinking, i. e. the London School of Linguistics. Further yet, the consequences on British general linguistics operate on two levels: the influence on many scientists, beginning with the members of the London School (Halliday, Robins, Palmer, Sinclair, Leech...) and, most of all, the first chair of General Linguistics at SOAS granted to Firth in 1944.

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Adjectives at the left periphery as an indication of a DP in Serbo-Croatian

Branimir Stanković

The paper proposes a determiner phrase (henceforth DP) analysis of nominal expressions in article-less Serbo-Croatian, arguing that, besides Cinque's (2010) indirect and direct modification adjectives, there is also a third type of modification at the left periphery. The acceptability of pseudo-oxymoronic phrases such as *novi stari (narodnjački) hit* 'a new/another old (folk) hit' indicates that the two antonymous adjectives should be analyzed at different functional projections. A closed set of analyzed adjectives, in their relevant interpretations, value d-features, always precede other adjectives, including comparatives and superlatives, as well cardinal/collective numbers, and, most importantly, they block left branch extraction. The mentioned empirical facts suggest that these adjectives might be positioned in the hypothesized determiner phrase.

1. Introduction

The present paper deals with two objectives. The first one pertains to the issue of appropriate analysis of nominal expressions in Serbo-Croatian (henceforth SC), an article-less South Slavic language, arguing in favor of a version of a split-DP model. Our second objective is the syntactic status of a closed set of pre-cardinal adjectives, such as *dati* '(the) given', *konkretni* '(the) concrete' and *imenovani* '(the) named'. In the analyzed readings, these adjectives value d-features, they always precede other adjectives, including comparatives and superlatives, as well cardinal/collective numbers, and they block left-branch and adjunct extractions. This indicates that they are positioned at a distinct functional projection high at the left periphery of the nominal expression. Moreover, the acceptability of pseudo-oxymoronic¹ phrases such as *novi stari narodnjački hit* 'a new/another old folk hit' or *isti (potpuno) drugačiji amaterski plesač* 'the same (totally) different amateur dancer'² suggests that the two antonymous adjectives should be

¹ I use the term **pseudo-oxymoronic** for phrases that contain antonymous pair of adjectives, such as *visible* and *invisible* in Barbara Čitko's example *invisible visible stars*, which is acceptable if it is denoting the set of stars generally visible (individual-level), but not visible at the moment of speaking (stage-level) (see examples (3) and (4) in Section 2). Given the fact that the two antonymous adjectives are not interpreted at the identical temporal domain, the phrase is just formally oxymoronic, i.e. it is pseudo-oxymoronic.

² See Section 4 for an explanation and a discussion of these examples.

analyzed at different functional projections³. On the basis of these findings, I will argue that, besides Cinque’s (2010) direct and indirect modification adjectives, there is also a third type of modification at the level of split-DP, available even in article-less languages such as SC.

The paper is structured as follows. Section 2 introduces Cinque’s (2010) two types of adjective modification, along with the distinction between short and long adjectives in SC. Section 3 reviews the discussion concerning the existence of DPs in SC. Section 4 presents empirical data suggesting the presence of a functional projection sensitive to discourse features in SC. Section 5 proposes an appropriate analysis and discussion of this data. Section 6 lays out the conclusions.

2. Syntax and semantics of adjectives
2.1. Direct and indirect adjective modification

Based on the syntax and semantics of adjectives in Germanic and Romance languages mainly, while also considering large corpora from both Indo-European and non-Indo-European languages, Cinque (2010) argues that adnominal adjectives have two separate sources. In other words, there are two types of adjective modification: direct and indirect modification⁴. The first adjective source is a direct adnominal modification source, which the author takes to involve a merger of different classes of adjectives in the specifier of various dedicated functional heads of the extended projection of the NP. The other is a relative clause source, to which the other source cannot be reduced. Cinque assumes that the Merge position of relative clauses is prenominal, specifically in the specifier of a projection **above** the projections hosting direct modification adjectives, as sketched in (1):

- (1) [DP [FP [AP *indirect modification adjective*] [FP [AP *direct modification adjective*] [NP]]]]

Cinque (2010) lists clusters of semantic properties associated with each adjective source, presented in the table given in (2).

(2)	indirect (reduced relative clause) modification	direct modification	
[Det	[stage level or individual level	[individual level	NP
[Det	[restrictive	[non-restrictive	NP
[Det	[implicit relative clause	[modal	NP
[Det	[intersective	[non-intersective	NP
[Det	[relative to a comparison class	[absolute	NP
[Det	[comparative with superlatives	[absolute with superlatives	NP
[Det	[specific or non-specific	[specific	NP
[Det	[propositional ‘unknown’	[evaluative ‘unknown’	NP
[Det	[NP dependent ‘different’	[discourse-anaphoric ‘different’	NP

³ An anonymous reviewer commented that the acceptability of the presented pseudo-oxymoronic phrases suggests that “one adjective is functional and one is lexical, and not that both have a functional projection”. This is actually my point, as well, but I follow Cinque in the idea that **all** adjective modifiers are merged in the specifier of a functional projection (for more on this idea, see beginning of Section 2).

⁴ Cinque borrowed the term pair *direct* and *indirect modification* from Sproat and Shih (1988, 1991).

[Det	[deictic	[generic	NP
[Det	[literal	[possible idiomatic interpretation	NP

To illustrate the distinction between the two adjective types, consider (3) and (4). Cinque builds his analysis on a number of previous studies, such as Bolinger (1967), Ferris (1993), Sadler & Arnold (1994), Svenonius (1994) and Larson (1998). They all note that prenominal English adjectives are ambiguous between an interpretation in which they denote an enduring, or individual-level property and one in which they denote a temporary, or stage-level one, exemplified in (3), while in postnominal position they unambiguously denote a stage-level property, as shown in example (4).

- (3) The visible stars include Aldebaran and Sirius. (ambiguous)
 ‘The stars that are generally visible include Aldebaran and Sirius.’ (individual-level)
 ‘The stars that happen to be visible now include Aldebaran and Sirius.’ (stage-level)
 (Cinque 2010)
- (4) The (only) stars visible are Aldebaran and Sirius (unambiguous)
 *‘The (only) stars that are generally visible include Aldebaran and Sirius.’ (individual-level)
 ‘The (only) stars which happen to be visible now include Aldebaran and Sirius.’ (stage-level)

According to Larson (1998), Barbara Čitko traces confirmation for the two sources and their presumed ordering when in pre-nominal position, (5)-(6). As expected by Cinque’s model, the indirect modification adjective, with a stage-level reading here, is positioned more distant from the noun than the direct modification adjective, which has an individual-level reading:

- (5) The INVISIBLE visible stars include these... (Cinque 2010)
 indirect mod. direct mod.
- (6) *The VISIBLE invisible stars include these...

Example (5) refers to intrinsically visible stars that happen to be not visible at the moment of speaking. However, (6) is mostly out, as it denotes a set of stars visible at the moment of speaking, but generally not visible. The latter ordering is possible if we assume that there are stars that are not generally visible by naked eyes, but are visible due to a telescope used in the moment of speaking, or in similar settings. Still, even in such a context, the ordering would retain the correlation between the two hypothesized modifications, where the closer, direct modification adjective brings the individual-level interpretation, while the indirect modification adjective triggers stage-level reading.

In Section 4, I introduce similar, pseudo-oxymoronic language phrases, based on which I argue that there is another, third type of adjective modification, which is high at the level of split-DP. Unlike (5) and (6), at this higher structure position adjectives are mostly non-predicative (NONP). So, the ordering of adjectives is reversed, as non-predicative adjectives precede predicative (PRED) ones, which can then precede non-predicative adjectives:

- (7) *taj isti*_{NONP} (*potpuno*) *drugačiji*_{PRED} *amaterski*_{NONP} plesač
 that same (totally) different amateur dancer
 ‘the very same (totally) different (kind of) amateur dancer’

The phrase *taj isti (potpuno) drugačiji amaterski plesač* ‘the very same (totally) different (kind of) amateur dancer’ refers to the identical person (referent) already introduced to the discourse, who dances in a different manner than some other dancers (for analysis and further explanation of example (7), please check Section 4).

In the following subsection, I will introduce the difference between SC long and short adjectives, which Cinque (2010) argues to be in correlation with the two modification types.

2.2. SC long and short adjectives

There are two different adjective forms in SC, a long (LAF) and a short adjective form (SAF), traditionally labeled *definite* (8-a) and *indefinite adjective aspect* (8-b). Both classes are regularly used as adnominal modifiers.

- (8) a. *odličn-i* rad o pridevima b. *odličan-Ø* rad o pridevima
 excellent-LAF paper about adjectives excellent-SAF paper about adjectives
 ‘an/the excellent paper on adjectives’ ‘an excellent paper on adjectives’

Based on the fact that, unlike SAFs, LAFs are almost never found in predicative position (see example 9), and based on their relative ordering, where SAFs regularly precede LAFs (Fekete 1969, Leko 1992, Giusti 2006), (see example 10), Cinque (2010) argues that LAFs are direct, while SAFs are indirect modification adjectives, (see example 11). Nevertheless, Cinque doesn’t offer any explanation on the syntactic mechanism by which adjectives take one or the other form.

- (9) Rad je *odličan-Ø* / **odličn-i*.
 paper is excellent-SAF excellent-LAF
 ‘The paper is excellent.’

- (10) a. *odličan-Ø* obimn-i rad o pridevima
 excellent-SAF extensive-LAF paper about adjectives
 ‘an excellent extensive paper on adjectives’
 b. ??*odličn-i* obiman-Ø rad o pridevima
 excellent-LAF extensive-SAF paper about adjectives

- (11) [Det [*indirect modification adjective* = SAF [*direct modification adjective* = LAF [NP]]]]

Although SAFs regularly precede LAFs, Giusti (2006) presents some cases of post-demonstrative SAFs, while Marušić & Žaucer (2007), Arsenijević & Stanković (2009) and Stanković (2014, 2015a) introduce some counter-examples to (10), with LAFs preceding SAFs. This opens space

for another, third structure position, high at the split-DP, where a small closed set of adjective items may appear, as I argue in Section 5.

2.2.1. Definiteness

The traditional labeling of LAFs and SAFs as *definite* and *indefinite adjectival aspect*, respectively, comes from the definite or indefinite interpretation that the adjectives trigger to the referent of the entire nominal expression, when present in the context. In this view, definiteness is seen as a pragmatic concept, a discourse marker of the old/new status of the referent in the relevant discourse domain (Christophersen 1939, Heim 1983). Once the referent of the nominal phrase *marljiv student* ‘a hardworking student’ is already established in discourse, referring to the same referent is only possible with a LAF, while a SAF would be used only to introduce new referents for the same expression:

- (12) a. [Marljiv-Ø student]_i je ušao u kabinet. Prisutni student su prekinuli
 hardworking- SAF student aux came in cabinet present students AUX stopped
 razgovor. [Marljiv-Ø student]_{*i,j} je ustao.
 conversation hardworking-SAF student AUX stood up
 ‘A hardworking student came into the office. The present students stopped the
 conversation. A hardworking student stood up.’
- b. [Marljiv-i student]_i je ušao u kabinet. Prisutni studenti su prekinuli
 hardworking- LAF student AUX came in cabinet present students aux stopped
 razgovor. [Marljiv-i student]_{i,j} je ustao.
 conversation hardworking- LAF student AUX stood up
 ‘{A hardworking student / The hardworking student} came into the office. The present
 students stopped the conversation. {A hardworking student / The hardworking} student
 stood up.’

As visible from the first sentences in example (12-a) and (12-b), introducing new referents is possible both with LAFs and SAFs. This is a consequence of the fact that LAFs can have both the individual-denoting definite, and the kind-denoting interpretation, resulting in semantic ambiguity of the morphologically marked form, i.e. LAF⁵ (Stanković 2015c, cf. Aljović 2002 for an alternative analysis of the semantic ambiguity of LAFs). For this reason, the LAF in the third sentence of example (12-b) can refer to the discourse-old referent introduced in the first sentence, or some other, discourse-new referent. As for the morphologically non-marked SAFs in both the first and third sentence in (12-a), it leads to an unambiguous indefinite reading of the entire expression. They introduce new referents to the discourse, and these are different from the ones already established in the discourse (if any of them are already part of the discourse at all).

⁵ LAFs regularly appear in lexical idioms and collocations such as *beli luk* ‘garlic’, lit. ‘white onion’, as well as classifying adjectives. These types of adjectives almost never take the short form. As for descriptive adjectives, their LAF can have two readings—a kind-denoting interpretation, presupposing kinds of referents, and an appropriate individual-denoting interpretation. As for SAFs, they usually lack the kind-denoting reading.

2.2.2. Uniqueness

Definiteness can be interpreted as a pragmatic concept, as shown in example (12). However, it can also be treated as a semantic category. In the latter approach, a definite NP denotes referents that are either unique in the universe, as argued by Russell (1905), or unique in the relevant domain, as argued by later scholars. Lëbner's (1985) functional nouns, such as *father*, *angle*, *top* or *president*, bring a strong presupposition of uniqueness, because of their internal semantic structure. This is why they cannot combine with SAFs. Compare examples (13-a) and (13-b):

- (13) a. *Marijin dobar-Ø otac b. Marijin dobr-i otac
 Maria's good-SAF father Maria's good-LAF father
 (intended) 'Maria's good father' 'Maria's good father'

SAFs presuppose the existence of other referents not introduced to the discourse. In example (13-a) the adjective *dobar* 'good' cannot bear the SAF when modifying the functional noun *otac* 'father', as this presupposes that Maria has other fathers, who are not good. This interpretation is dismissed, resulting with ungrammaticality of the nominal expression in (13-a). Unlike the SAF, the LAF is acceptable when modifying functional nouns.

2.2.3. Generic contexts

The two SC adjective forms display different readings when the modified noun phrases are interpreted as generic NPs. SAFs bring a restrictive presupposition – they presuppose that there are other referents, which do not share the property denoted by the adjective. In example (14), the SAF in the phrase *pošten Srbin* 'an honest Serb' has a restrictive reading: it carries the presupposition that there are honest and dishonest Serbs. As for the LAF, it is ambiguous between the restrictive, and the non-restrictive interpretation. The latter presupposes that Serbs are honest "generically".

- (14) a. Pošten-Ø Srbin plaća porez. (restrictive) b. Pošten-i Srbin plaća porez. (ambiguous)
 honest-SAF Serb pays taxes honest-LAF Serb pays taxes
 'An honest Serb pays his/her taxes.' 'An honest Serb pays his/her taxes.'
 * 'Being honest, a Serb pays his/her taxes.' 'Being honest, a Serb pays his/her taxes.'

Similar to example (12), where we had the morphologically marked LAF ambiguous between a definite and an indefinite regarding, while the morphologically non-marked SAF triggered an unambiguous indefinite reading, in example (14), the LAF is ambiguous again, while the SAF triggers an unambiguous restrictive interpretation. This is presented in the table given in (15), which comprises the complete list of semantic clusters associated with the two adjective forms (Stanković 2015c):

(15)	SAF	LAF
Definiteness:	indefinite	definite/indefinite
Uniqueness:	non-unique	unique/non-unique

Epistemic specificity:	non-specific	specific/non-specific
Generic restrictiveness:	restrictive	non-restrictive/restrictive
Quantificational restrictiveness:	restrictive	non-restrictive/restrictive
Individual/Stage-level:	stage-level	individual/stage-level
(Non-)intersective:	subsective	intersective/subsective

2.3. *Interim summary*

To recap, I first introduced Cinque's (2010) two adjective modifications, and their respective correlation to SC SAF and LAF. As for SAF and LAF, they trigger appropriate sets of interpretation to the entire nominal expression, related to reference (definiteness, uniqueness, epistemic specificity), restrictiveness and intersective/subsective difference in reading. In Section 3 I address the various cases being made to find the most suitable model to explain nominal expressions in article-less languages. As such, I examine arguments in favor of DP analysis and ones against.

3. *DP or 'bare' NP for SC nominal expressions*

3.1. *Left-branch extraction*

Ever since Ross's (1967) postulation of Left Branch Condition, which restricts extraction of determiners, possessives and adjectives from the rest of the nominal phrase in languages with articles, and Corver's (1992) hypothesized DP/NP Parameter, article-less Latin, Chinese, Russian, Czech and SC (to name a few) are argued to have a simple, 'bare' NP configuration. In this view, article-less languages lack the D functional projection, which acts like a barrier for the mentioned movement in languages with articles (Zlatić 1997, Trenkić 2004, Bošković 2008, Despić 2011, 2013). As a consequence, left-branch and adjunct extractions are acceptable in SC, as illustrated in example (16), but are ungrammatical in English (see example 17).

- (16) **Skupa_i** / **Ta_i** je vidio [*t_i* kola].
 Expensive that AUX seen car
 'It is the expensive / that car that he saw / has seen.'

- (17) ***Expensive_i** / ***That_i** he saw [*t_i* car].

3.2. *Are SC determiners adjectives?*

Zlatić (1997) observes the morphology and syntax of SC adjectives and functional elements (demonstratives/anaphoric pronouns, quantifiers and determiners). Both classes share the same inflectional inventory, as shown in example (18), and can be found in almost any syntactic position with respect to the head-noun, as in (19). This stands in contrast to languages with articles, which have a far stricter word order in the DP domain, as illustrated in example (20).

- Empirical data shows that SC functional elements are actually adjectives with a rather free ordering of elements, Zlatić concludes. This means that interpreting SC demonstratives/anaphoric pronouns as correlatives of the definite article, and at the level of DP seems inappropriate. In Section 4 I present certain SC nominal expressions with a strict word order, which contain some sort of functional adjectives that block left-branch and adjunct extractions, alike the situation with DPs in languages with articles.

Besides left-branch and adjunct extractions, Bošković (2008) postulates a long list of syntactic and semantic differences between languages with articles and languages without articles. Unlike languages with articles, article-less languages such as SC, Latin, Japanese, Korean, Turkish, Hindi, Chukchi, Chichewa and Warlpiri all share the following features:

- (21) a. They allow scrambling (of the Japanese type).
b. They disallow negative raising.
c. They don't show superiority effects with multiple wh-fronting (if present).
d. They don't allow clitic doubling.
e. They don't allow transitive nominals with two genitives.
f. They don't allow the majority reading of superlatives.
g. They allow for predicative possessives.
h. They have possessives that can't be modified by another possessive or adjective.
i. They have possessives that do not bring exhaustive presupposition when in pre-numeral (pre-cardinal) position.

Bošković (2008) assumes that article-less languages lack DP projections, which results in the listed syntactic and semantic features. Basically, this means that acquiring a language, among other issues, involves setting the hypothesized NP/DP Parameter based on the language input.

Stanković (2015b) questions Bošković's (2008) generalizations, investigating the distribution of the postulated features that contrast DP from no-DP languages in article-less Serbian Prizren-Južna Morava (PJ) and Svrljig-Zaplanje dialects (SZ), on one side, and the Serbian Timok-Lužnice (TL) dialect and Macedonian language, on the other (the latter two varieties have articles). Showing that most of Bošković's predictions are simply not correct when applied to PJ, SZ, TL and Macedonian, I determine that the proposed differences do not form strict groups of isoglosses with a clear demarcation line between languages/dialects with and without articles. I conclude that the Universal DP Hypothesis seems to be more suitable for analyzing nominal expressions in article-less languages which are on the so-called "NP/DP border". This possibility is open if we assume that DP in article-less languages is phonologically null, but can be (occasionally) active when occupied with certain discourse-related elements, resulting with syntactic restrictions like left-branch and adjunct extractions (as will be presented in the next section of the paper).

3.4. The adjective *sam* 'alone, himself/herself'

Progovac (1998), following Postal (1969) and Longobardi's (1994) argumentation about the contrast between Italian proper nouns and pronouns based on their position relative to adjectives like *solo* 'alone', shows that SC exhibits similar noun vs. pronoun asymmetries. In her view, these asymmetries "are best captured by placing pronouns in D position (...), and nouns in N position" (Progovac 1998: 82-83). Namely, while SC proper names follow the adjective *sam* 'alone', (22)-(23), personal pronouns always precede it, (24)-(25):

- | | |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| (22) I samu Mariju to nervira.
and alone Mary that irritates
'That irritates even Mary.' | (23) ?*I Mariju samu to nervira.
and Mary alone that irritates |
| (24) ?*I samu nju to nervira
and alone her that irritates
'That irritates even her.' | (25) I nju samu to nervira
and her alone that irritates |

Progovac (1998) argues that since SC has no articles, and proper names do not raise to D in syntax, the only category that occupies D position at an audible level in SC are pronouns. Given the contrast shown in (22)-(25), she assumes that SC pronouns are generated at N and subsequently move to D, with the conclusion that this may mean that the category D is a universal property of UG.

Despić (2013) critically reviews Progovac's (1998) analysis with the remark that it creates an ordering paradox with respect to the position of possessives and demonstratives to the adjective *sam* 'alone', as the adjective must precede these two pronoun classes:

(26) I **sam** **njegov** brat se složio sa tim.
 and alone his brother REFL. agreed with that
 ‘His brother himself (has) agreed with it’

(27) ?*I **njegov** **sam** brat se složio sa tim.
 and his alone brother REFL. agreed with that

In most DP analyses, demonstratives and possessives are structurally higher than D, either as specifiers of DP or as a part of some higher functional projection. The question is, how come these pronouns necessarily follow the adjective if its position is fixed below the null D head, as Progovac suggests? Following Eckardt (2002), Despić proposes that *sam* is an intensifier and therefore always in focus, which projects a phrase of its own dominating NP, as set out in (28). Unlike all other adjectives, possessives and demonstratives in SC, this Intensifier Phrase is not adjoined to NP.

(28) [_{IntensifierP} *Intensifier* [_{NP} *Demonstrative* [_{NP} *Possessive* [_{NP} N]]]]

The structure in (28) correctly predicts that the adjective *sam* in its intensifying reading cannot be extracted in the same manner as regular adjectives, possessives or demonstratives. This is illustrated in examples (29) and (30):

(29) Video **sam** **samog** Tita. (intensifying reading)
 seen AUX alone Tito
 ‘I saw Tito himself’

(30) **Samog** **sam** video Tita. (non-intensifying reading)
 alone AUX seen Tito
 ‘I saw Tito alone’

When extracted, the adjective can only have a descriptive, non-intensifying interpretation, as in (30). Moreover, the proposed analysis predicts that *sam* cannot modify clitic pronouns, which due to their prosodic nature cannot be part of the argument in focus:

<p>(31) a. Video sam je samu. seen AUX her_{CLITIC} alone ‘I saw her alone.’ *‘I saw her herself.’</p>	<p>b. Video sam nju samu. seen AUX her_{STRONG} alone ‘I saw her alone.’ ‘I saw her herself.’</p>
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The author concludes that he had reviewed probably the strongest argument for the existence of null D in SC, offering an alternative no-DP analysis, which has “a number of specific syntactic, morphological and semantic arguments that point towards the superiority of the no-DP analysis” (Despić 2011: 266).

3.5. Determiners and adjectives still differ

Caruso (2011, 2012) addresses Zlatić's (1997) argument that, based on their morphology and syntax, SC determiners are adjectives (already presented here in (18) and (19)). Adopting Frleta's (2005) observations, Caruso shows that Croatian descriptive adjectives constitute an open class, whose inventory can be arbitrarily enlarged by applying derivational morphology, as shown in (32-a). This is in contrast to determiners, which constitute a closed class with a limited and clearly defined inventory of unproductive items, as can be seen in (32-b):

- (32) a. *crven* → *crvenkast* → *zacrvenjen* b. *ovaj* → **ovajkast* → *zaovajjen*
 red reddish red-hot this *thisish -

Moreover, (scalar) descriptive adjectives have comparative and superlative forms, while determiners in general cannot be graded. Also, descriptive adjectives can be modified by various adverbs, while modification of determiners is not possible, with the exception of a few indefinite quantifiers (such as *malo* 'little' or *puno* 'a lot'). Finally, if the predicative nature of SC possessives is proof of their adjectival nature, as argued by Bošković (2008) (*cf.* (21-g) in Subsection 3.3)), we would expect all other determiners to display the same behavior. This, however, is not the case:

- (33) Ova knjiga je **jedna* / ?*prva* / **svaka* / **neka*.
 This book is **one* / ?*first* / **every* / **some*.

The data presented in example (33) shows that SC determiners have different derivational morphology and syntax from descriptive adjectives, in spite of the inflectional commonalities between these two classes. This suggests that they should not be analyzed as a single class.

Stanković (2014) critically reviews Bošković's (2008) generalization that only pre-numeral possessors in languages with articles may induce an exhaustivity presupposition. Contrasting the interpretations of SC expressions with post-cardinal and pre-cardinal possessives, as well as spatial and temporal adjectives, I show that phrases with post-cardinal possessive, spatial or temporal adjectives are ambiguous between the exhaustive (definite, unique, specific) and non-exhaustive (indefinite, non-unique, non-specific) reading, exemplified in (34). Meanwhile, the pre-cardinally positioned adjective triggers the exhaustive interpretation for the same cardinal phrase when uttered with neutral phrase intonation, as shown in (35):

- (34) **Pet njihov-ih / sutrašnj-ih prezentacij-a** se otkazuje. (ambiguous)
 five their-GEN.PL tomorrow's-GEN.PL presentations-GEN.PL REFL cancel
 'Five of their / tomorrow's presentations will be canceled'
 'Their / tomorrow's five presentations will be canceled'

- (35) **Njihov-ih / Sutrašnj-ih pet prezentacij-a** se otkazuje. (exhaustive)
 their-GEN.PL tomorrow's-GEN.PL five presentations-GEN.PL REFL cancel
 *'Five of their / tomorrow's presentations will be canceled'
 'Their / tomorrow's five presentations will be canceled'

Given the fact that the pre-cardinal adjectives *njihovih* 'their' and *sutrašnjih* 'tomorrow's' in example (35) have the same number and case feature assigned by the cardinal number, i.e.

genitive plural, I argue that possessive, spatial and temporal adjectives might be generated in post-cardinal position. In addition, I assume that these adjectives subsequently move to some functional projection of the split DP in order to check the definiteness, uniqueness or specificity feature. Namely, as the semantics of these adjectives are tightly related to discourse, they move to pre-cardinal position driven by their semantic content to express features related to definiteness, uniqueness or specificity. Moreover, using Frleta's (2005) and Caruso's (2011, 2012) criteria for distinguishing descriptive adjectives from determiners, I show that SC possessive, spatial and temporal adjectives share more features with determiners, as these three adjective classes have a) limited, non-productive inventories, b) no comparative or superlative forms, and c) they can't be modified by adverbs. Also, unlike SC descriptive and substance adjectives, which can take both long and short adjective form, these three classes in SC can have only one adjective form – possessives can only take the short adjective form, while spatial and temporal adjectives can only bear the long adjective form.

In this Section, I have presented the main arguments for and against DP analysis of SC nominal expressions offered in the literature. Some of the criteria invoked here will be used for arguing in favor of the existence of some kind of a DP in SC in Section 5, based on the empirical data introduced in the following section.

4. Adjectives at the left periphery

SC contains a closed set of pre-cardinal adjective items that are regularly found at the initial position (or post-determiner position, if a determiner is present) of the nominal expression in the analyzed interpretations, preceding all other adjectives, including comparatives and superlatives.⁶ In the examples (36)-(37) the lexical content of a descriptive or a deverbal adjective is interpreted at a more abstract level of discourse (presupposing interlocutors, referents, distance/proximity axes), providing the interlocutor with the information whether the referent of the language phrase is given (meaning, already part of the discourse), as in case with *dati* 'given' in (37-a), discourse-new, as with *novi* 'new' in (37-b), or whether the referent is identical with the previous referent of the same noun phrase, like the case is with *isti* 'same' in (38-b).

(36) a. dat-i nedat(-i) pravni dokument
 given-LAF not given-SAF/LAF law document
 'the given/mentioned not handed law document'

b. *nedat(-i) dati pravni dokument
 *not given-SAF/LAF given-LAF law document

(37) a. ostal-i na stolu ostal-i markeri b. nov-i nov sportski auto (from www)
 left-LAF on table left-LAF markers new-LAF new-SAF sport car
 'the rest of the markers left on the table' 'a new/another newly made sports car'

⁶ Cinque (2010), Marušić & Žaucer (2013) and Stanković (2014) present other cases of pre-cardinal adjectives.

- (38) a. najbolja dva ista plesača b. ista dva najbolja plesača
 best two same dancers same two best dancers
 ‘the best two same (kind of) dancers’ ‘the (very) same two best dancers’

In the pseudo-oxymoronic phrase in (36-a), the lexical semantics of the initial adjective is interpreted at the level of discourse, valuing d-features⁷ – it is the **referent** of the nominal expression that is given (mentioned) in the discourse. At the same time, at **reference**-level, the antonym denotes a certain *document* that is not given, meaning, not handed, or delivered to a person involved in the situation. The reverse ordering in (36-b) is not acceptable – during the lexicalization process, the negative form of the adjective *dati* ‘given’ never became a marker for a discourse-new referent, so (36-b) is out, just as it is out in its English counterpart. Similarly, the deverbal (participle) adjective *ostali* ‘left’ in (37-a) at this higher hypothesized structure position is interpreted as ‘the other / rest of the...’, referring to the complement-subset of the contextually established or presupposed maximized denotation set of the modified NP. As for the adjective *novi* ‘new’, at the left periphery it is used as an ordinal adjective, presupposing a list of previous and upcoming referents of the expression, while in its discourse-irrelevant, non-ordinal, descriptive reading, the adjective *novi* ‘new’ in this context is interpreted as ‘newly manufactured, recently made’ sports car. This is what allows for pseudo-tautological combinations such as *novi nov sportski auto* ‘another newly made sports car’, as in (37-b).

The presented adjectives in the intended readings are regularly found in pre-comparative and pre-superlative position, as shown in (38-b). In post-comparative/post-superlative position they can only be interpreted as descriptive, without valuing d-features, as in (38-a). Cinque (2010) assumes that the comparative/superlative morpheme is merged high up in the functional structure of the DP, from where it attracts the appropriate adjective (cf. Heim 1999, Stateva 2000, Sharvit & Stateva 2002). This suggests that the position of pre-comparative/pre-superlative adjectives might be high in the assumed split-DP, as will be proposed in the next section. Notice the adjective *isti* ‘same’ in (38-a), which shifts from kind- (‘same kind of’) to object-/individual-referring semantics (‘same object/individual as’), as in (38-b). The latter reading could simply be derived from its assumed syntax position in the split-DP.

A serious indication that the analyzed adjectives occupy a separate functional projection (of the ‘D type’) is the blocking effect that they produce on left-branch and adjunct extractions. Consider examples (39-a) and (39-b), where adjectives such as *dotični* ‘(the) concerned’ and *konkretni* ‘(the) concrete’ serve as a barrier for extraction of material from the rest of the nominal expression.⁸

- (39) a. *Obimni_i sam pronašao dotični / konkretni t_i rad , a ne...
 extensive-LAF AUX found concerned-LAF concrete-LAF paper and not
 (int.)‘It is the concerned/concrete extensive paper I have found, and not...’

⁷ One possible way to capture this is by assuming that the analyzed adjectives are “tagged” with appropriate features such as [+definite], which are to be checked and valued in the hypothesized split DP. The claim the adjectives such as *dati* ‘(the) given’ value d-features is based on the semantic (and pragmatic) fact that phrases containing these markers are non-ambiguously interpreted as definite/specific.

⁸ An anonymous reviewer raised the question of the possibility of extraction of SAFs in cases such as (39). These extractions are also out.

- b. *[O pridevima]_i sam pronašao dotični / konkretni rad _{t_i}, a ne...
 about adjectives AUX found concerned-LAF concrete-LAF paper and not
 (int.) 'It is the concerned/concrete paper on adjectives I have found, and not...'

In case the adjectives *dotični* '(the) concerned' or *konkretni* '(the) concrete' were absent from the phrase in examples (39-a) and (39-b), the extraction of the descriptive adjective *obimni* 'extensive' or the adjunct *o pridevima* 'on adjectives' from the rest of the nominal expression would be possible. Recall that Despić (2011) uses the same type of argumentation to support his no-DP analysis of the adjective *sam* 'alone, himself/herself' in a separate Intensifier projection, dominating NP, and not adjoined to NP, as has already been presented in Subsection 3.4. Using the same line of reasoning, one could argue that adjectives such as *dotični* '(the) concerned' and *konkretni* '(the) concrete' occupy a distinct functional projection which dominates NP, as opposed to being adjoined to it. Given the semantics of the presented closed set of adjectives, and the fact that they value d-features, it is reasonable to treat this dominating functional projection as some kind of DP.

As has already been emphasized in the introduction, the analyzed adjectives in this higher structure position are mostly non-predicative (NONP) in the intended reading (consider (40), where the adjectives *dat* 'given' and *ostao* 'left' in predicative position can only have descriptive interpretations). This is the reason why the ordering of adjectives is reverse from the one suggested by Cinque (2010), as non-predicative adjectives at the left periphery precede predicative (PRED) ones, which again can precede non-predicative adjectives, (41):

- (40) Ovaj dokument je dat / ostao.
 this document is given left
 'This document is given / left.'
 *'This document is mentioned / the rest.'

- (41) taj isti_{NONP} (potpuno) drugačiji_{PRED} amaterski_{NONP} plesač
 that same (totally) different amateur dancer
 'the very same (totally) different (kind of) amateur dancer'

We should also take into consideration the following fact. I have already shown that regular descriptive adjectives constitute an open class with an inventory that can be arbitrarily enlarged through the attachment of different suffixes (as presented in example (32) in Subsection 3.5). Unlike these adjective, the analyzed adjectives in the intended readings constitute a closed class, with a limited and a clearly defined inventory of unproductive items, behaving like determiners, (42):

- (42) dotični → *dotičnikast → zadotičnjen
 concerned *concernedish -

Also, in their descriptive readings, the analyzed adjectives regularly have comparative and superlative forms, but in the intended interpretations they cannot be graded, as illustrated in (43).

- (43) imenovani / *imenovaniji / *najimenovaniji političar
 named *more named *most named politician

Finally, it is important to note that none of the analyzed adjectives can have the intended discourse-relevant reading (_{DIS}) in predicative position, as can be seen in example (44-a). In this respect, the presented adjectives behave like determiners in languages with articles, which can't be found 'bare' in predicative position, which is exemplified in (44-b).

- (44) a. Ova knjiga je *konkretna_{DIS} / *data_{DIS}.
 this book is *concrete_{DIS} / *given_{DIS}
 b. This book is *the / *a / *some.

It seems that the 'bare' NP model cannot account for the facts presented in this section. At this point, several questions arise. If all SC adjectives, possessives and demonstratives are simply adjoined to NP, how come the analyzed adjectives must precede cardinal numbers and all other adjectives, including comparatives and superlatives? Why are phrases such as *novi stari narodnjački hit* 'a new/another old folk hit' even acceptable? If two antonymous adjectives are interpreted at the same syntactic level, they should form an oxymoron. More importantly, what is the reason for the blocking effect the presented adjectives have on left-branch and adjunct extraction? In the next section I will propose a DP analysis, which can account for all of the data introduced in this section.

5. The proposal

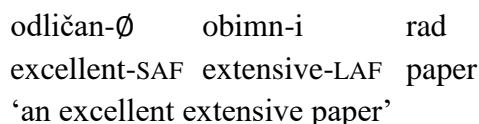
Based on the facts I have presented in Section 4, I propound a split-DP model for interpreting examples such as (36)-(38), but not just limited to article-less languages such as SC. In a broader perspective, I argue that, besides Cinque's (2010) two types of adjective modification, the direct and indirect one, there is also a third type of adjective modification. This adjective modification is realized high at the left periphery of the nominal expression, in immediate post-demonstrative position, where a closed set of adjectives, such as *dati* '(the) given', *konkretni* '(the) concrete', *imenovani* '(the) named', *dotični* '(the) concerned', *isti* '(the) same', *ostali* 'left/the other/rest', *stari* '(the) old/previous', *novi* '(the) new/next/another' and *prošli* 'passed/(the) previous', modify the referential expression. This is in contrast with Cinque's (2010) direct and indirect modification adjectives, which constitute part of the positive description.

The proposed model is presented in (45). The appropriate features of definiteness, uniqueness, specificity etc. are positioned in the head of DP. When any of these features is positively specified, the adjectives present in the nominal expression have to agree with it/them by taking the LAF. This explains why SAFs trigger an indefinite, non-unique or non-specific interpretation, while LAFs can have a definite, unique or specific reading. Nevertheless, we need to capture the fact that morphologically marked LAFs are ambiguous between the two sets of interpretations. A possible solution to this could be postulating a separate, kind-denoting DP immediately below NumP, in addition to the individual-/object-denoting DP on top of the syntactic tree (*cf.* a similar configuration with a DP below NumP and Partitivity Phrase (PartP) proposed by Arsenijević 2006).

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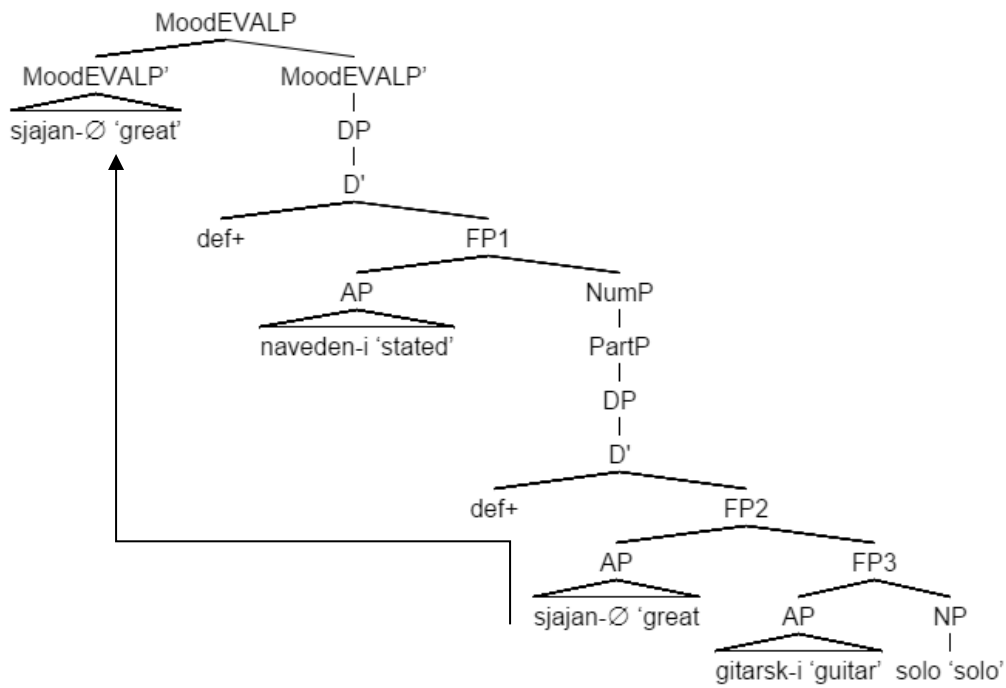
graph TD
    DP1[DP] --- D_prime1[D']
    DP1 --- FP1[FP1]
    D_prime1 --- def1[def+]
    D_prime1 --- FP1
    FP1 --- AP1[AP]
    FP1 --- NumP[NumP]
    AP1 --- dat_i["dat-i 'given'"]
    NumP --- PartP[PartP]
    PartP --- DP2[DP]
    DP2 --- D_prime2[D']
    D_prime2 --- def2[def+]
    D_prime2 --- FP2[FP2]
    FP2 --- AP2[AP]
    FP2 --- FP3[FP3]
    AP2 --- nedat_i["nedat-i 'not given'"]
    FP3 --- AP3[AP]
    FP3 --- NP[NP]
    AP3 --- pravn_i["pravn-i 'law'"]
    NP --- dokument["dokument 'document'"]
  
```

Stanković (2015c) shows that the referential and epistemic status of the entire nominal expression in SC depends on the adjective form of the initial adjective present in the phrase (in case that non-mandatory definite or indefinite ‘determiners’, such as *taj* ‘that’, *ovaj* ‘this’; *jedan* ‘one, a’ or *neki* ‘some’, are not used). This means that the acceptable nominal expression in (46) can only have an indefinite, non-unique or non-specific interpretation. But, if the initial SAF *odličan-Ø* ‘excellent’ is an indirect modification adjective, positioned below NumP, how can it differ in

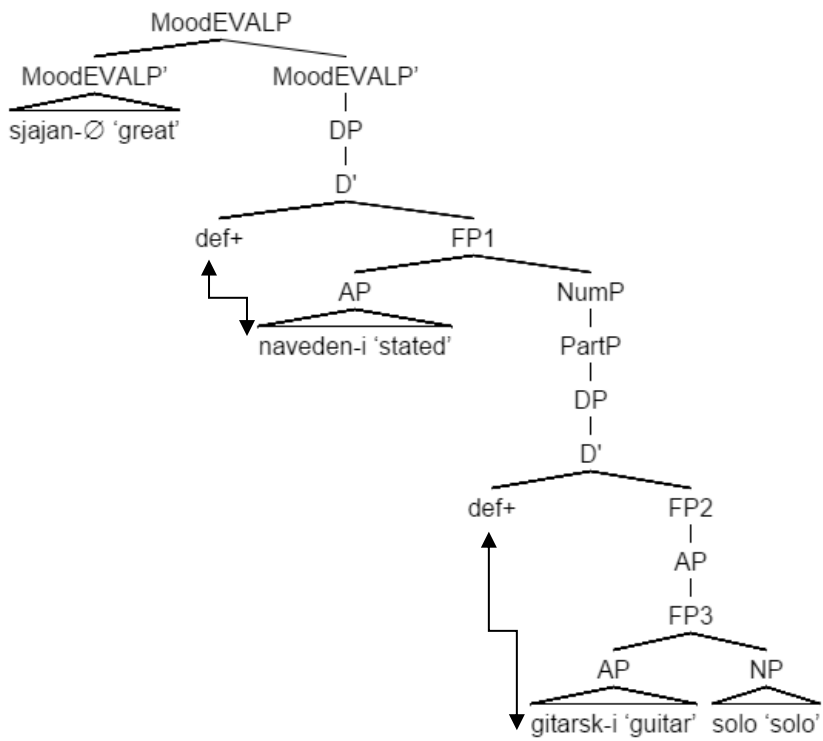


(49) [MoodEVALP [MoodEVALP' *sjaajan*-Ø ‘great’] [MoodEVALP' [DP [D' [def+] [FP1 [AP *naveden-i* ‘stated’]
[NumP [PartP [DP [D' [def+] [FP2 [AP ~~*sjaajan-Ø*~~ ‘great’] [FP3 [AP *gitar-sk-i* ‘guitar’] [NP *solo*
‘solo’]]]]]]]]]]]]]

a. LF



b. Agree



naveden-i sjajan-Ø gitarsk-i solo
 stated-LAF great-SAF guitar-LAF solo

‘the stated great guitar solo’

The examples (45)-(49) cover all possible adjective combinations available in SC. Unlike the ‘bare’ NP analysis, the proposed model can account for the entire SC data, including examples with left-branch and adjunct extractions, as well as the presented phrases in which left-branch and adjunct extractions are blocked.

6. Conclusion

In this paper I argued that determiner phrases are projected even in article-less languages such as SC, based on the behavior of a closed set of adjectives like *dati* ‘(the) given’, *konkretni* ‘(the) concrete’, *imenovani* ‘(the) named’, *dotični* ‘(the) concerned’, *isti* ‘(the) same’, *ostali* ‘left/the other/rest’, *stari* ‘(the) old/previous’, *novi* ‘(the) new/next/another’ and *prošli* ‘passed/(the) previous’. I showed that in their discourse-relevant interpretations, these adjectives a) value d-features, b) always precede other adjectives, including comparatives and superlatives, as well as cardinal/collective numbers, and c) they block left-branch and adjunct extractions. This suggests that they are positioned at a distinct functional projection high at the left periphery of the nominal expression. The acceptability of pseudo-oxymoronic phrases such as *novi stari narodnjački hit* ‘a new/another old folk hit’ or *isti (potpuno) drugačiji amaterski plesač* ‘the same (totally) different amateur dancer’ was interpreted as an indication that the two antonymous adjectives should be analyzed at different functional projections. On the basis of these empirical facts, I argued that, besides Cinque’s (2010) direct and indirect modification adjectives, there is also a third type of modification at the level of split-DP, available even in article-less languages such as SC. An appropriate model was proposed for analyzing Serbo-Croatian LAFs and SAFs, consisting of two DPs – an individual-/object-denoting DP, and a kind-denoting DP, located below the Numeral and Partitivity projection. The LAF was interpreted as an agreement relation between the adjective and the corresponding definiteness, uniqueness and/or specificity features, situated in the head of the DP.

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Double Passivization in Turkish: A Structure Removal Approach

Andrew Murphy

This paper deals with ‘double passivization’ in Turkish, an impersonal passive construction with two occurrences of passive morphology and two instances of argument reduction. The aim will be to adequately capture the fact that each instance of passivization seems to be mirrored by a morphological reflex on the verb. I will adopt the theory of passivization in Müller (2014, 2015*a,b*), who assumes that passivization involves merging and subsequently removing the external argument from the structure. The analysis of double passivization assumes two Voice projections above *v*P, each headed by a passive suffix. This approach will allow us to capture the relevant data for Turkish and it will also be shown how this approach extends to another case of double passivization in Lithuanian as well as antipassive constructions.

1. Introduction

In this paper, I propose an analysis of double passives, i.e. passives with two occurrences of passive morphology, which assumes that each passive morpheme corresponds to the head of a Voice projection. Furthermore, I argue that argument reduction in passivization is triggered by each of these heads and is carried out by the operation *Remove* proposed by Müller (2014, 2015*a,b*), which removes arguments from the structure. Accordingly, two Voice projections in double passives entails that two instances of argument reduction must take place. This analysis will capture two main properties of double passives identified by Postal (1986). In Section 2, I will present the data pertaining to passives and double passives in Turkish. Section 3 will discuss various approaches to argument reduction and to what extent they can be applied to double passives. Section 4 presents an analysis of double passives based on the operation *Remove*. Section 5 will discuss some further implications of this approach to the passive such as accusative absorption as well how this analysis extends to argument demotion in double passives in Lithuanian and antipassive constructions with argument reduction.

2. The data

Passivization is typically analysed as suppression of the ‘most prominent’ (external) argument coupled with promotion of the internal argument to the subject. In this paper, I will focus on a particular passive construction in Turkish involving two occurrences of passive morphology as well as what looks like two instances of passivization, i.e. reduction of both the internal and external argument. Double passivization involves two instances of a passive suffix that are ‘stacked’ on top of each other. Instances of ‘stacked’ or double passives have received little attention in the literature for perhaps two reasons: (i) They are typologically rare (Kiparsky 2013 attributes this to a ‘morphological bottleneck’), (ii) They do not exist in English and other languages where the passive has been particularly well studied. Nevertheless, instances of double passives have been reported in Turkish (Özkaragöz 1986), Kazakh (Şahan Güney 2006), Lithuanian (Timberlake 1982; Keenan & Timberlake 1985), Sanskrit (Ostler 1979) and Irish (Nerbonne 1982). Its existence has important implications for any theory of the passive since a theory of the passive designed to handle one instance of argument reduction should be able to be extended to account for instances of dual argument reduction. As will be shown, this is not always straightforward for many of the analyses we will encounter.

2.1. Double passives in Turkish

Being a nominative-accusative language like English, the passive in Turkish is expressed by suppression of the external argument (*Hasan* in (1)), promotion of the argument normally marked with accusative to the nominative and passivization is indicated by a morphological reflex on the verb:

- (1) a. Hasan-Ø kapı-yı kapad-ı
 Hasan-NOM door-ACC close-PAST
 ‘Hasan closed the door.’
 b. Kapı-Ø (Hasan tarafından) kapat-ıl-dı
 door-NOM Hasan by.ABL close-PASS-PAST
 ‘The door was closed (by Hasan)’ (Kornfilt 2010)

The passive suffix takes the form *-(I)l* after consonants (1), *-n* after vowels (2) and *-(I)n* after laterals, where *(I)* stands for a vowel, which harmonizes to the closest vowel in the stem.

- (2) Dün bütün gün kitap oku-n-du
 yesterday whole day book read-PASS-PAST
 ‘Books were read the whole day yesterday.’

The focus of this paper are so-called ‘double passives’, where there are two occurrences of this passive morpheme. Examples are given in (3)-(5):

- (3) a. Bu şato-da boğ-ul-un-ur
 this chateau-LOC strangle-PASS-PASS-AOR
 ‘People are being strangled in this chateau.’
 b. Harp-te vur-ul-un-ur.
 war-LOC shoot-PASS-PASS-AOR
 ‘People get shot in wars.’ (Özkaragöz 1986)
- (4) Bu oda-da döv-ül-ün-ür
 this room-LOC beat-PASS-PASS-AOR
 ‘There is beating going on in this room.’ (Kiparsky 2013)
- (5) Bu hamam-da iyi yıka-n-ıl-ır
 this bath-LOC well wash-PASS-PASS-AOR
 ‘[One] can get washed pretty well in this bath house.’ (Göksel & Kerslake 2005)

Note that in each example we have a transitive verb and therefore two instances of argument reduction. Furthermore, each sentence has an implied internal and external argument, which follows from the fact that only transitive verbs are possible in the construction. Finally, all above examples exhibit aorist tense. These are identified as the main three characteristics of double passives by Postal (1986) and can be summarized as follows:

- (6) *Characteristics of double passives in Turkish:* (Postal 1986)
 a. Only passives of transitive verbs are possible.
 b. Both arguments must be understood as implied arguments.
 c. They are only possible with aorist tense.

In this paper, I will focus on providing an explanation of the first two characteristics as the third is perhaps largely semantically motivated.¹ Evidence for (6a,b) comes from the fact that double passives are not possible with non-transitive verbs such as unergatives (7) and unaccusatives (8):

- (7) *Bura-da koş-ul-un-ur.
 here-LOC run-PASS-PASS-AOR
Int. ‘There is running here.’ (Unergative)
- (8) *Okyanus-ta bat-ıl-ın-ır
 ocean-LOC sink-PASS-PASS-AOR
Int. ‘In this ocean, there is sinking.’ (Unaccusative)

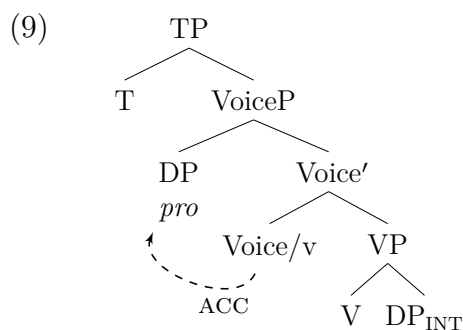
¹Furthermore, it seems to be more of a strong tendency than an inviolable property of the construction (Göksel & Kerslake 2005:136). The fact that both arguments are implied may strongly lend itself to a generic interpretation and thus explain the use of the aorist. (Özkaragöz 1986:78) provides some examples with past tense marking rather than aorist. However, she also claims that these are not ‘genuine’ double passives as the passive marker can be used to disambiguate cases where the passive marker -n is syncretic with the reflexive marker.

3. Previous approaches to argument reduction

A central characteristic of passive clauses is that they often involve argument reduction. Every theory of personal passives has to explain argument reduction and thus, an analysis should be applicable to instances of dual argument reduction. Ideally, one should simply be able to apply a passivization operation twice (once to the active structure and again to the resulting personal passive) and arrive at double passive. In the following section, I will review the main approaches to argument reduction in the literature and assess how each analysis can be extended to double passivization. We will see that extending these analyses to the problem at hand is not always without problems.²

3.1. Silent external arguments

A entirely different approach is to assume that the external argument is in fact present but simply not pronounced (Sternefeld 1995; Borer 1998; Collins 2005). In generative approaches, this is normally assumed to be *pro*. This silent argument then occupies the ordinary subject position (e.g. Spec-vP) and absorbs accusative case and the external theta-role usually assigned to the external argument:



One of the main criticisms that can be levelled at this kind of approach when applied to double passivization is that they do not derive the link between dual passive morphology and dual instances of argument reduction. The analysis of double passives under this view would simply consist of ensuring that two *pro* arguments be merged in place of the internal and external argument. Thus, the link here seems somewhat arbitrary. Furthermore, such approaches suffer another technical problem: if the external argument is syntactically present, then it is unclear why it does not count as an intervening goal for movement to

²For reasons of space, I do not discuss one major class of approaches that locate argument reduction in the lexicon (e.g. Chomsky 1981; Bresnan 1982; Jackendoff 1987; Booij 1992; Wunderlich 1993). In these approaches, there is never a syntactic external argument since the lexical entry of a transitive verb is changed into an intransitive verb before argument selection takes place. I consider this problematic in the light of the evidence for a syntactic external argument in Section 3.2. Another option is to have a lexical passivization rule apply twice in succession, see S. Müller (2016) for a discussion of this approach and associated problems.

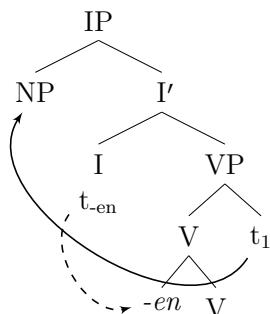
Spec-TP. In (9), the silent external argument is higher and thus Minimality considerations should block movement of the internal argument (10).³

Furthermore, the existence of a small *pro* does not receive any kind of independent motivation for passives in non pro-drop languages such as English (Wanner 2009:145). Its postulation is only motivated a solution for this problem in passives and is therefore an *ad hoc* solution to a technical problem. Furthermore, the question of how this *pro* argument is semantically-linked to a DP in a *by*-phrase is far from trivial and will certainly entail more than simple co-indexation (cf. Sternefeld 1995).

3.2. Passive morphemes as arguments (Baker, Johnson & Roberts 1989)

Following Jaeggli (1986), Baker, Johnson & Roberts (1989) (henceforth: BJR) propose approach to the passives in the framework of Government & Binding, where the passive morpheme (-*en* in English) has argument status. Under their approach, the passive morpheme is present in syntax and behaves like an NP argument in that it can be assigned θ -roles and case. The passive morpheme is base-generated in I and then assigned accusative case and the external argument θ -role. It is assumed that the passive morpheme behaves like a clitic syntactically. Thus, BJR propose a ‘downgrading’ operation where -PASS lowers onto the verb:

(10) *Passivization in English* (Baker, Johnson & Roberts 1989):



Baker, Johnson & Roberts (1989:232f.) also discuss double passives such as those discussed here in Turkish and those in Lithuanian. They claim that the passive morpheme in languages such as Lithuanian and Turkish, which allow double passives, is actually an N element and not INFL. This element is then base generated directly in argument positions. This allows for the possibility of having two instances of passive morphology: one in subject position and the other in argument position. Their proposed derivation of double passives is given in (11):

³ This is what Collins (2005) worked hard to avoid with his ‘smuggling’ analysis. Nevertheless, I will not discuss his approach here as it is essentially a *pro* approach: He assumes that the external argument in *by*-phrases is in the canonical Spec-vP position, however, in passives without a *by*-phrase he is forced to assume a *pro* argument.

(11) *Derivation of double passives* (BJR 1989:233):

- a. [IP -PASS [I' I [VP V -PASS]]]
- b. [IP t_{pass} [I' I+PASS [VP V -PASS]]] (Incorporation)
- c. [IP -PASS [I' I+PASS [VP V t]]] (NP-movement)
- d. [IP t_{pass} [I' I+PASS+PASS [VP V t_{pass}]]] (Incorporation)
- e. [IP t_{pass} [I' t_{I+PASS+PASS} [VP V+I+PASS+PASS t_{pass}]]] (Cliticization)

Both argument positions are occupied by a passive morpheme (11a). The first step is that the passive morpheme in subject position lowers onto INFL (11b). Next, the passive morpheme in object position moves to the subject position (11c). This would be the derivation of a normal passive clause in these languages. However, since it is another passive morpheme that moves to subject position and not an NP, this also incorporates into INFL (11d). In a final step, the entire complex cliticizes to the verb (11e).

This analysis can capture the observation in (6) that double passives are only possible with transitive verbs under the assumption that each passive morpheme is an argument of the verb. There are, however, a number of problems with this approach. As it stands, the theory seems to make incorrect predictions regarding affix order in Turkish. The order of affixes in Turkish is rigidly V+PASS+PASS+I (cf. (5)), yet following Baker's own *Mirror Principle* (1985), the order of affixes mirrors the order in which syntactic operations take place and therefore the structure in (11) derives the incorrect order *V+I+PASS+PASS since the complex I+PASS+PASS (11d) is first formed and then this entire complex cliticizes onto I (11e). No matter how it is linearized (*V+[I+PASS+PASS] (12) or *[I+PASS+PASS]+V), it is not possible to derive the correct order without further assumptions.⁴

Another major drawback of their approach is that the argument status of the passive morpheme means that there is no external argument syntactically present. This is problematic in the light of evidence suggesting that there is a syntactically present external argument. For example, it is possible for this phonologically absent subject to control a PRO in a lower clause (Manzini 1983; Sternefeld 1995):⁵

- (12) a. They_i decreased the price [PRO_i to the help poor].
 b. The price was decreased [PRO_i to the help poor].

⁴This may work if one is willing to entertain the idea that adjunction can be to the right for one kind of head and to the left for another, but this goes against assumptions about incorporation in Baker (1988, 1998), namely that adjunction is always to the left of the targeted head (Baker 1998:29).

⁵An anonymous reviewer correctly points out that this diagnostic may not be completely unproblematic since it has been noted (e.g. by Landau 2010) that implicit arguments can also control PRO:

- (i) It is impossible [PRO to visit me together].

Of course, it could be the case that implicit arguments are actually first syntactically removed as with passive external arguments. I will leave this issue to future research, however.

Furthermore, it is possible for so-called ‘subject-oriented adverbs’ to occur in passives. In (13b), the passivized variant of (13a), it is still possible for the subject-oriented adverb to occur. This suggests that there is in fact a syntactically/semantically present external argument at some point of the derivation in order to establish control and adverbial modification of the subject.

- (13) a. Die Mädchen haben die Cocktails nackt serviert.
 the girls have the cocktails naked served
 ‘The girls served the cocktails (while) naked.’
 b. Die Cocktails sind nackt serviert worden.
 the cocktails have naked served been
 ‘The cocktails were served naked.’ (Sternefeld 1995)

Baker, Johnson & Roberts (1989) do in fact discuss some of these data and want to claim that the passive suffix can fulfil all the functions of a genuine referential DP, but as far as I can see, these assumptions are implausible from a semantic point of view.

3.3. *Argument reduction by existential closure (Bruening 2013)*

A different approach is proposed by Bruening (2013), who claims that argument reduction is carried out by existential binding of the external argument slot. His assumption is that the Voice head (=vP) introduces the external argument. He proposes a denotation for Voice (*v*) in active clauses that is very similar to that of Kratzer (1996) as in (14):

- (14) The lobbyist bribed the senator.
- $$\begin{array}{c}
 \text{VoiceP } \lambda e.\text{bribing}(e, \text{the senator}) \wedge \text{Initiator}(e, \text{lobbyist}) \\
 \swarrow \quad \searrow \\
 \text{DP} \qquad \text{Voice'} \quad \lambda e.\lambda x.\text{bribing}(e, \text{the senator}) \wedge \text{Initiator}(e, x) \\
 \text{The lobbyist} \qquad \swarrow \quad \searrow \\
 \text{Voice} \qquad \text{VP } \lambda e.\text{bribing}(e, \text{the senator}) \\
 \lambda f_{(s,t)}.\lambda e.\lambda x.f(e) \quad \swarrow \quad \searrow \\
 \wedge \text{Initiator}(e, x) \quad \text{V} \qquad \text{DP} \\
 \qquad \text{bribe} \qquad \text{the senator}
 \end{array}$$

Under his account, there is an additional Pass projection in passives, which corresponds to the Voice projection in the majority of other analyses we will discuss here. Bruening assumes that this head selects a Voice projection without an external argument.⁶ This Pass head therefore introduces existential closure (\exists) of the unsaturated variable corresponding to the external argument (*x* in this case):

⁶I will not go into the details of his selection mechanism here. Furthermore, I will omit his discussion of *by*-phrases and concentrate on the relevant issue of reduction of the external argument.

-
- PassP $\lambda e.\exists x.bribing(e,the\ senator) \wedge Initiator(e,x)$
- Pass
 $\lambda f_{(s,t)}.\lambda e.\exists x.f(x,e)$

VoiceP $\lambda e.\lambda x.bribing(e,the\ senator)\wedge Initiator(e,x)$

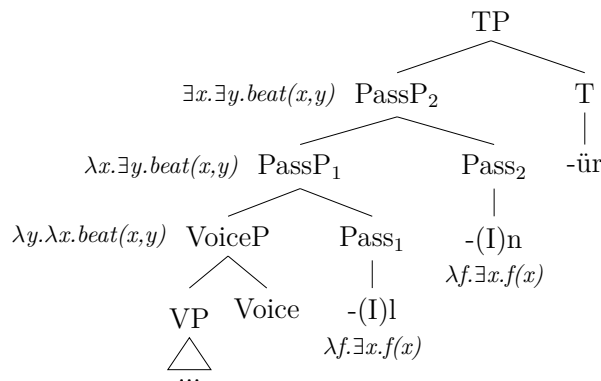
Voice
 $\lambda f_{(s,t)}.\lambda e.\lambda x.f(e)$
 $\wedge Initiator(e,x)$

VP $\lambda e.bribing(e,the\ senator)$

V
bribe

DP
the senator

(16) Bu oda-da döv-ül-ün-ür
this room-LOC beat-PASS-PASS-AOR
'There is beating going on in this room.'



The problem with this approach is that the lower Pass head (Pass₁) first reduces the internal argument (by closing the *y* slot) and then the higher head existentially binds the external argument slot. Thus, the derivation of the passive in Turkish under this approach would be *transitive* → *antipassive* → *passive*. If this analysis were correct, a single passivization operation in Turkish should result in an antipassive and then double passives would be derived by a second passivization operation. The antipassive is characterized by reduction or demotion of the internal argument rather than the external argument (see Silverstein 1972 and Section 5.2). The fact that the antipassive construction is impossible in Turkish yields this analysis untenable.

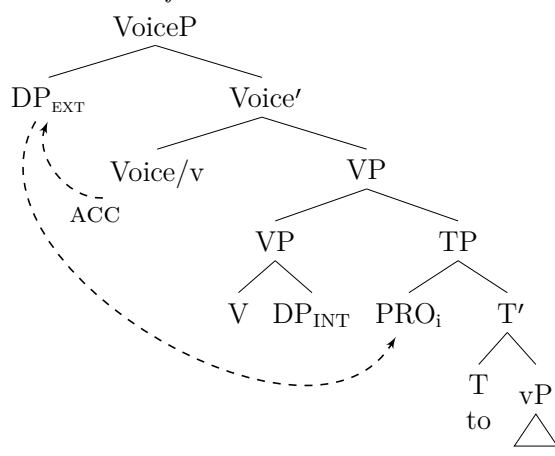
3.4. Summary

In this section, we encountered various approaches to argument reduction and how they could be applied to instances of double passivization. Recall the problematic observation that we seem to have evidence both for and against the existence of an external argument in passive constructions. Thus, it seems that whether one assumes that there is an external argument syntactically present or not, different problems arise in each case. The question at this juncture is whether there is a third possibility that avoids all these problems. An alternative recently explored by Müller (2014, 2015*a,b*) assumes that the external argument is present for part of the derivation and is then later removed. This is the approach to argument reduction that I will adopt in the analysis to follow.

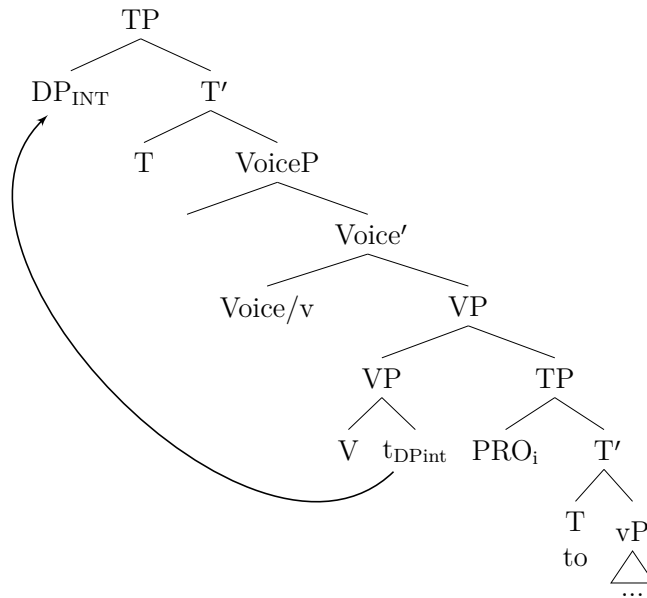
4. The analysis

The problem we are facing with regard to the external argument in passives is that there seem to be arguments both for and against its syntactic presence. Thus, a completely satisfactory analysis would need to ‘have its cake and eat it’ by assuming that external argument is both syntactically present and absent. Rather pursue deep metaphysical questions of how a syntactic object can be both present and absent at the same time, I will follow Müller (2014, 2015*a,b*) in assuming that the external argument is present for only part of the derivation and is then later removed. This is what he calls the ‘short life-cycle of external arguments’. This will allow an external argument to present in the structure long enough to established downward relations such as binding/control (17), but be removed from the structure at later stage of the derivation early enough for it not to act as an intervener for movement of the subject (18):

(17) *Establishment of downward relations:*



(18) No intervention after removal of DP_{EXT} :



The question at this point is what kind of operation can be proposed in a Minimalist framework to achieve this result. Such an operation will be presented and discussed in the following section.

4.1. Remove

In this section, I will present a syntactic operation recently discussed in Müller's (2014; 2015a; 2015b) analysis of the passive that will allow us implement the analysis sketched above. Whereas External Merge takes elements from the workspace/numeration and adds them to the existing structure, the operation Müller (2014, 2015a,b) dubs *Remove* can actually take already-merged elements out of the tree. Note that this is similar to Sideward Movement (Nunes 2004), which is an operation that moves elements between workspaces. An important difference between *Remove* and Sideward Movement is that *Remove* occurs in a very strict structural configuration; in a Spec-Head configuration with a head bearing a $[-F-]$ feature. As such it is very much the reverse operation of Merge (Merge = workspace \rightarrow tree, Slice = tree \rightarrow workspace).⁷ We can view this structure removal therefore as movement back into the workspace. Müller (2014, 2015a) assumes that, like Merge, this operation only applies at the root node and therefore does not violate the Extension Condition (Chomsky 1995).⁸ I assume two types of structure building features:

⁷The triggers for Sideward Movement are somewhat unclear and thus it remains less-restricted than Slice, although see Nunes (2012) for recent discussion of this point.

⁸Note that Müller (2015b) assumes a less stringent approach to *Remove* with regard to its target (i.e. it can apply both to phrases and to heads), as well its mode of application (i.e. internal vs. external *viz.* Merge). Since the following analysis does not require any of these additional assumptions, I will simply

‘bullet’ features triggering (External or Internal) Merge $[\bullet F \bullet]$, and ‘star’ features triggering Agree operations $[*F*]$. Assuming that *Remove* is also feature-driven, we can then add a corresponding *Remove* feature to our list of structure building features:

- (19) *Structure-building features:*
- a. *Merge* features: $[\bullet F \bullet]$
 - b. *Probe* features: $[*F*]$
 - c. *Remove* features: $[-F-]$

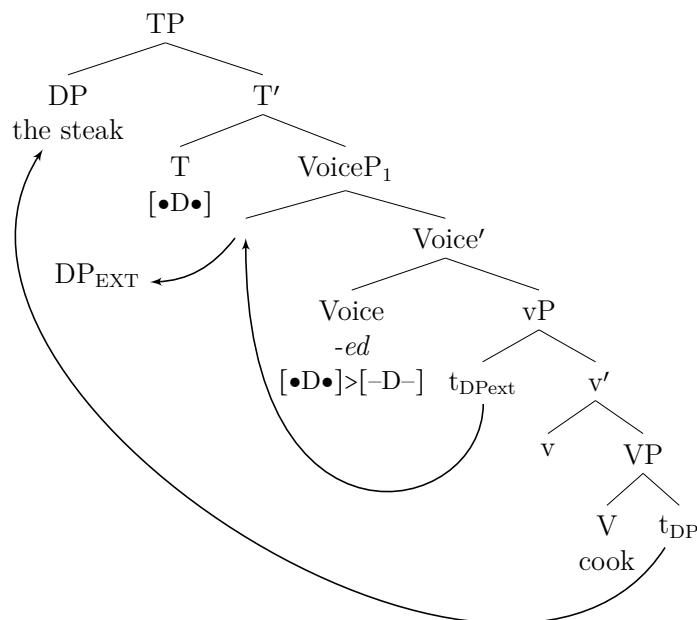
In the following section, we will see how these features can be combined to successfully derive both passives and double passives in Turkish.

4.2. A *Remove* approach to standard passives

Now, let us see how *Remove* can be applied to standard passives. I follow Merchant (2013), Harley (2013), Legate (2014) and the growing body of literature, suggesting that Voice and *v* constitute distinct heads (contra Kratzer 1996) in the clausal spine. The morphological reflex of passivization is captured by assuming the passive suffix is the head of VoiceP above vP and that it bears a Merge-triggering feature $[\bullet D \bullet]$ and a *Remove*-feature $[-D-]$. These are featured are ordered with regard to one another so that $[\bullet D \bullet]$ precedes $[-D-]$. The derivation will precede as follows: The $[\bullet D \bullet]$ feature first triggers internal merge of the closest DP (since the numeration is empty); in (20), the external argument. This DP is then moved back into the workspace in order to check the *Remove* feature $[-D-]$ and is therefore no longer present at the point of the derivation where T probes for a goal for movement to Spec-TP:

assume that the $[-D-]$ applies only to phrases and in a Spec-Head configuration. See Müller (2015*b*) for application of *Remove* to a number of other constructions.

- (20) The steak was cooked.



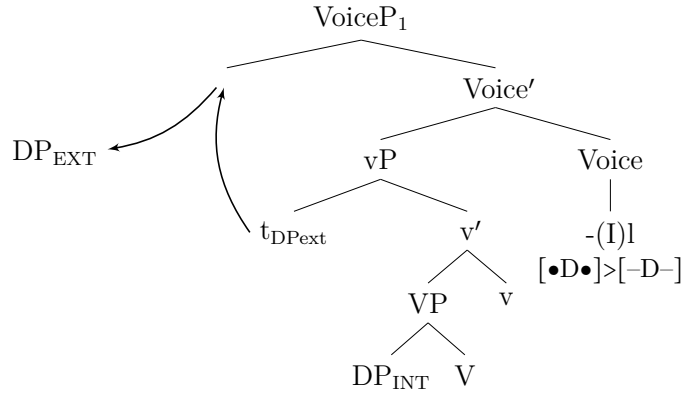
As a result, it is the internal argument that is moved to Spec-TP, thus deriving a standard passive construction. Now that the analysis of a personal passive, the corollary of our theory of double passivization was that we simply apply this passivization operation twice. In the following section, we will see that simply assuming a second Voice projection for double passives will derive this result.

4.3. Deriving double passives

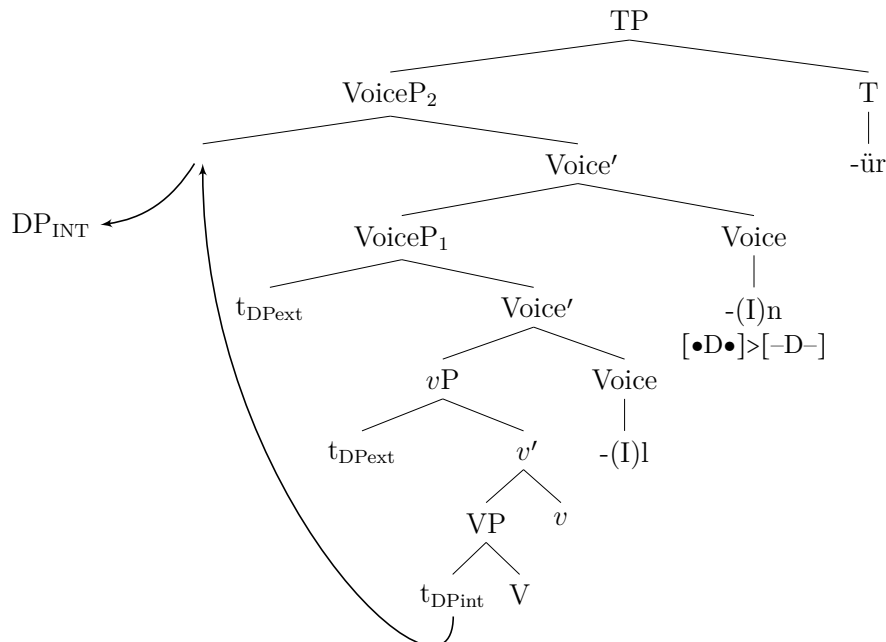
Recall the following example of double passives from (4) (repeated below):

- (4) Bu oda-da döv-ül-ün-ür
 this room-LOC beat-PASS-PASS-AOR
 'There is beating going on in this room.'

The derivation of these structures proceeds as follows: the first passive suffix on Voice₁ (-*ül*) bears both a Merge feature and a Remove feature. The Merge feature will trigger movement of the closest c-commanded DP to Spec-VoiceP. In this case, it is the external argument in Spec-vP. Subsequently, the next feature to be discharged is the Remove feature. This feature removes a DP from the specifier and moves it 'sideways' back into the workspace:

(21) *Reduction of the External Argument:*

Since each passive morpheme corresponds to a Voice projection, double passives contain a second Voice projection headed by another passive suffix. This Voice projection has exactly the same features as the first and will thus result in a second passivization operation being carried out. The Merge feature $[\bullet D \bullet]$ on Voice_2 requires that the closest c-commanded DP moves to its specifier. Since the external argument has been removed, the closest (and only) DP in the structure is the internal argument (Müller 2014, 2015*a,b*). Accordingly, the internal argument moves to Spec-VoiceP₂. As before, the Remove feature now triggers the removal of this argument:

(22) *Reduction of the Internal Argument:*

The structure we have now contains neither an internal nor external argument, i.e. double passivization constitutes two instances of argument reduction. This can therefore explain

the fact that double passives are only possible with transitives and not possible with unergatives (7) or unaccusatives (8). In each of these cases, the second VoiceP would not be able to check its Merge and Remove features since there would be no further DP present in the structure after the first argument had been removed.

4.4. Semantic interpretation

One question that arises at this point is what *Remove* does semantically and how we can capture the characteristic of double passives in (6) that both the external and internal argument are implicit. If we remove arguments from the structure, what consequences does this have for semantic interpretation? The fact that both arguments are still implied can be captured in the following way: Assuming that movement leaves some kind of trace or copy that is interpreted as unbound variable (or a variable for an assignment function in Heim & Kratzer 1998), we can also assume that the *Remove* operation (being essentially a form of Sideward Movement) leaves a trace/copy of the DP corresponding unbound variable in its launching site.⁹ Let us assume that the trace of a moved element is interpreted as an unbound variable (e.g. x').

Following Heim & Kratzer (1998), there is lambda abstraction over the variable below the point at which the moved phrase is remerged. Under this approach, what happens if the moved element is not remerged into the structure? Let us assume that the variables remain unbound in such cases. Furthermore, I will follow Diesing (1992) in proposing that existential closure of variables takes place at what she called the ‘VP’ edge. For present purposes, this corresponds to everything below T (so the highest VoiceP). Diesing (1992) discussed examples such as the following that show that if a bare plural (assumed to have a variable-like meaning) stays inside the VP, it receives an existential interpretation (23)b:

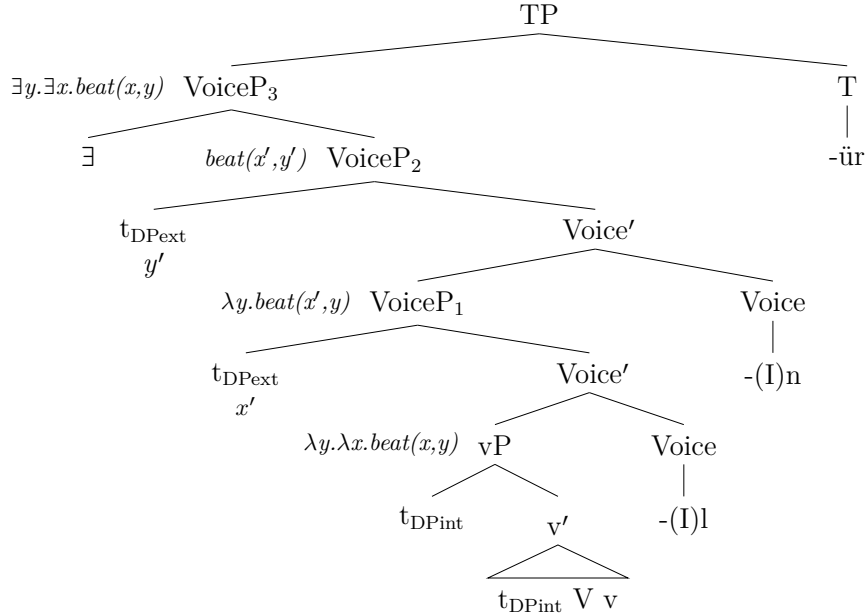
(23) Sharks are visible.

- a. $[_{IP} \text{Sharks}_i \exists [_{VP} t_i \text{ are visible}]]$
‘Sharks generally have the property of being visible.’
- b. $[_{IP} \exists [_{VP} \text{Sharks are visible}]]$
‘There are some sharks visible right now.’

Similarly, we can assume that existential closure of unbound variables happens below T:

⁹In the following, I will simplify assumptions about traces/copies slightly for reasons of exposition and simply assume that lower copies are unbound variables. Nevertheless, an implementation using the assignment function in Heim & Kratzer (1998) would derive the same result. An anonymous reviewer commented that this approach seems more amenable to Trace Theory rather than the Copy Theory of Movement. The fact that traces are postulated here rather than copies is, however, not relevant to this criticism, since proponents of the Copy Theory have to posit some kind of LF operation (e.g. *Trace Conversion*) that turns all lower copies into variables anyway (see Fox 1999, 2002; Sauerland 1998, 2004).

(24) *Existential closure of traces of Removed DPs:*



Above, we are forced to assume the domain of existential closure is actually at the VoiceP edge rather than, say, vP. Evidence supporting this idea comes from the examples in (25) from Carlson (1977):

- (25) a. Children were dancing in the street. (✓ existential)
 b. Doctors are intelligent. (*existential)

Here we see that existential closure of bare plurals only seems possible with passives. This suggests that the domain of existential closure is at VoiceP and thus higher than the subject in (25b).

5. Extensions: Deriving other properties of the passive

5.1. Double passives in Lithuanian

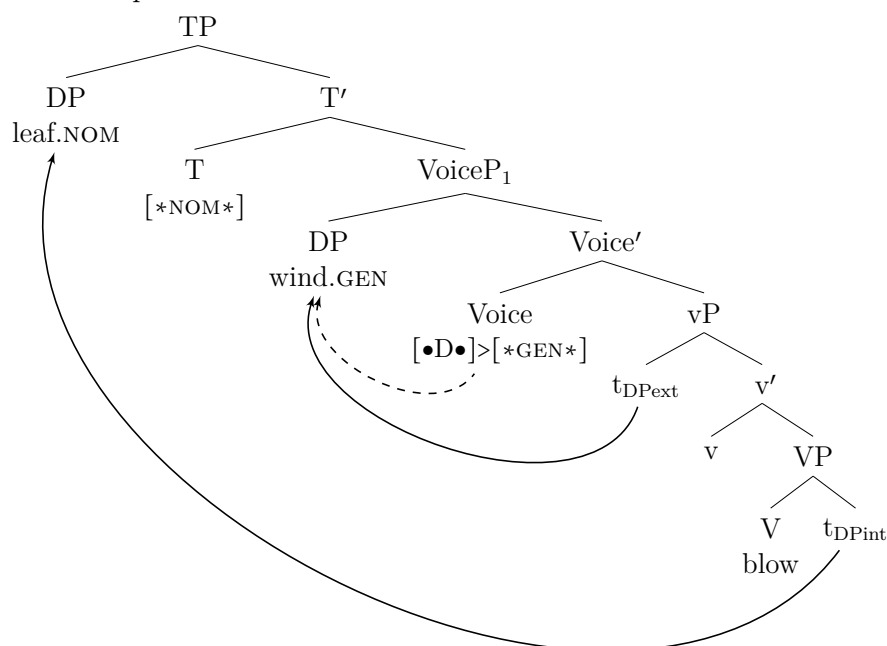
In this section, we will see how the analysis developed here for Turkish can be applied to similar cases of double passivization, e.g. in Lithuanian (Timberlake 1982; Keenan & Timberlake 1985). Lithuanian does not form the passive by means of argument reduction, but rather argument *demotion*. The external argument in passives is realized as an oblique argument in the genitive case (27), rather than the nominative as in active clauses (26):

- (26) Vėjas nupūte ta lapeli.
 wind.NOM blow that leaf.ACC
 'The wind blew down that leaf.'

- (27) Tas lapelis vėjo nupustas.
 this leaf.NOM wind.GEN blow
 ‘That leaf was blown down by the wind.’ (Timberlake 1982)

Since there is no argument removal, we can assume that the Voice head in Lithuanian does not bear a $[-D-]$ feature, but rather a case feature for genitive ($[*GEN*]$). This feature will assign genitive to the external argument that moves to Spec-VoiceP via Spec-Head Agree and will thereby bleed further assignment of nominative to the external argument. Instead, the internal argument is assigned nominative and moves to Spec-TP:¹⁰

- (28) *Personal passive in Lithuanian:*



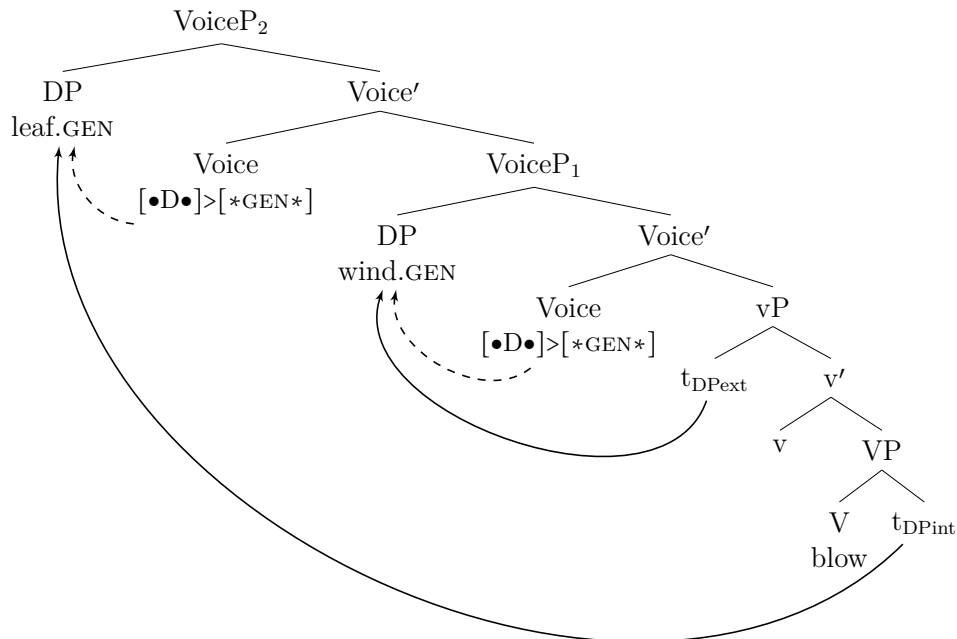
In Lithuanian double passives, the internal argument is also realized with genitive case as shown in (29):

- (29) To lapelio būta vėjo nupūsto.
 this leaf.GEN was wind.GEN blow
 ‘That leaf was blown down by the wind.’ (Timberlake 1982)

¹⁰ An anonymous reviewer notes that the movement to Spec-TP in (28) seems to be a typical configuration for *defective intervention* (Chomsky 2000, 2008), i.e. movement of a DP crosses a deactivated goal. It is worth noting that defective intervention seems to arise as a result of ϕ -probing of T (e.g. with datives in Icelandic Holmberg & Hróardóttir 2003; Sigursson & Holmberg 2008) and concomitant movement to Spec-TP (e.g. McGinnis 1998; Hartman 2011; Keine & Poole 2015). However, the fact that defective intervention arises in Icelandic without movement could suggest that defective intervention is linked to ϕ -agreement and, since EPP-movement is parasitic on this, it often looks like a constraint on movement (see Preminger 2014 for discussion). If this is on the right track, then since the Voice head has a simple ‘EPP’ feature ($[•D•]$) but no probe, we may not expect to find defective intervention here after all.

Thus, we have two instances of argument demotion parallel to the two instances of argument reduction in double passives in Turkish. Accordingly, we can follow the analysis of the Turkish data and assume that double passives in Lithuanian contain a second VoiceP projection bearing the same features ($[\bullet D \bullet]$, $[*GEN*]$) thereby resulting in movement of the internal argument to Spec-VoiceP₂ where it is also assigned genitive and thus bleeding of nominative case assignment:

(30) *Double passive in Lithuanian:*



Thus, we see that languages can differ with regard to their passive strategies (argument reduction vs. demotion) and whether passivization is realized morphologically (i.e. whether the Voice head has an overt Spellout or not), but nevertheless the analysis with two identical VoicePs can be extended to both.

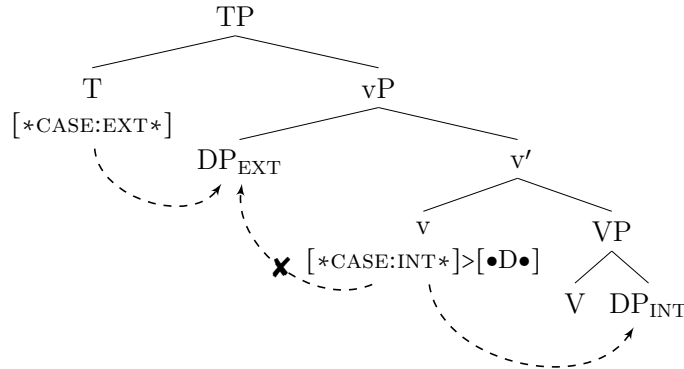
5.2. Antipassives

This section will show how the *Remove* approach to passives sketched above can explain the availability of so-called ‘antipassive’ constructions in ergative-absolutive languages. The ‘antipassive’ (Silverstein 1972) is a construction in ergative languages that is characterized as the demotion or reduction of the internal argument. In antipassives in Godoberi (31), the internal argument is suppressed and the antipassive marker *-a* appears on the verb. In Chukchee (32) and West Greenlandic Inuttut (33), we see a similar process of reduction of the internal argument coupled with antipassive marking on the verb.

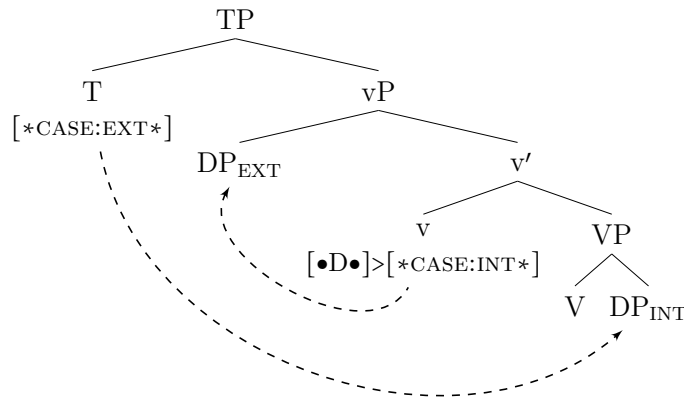
- (31) *Antipassive in Godoberi:* (Kibrik 1996)
- a. ʔali-di q'iru b-el-ata-da.
 Ali-ERG wheat NEUT-thresh-IPF.CONV-AUX
 'Ali is threshing wheat.'
- b. ʔali w-ol-a-da.
 Ali MASC-thresh-APASS.CONV-AUX
 'Ali is threshing.'
- (32) *Antipassive in Chukchee:* (Bittner & Hale 1996)
- a. yemronə-na qərir-ərkən-in ekək
 Yemron-ERG_i search-PRES-3SG_i>3SG_j son.NOM_j
 'Yemron is searching for his son.'
- b. yemron ine-lqərir-ərkən
 Yemron.NOM_i APASS-search-PRES.3SG_i
 'Yemron is searching.'
- (33) *Antipassive in West Greenlandic Inuttut:* (Saddock 2003)
- a. Toquppaa
 toqut-Va-a
 kill-IND-3S/3S
 'He/she/it killed him/her/it.'
- b. Toqutsivoq
 toqut-si-Vu-q
 kill-APASS-IND-3S
 'He/she/it killed (something).'

The analysis I propose rests on assumptions in Müller (2009) about how ergative-absolutive systems are derived. Müller proposes that the order of the operations on *v* determines what the alignment system will be. Let us assume abstract types of case: a morphologically marked internal case (ACC, ERG) and a morphologically unmarked external case (NOM, ABS). Müller assumes that the former is assigned by T and the latter by *v*. At the point in the derivation σ where *v* has merged with VP, there is what Müller calls an 'indeterminacy in rule application'. Assuming the *v* head carries out (at least) the following two operations, (i) externally merge an argument in its specifier ([•D•]), (ii) assign case to the 'closest element' (e.g. [*CASE:INT*]), whereby elements in its specifier are preferred (*Spec-Head Bias*), then in principle, either rule can apply at σ . If [*CASE:INT*] applies before [•D•], then the 'closest' goal will be the internal argument and internal (or accusative/ergative) case will be assigned. Subsequently, T will assign external case to the external argument (34).¹¹ This derives a nominative-accusative alignment:

¹¹ This is a case of *counterfeeding* (Kiparsky 1973) of Spec-Head Agree as if [•D•] had applied before [*CASE:EXT*], it would have fed this operation.

(34) *Nominative-Accusative Alignment:*

For ergative-absolutive alignments (those languages, which tend to have antipassive constructions), the order of operations on *v* is reversed. Since [•D•] applies before [*CASE:INT*], it feeds Spec-Head Agree and internal (ergative case) is assigned to DP_{EXT}. T then assigns external case (absolutive) to the internal argument as in (35).

(35) *Ergative-Absolutive Alignment:*

Thus, the difference between ergative-absolutive and nominative-accusative languages is simply the order of operations on the *v* head. Accordingly, the analysis of the antipassive will rely on this fact. It is often assumed that the availability of a DP as potential goal for Agree is directly linked to whether it has been assigned case or not. DPs which have not yet been assigned case are still ‘active’ for Agree operations, whereas those already assigned case are ‘deactivated’ in the process. This can be summarized as follows:

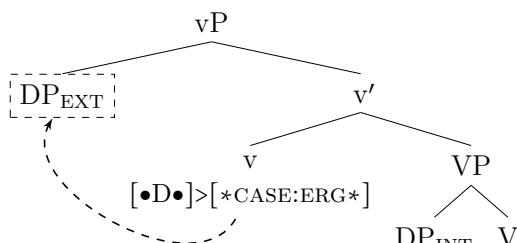
(36) *Activity Condition* (Chomsky 2000, 2001):

A syntactic object α is a potential goal for syntactic operations iff α bears an unvalued Case feature.

In ergative-absolutive languages such as (31)–(33), [•D•] feeds Spec-Head assignment of internal case to the external argument in Spec-vP. In the derivation of structures in an ergative language, the external argument is assigned internal (ergative) case and is

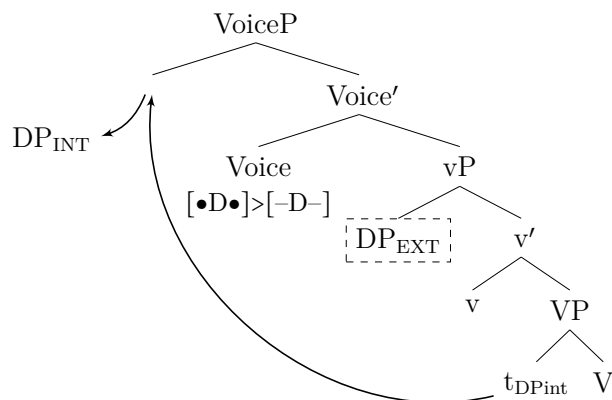
therefore deactivated for further Agree operations as indicated by the dashed box:

(37) *Deactivation of DP_{EXT} :*

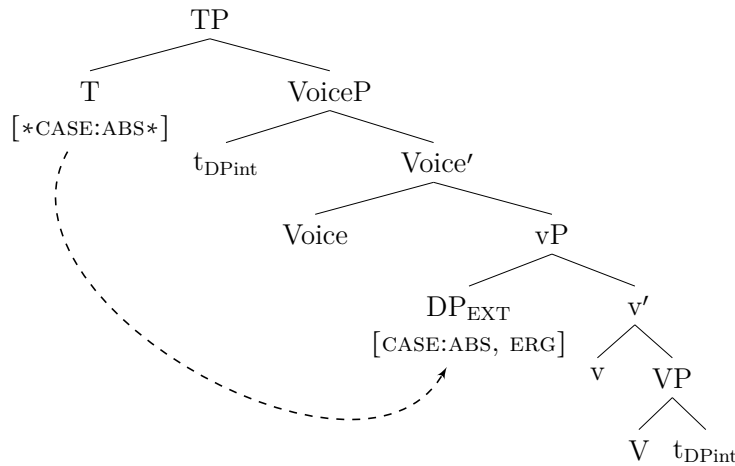


Thus, when Voice is merged above vP, DP_{EXT} is not an active goal for the $[\bullet D \bullet]$ feature. Instead, it probes further and attracts the internal argument to Spec-VoiceP and subsequently removes it from the structure:

(38) *Reduction of Internal Argument:*



A necessary assumption at this point is that cases can be ‘stacked’ (see McCreight 1988; Yoon 2004; Merchant 2006; Richards 2013), i.e. multiple case assignment is possible. Since assignment of absolutive to DP_{INT} in (38) was bled by the *Remove* operation, T still has internal (absolutive) case to assign: $[\ast CASE:INT \ast]$. Therefore, let us assume that a case-marked DP is inactive for all syntactic operations (e.g. movement or extraction; Chomsky 2000) apart from further case assignment. Accordingly, T can assign absolutive case to the external argument as in (39) (where internal and external case have been replaced by the corresponding ergative and absolutive):

(39) *Case Stacking:*

The case features on the external argument DP now bears two values and the question arises at this point as to which case is realized on a DP with stacked cases. I assume that this conflict is resolved by referring to the Case Accessibility Hierarchy proposed in (Otsuka 2006:84) given in (40):

(40) *Case Accessibility Hierarchy:*

Unmarked Case (NOM/ABS) > Marked Case (ACC/ERG) > Oblique

This means that for a DP which was assigned both internal and external case (or absolutive and ergative in this present example), only the highest case on the hierarchy in (40) would be morphologically realized (i.e. absolutive).

6. Conclusion

In this paper, I propose an analysis of double passivization constructions in Turkish, which exhibit both two instances of passive morphology and two instances of argument reduction. There is a syntactic dilemma posed by the fact there is evidence (e.g. from control) suggesting that an external argument is present; however, at the same time this creates a problem as it should then act as intervener for raising of the object. These apparently conflicting representations can be solved by adopting the theory of the passive in Müller (2014, 2015*a,b*) and applying it, with some minor additions, to double passives in Turkish. Argument reduction is treated as introduction and subsequent removal of the external argument.

It was also shown that this analysis can adequately capture two important characteristics of double passives in Turkish: (i) the restriction to transitive verbs, (ii) both an internal and external argument are implicit. The first property is captured by the fact that two Voice projections will require two DPs in order for all features to be checked.

The second property comes from the fact that the DPs were syntactically present at some point and thereby leave a trace/copy behind that is interpreted as an unbound variable that undergoes existential closure.

I also offered some tentative analyses of how this general approach involving the operation *Remove* can be applied to argument demotion in Lithuanian and antipassivization in general. Furthermore, Müller (2015*b*) points out a vast number of other constructions containing ‘conflicting representations’ that seem amenable to this kind of analysis. Therefore, exploring and developing the *Remove* operation seems like a worthwhile endeavour for future research.

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Three explanatory challenges for Copy Theory

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This paper advances a new approach to the syntax-PF mapping of movement chains. It is argued that Non-Distinctiveness of copies can be defined as an inclusion relation between the features of syntactic constituents at the interfaces. The assumptions behind such a definition (i.e., Late Insertion and unvalued features being ‘invisible’ at the interfaces) allow deriving (i) that only one link per chain is pronounced and (ii) that such a link must be the higher one in the structure. Wh-copying and low copy pronunciation phenomena are also shown to be captured by the proposed system.

1. Introduction

According to *Copy Theory* (Chomsky 1993), syntactic movement does not exist as an independent operation (i.e., nothing really *moves*), but it is an epiphenomenon of how the PF component phonetically realizes *chains*, collections of (occurrences of) *non-distinct* syntactic objects (SO). To illustrate this, consider a passive sentence as (1a):

- (1) a. John was kissed.
- b. [TP John [T' was [VP kissed ~~John~~]]]
- c. CH = (John, ~~John~~)

Passive sentences are classically understood as consisting of an operation moving the internal argument of the verb to the subject position. Under Copy Theory, this analysis involves a *Copy* operation generating a new occurrence of the internal argument in the Spec,T position (1b). Since both occurrences of *John* are non-distinct (i.e., they are ‘the same’ somehow), they are assumed to form the chain CH depicted in (1c), and given that both constituents are in the same chain, the lower copy in the structure is ‘deleted’ from the phonological representation.

In other words, Copy Theory presupposes a complex mapping mechanism between the ‘phonological’ form of a sentence (1a), its syntactic representation (1b) and one or more (non-trivial) chains (1c). In order to provide a principled and explanatory account of such a mapping, Copy Theory should be able to answer three important questions which here, for ease of presentation, will be termed the *Challenges of Copy Theory*.

(2) *Challenges of Copy Theory*a. *Sameness Challenge*

How does grammar distinguish between real copies and non-transformationally related tokens of the same lexical item?

b. *Uniqueness Challenge*

Why is it necessary to delete copies from the phonological representation?

c. *Rank Challenge*

Why is the structurally highest copy in a chain the one that should be pronounced?

The main aim of this paper is to provide a unified answer for these explanatory challenges on the PF-computation of syntactic chains. Thus, in section 2, it will be demonstrated that the ‘standard’ approach to the questions in (2) (Nunes 1995, 2004) presents both explanatory and theory-internal issues. Section 3 advances a novel approach to the three challenges grounded on the idea that movement chains are interface representations formed on inclusion relations between the features of syntactic constituents. Section 4 shows how this new system allows dealing with some of the empirical exceptions to the Uniqueness and Rank Challenges. Finally, section 5 contains the conclusions.

2. *Nunes’ (1995, 2004) answers to the three challenges*

The first fine-grained attempt to answer the challenges of Copy Theory was offered by Nunes (1995, 2004), who was also the first scholar in pointing out the necessity of solving in a principled manner the Uniqueness and Rank challenges. However, as will be shown, his proposal suffers theoretical and conceptual drawbacks.

2.1. *The Sameness Challenge*

The defining property of a movement chain under Copy Theory is *Non-Distinctiveness*: all the members of a chain should be the ‘same’ in some relevant way. However, defining Non-Distinctiveness has proven to be extremely difficult (cf. Chomsky 1995, Nunes 1995, 2004, Leung 2007). In a structure like (3)¹, for example, there seems to be no single relevant property allowing the differentiation between the members of the chain in the matrix clause, CH₁ = (*John*₁, *John*₂), and the members of the chain in the subordinate clause, CH₂ = (*John*₃, *John*₄). For example, *John*₁ and *John*₃ share the same set of ϕ -features, occupy Spec,T positions and carry nominative Case.²

(3) [TP *John*₁ [T' T [VP *John*₂ [V' said that [TP *John*₃ [T' was [VP kissed *John*₄]]]]]]].

Given the difficulty to distinguish real copies from tokens of the same lexical item, Chomsky (1995) proposed a marking mechanism to signal those elements related by internal Merge. Nunes (1995, 2004) basically adopts the same approach. The idea is that every lexical item selected from the Numeration should be marked as distinct by assigning it an index; so if the lexical item *John* is selected twice from the numeration, two differently marked elements *John*_{*i*}

¹ Numerical indexes are introduced on copies only for expository purposes.

² Chomsky (2008) and Martin & Uriagereka (2014) assume that Non-Distinctiveness is computed in the domain of a *phase*. While this assumption allows deriving the chains in (3), it does not work for cases as the following:

(i) [CP *Who*₁ [C' C [TP *who*₂ [T' T [VP *who*₃ [VP said [CP *who*₄ [C' C [TP *who*₅ [T' was [VP kissed *who*₆]]]]]]]]]]]]]]]

and *John_j* should enter the syntactic computation. Since the Copy operation replicates both the lexical item and its formal markings, a copy of a constituent will also carry its index. Therefore, the problem of differentiating copies from occurrences vanishes since grammar generates representations with unambiguous markings identifying sameness relations.

- (4) [TP John_i [T' T [VP John_i [V' said that [TP John_j [T' was [VP kissed John_j]]]]]]].

There are two main problems with this solution. First, it violates the *Inclusiveness Condition* (Chomsky 1995), a meta-theoretical principle banning the introduction of non-lexical material in the syntactic derivation (e.g., indexes, bar levels, traces). Such a violation is particularly problematic for Copy Theory since one of the classical conceptual advantages of assuming copies over traces has been supposed to be their compliance with Inclusiveness. However, there is nothing particularly more principled in assuming the existence of Non-Distinctiveness markings for copies over coindexed empty categories. As Neeleman & van de Koot (2010:332) put it, it seems that 'Copy Theory by itself does not resolve the tension between Inclusiveness and the displacement property of natural language'.

The second problem is more serious. Ideally, a principled theory of Non-Distinctiveness of copies should postulate in an explicit way the relevant properties shared by two SO for them to be interpreted as the same element by the grammar. Therefore, assuming the existence of a special mechanism marking elements as non-distinct (no matter how elegant this mechanism may be) is not really explicative; it is just a theoretical device to inductively get the right result.

2.2. The Uniqueness Challenge

As already mentioned, Copy Theory should provide an explanation for the general ban on multiple copy pronunciation. The problem is shown in the following pair:

- (5) a. John was kissed ~~John~~.
b. *John was kissed John.

For some reason, it is impossible (in the general case) to pronounce more than one copy. According to Nunes (2004), the pattern in (5) follows from assuming the *Linear Correspondence Axiom* (LCA) of Kayne (1994). Kayne observes that one of the defining properties of linear orderings is an *Antisymmetry* requirement: for any ordered set of elements, the definition in (6) is trivially true.

- (6) *Antisymmetry*
If X precedes Y, then Y cannot precede X.

However, if Copy Theory is assumed and several copies of 'the same' constituent are present in the structure, a PF representation like (7a) would not immediately comply with (6) since, for example, the (higher copy of the) SO *John* would precede the SO *was* and, at the same time, the SO *was* would precede the (lower copy of the) SO *John*.

- (7) a. [TP John₁ [T' was [VP kissed John₂]]]
b. *John₁ < was < kissed < John₂ [VIOLATION OF ANTISYMMETRY]

Therefore, according to Nunes, it is necessary to reduce every movement chain to only one element by deleting some of its constituents. The mechanism in charge of doing so is termed *Chain Reduction*.

(8) *Chain Reduction* (Nunes 2004:27)

Delete the minimal number of constituents of a nontrivial chain CH that suffices for CH to be mapped into a linear order in accordance with the LCA.

Thus, if Chain Reduction applies and phonologically deletes the lower copy of *John* in (7a), the structure can be now linearized in accordance to the LCA:

- (9) a. [TP John₁ [T' was [VP kissed ~~John~~₂]]]
b. John₁ < was < kissed

Since the definition of Chain Reduction encodes a very explicit economy condition ('delete the minimal number of constituents...'), it is implied that (8) will not be applied when it is not necessary for convergence at PF.

2.3. The Rank Challenge

If, as Nunes proposes, the requirement of deleting all constituents in a chain except for one follows from the Antisymmetry requirement on linear orderings, then it is necessary to explain why Chain Reduction cannot (generally) apply to the higher copy. In other words, explaining the pair in (10) is still required.

- (10) a. John was kissed ~~John~~.
b. *~~John~~ was kissed John.

Nunes' explanation follows from a natural observation: if there is a preference for pronouncing the higher link in a non-trivial chain, there must be a relevant asymmetry between this element and the remaining constituents of the chain. In this sense, while all the copies in a chain are 'the same' because of a Non-Distinctiveness marking, their formal features may actually differ. This is clear in (11), where the lower copy of *John* bears an uninterpretable Case feature (uC), whereas the higher copy has already checked that feature with the T head.

- (11) [TP John_C [T' was [VP kissed John_{uC}]]]

This representation is not legible at PF since the lower copy of *John* retains its uninterpretable Case feature uC and, by assumption, uninterpretable features (uFF) cause the crash of the derivation at the interfaces. Thus, Nunes requires assuming an operation in charge of getting rid of uFF at PF:

(12) *FF-Elimination* (Nunes 2004:31)

Given the sequence of pairs $\sigma = \langle (F, P)_1, (F, P)_2, \dots, (F, P)_n \rangle$ such that σ is the output of Linearize, F is a set of formal features, and P is a set of phonological features, delete the minimal number of features of each set of formal features in order for σ to satisfy Full Interpretation at PF.

In few words, the mechanism depicted in (12) targets uFF and eliminates them from the phonological representation.

According to Nunes, by assuming (12), it is possible to explain the contrast between (10a) and (10b): if the lower copy of *John* is deleted as in (10a), then it is not necessary to apply FF-Elimination on the resulting representation since Chain Reduction has already deleted the problematic uC feature all together with the constituent.

(13) *Derivation applying Chain Reduction to the lower copy*

[TP John_C [T' was [VP kissed John_{uC}]]] [BY CHAIN REDUCTION]

However, if the higher copy of *John* is deleted instead, as in (10b), the uC on the lower copy will still be a problem. Thus, in this case it is necessary to apply FF-Elimination to delete it.

(14) *Derivation applying Chain Reduction to the higher copy*

a. [TP ~~John_C~~ [T' was [VP kissed John_{uC}]]] [BY CHAIN REDUCTION]

b. [TP ~~John_C~~ [T' was [VP kissed John_{uC}]]] [BY FF-ELIMINATION]

Given that the derivation in (13) involves fewer operations than the one in (14), the latter is unacceptable because of an economy consideration: shorter derivations block longer derivations. This kind of scenario will arise systematically for any sentence with non-trivial chains: deleting higher links in chains will always demand additional applications of FF-Elimination, thus deleting lower copies and pronouncing the higher one is predicted to be the general case in any language.

Although framed elegantly, Nunes' answer for the Rank Challenge is based on a conception of derivational economy that has been widely criticized over the years: *Global Economy* (cf. Collins 1997; Johnson & Lappin 1997). To make the point clear, consider the condition in (15), which is a broad statement of the economy consideration explaining the pair in (10).

(15) *Shortest Derivation Condition (Kitahara 1997:19)*

Minimize the number of operations necessary for convergence.

The definition in (15) is global since it requires comparing hypothetical derivations and their interpretable outputs (a *reference set*, in Chomsky's (1995) terms). For the case at hand, this implies that for every syntactic representation containing a movement dependency, the grammar must compare all the possible ways in which the chain can be reduced to only one link, and then 'choose' the most economic option. Of course, the process seems almost trivial for a representation as (11), where there is only one chain with two copies, but the comparison becomes increasingly more complex with every additional copy and chain in the structure: a representation with *n* copies on it will require comparing *n* alternative derivations involving Chain Reduction and FF-Elimination before picking a copy for pronunciation.

The inherent complexity of global economy based models (and their computational intractability, cf. Johnson & Lappin 1997) led to the introduction of the *Local* approach to economy conditions. A general definition of such is found in (16).

(16) *Local Economy (Collins 1997:2)*

Given a set of syntactic objects Σ which is part of a derivation *D*, the decision whether an operation *OP* may apply to Σ is made only on the basis of information available in Σ .

Therefore, according to (16), the decision of which copy should be pronounced in a structure like (11) may only involve information available in (11), and not an evaluation of all possible alternatives.

An account of the Rank Challenge on these lines can be found in Nunes (2011). Somewhat following Bošković's (2007) theory of movement, Nunes assumes that a syntactic object can check its uFF only if it probes for them in its c-command domain. So, for example, if a DP requires checking an uninterpretable Case feature *uC* with a T-head (17a), a copy of the DP will be merged in Spec,T (17b) and, from there, it will probe the T-head to check its *uC* feature (17c). Finally, the higher copy of the DP will probe for the *uC* features of its lower counterparts, making the representation fully interpretable (17d).³

- (17) a. [TP T [... DP_{uC}]]
 b. [TP DP_{uC} [T' T [... DP_{uC}]]]
 c. [TP DP_C [T' T [... DP_{uC}]]]
 d. [TP DP_C [T' T [... DP_C]]]

According to Nunes, the structure in (17c) is already interpretable at PF (presumably because the lower copy containing the uFF will be deleted anyway⁴), so Spell-Out applies at this point, delivering (17c) to the phonological interface and commencing the derivational step in (17d) to the covert component. The representation shipped to PF (17c) contains two copies of the DP, but only the higher one has checked its uFF features. Given that these features are supposed to encode information independently required by morphological operations (e.g., Case), phonological realization of the higher copy follows.

As an advantage, this proposal complies with (16), since the decision of which copy should be pronounced is taken on the basis of the information available at the representation in (17c) only. Also, it dispenses with FF-Elimination, an unprincipled post-syntactic operation deleting formal features.

However, for this proposal to work it is necessary assuming that the syntactic representation must be shipped to the phonological component in the precise moment when the higher copy in the chain has an 'advantage' over the remaining links regarding competition for pronunciation (i.e., in the derivational step (17c)). Moreover, this assumption implies a very particular kind of (multiple) spell-out mechanism:

- (18) A syntactic domain must be transferred to the interfaces at the derivational step when only the higher link in a non-trivial chain has checked all its uFF.

Because of this very strong assumption, whose consequences and potential predictions have not been yet explored, Nunes' (2011) proposal cannot be considered a principled answer for the Rank Challenge.

³ The last step in this derivation does not seem to be fully compatible with Bošković's set of assumptions since the element checking its uFF is c-commanded by its interpretable counterpart. For relevant discussion on the directionality of Agree, see Zeijlstra (2012).

⁴ If this is actually the reason to allow an uFF to reach PF, there is a look-ahead problem: how does grammar 'know' at this point that lower copies will be deleted?

2.4. Interim conclusions

While Nunes' answer for the Uniqueness Challenge is explanatory and elegant, his proposals for the Sameness and Rank challenges require further revision. Particularly, the proposal lacks a principled definition of Non-Distinctiveness, maybe the most important property of movement dependencies under Copy Theory.

3. An inclusion-based approach to the challenges

The essential assumption for the present proposal is *Late Insertion*: syntax operates with abstract morphemes without any phonological information; syntactic representations are provided with phonological exponents post-syntactically through an operation termed *Vocabulary Insertion* (VI, cf. Halle & Marantz 1993). Therefore, syntactic terminals are supposed to consist of sets of features only.

It will also be assumed that syntactic features are pairs of attribute-value $\langle \text{Att}, \text{Val} \rangle$, where the attribute designates a feature class (e.g., *Number*, *Case*) and the value a member of such a class (e.g., SINGULAR, DUAL; NOMINATIVE, GENITIVE). This assumption follows from the observation that syntactic operations such as *Agree* (Chomsky 2001) typically target classes of features and not pure values (cf. Adger & Svenonius 2011). However, it seems that this assumption is not necessary for the interfaces: features at PF and LF are interpreted as instructions based on *privative* values that make no use of attributes (e.g., the noun *dogs* is interpreted as a plurality of entities without reference to the *Number* class). Therefore, a syntactic terminal consisting on the features $\{\langle \text{Att}_1, \alpha \rangle, \langle \text{Att}_2, \beta \rangle\}$ will be interpreted at PF and LF simply as the set $\{\alpha, \beta\}$. As an extension of this idea, a valueless feature $\langle \text{Att}, _ \rangle$ will lack a representation at the interfaces, rendering it *uninterpretable*. Thus, a syntactic terminal with the features $\{\langle \text{Att}_1, \alpha \rangle, \langle \text{Att}_2, \beta \rangle, \langle \text{Att}_3, _ \rangle\}$ will be also interpreted as the set $\{\alpha, \beta\}$.⁵

Regarding feature valuation, the Probe-Goal system proposed by Chomsky (2000, 2001) is adopted: a *Probe* P carrying an unvalued feature $\langle \text{Att}_1, _ \rangle$ agrees with a *Goal* G carrying a valued version of the same feature $\langle \text{Att}_1, \alpha \rangle$ if (i) P c-commands G, (ii) there are no interveners between P and G, and (iii) the *Activity Condition* holds.

(18) *Activity Condition* (Chomsky 2001)

A goal G is accessible for Agree iff G has at least one uninterpretable feature.

It will be also assumed that Agree participates in both A and A'-dependencies. Therefore, a SO like *who* in (19a) will require carrying two activity-related uFF to engage in two different kinds of agreement relations: an unvalued Case feature $\langle \kappa, _ \rangle$ to be accessible to finite T, and an unvalued left-peripheral feature $\langle \omega, _ \rangle$ to be accessible to the interrogative complementizer.⁶ The valuation procedure of these features is briefly sketched in (19b). As standardly assumed, each new occurrence of *who* in the structure is a copy of the previous and closest version of *who*. From right to left, the first copy of *who* enters the derivation with both uFF, $\langle \kappa, _ \rangle$ and

⁵ Questions may arise regarding obligatoriness of syntactic operations if uFF do not trigger the crash of a representation at the interfaces. There are two alternatives: either a set of filters of good formation are assumed to apply on chains (e.g., Case Filter, Wh-Criterion), or an *Obligatory-Operations Model* (cf. Preminger 2011, 2014) is adopted. No important differences follow from embracing either of these options.

⁶ The features in the Probes are omitted for simplicity. Also, the irrelevant featural content of Goals (e.g., ϕ -features, definiteness features) is abbreviated by using suspension points ('...').

$\langle \omega, _ \rangle$. The second copy is generated by cyclic movement, so no features are satisfied in this position (cf. Bošković 2007). The third copy moves to value T's ϕ -features, so it receives nominative Case (i.e., $\langle \kappa, _ \rangle$ becomes $\langle \kappa, \text{NOM} \rangle$).⁷ The fourth and last copy enters in an Agree relation with the interrogative complementizer, so the activity feature for discourse-scope related dependencies gets satisfied (i.e., $\langle \omega, _ \rangle$ becomes $\langle \omega, Q \rangle$).

- (19) a. $[_{CP} \text{Who } [_{TP} \text{who seems } [_{TP} \text{who to be } [_{\text{who}} \text{happy}]]]]?$
 b. $\text{Who}_{\langle \kappa, \text{NOM} \rangle, \langle \omega, Q \rangle, \dots} \dots \text{who}_{\langle \kappa, \text{NOM} \rangle, \langle \omega, _ \rangle, \dots} \dots \text{who}_{\langle \kappa, _ \rangle, \langle \omega, _ \rangle, \dots} \dots \text{who}_{\langle \kappa, _ \rangle, \langle \omega, _ \rangle, \dots}$

If, as assumed, only the value-part of the feature is visible at the interfaces (i.e., if features are privative instructions after narrow syntax), then it is predicted that PF and LF will not exactly ‘see’ a representation like (19b) but one as (20), where higher copies carry more features than their lower counterparts.

- (20) $\text{Who}_{\langle \text{NOM}, Q, \dots \rangle} \dots \text{who}_{\langle \text{NOM}, \dots \rangle} \dots \text{who}_{\langle \dots \rangle} \dots \text{who}_{\langle \dots \rangle}$

In (20) there is an *inclusion* relation between the features of immediate occurrences of *who*: the set $\{\text{NOM}, \dots\}$ is a subset of the set $\{\text{NOM}, Q, \dots\}$ (i.e., $\text{who}_{\langle \text{NOM}, \dots \rangle} \subseteq \text{who}_{\langle \text{NOM}, Q, \dots \rangle}$); the set $\{\dots\}$ is a subset of the set $\{\text{NOM}, \dots\}$ (i.e., $\text{who}_{\langle \dots \rangle} \subseteq \text{who}_{\langle \text{NOM}, \dots \rangle}$); and the set $\{\dots\}$ is a subset of the (identical) set $\{\dots\}$ (i.e., $\text{who}_{\langle \dots \rangle} \subseteq \text{who}_{\langle \dots \rangle}$). Such a relation will arise systematically for every new copy of a constituent, so it may be capitalized to define Non-Distinctiveness of copies:

(21) *Non-Distinctiveness*

Two constituents α and β are non-distinct if:

- a. α c-commands β ,
- b. the features of β are a subset of the features of α ,
- c. there is no δ between α and β being a proper subset of α or a proper superset of β .

The definition in (21) allows identifying non-distinct SO by inspecting the features of constituents in a phrase marker: two elements will be considered ‘the same’ if they are in a local relation and the higher element ‘contains’ the features of the lower one. Moreover, given that such an inclusion relation can only hold at PF and LF, where unvalued features are not ‘visible’, Non-Distinctiveness must be assumed to be computed independently and in parallel at both interfaces. Therefore, PF and LF are supposed to compute their own chains by using the definition in (21) and interface-specific principles.

Even though (21) only makes reference to ‘two constituents α and β ’, the definition still predicts the existence of chains with more than two links, given that identity-like relations as Non-Distinctiveness are inherently transitive. Therefore, in a representation like (20), $\text{who}_{\langle \text{NOM}, Q, \dots \rangle}$ and $\text{who}_{\langle \dots \rangle}$ are expected to form part of the same chain even if they do not strictly comply with (21) since $\text{who}_{\langle \text{NOM}, Q, \dots \rangle}$ and $\text{who}_{\langle \text{NOM}, \dots \rangle}$ are non-distinct, and $\text{who}_{\langle \text{NOM}, \dots \rangle}$ and $\text{who}_{\langle \dots \rangle}$ are also non-distinct (i.e., $\text{who}_{\langle \text{NOM}, Q, \dots \rangle}$ and $\text{who}_{\langle \dots \rangle}$ must also be non-distinct by transitivity).

Such a characterization of Non-Distinctiveness does not violate Inclusiveness since (21) only takes into consideration independently motivated features on SO. In this sense, the three

⁷ A reviewer correctly observes that it is unclear whether *who* moves to Spec,T because it was attracted by T's ϕ -features (the ‘attract’ approach to movement), or whether the $\langle \kappa, _ \rangle$ feature on *who* forces it to move upstairs (the ‘greed’ approach to movement). Such an ambiguity is deliberate: no relevant contrast follows from preferring any of these mechanisms.

conditions coded in (21a), (21b) and (21c) refer to almost uncontroversial properties of syntactic movement (i.e., c-command, Last Resort and Relativized Minimality, respectively), so no ad-hoc notions are invoked.⁸

Regarding its empirical predictions, a proper definition of Non-Distinctiveness is expected to be able to distinguish between cases where two occurrences of *John* are supposed to form a chain and cases where they do not. Thus, (21) should derive the following contrast:

- (22) a. John was kissed ~~John~~.
b. John kissed John.

The simplest case is the one in (22a), where both occurrences of *John* do form a chain. A more detailed representation of this sentence is offered in (23).

- (23) a. [TP John_{<K,NOM>, ...} was [VP kissed John_{<K,>, ...}]]
b. [TP John_{NOM, ...} was [VP kissed John_{...}]]

Under a conventional analysis of passives, the higher copy values its Case feature through Agree with T (23a). Therefore, at the interfaces (cf. 23b), this occurrence will contain the features of its original counterpart. Since (i) these elements are in a c-command relation, (ii) the c-commanding element contains the features of its lower counterpart, and (iii) there are no interveners between them, both copies are taken to be ‘the same’ element and, consequently, form a non-trivial chain.

Regarding (22b), both overt occurrences of *John* are required to be considered distinct elements by the grammar. A more fine-grained representation of this sentence is offered in (24), where an unpronounced occurrence of *John* is taken to occupy the Spec,v position.

- (24) a. [TP John_{<K,NOM>, ...} [VP John_{<K,>, ...} [VP kissed John_{<K,ACC>, ...}]]]
b. [TP John_{<NOM>, ...} [VP John_{...} [VP kissed John_{ACC, ...}]]]

In this derivation, the occurrence of *John* in the complement position of the verb receives accusative Case through agreement with v. A different occurrence of *John* is externally merged in Spec,v, and a copy of it is internally merged in Spec,T, where it values its Case feature. At the interfaces (cf. 24b), this creates a scenario where the first two copies are interpreted as non-distinct: *John*_{NOM, ...} c-commands and contains *John*_{...}, and there are no interveners between them. However, *John*_{ACC, ...} is considered distinct from the other two occurrences since its features are not included in any of its c-commanding counterparts. Thus, two different chains are formed in this case and both receive phonological representation.

As already mentioned, a particularly complex case examined by Nunes (1995, 2004) involves sentences like (3), where it is necessary to predict the existence of two chains with the same Case values. A detailed representation of this sentence is offered in (25).

- (25) a. [TP John_{<K,NOM>, ...} [VP John_{<K,>, ...} said that [TP John_{<K,NOM>, ...} was [VP kissed John_{<K,>, ...}]]]]
b. [TP John_{NOM, ...} [VP John_{...} said that [TP John_{NOM, ...} was [VP kissed John_{...}]]]]

⁸ In fact, Nunes (1995) considers the possibility of deriving Non-Distinctiveness from Last Resort and Locality, but he disregards the idea mainly because he sticks to the (empirically unmotivated) assumption that uFF must be checked and deleted in every single member of a chain.

The embedded sentence here involves an identical derivation to the one in (23): an occurrence of *John* is externally merged as a complement of the verb and a copy of it ‘moves’ to the Spec,T position valuing its Case feature. The matrix clause comprises a new occurrence of the lexical item *John*, this time being externally merged in the Spec,v position, and its movement to Spec,T to value Case features. According to the definition in (21), at the interfaces (cf. 25b) there will be only two chains: (i) the one formed by matrix *John*_{NOM, ...} and *John*_{...}, and (ii) the one formed by embedded *John*_{NOM, ...} and *John*_{...}. Any other potential ‘sameness’ relations are ruled out. Thus, for example, even if matrix *John*_{NOM, ...} contains the features of embedded *John*_{NOM, ...}, they cannot be considered ‘the same’ since there is a closer element being contained and c-commanded by matrix *John*_{NOM, ...}: matrix *John*_{...}. The same intervention effect arises between the two versions of *John*_{...}: there is an element between them already containing the features of embedded *John*_{...}.

Once the Sameness Challenge has been surpassed, it is necessary to answer the Uniqueness and the Rank Challenges. As already mentioned, proposing a response for the former involves explaining the following pair:

- (26) a. John was kissed ~~John~~.
 b. *John was kissed John.

Given the present set of assumptions, there is a straightforward way to derive the unacceptability of (26b). Consider first how Nunes’ (1995, 2004) system works in this regard: in such a lexicalist type of model, where lexical items carry phonological information through the entire derivation, it is necessary to postulate deletion operations applying on chains to reduce them to only one element. Thus, for a chain with *n* links, Nunes requires an algorithm determining the application of Chain Reduction *n*–1 times. On the contrary, in a Late Insertion system as the one advanced here, the introduction of phonological exponents in abstract syntactic terminals depends on the application of the PF operation *Vocabulary Insertion* (VI, Halle & Marantz 1993). So, no matter how many links there may be in a chain, the number of applications of VI must remain constant: it should apply only once.

Consider for explicitness the following example.

- (27) [_{CP} Who [_{TP} ~~who~~ seems [_{TP} ~~who~~ to be [_{TP} ~~who~~ happy]]]]?

According to Nunes’ assumptions, three occurrences of *who* are silent in (27) due to three applications of Chain Reduction; on the contrary, if Late Insertion is adopted, the number of pronounced copies in (27) follows from restricting the application of VI to only one link in the chain. Therefore, deriving the pair in (26) (and solving the Uniqueness Challenge) under the present approach involves explaining why *VI requires to apply only once per non-distinct constituent* in a syntactic representation. In order to elucidate this, consider first the representation in (28).

- (28) *~~John~~ was kissed ~~John~~

Nunes derives (28) as a violation of the economy condition on the application of Chain Reduction (i.e., it is not necessary to delete all the links in a chain to comply with the LCA). Such an explanation is not available under a Late Insertion approach. However, it can be argued that the unacceptability of (28) follows from a more basic and general constraint, the *Condition of Recoverability of Deletion* (cf. Chomsky 1964).

(29) *Condition on Recoverability of Deletion*

An element may be deleted (i.e., not pronounced) if it is totally determined by a structurally related syntactic constituent.

According to this condition, the sentence in (28) is unacceptable because the lexical information in the unpronounced DP cannot be recovered from any structurally related constituent.

If this kind of explanation is on the right track, a principled answer for the Uniqueness challenge may be derived from a natural tension raised by derivational economy and the condition in (29). Assume that assigning phonological representation to abstract syntactic terminals is a costly PF-operation (i.e., pronouncing an element involves more effort than not pronouncing it). Under this condition, the most economical way of complying with the Condition on Recoverability of Deletion is pronouncing structurally related non-distinct elements (i.e., members of a chain) as few times as possible.

To put it in slightly different terms, VI can be conceived as a Last Resort kind of operation applying on syntactic terminals in order to avoid violations of (29). According to such an approach, pronouncing only one link per chain ‘should be enough’ to preserve the information in the phrase marker; any additional application of VI on members of a single non-trivial chain would be vacuous, redundant and unmotivated, since all of them are supposed to carry the same information.

For concreteness, consider again the pair in (26). Following the logic of the previous paragraphs, the representation in (26b) is predicted to be unacceptable due to a violation of Last Resort since it requires an extra and unmotivated application of VI on the lower link in the chain.

One of the noteworthy appeals of such a solution for the Uniqueness challenge is that it does not rely on any particular theory of linearization. In other words, while the proposal is fully compatible with the LCA, it does not require assuming it to derive the proper pattern of phonological realization of non-trivial chains (as opposed to Nunes’ proposal, which is widely based on an antisymmetric framework).

What remains is deriving an answer for the Rank Challenge. As said, it must involve an explanation for the following pair:

- (30) a. John was kissed ~~John~~
 b. *~~John~~ was kissed John

Such a pattern can be explained if VI is assumed to apply on a linearized representation in the same order than the sentence is actually spelled-out (i.e., ‘from left to right’) while obeying an *Earliness* kind of logic (cf. Pesetsky 1989).

(31) *Earliness*

If a representation Σ is a proper input for an operation OP, apply OP immediately (i.e., apply operations as soon as possible).

If sentences are linearized before introducing phonological matrixes, VI should apply on PF representations as (32), where precedence relations have been already established between constituents.

- (32) John < was < kissed < John

Given that VI is assumed to apply by respecting the order in which elements are pronounced, it would target first the ‘leftmost’ occurrence of *John*, which corresponds to the higher member of the non-trivial chain $CH = (John, John)$, and would assign it a phonological exponent. Then, it would proceed to target step by step the remaining constituents in the linear representation, until running into the lower link in the chain $CH = (John, John)$. However, since applying VI on this constituent is not motivated to comply with the Condition on Recoverability of Deletion, the ‘rightmost’ occurrence of *John* remains silent. The relevant steps on the application of VI are sketched in (33), where the underlining signals an element that has undergone VI.⁹

- (33) a. John < was < kissed < John [BY VI]
 b. John < was < kissed < John [BY VI]
 c. John < was < kissed < John [BY VI]
 d. John < was < kissed < ~~John~~ [BY UNIQUENESS]

This kind of explanation offers two important advantages. First, it derives the Rank Challenge from independently motivated grammatical principles (i.e., earliness and linear order), dispensing with potential ad-hoc rules motivating the pronunciation of the higher copy. Second, it offers a ‘flexible’ algorithm to decide which link in the chain will be pronounced: if, for some reason, the first occurrence in a chain cannot be pronounced (e.g., if such a constituent is not a proper input for VI), the next one will. As is well known, there are several analyses based on Copy Theory exploiting the possibility of pronouncing lower copies in the syntactic representation if some PF conditions are met (cf. Franks 1998; Bobaljik 2002; Bošković 2002; Nunes 2004; among many others). A satisfying answer for the Rank Challenge must be capable of capturing this general intuition.¹⁰

4. Deriving the exceptions to the Uniqueness and Rank Challenges

Several exceptions to the Uniqueness and Rank challenges have been proposed in the literature as evidence for the existence of copied constituents in syntactic representations. A well-known exception to Uniqueness is *Wh-copying*: some languages allow for more than one occurrence of the same wh-pronoun to be spelled-out in wh-questions:

⁹ The same results may be derived from a more articulated proposal on the interaction between linearization and VI. For example, Arregi and Nevins (2008) assume that Linearization and VI apply cyclically in a top-down fashion. On their account, VI would be applied on the higher member of a chain while, by hypothesis, the remaining links would remain silent by Uniqueness.

¹⁰ There is an alternative way of exploiting the current set of assumptions to derive an answer for the Rank challenge. Consider the featural content of the copies of *John* in the syntactic representation underlying (30a) and (30b).

(ii) $John_{\{NOM, \dots\}}$ was kissed $John_{\{\dots\}}$

At PF, the higher copy of *John* has an additional Case feature. Thus, a strict interpretation of (29) would predict that such a copy should be the one receiving phonological representation (i.e., if the lower copy is pronounced, the Case feature would be ‘lost’). Since the scenario where the higher copy contains more features than its lower counterparts is systematic, a possible answer for the Rank Challenge could rely on some version of the following derived principle:

(iii) *Pronounce the Superset*

Given a Chain CH , apply VI to the link which is the superset of the features of all remaining links in CH . Such an account for the pair in (30) is extensionally equivalent to the explanation proposed by Nunes based on economy considerations: both predict that the element engaging more Agree relations will be pronounced.

(34) *German (McDaniel 1986)*

Wen glaubt Hans wen Jakob gesehen hat?
 Who thinks Hans who Jakob seen has
 'Who does Hans think Jakob saw?'

Nunes (1995, 2004) proposes an elegant explanation for these patterns. According to him, an intermediate copy of the *wh*-pronoun in this sentence is morphologically reanalyzed as part of the embedded complementizer through an application of *Fusion* (Halle & Marantz 1993), an operation that combines two terminal nodes into a single one.¹¹ Thus, the resulting representation would look like (35), where the # symbols indicate the boundaries of a newly formed syntactic terminal.

(35) [_{CP} Wenⁱ... [_{CP} #wenⁱ+C# [_{TP} ... wenⁱ ...]]]

In Nunes' system, Chain Reduction is necessary to make a non-trivial chain linearizable at PF according to the LCA. In addition, Nunes also follows Chomsky's (1995) proposal that the LCA does not apply word-internally. As a consequence of these two assumptions, it is not necessary to delete the reanalyzed copy of the *wh*-pronoun *wen*: i.e., if the LCA cannot manipulate this occurrence, then deleting it because of LCA-related reasons is unnecessary. Therefore, the intermediate copy is predicted to be pronounced.

This analysis makes two strong predictions regarding *Wh*-copying. First, since the reanalysis operation targets a pronoun and an embedded complementizer, it is predicted that there is no multiple copy pronunciation involving the lowest link in a chain. This prediction is borne out in the following German examples:

(36) *German (Fanselow and Mahajan 1995)*

Wen denkst Du wen sie meint wen Harald liebt?
 Who think you who she believes who Harald loves
 'Who do you think that she believes that Harald loves?'

(37) *German (Nunes 2004)*

*Wen glaubt Hans wen Jakob wen gesehen hat?
 whom thinks Hans whom Jakob whom seen has
 'Who does Hans think Jakob saw?'

In (36) there are three copies of *wen*, each of them occupying a position in the left periphery of their clauses. In (37) there are also three copies of *wen*, but the sentence is unacceptable since the rightmost copy is spelled-out in its original thematic position.

The second happy prediction of this analysis involves the phrasal status of reanalyzed elements: since *Fusion* is a morpho-phonological operation, it can only apply to syntactic

¹¹ According to Halle & Marantz (1993), two terminals can fuse only if they are in a sisterhood relation. However, it is standardly assumed that successive cyclic movement proceeds by occupying specifier positions. To deal with this, Nunes assumes that successive cyclic movement can proceed via adjunction in some cases. See Nunes (1998) for relevant discussion.

An alternative solution is independently advanced by Matushansky (2006), who proposes a morphological operation that transforms a spec-head relation between two minimal categories into a head-adjunction kind of configuration. For concreteness and simplicity, this second option is adopted.

terminals (and not to whole phrases). Thus, Nunes' analysis predicts the inexistence of multiple copy phenomena with full phrases. This prediction seems to be true:

(38) *German (Nunes 2004)*

**Wessen Buch* glaubst du *wessen Buch* Hans liest?
 whose book think you whose book Hans reads
 'Whose book do you think Hans is reading?'

Therefore, the reanalysis-based explanation for these patterns has strong empirical support.

Consider now what would happen if exactly the same analysis is 'translated' into the system proposed here. First, a syntactic representation as the one offered in (36) would look like (39a) at the syntactic component and like (39b) at PF:

- (39) a. $[CP \text{ Wen}_{\langle \kappa, \text{ACC} \rangle, \langle \omega, \text{Q} \rangle, \dots} \dots [CP \text{ wen}_{\langle \kappa, \text{ACC} \rangle, \langle \omega, \text{Q} \rangle, \dots} C_{\langle \text{Cat}, \text{C} \rangle, \dots} [TP \dots \text{wen}_{\langle \kappa, \text{ACC} \rangle, \langle \omega, \text{Q} \rangle, \dots} \dots]]]$
 b. $[CP \text{ Wen}_{\langle \text{ACC}, \text{Q} \rangle, \dots} \dots [CP \text{ wen}_{\langle \text{ACC}, \dots \rangle} C_{\langle \text{C}, \dots \rangle} [TP \dots \text{wen}_{\langle \text{ACC}, \dots \rangle} \dots]]]$

Here, the lower copy of *wen* received Case in-situ, then a copy of it was merged in the embedded Spec,C position through cyclic movement and, finally, a new copy of it was merged in the matrix Spec,C position to receive a left-peripheral feature Q from the interrogative complementizer. Regarding the embedded complementizer, it carries, at least, a categorial feature C. Now, suppose that the morpho-phonological operation Fusion applies at PF, before Non-Distinctiveness is computed, to the embedded complementizer and the copy of *wen* in its specifier position. For concreteness, the definition of Fusion in (40) is adopted:

(40) *Fusion (Embick 2010:78)*

$[_x \alpha] \frown [_y \beta] \rightarrow [_{x/y} \alpha, \beta]$
 where α and β are features of X and Y.

According to this definition, the features of both terminals are combined into a single set. Thus, the result of applying (40) to embedded C and its specifier would look as (41) at PF:

- (41) $[CP \text{ Wen}_{\langle \text{Q}, \text{ACC} \rangle, \dots} \dots [CP \# \text{wen} + C_{\langle \text{C}, \text{ACC} \dots \rangle} \# [TP \dots \text{wen}_{\langle \text{ACC}, \dots \rangle} \dots]]]]$

As established in (40), the new syntactic node $\text{wen} + C_{\langle \text{C}, \text{ACC} \dots \rangle}$ contains the former features of $\text{wen}_{\langle \text{ACC}, \dots \rangle}$ and $C_{\langle \text{C}, \dots \rangle}$. This result has important consequences for chain formation according to (21): the set of features of $\text{wen}_{\langle \text{Q}, \text{ACC} \dots \rangle}$ does not contain the features of $\text{wen} + C_{\langle \text{C}, \text{ACC} \dots \rangle}$. Therefore, these two elements cannot be interpreted as non-distinct. However, $\text{wen} + C_{\langle \text{C}, \text{ACC} \dots \rangle}$ does contain the features of $\text{wen}_{\langle \text{ACC}, \dots \rangle}$, so they are interpreted as 'the same' and should form a chain. In other words, the definition of Non-Distinctiveness in (21) predicts that two chains at PF must be formed from the three copies in (41): (i) one consisting only on the copy of *wen* in matrix Spec,C (i.e., $\text{CH}_1 = (\text{wen}_{\langle \text{Q}, \text{ACC} \dots \rangle})$), and (ii) the other formed by the remaining occurrences of *wen* (i.e., $\text{CH}_2 = (\text{wen} + C_{\langle \text{C}, \text{ACC} \dots \rangle}, \text{wen}_{\langle \text{ACC}, \dots \rangle})$). Since these are two different chains, each of them receives phonological representation independently according to the already discussed answers for Uniqueness and Rank.¹²

¹² As a clarification note, remember that Fusion is a morphological operation that applies only in the PF-side of the grammar. At LF, the three copies of *wen* remain unaltered, so they are predicted to form a single non-trivial chain with its usual semantic interpretation.

An account of Wh-copying in these terms offers an important empirical advantage over Nunes' system.¹³ Consider a case where a head *Y* moves to a head *X* (i.e., the derivational step from (42a) to (42b)). In principle, both systems predict that the lower copy of *Y* does not receive phonological realization at PF: for Nunes, this follows from applying Chain Reduction to the copy of *Y* with more unchecked uFF; for the current proposal, this follows from applying VI according to linear order.¹⁴

- (42) a. [XP X [YP Y ...]]
 b. [XP [X° Y [X° X]] [YP \bar{Y} ...]]

Suppose, however, that Fusion combines *X* and *Y* after head movement takes place. Under Nunes' assumptions, both occurrences of *Y* should be pronounced. Just as in (35), an element that is reanalyzed as part of a bigger word through Fusion becomes inaccessible to the LCA. Consequently, no violation of the antisymmetry condition on linear orderings in (6) may arise by pronouncing both copies of *Y*. Therefore, Chain Reduction is not required to apply to the lowest occurrence of *Y*.

- (43) [XP #Y+X# [YP Y ...]]

On the contrary, under the current set of assumptions, the lowest copy of *Y* should remain silent. If *Y* and *X* undergo Fusion, then their features combine into a single syntactic terminal #Y+X# that 'contains' the features of the lowest occurrence of *Y*. Therefore, the definition of Non-Distinctiveness in (21) predicts that #Y+X# and *Y* must form a chain CH = (Y+X_{X, Y, ...}, Y_{Y, ...}), where only #Y+X# is expected to be pronounced due to Uniqueness and Rank.

- (44) [XP #Y+X_{X, Y, ...}# [YP \bar{Y} _{Y, ...} ...]]

The pattern predicted by the system advanced here is systematically attested in cases where Fusion is assumed to apply after head movement. For example, Julien (2002) proposes an analysis on these lines for fused markers of polarity and tense in Bambara.

- (45) *Bambara* (Julien 2002:307)

- a. dúnan yé dɔɔ mìn
 Guest AFF.PAST millet.beer drink
 'The guest drank millet beer'.
 b. ñ mùso má jéǵǵ fèere
 my wife NEG.PAST fish buy
 'My wife did not buy fish'.

According to her, if the standard assumption that tense and polarity are generated as different heads is maintained, a transformational derivation must have caused them to end up in a single

¹³ I am grateful to Jonathan Bobaljik (p.c.) for this observation.

¹⁴ A usual problem with postulating head movement as a narrow syntactic operation is that the moved head does not c-command its lower counterpart under standard definitions of c-command. While Kayne (1994) argues that the moved head can actually c-command the complement of its host head, a common solution to this issue involves assuming a more complex definition of c-command (e.g., m-command, Aoun & Sportiche 1983). Both assumptions are equally useful for the case at hand.

syntactic terminal. This derivation is the one already sketched in (42) and (44): the Polarity head moves to Tense, and Fusion applies to them. As can be seen in (45), such a derivation is supposed to proceed in exactly the same way as predicted by the present proposal: the lowest occurrence of the Polarity head remains silent. As already discussed, this pattern does not follow from Nunes' system since it predicts multiple copy pronunciation every time a moved element undergoes Fusion.

Summing up, the reanalysis explanation for Wh-copying is fully compatible with the system advanced here. In fact, it seems to be more precise than Nunes' account on restricting the contexts that trigger multiple copy pronunciation. Moreover, Wh-copying phenomena have been shown to follow straightforwardly from the definition of Non-Distinctiveness itself, so no additional assumptions (e.g., the LCA not 'seeing' inside words) are required.

Regarding exceptions to Rank, there are several cases in the literature where it has been argued that a low member of a movement chain is pronounced. According to Bošković (2000, 2002), one of these cases is attested in Serbo-Croatian, a multiple wh-fronting language. As usual in this type of language, Serbo-Croatian multiple wh-questions typically exhibit all wh-pronouns in the left periphery of the sentence.

(46) *Serbo-Croatian* (Bošković 2002:355)

- a. Ko šta kupuje?
Who what buys
- b. *Ko kupuje šta
Who buys what
'Who buys what?'

However, Serbo-Croatian shows a different behavior regarding sentences with two phonologically identical wh-pronouns. In these cases, one of the pronouns is spelled-out in its thematic position.

(47) *Serbo-Croatian* (Bošković 2002:364)

- a. *Šta šta uslovljava?
What what conditions
- b. Šta uslovljava šta?
what conditions what
'What conditions what?'

Bošković argues that this scenario follows from a PF constraint on the phonological realization of two adjacent homophone elements, i.e., *Antihomophony*. The pattern in (48) supports this account: if an adverb intervenes between the wh-pronouns, they are required to be pronounced in the left periphery of the sentence.

(48) *Serbo-Croatian* (Bošković 2002:364)

- a. Šta neprestano šta uslovljava?
What constantly what conditions
- b. *Šta neprestano uslovljava šta?
What constantly conditions what
'What constantly conditions what?'

Bošković's proposal involves assuming that (i) narrow syntax always generates a copy of the object wh-pronoun in the left periphery, but (ii) pronouncing the higher occurrence is forbidden if it generates an output violating Antihomophony.

This analysis is easily translatable into Nunes' system. According to him, pronouncing the higher copy is the more economical way of applying Chain Reduction and FF-Elimination to a non-trivial chain. However, such an optimal PF derivation may lead to Antihomophony violations in Serbo-Croatian:

- (49) *Štaⁱ šta^j ... uslovljava šta^j? [BY ANTIHOMOPHONY]

If this kind of derivation leads to an unacceptable output, it cannot block less economical alternatives. Therefore, a derivation where Chain Reduction applies to the higher copy and FF-Elimination deletes the features in the lower copy would be acceptable.

- (50) a. Štaⁱ štaⁱ_ε ... uslovljava šta^j_uC? [AFTER CHAIN REDUCTION]
 b. Štaⁱ štaⁱ_ε ... uslovljava šta^j_uC? [AFTER FF-ELIMINATION]

In a nutshell, Nunes' approach captures low copy realization due to its 'flexible' answer to the Rank Challenge: pronouncing the higher copy is not mandatory, but the best alternative given certain PF conditions. If those conditions are not met, acceptability of pronouncing low copies follows. This account, however, has the already discussed disadvantage of making use of global economy.

A similar kind of 'flexibility' is predicted by the answer to the Rank challenge proposed in this paper. Particularly, the definition of Earliness in (31) explicitly states a condition on the application of derivational mechanisms: an operation OP applies if and only if its input complies with the requirements imposed by OP. Suppose, then, that the Antihomophony restriction in Serbo-Croatian is encoded as a condition on the application of VI.

(51) *Antihomophony*

VI cannot apply two consecutive times for the same exponent.

Assuming (51), the phonological realization of the sentence in (44b) would follow the steps depicted in (52), where underlined words represent constituents with phonological exponents: in (52a), the first occurrence of *šta* (i.e., the leftmost copy of subject of the sentence) undergoes VI; in (52b), Antihomophony prevents the introduction of phonological exponents to the second occurrence of *šta* (i.e., the leftmost copy of the direct object); in (52c), the third occurrence of *šta* (i.e., the rightmost copy of the subject) remains silent due to Uniqueness; in (52d), VI applies to the verb; and finally, in (52e), VI targets the last occurrence of *šta* (i.e., the rightmost copy of the direct object).

- (52) a. Šta_{SUBJ} < šta_{OBJ} < šta_{SUBJ} < uslovljava < šta_{OBJ} [BY VI]
 b. Šta_{SUBJ} < šta_{OBJ} < šta_{SUBJ} < uslovljava < šta_{OBJ} [BY ANTIHOMOPHONY (CF. 51)]
 c. Šta_{SUBJ} < šta_{OBJ} < šta_{SUBJ} < uslovljava < šta_{OBJ} [BY UNIQUENESS]
 d. Šta_{SUBJ} < šta_{OBJ} < šta_{SUBJ} < uslovljava < šta_{OBJ} [BY VI]
 e. Šta_{SUBJ} < šta_{OBJ} < šta_{SUBJ} < uslovljava < šta_{OBJ} [BY VI]

In the same way, by assuming that VI applies in a monotonic fashion respecting linear order, it is possible deriving the pattern in (48), where an adverb intervenes between both wh-pronouns

in the left periphery. The derivation proceeds following similar steps than in (52): in (53a), the first occurrence of *šta* (i.e., the leftmost copy of subject) undergoes VI; in (53b), the adverb *neprestano* undergoes VI; in (53c), the second occurrence of *šta* (i.e., the leftmost copy of the direct object) undergoes VI; in (53d), the third occurrence of *šta* (i.e., the rightmost copy of the subject) remains silent due to Uniqueness; in (53e), VI applies to the verb; and finally, in (53f), the fourth occurrence of *šta* (i.e., the rightmost copy of the direct object) remains silent due to Uniqueness.

- (53) a. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \text{neprestano} < \check{\text{š}}\text{ta}_{\text{OBJ}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \text{uslovljava} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY VI]
 b. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \underline{\text{neprestano}} < \check{\text{š}}\text{ta}_{\text{OBJ}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \text{uslovljava} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY VI]
 c. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \underline{\text{neprestano}} < \underline{\check{\text{š}}\text{ta}_{\text{OBJ}}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \text{uslovljava} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY VI]
 d. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \underline{\text{neprestano}} < \underline{\check{\text{š}}\text{ta}_{\text{OBJ}}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \text{uslovljava} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY UNIQUENESS]
 e. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \underline{\text{neprestano}} < \underline{\check{\text{š}}\text{ta}_{\text{OBJ}}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \underline{\text{uslovljava}} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY VI]
 f. $\check{\text{Š}}\text{ta}_{\text{SUBJ}} < \underline{\text{neprestano}} < \underline{\check{\text{š}}\text{ta}_{\text{OBJ}}} < \check{\text{š}}\text{ta}_{\text{SUBJ}} < \underline{\text{uslovljava}} < \check{\text{š}}\text{ta}_{\text{OBJ}}$ [BY UNIQUENESS]

In sum, the system advanced here is also perfectly capable of dealing in a principled manner with exceptions to Rank. As an advantage over Nunes' account, it does not require global economy conditions to derive low copy pronunciation in Serbo-Croatian according to Bošković's (2000, 2001) analysis.

5. Conclusions

This paper has discussed some explanatory drawbacks of one of the prominent approaches to phonological realization of chains in current literature (Nunes 1995, 2004). In particular, such a proposal lacks an attempt to define Non-Distinctiveness and requires assuming global economy conditions to explain why the highest copy in a non-trivial chain is usually the link that receives phonological representation.

The account of the three challenges advanced here is based on a simple idea: unvalued features at syntax are 'invisible' (i.e., uninterpretable) at the interfaces. This assumption leads to interface representations where Non-Distinctiveness may be calculated as inclusion relations between the features of constituents in a phrase marker. The second important assumption, Late Insertion, allows explaining why only the highest member of a chain is pronounced: VI is an operation that complies with Last Resort and applies according to linear order.

The proposed system also allows deriving well known exceptions to Uniqueness and Rank. Regarding the former, it was demonstrated that an account of Wh-copying phenomena follows straightforwardly from the inclusion-based definition of Non-Distinctiveness by assuming that a wh-pronoun can be morphologically reanalyzed as part of an embedded complementizer. With respect to exceptions to Rank, it was shown that Bošković's (2000, 2001) analysis of wh-fronting in Serbo-Croatian may be elegantly implemented.

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Modelling the syntax-discourse interface

A syntactic analysis of *please*

Rebecca Woods

Many scholars have proposed a Speech Act Phrase (SAP) high in the left periphery that is said to encode aspects of the discourse context, including illocutionary force. However, the potential identity of the head of this projection is up for debate. I propose that *please* is a candidate for the overt SA head in English. Distributional, interpretive and acquisition data show that there are (minimally) two types of syntactically-integrated *please*. One is a functional head that marks an utterance as a request. The other is an adverbial whose use is determined by contextual factors and that marks politeness.

1. Introduction

Speech act theory is undergoing a productive revival. Many authors agree on the principle of a Speech Act projection (SAP) above the main clause, headed by a marker of illocutionary force, overt or covert, in its head.

Illocutionary force is difficult to find a unified explanation for, as it is neither propositional nor as divorced from syntax as pragmatic factors such as subtext. I propose here that illocutionary force has a syntactic reflex and is not purely pragmatic. I assume that illocutionary force refers to the primary intention of the speaker in uttering the sentence given the syntactic clause type that she chooses, similarly to Coniglio & Zegrean (2012), though this characterisation of illocutionary force will certainly not be the final word on the matter.

If illocutionary force is present in syntax, it is fair to assume that it is overtly spelled out in at least some cases. In this article, I will examine a candidate for the overt spell-out of illocutionary force in English, namely *please*. *Please* has been variously analysed as an adverbial, a discourse marker, and a politeness marker, but I will show that there are in fact many types of *please* in English and that they vary according to their position in the clause, their compatibility with different clause types and the implicatures that they give rise to.

I will present a small corpus study of *please* and its distribution, data regarding the use of *please* by children acquiring British English and other syntactic and semantic data. On the basis

of the syntactic distribution and characteristics of *please* and the patterns of its acquisition it will be proposed that there are (minimally) two types of syntactically-integrated *please* and that one of these is an overt realisation of the SA head (referred to in this article as the IA, Illocutionary Act, head). My primary focus will be on the proposed illocutionary act head instantiation of *please*; it is only compatible with imperative and interrogative clause-types and bestows requesting force on the clauses in which it appears. This type of *please* is predominantly clause-initial though there is a clause-medial variant. The other type of *please* is a politeness marker; this marker is clause-final and can combine not only with interrogatives and imperatives but with declaratives as well. There is also a third type of *please* that I will call standalone *please*. Standalone *please* is not integrated at the clause level but at the discourse level. I will then examine the consequences of this work for speech act theory before concluding.

For clarity, I lay out here the assumptions that I make about what constitutes the illocutionary act of requesting and how I will treat these in my methodology. Requesting illocutionary acts are direct acts made by the speaker. Such an act consists of an utterance through which the speaker requires and obliges the addressee to act in a specified way, whether or not that act contains a linguistic component. Though this definition seems to correlate with Searle's (1979) class of 'directives', there is a key difference. While Searle includes all types of question in his class of directives, I will show that not all types of questions can be requests. Some questions may only be interpreted as information-seeking questions where others may be interpreted as either information-seeking questions or requests. Only the latter type of question is compatible with *please*. Imperatives are another clause type that canonically forms requesting illocutionary acts. There is no reason to assume that politeness is directly a part of making a request.

Subsequently, indirect requests that make use of context and subtext to form requests, such as the use of "It's cold in here" to mean "Close the window", are not classed as requesting illocutionary acts. However, these kinds of sentences will not be excluded from my data; instead, the data will show that indirect requests are almost never marked with *please* precisely because they are statements at the syntactic level before they are interpreted as requests at the pragmatic level.

2. A syntactic investigation of 'please'

This section will be structured as follows: the distribution of *please* over clause types will be examined using the ICE-GB corpus (University College London 1998); other syntactic characteristics of *please* will be outlined; and the acquisition of *please* will be detailed using examples from the Manchester corpus (Theakston et al. 2001) in CHILDES (MacWhinney 2000).

2.1. Distribution of 'please'

2.1.1. Canonical positions of 'please'

While syntactically-integrated *please* can appear sentence-initially, -medially or -finally, it seems that there are some restrictions according to clause types. The paradigm is illustrated

in examples (1)-(4).¹

- (1) Interrogative clauses
 - a. Please can I have a beer?
 - b. Can I please have a beer?
 - c. Can I have a beer please?
- (2) Imperative clauses
 - a. Please get me a beer.
 - b. Get (*please) me (*please) a beer.
 - c. Get me a beer please.
- (3) Declarative clauses
 - a. *Please I'll have a beer.²
 - b. *I'll please have a beer.
 - c. I'll have a beer please.
- (4) Declaratives outside of question-response contexts
 - a. *Please there's a mouse there.³
 - b. *There please is a mouse there.
 - c. *There's a mouse there please.

2.1.2. Naturalistic uses of 'please'

To examine in more detail the types of clause in which *please* appears, a study of naturalistic uses of *please* was conducted using the International Corpus of English: Great Britain edition (ICE-GB). The ICE-GB corpus contains 199 instances of *please* (excluding uses of the verb

¹Imke Driemel (p.c.) notes that the paradigm is almost exactly the same in German, with the exceptions of (2b), as illustrated in (i), and (3b), as illustrated in (ii):

- (i) Gib mir bitte ein Bier.
- (ii) Ich möchte bitte ein Bier.

I believe that (i) and (ii) are acceptable in German compared to English due to the make-up of the German *Mittelfeld*, which provides natural clause-medial positions for particles. English does not have the same range of clause-medial positions for discourse-oriented elements: it does not make use of discourse particles below tense; assertive force tends to be marked on the tense-marked element, for example via the dummy auxiliary 'do' (Duffield 2007; Roeper & Woods in preparation); speech-act adverbs can only appear sentence-medially if pronounced as parentheticals. The acceptability of (ii) may, however, mean that the make-up of *bitte* is slightly different to *please*, as it may be integrated clause-medially into declaratives where *please* may not. Alternatively, given that clause-initial *please* is also blocked in declaratives in German, perhaps the medial *bitte* in (ii) is an adverbial rather than a force marker. Driemel (p.c.) also suggests that this is so as (ii) only receives a polite, not a requesting, reading.

²Note that this linear string is possible with a prosodic break between *please* and the rest of the clause:

- (i) Please - I'll have a beer.

In this case *please* is a standalone item, a request in and of itself and is not part of the same clause as "I'll have a beer", and as such is not *clause-initial* in the same way as (1a), for example. Standalone *please* will be dealt with later in section 2.1.3.

³See the previous footnote.

to *please*).⁴ The tables below show the distribution of *please* in different clausal positions and across different clause types. Table 1 shows how *please* is distributed across different clausal positions in the ICE-GB corpus. It shows that clause-initial *please* is more than twice as common as clause-final *please*, which is in turn twice as common as clause-medial *please*.

Table 1: Clausal position of *please* in the ICE-GB corpus (overall)

Position	Number of occurrences
Clause-initial	114
Clause-medial (VP edge)	27
Clause-final	50
Other (e.g. standalone)	8
Total	199

Table 2 shows the clausal position of *please* in the corpus's speech texts: the majority of examples of clause-final *please* appear in the speech part of the corpus, and clause-final *please* is more common than any other position.

Table 2: Clausal position of *please* in the ICE-GB corpus (speech only)

Position	Number of occurrences
Clause-initial	28
Clause-medial (VP edge)	6
Clause-final	46
Other (e.g. standalone)	6
Total	86

Table 3 shows which types of clause co-occur with *please* in the speech part of the corpus. *Please* predominantly occurs with the clause types typically used to perform requests, namely interrogatives and imperatives.

Table 3: Clause types with *please* in the ICE-GB corpus (speech)

Clause type	Number of occurrences
Declaratives	4
Fragments (e.g. yes, no, NP)	16
Standalone	2
Interrogatives	28
Imperatives	35
Conditional	1
Total	86

⁴The corpus was not annotated for clause type so this annotation was done by hand. Clause type was determined by classical diagnostics such as verb position, verb mood and so on. Punctuation was not used as a reliable diagnostic particularly because of variation in its use with respect to embedded clauses.

Table 4 shows the clause types that co-occur with *please* in the written part of the corpus. The results are the same as in table 3, though there are fewer interrogatives and fragments in the written corpus.

Table 4: Clause types with *please* in the ICE-GB corpus (written)

Clause type	Number of occurrences
Declaratives	3
Standalone	4
Interrogatives	20
Imperatives	86
Total	113

It is clear that clause-initial *please* is the most common position overall in the corpus and predominates in writing. However, clause-final *please* is the most common position in spoken texts and is much more common in speech than in writing in general. With respect to different clause types, imperatives are the most common clause types to host *please* in both spoken and written texts, followed by interrogatives. Given that these are the canonical forms for requesting, that may not seem surprising. In contrast, *please* is rare with declaratives in either speech or writing. The fact that *please* occurs in declaratives at all, given that they are not used to express direct requests, deserves scrutiny.

2.1.3. Declarative clauses and ‘please’

Please appears in the following declarative sentences in the ICE-GB corpus; (5) shows *please* in declaratives in speech contexts and (6) in written contexts.

(5) (In speech contexts)

- a. I’ll have white ice cream please.
- b. I’ll have strawberry ice cream please.
- c. So I ask for single questions please.
- d. I want to hear what the witness says. please

(6) (In written contexts)

- a. “Please, he’s my son.”
- b. “Please, Brett... I hate to see you angry like this.”
- c. The policeman said, “I’d like your full name and address, please.”

The examples in (5) and (6c) show utterance-final *please*. The roles of these sentences in discourse fall into three categories, as listed in (7). These categories are very subtly different and were determined based on the wider context of the examples in (5) and (6c).

(7) a. Responses to questions, e.g. *I’ll have strawberry ice cream please.*⁵

⁵It is true that every conversational move can be seen as an answer to a question under dynamic semantics frameworks such as Question Under Discussion (Roberts 2012) or Inquisitive Semantics. In this case, however, I

- b. Overt performative requests, e.g. *So I ask for single questions please.*
- c. Indirect requests that express desire on the part of the speaker, e.g. *I want to hear what the witness says please.*

Interestingly, the examples of utterance-initial *please* in declaratives in (6a) and (6b) uniquely appear in written contexts and share some particular characteristics. Firstly, they are both literary representations of speech. Secondly, *please* in these sentences is not integrated into the syntax of the declarative clause. This is indicated by the comma punctuation, though this is not a wholly reliable way of determining whether or not something is syntactically integrated; topics and foci in English, for example, are often separated from the rest of the clause by a prosodic break. However, *please* in these contexts is not directly linked to the statement made but seems to be elliptical; for (6a), for example, we could imagine underlying structures as in (8).

- (8) a. Please ~~spare him~~, he's my son.
- b. Please ~~listen to my plea~~, he's my son.

The analysis of standalone *please* as an elliptical structure also accounts for the possible readings identified in examples (3a) and (4a), reanalysed here in (9).

- (9) a. Yes I'll ~~have a drink~~ please - I'll have a beer.
- b. Please ~~help~~ - there's a mouse over there.

This kind of ellipsis can be accounted for using an analysis such as that proposed in Weir (2014), in which the antecedent for the ellipsis is the Question Under Discussion (QUD). (9b) is a simple case of clausal ellipsis in which the QUD is something like *What do you need?* (9a) is more complicated. It is compatible with a QUD antecedent such as *Would you like something to drink?* that might actually be overt, or could be indicated with a gesture such as raising an invisible glass to the mouth. I assume that *please* here is clause-final and is base-generated low in the clause (see section 3.3 for details) and is fronted via some kind of focus movement (in the vein of Weir (2015)), followed by ellipsis of the TP. However, as standalone *please* is not the focus of this article, I will leave the details of this analysis for future work.

Given a standalone analysis of the examples in (6a) and (6b) and similar cases, we do not see any examples of syntactically-integrated *please* in sentence-initial position in declarative clauses.

To summarise, examples of *please* in written declaratives are all found in literary examples of direct speech and constitute separate acts from the declarative they appear with. Amongst the examples of *please* in spoken declaratives, all four examples of *please* are clause-final. It therefore appears that clause-initial *please* is strongly restricted to imperatives and interrogatives. *Please* may also appear before both these clause types and declarative clauses if it is a 'standalone' *please* that is distinguished from the following clause both by prosody and in its structure, as standalone *please* is an elliptical structure with its own propositional content.

refer to 'responses to questions' in the most literal overt sense.

2.2. (Other) characteristics of 'please'

In addition to its clausal position and the type of clause it may occur in, the distribution of *please* is restricted in other ways.

2.2.1. Embedded contexts

Please is restricted in embedded contexts: we find examples like (10) where a mental state report is used to make an indirect request and contains clause-medial *please*, but *please* in reported speech like (11) is ungrammatical.

(10) I wonder if someone might please check the books. ICE-GB

(11) He asked me (*please) whether (*please) I would (*please) go to the dance with him.

However, *please* is permitted in embedded clauses in which the centre of evaluation (to use Speas & Tenny's (2003) term) has shifted from the speaker, for example in free indirect discourse examples such as (12). Furthermore, dialects that have independently been shown to embed full illocutionary acts permit *please* in these contexts. An example is the embedded inverted question (EIQ) shown in (13), which is found in a number of English dialects and permit *please* as illustrated in (14).⁶

(12) She asked if she might see a hand-mirror please. ICE-GB

- (13) a. He asked me would I go to the dance with him.
b. *He asked me whether would I go to the dance with him.

- (14) a. He asked me please would I go to the dance with him.
b. He asked me would I please go to the dance with him.
c. *He asked me whether please would I go to the dance with him.
d. *He asked me whether would I please go to the dance with him. North West Eng.

2.2.2. Modification

Unlike adverbs but like functional heads, *please* cannot be modified, as (15) shows.

- (15) a. *Very please. (cf. ^{OK}very kindly)
b. *Hugely please. (cf. ^{OK}hugely grateful)
c. *Many please. (cf. ^{OK}many thanks)

However, *please* can apparently be modified by a less common intensifier, *pretty*, also exemplified in its more usual usage in (16).

- (16) a. Pretty please!
b. That's pretty impressive.

What is interesting is that intensifier *pretty* in *pretty please* does not act exactly like the *pretty*

⁶See McCloskey (2006), Krifka (2014), Woods (2014, in press) for more information on this phenomenon.

in “That’s pretty impressive”. Where *pretty* attenuates the adjective in the latter, there is no attenuation in *pretty please*. Neither does *pretty please* denote a ‘prettier’ *please* than standalone *please*, though there seems to be more of a sense of charm and persuasion—related to the root meaning of *pretty*—attached to *pretty please* than in “That’s pretty impressive.” It is also not possible to modify *please* with any other adverbial that is similar to *pretty*, as (17) illustrates.

- (17) a. *Beautiful please.
b. *Charming please.

Moreover, *pretty please* has a restricted distribution too: in the British National Corpus⁷, it appears only three times and always as a standalone utterance.

Although *pretty* is an intensifier and can combine with *please*, the facts that it intensifies *please* differently from adjectives like *impressive*, retains more of its root meaning and has a restricted distribution suggest that *pretty please* is an idiom, possibly brought about by combining the two meanings of the lexeme *pretty*.

2.2.3. Co-ordination

Adverbs can typically be stacked or co-ordinated, where functional heads in the same projection cannot. This is illustrated using German discourse particles in (18) and in English in (19).

- (18) *gehen Sie doch und mal zum Arzt.
go you PRT and PRT to.the doctor
“Go to the doctors!” Coniglio (2005:30)
- (19) *Please and fine, fetch me the bucket.

2.2.4. Are all interrogatives equal?

Not all interrogative clauses naturally co-occur with *please*. This is shown below in (20), in which information-seeking questions that cannot be construed as requests are incompatible with clause-initial *please*.

- (20) a. Please will you find me a partner?
b. Please can you persuade him to come?
c. *Please did you get that dress at Macy’s?
d. *Please where did you get that dress? Sadock (1974)

Sadock (1974) claims that there is no difference in *meaning* between examples like (20a), a polar interrogative with a modal auxiliary, and (20c), a polar interrogative with do-support, that should make them more or less appropriate with regards to *please*. He illustrates what he means by ‘a difference in meaning’ using examples such as (21).

⁷Examples of usage taken from the British National Corpus (BNC) were obtained under the terms of the BNC End User Licence. Copyright in the individual texts cited resides with the original IPR holders. For information and licensing conditions relating to the BNC, please see the web site at <http://www.natcorp.ox.ac.uk>.

- (21) a. Feed the cat.
b. Feed the dog.

In the case that you only have a cat, telling me to feed the dog is inappropriate due to the meaning of the constituent parts of the sentence. Sadock argues that this is not the case with (20a) and (20c) because a context could be constructed in which (20c) too is grammatical. However, it may be argued that this is not the case - the *structure* of the sentence must change to make (20c) grammatical, as (22) illustrates.

- (22) *Context: A really wants to know where B got the dress because owning the dress will make A's life immeasurably happier, but B is refusing to tell A where the dress came from. A resorts to guessing.*

A: *Please* - did you get the dress in Macy's?

In (22), the *please* used is actually of the standalone kind that can make requests in and of itself (cf. Sadock (1974:89) and section 2.1.3). Therefore, while it should be able to combine with the information-seeking question in (20c) if clause-type alone matters, it is actually already associated with a different type of content that has been elided. Some possible underlying structures for (20c) are shown in (23). The correct structure depends on the context in which (20c) is uttered.

- (23) a. Please ~~tell me~~ - did you get the dress in Macy's?
b. Please ~~stop teasing me~~ - did you get the dress in Macy's?
c. Please ~~will you tell me the answer~~ - did you get the dress in Macy's?

The data above show that syntactically-integrated clause-initial *please* is only compatible with polar questions with modal force. Often, the speaker is coreferential with a benefactive argument, either overtly (as in (20a)) or covertly (as in (20b), though a third-party could also be the benefactive here). Given that the interrogatives in (20a)-(20b), but not other kinds such as those in (20c)-(20d), permit syntactically-integrated clause-initial *please*, a simplistic one-to-one correspondence between clause type and illocutionary force cannot be upheld.

2.3. Acquisition of 'please'

Given that *please* has a very different distribution depending on whether it is clause-initial or clause-final, it is increasingly attractive to argue that there are two types of syntactically-integrated *please* in English. Assuming Rizzi's (1993) Truncation Hypothesis for first language acquisition, if it can be shown that one type of *please* is dependent on the acquisition of higher structure, but the other type of *please* is not, this will support the claim that the two types of *please* differ structurally.

It is hypothesised that the clause-initial *please* is dependent on the acquisition of the CP layer, as it is proposed to be generated in a projection above CP. In contrast, clause-final *please* is hypothesised to be an adverbial and so will not be dependent on CP having been acquired in order for the child to use it.

This diagnostic is not available for the analysis of other proposed illocutionary heads such as Romanian discourse markers like *hai*, because *hai* exclusively appears clause-initially or as a standalone marker and as such the acquisition of high functional head *hai* cannot be distinguished from any other potential type of *hai*.

As the successful acquisition of CP is crucial for the proper formation of questions in English, I will compare the children's use of clause-initial *please*⁸ with their use of full adult-like questions.

It is not surprising to find that *please* occurs very early on in children's speech. There is a lot of support for the use of *please* as a politeness strategy by caregivers. This is illustrated in (24) from the Manchester corpus (Theakston et al. 2001) in the CHILDES database (MacWhinney 2000).

- (24) Aran (2;3)
 MOT: well if you want somebody to do something what do
 you say ?
 CHI: please
 MOT: oh good
 MOT: I'm glad you know that

Taking the first three subcorpora of the Manchester corpus (Anne, Aran and Becky), there were 324 uses of *please* by the children. As expected, *please* is used by the children from the earliest files (around age 1;10). Use of *please* is often prompted by the caregiver, either as a standalone fragment or with other fragments like *yes* or NPs such as *that*. These uses of *please* are exclusively utterance-final.

Clause-initial integrated uses of *please* emerge later and always contain (at least) a verb, as illustrated in table 5.

Table 5: First uses of sentence-initial *please*

Child	Age	Utterance
Anne	2;2	please [can I] have some
Aran	2;4	please race it mummy
Becky	2;6	please take the card off please

At no point in the corpora are there any examples of utterance-initial *please* with fragments, NPs or declarative clauses in any of the children's speech. Furthermore, in all cases, utterance-initial *please* occurs after or around the same time as the child has acquired CP. I have taken a particularly strict approach to determining the age of acquisition of CP as the age at which the child analysed wh-questions with inversion of a full auxiliary. The ages of acquisition of CP and first use of utterance-initial *please* are detailed in table 6.

⁸The corpus I have used is implicitly coded for prosody, as separate utterances are recorded on separate lines. This includes successive utterances by one speaker that are considered to be separate but that are not separated by utterances by another speaker, for example the mother's utterances (MOT) in (24). I have therefore assumed that utterance-initial *please* is integrated with the clause following it if it appears on the same line in the transcript. If it appears on a different line, I have considered it to be a case of standalone *please*.

Table 6: Children's first evidence of CP compared with age of first use of utterance-initial *please*

Child	Age of U-I <i>please</i>	Age of acquisition of CP	First evidence of CP
Anne	2;2	1;11	what did you do/where are moneys please
Aran	2;4	2;5	what is this one ⁹
Becky	2;6	2;2	what is that

It seems therefore that children must have acquired CP before they can use *please* in non-clause-final positions, suggesting that the specific functional position for this kind of *please* is also not acquired until this point. It also seems that the children are aware of the restricted use of clause-initial *please* as they only ever use it with true direct requests.

3. Is 'please' an illocutionary head?

The evidence presented so far suggests that there are two clear types of syntactically-integrated *please*: clause-initial *please*, whose distribution is restricted to prototypical requesting clauses and is acquired later; and clause-final *please*, which has a wider distribution and is less tied to requesting clauses. Clause-medial *please* is a slightly more complex case that will be shown to be a variant of clause-initial *please*. The next challenge is to determine how each type of *please* fits into the structure and integrates with the rest of the clause.

3.1. Clause-initial 'please'

The evidence above seems to suggest that clause-initial *please* is a head marking illocutionary force. It occupies a high position in the clause, which is to say it precedes everything else in the clause and, if it may be embedded, it is incompatible with overt complementisers as in (14). It is not only clausal position but other characteristics of *please* that suggest that it is a high functional head; clause-initial *please* fits many of the criteria proposed by Cardinaletti (2011) and Haegeman (2014) for high functional heads. *Please* is derived from a verbal root (though it itself does not inflect). It may not be modified nor may it be coordinated with other similar elements. It is not truth-conditional but does contribute to the interpretation of the sentence. Its contribution is to communicate something about the intentions of the speaker in making that utterance and, as will shortly be shown, it also restricts clauses to a request interpretation, even if another or several other types of force are usually compatible with that clause.

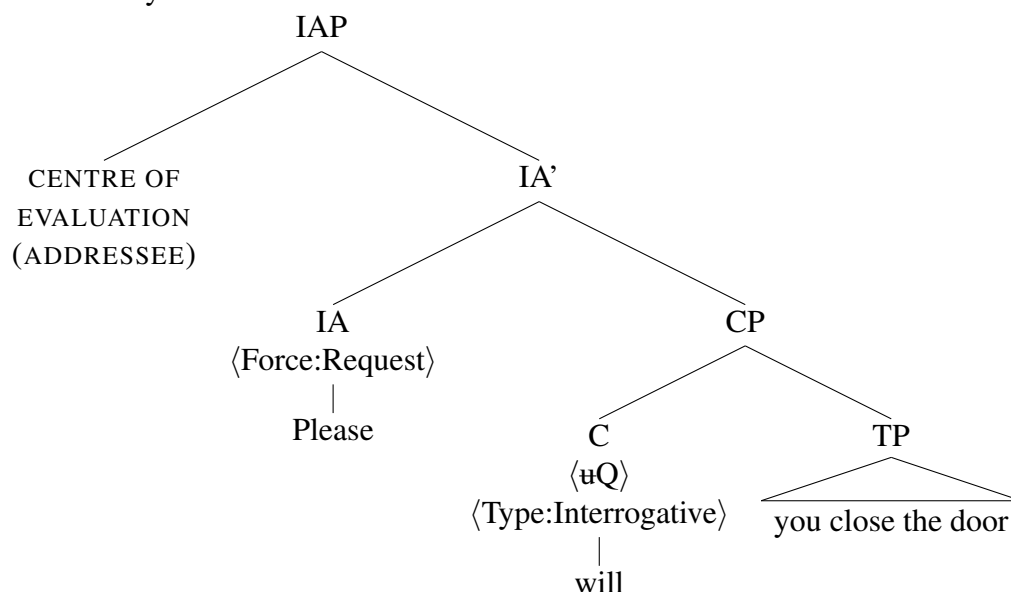
Moreover, the type of clause *please* may appear with is directly related to the requirements it places on the addressee. It has been shown that clause-initial *please* is restricted to polar interrogatives and imperatives; that is, forms used to express direct requests. Furthermore, in his discussion of the three main clause types, Portner (2004) proposes that interrogatives and imperatives differ from declaratives in that the 'centre of evaluation' is the addressee, not the

speaker.

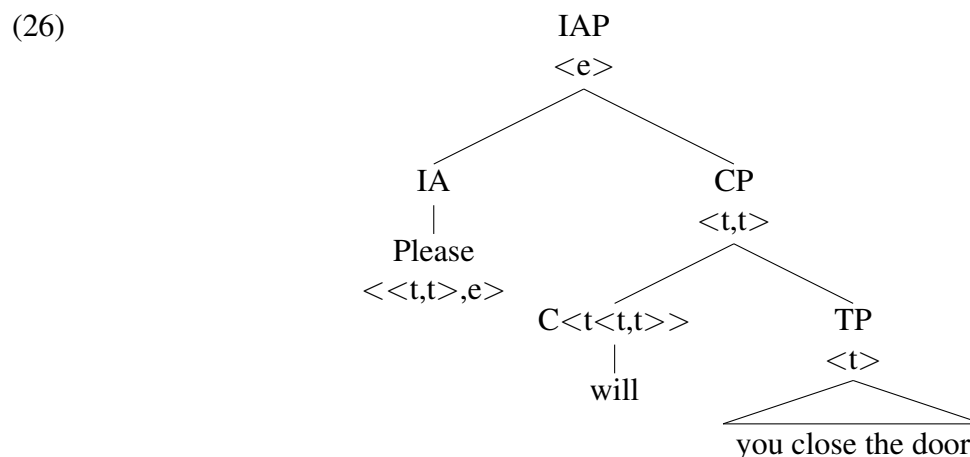
3.1.1. The structure and semantics of clause-initial 'please'

Following an amended version of the speech act phrase structure proposed by Hill (2007), the proposed structure for a sentence like (25a) is shown in (25b). Note that I label the projection that *please* is the head of as the Illocutionary Act Phrase (IAP) in line with Krifka (2014) to avoid confusion of this syntactic structure with pragmatically-determined speech acts (see also Woods (in press)).

- (25) a. Please will you close the door?
b.



Abstracting away from the role of the CENTRE OF EVALUATION, which is to apply the relevant context to the content of the CP, I propose that the semantic types of the elements in (25b) are as shown in (26).



The logic of this is as follows: the type for questions is a set of truth values $\langle t, t \rangle$ ¹⁰, which is taken by the IA head *please* as input to return an entity, namely the utterance *Please will you close the door*. There are a number of reasons to believe that the utterance (question plus overt illocutionary force) is an entity: firstly, utterances—whether information-seeking questions, statements, requests, or something else—are referred to using demonstrative pronouns, as noted by Davidson (1979) and demonstrated in (27).

- (27) a. That is not what I requested.
 (i) “Please would you close the door” is what I requested.
 (ii) That you would close the door is what I requested.¹¹
 b. I requested that.
 (i) I requested, “Please would you close the door.”
 (ii) I requested that you would close the door.
 (iii) %I requested would you please close the door.

Secondly, Roberts (2012:15) considers utterances to be semantic entities that constitute conversational moves. These semantic entities retain the information conveyed in the utterance without arguing that their internal structure is maintained in working memory, commensurate with recent psycholinguistic work. Lahiri (2002) also notes that there is a distinction to be made between an embedded question and an embedded question-utterance in Spanish; the latter has its own illocutionary force (of which the evidence is the presence of the quotative complementiser *que*) and is more restricted in its distribution than ‘typical’ embedded questions.

In fact, the proposal made in (26) is very similar to that made by Lahiri (2002) for the Spanish question-utterances: he proposes that there is a type coercion rule that lifts expressions of type $\langle s, t \rangle$, that is propositions, to utterances (a type of entity). I do not think that the role of *please* is to *coerce* a question into an utterance entity because this is simply the canonical, not some ancillary or secondary, use of clause-initial *please*. However, I suggest that the same kind of logic applies, whereby the input to the function denoted by the IA head *please* can be either a question of type $\langle t, t \rangle$ or an imperative of type $\langle e, t \rangle$ ¹².

The mechanism is as follows: assuming flexible types, *please* takes an argument *S* of a complex type $\langle \sigma, t \rangle$. It then returns the unique utterance *u* such that *u* is mapped onto *S*, where the propositional content of *u* and *S* are identical.¹³ The utterance that results is then checked against the relevant discourse context at the next stage (through the centre of evaluation, see Woods (forthcoming) for further details). The utterance *u* that is returned is of type *e*.

That the expression $\langle \sigma, t \rangle$ is the input of the function denoted by *please* is important as it accounts for the incompatibility of integrated clause-initial *please* with declarative utterances.

¹⁰See Cable (2007: section 2.7) for an in-detail examination of the compositional extensional semantics of questions; as already noted here, I abstract away from the question of extensions here.

¹¹Note that a true utterance with its own illocutionary force is not possible in sentence initial position (Moulton 2015; Woods forthcoming), hence the presence of the complementiser *that* and the lack of subject-auxiliary inversion. Moreover, the fact that the declarative complementiser *that* rather than the interrogative complementiser *whether* appears here is indicative of the difference between a request and a true information-seeking question.

¹²Here I follow Portner’s (2004) proposal that imperatives are properties, though I will not go into the finer structural details in this paper.

¹³Thanks to Norman Yeo for clarifying my thinking here.

Both questions and imperatives are of types that may serve as input to the function denoted by *please* but a declarative, which is a proposition of type *t*, is of the wrong semantic type. Hence when *please* is inserted into a declarative, a semantic clash occurs and interpretation fails.

Other interpretive properties of integrated clause-initial *please* are also accounted for by the structure in (25b). For example, the fact of *please*'s being the illocutionary act head and encoding illocutionary force explains why it is available in dialects that embed illocutionary acts and not those that do not. For example, embedded clauses in standard English are generally assumed to be clause-typed but unspecified for illocutionary force (read: the original speaker's intentions). Following Krifka's (2014) and Woods's (2014; in press) arguments for embedded illocutionary acts, the postulation of an extra layer of structure that bestows illocutionary force on the embedded clause explains the permissibility of *please* in embedded inverted interrogatives like those in (14).

Moreover, the fact that *please* encodes a specific type of illocutionary force is most clearly illustrated by a triad of examples from Sadock (1974). According to the theory sketched above, only (28c) is overtly marked for illocutionary force. In fact, while examples (28a) and (28b) could be genuine information-seeking questions about the addressee's ability to close the window, example (28c) can only be interpreted as a request.

- (28) a. Can you close the window?
 b. Can you close the window, please?
 c. Please can you close the window?

3.1.2. Clause-initial 'please' is not a politeness marker

Having established that *please* is a marker of requesting force, the question of its relationship to politeness cannot be ignored. Sadock (1974) noted that syntactically-integrated *please* in clause-initial position has the effect of softening a request. This is particularly clear in (29); clause-initial *please* can be used in non-polite contexts and seems to attenuate the non-polite utterance; it is possible to interpret *please* in (29a) and (29b) as expressing emotions such as exasperation and resignation rather than just intent to insult. In contrast, clause-final *please* in the same contexts is degraded because it is more directly associated with politeness.

- (29) a. Please fuck off.
 b. Please can you fuck off?
 c. ??Fuck off please.
 d. ??Can you fuck off please?

I propose that clause-initial *please* introduces a conversational implicature¹⁴ of attenuation precisely because of its main role as a request marker. The use of *please* in (29a) means that this form of the utterance is in competition with the bare form of the utterance, given that there is no antonym for *please*. Following Gricean reasoning, the result of the competition between the bare form and the form in (29a) is not that the imperative *fuck off* loses its basic meaning that the speaker wishes the addressee to leave and wishes to insult the addressee; in fact, a sense of

¹⁴Thanks to Eric McCready and George Tsoulas for help with this.

obligation is imposed on the addressee to fulfil the former wish that s/he leave. That is to say that the choice by the speaker to use *please* results in a sense of attenuation of the impolite force of the imperative *fuck off* precisely because the wish of the speaker that the addressee leave is foregrounded by the presence of *please*. This is as a result of applying the maxim of manner; on the assumption that the speaker does not wish to contradict herself by being both rude and polite, she must wish to highlight her remark as a request rather than as a simply insulting remark.

As this implicature is proposed to be a conversational implicature, it should be both reinforceable and cancellable:¹⁵ this can be shown to be the case in (30) and (31) respectively.

(30) Please fuck off - look, I don't mean to be rude, but I just can't deal with your presence right now. *Reinforcement*

(31) Please fuck off, and don't you dare show your ugly face around here again. *Cancellability*

Where the bare form *fuck off* may not necessarily be used in a situation in which the speaker wants to addressee to physically leave, (29a) requires such a situation. It is this shift in weight accorded to each part of the meaning of *fuck off* triggered by *please* that results in the attenuation of the impoliteness of the bare form.

3.1.3. Summary

The analysis in this section concludes that clause-initial *please* is the head of the Illocutionary Act Phrase, the highest projection in the clausal spine. It encodes requesting force and takes clauses of complex types as input and returns an utterance of type e. In this way it is incompatible with declarative clauses, which are of the simplex type t. This also accounts for the unembeddability of clause-initial *please*, except in those dialects that permit the embedding of illocutionary acts, such as North West England English. Illocutionary act head *please* is acceptable in non-polite contexts and as such is not a marker of politeness, but its inclusion in non-polite contexts gives rise to an implicature of attenuation because it foregrounds the obligations it places on the addressee regarding the request it marks over any impolite content.

3.2. Clause-medial 'please'

Although clause-medial *please* still seems to be restricted to requests, it has a slightly wider distribution than clause-initial *please*; in particular it can occur in declaratives with deontic modal force expressing necessity: the examples in (32) are attested.

- (32) a. Persons anxious to write their names will please do so on this stone only.¹⁶
 b. Ladies must please remain fully dressed while bathing.¹⁷

¹⁵Thanks again to Imke Driemel for reminding me of this.

¹⁶Taken from www.reddit.com/r/funny/comments/2gr9ol/a_very_british_response_to_graffiti/ - thanks to Jason Overfelt for sharing this.

¹⁷Taken from <http://www.tripadvisor.co.uk/LocationPhotoDirectLink-g297637-i214>

There are almost no examples of clause-medial *please* with a modal force expressing possibility: no examples were found in which modal verb *may* or *might* co-occur with *please* in a declarative clause.

This is an interesting restriction on the use of clause-medial *please* that does not apply to clause-final *please* (see (12), amongst other examples), nor to clause-initial and -medial *please* in other non-declarative clause types.

Clause-medial *please* is like clause-final *please* in that it is common in situations with set conventions, such as letter writing as in (33), or when there is a notable disparity in seniority between the interlocutors in (the attested but controversial) example (34) (in this case the disparity in authority between religious leaders and the faithful).

(33) Will you please acknowledge receipt of this letter by signing and returning the duplicate copy to me?¹⁸

(34) Women should please walk along this side of the road only.¹⁹

However, clause-medial *please* shares its interpretive properties with clause-initial *please*. As in (32), it is common in situations in which an (often socially necessary) expression of politeness may seem forced, born of frustration, or even sarcastic, for example in the situation in (35).

(35) I've asked you several times to see a doctor - will you *please* just make an appointment?

Clause-medial *please* also has an impact on the meaning of the sentence insofar as it restricts the interpretation of the sentence to that of a request. This is illustrated for interrogatives in (36) and for declaratives in (37).

(36) a. Can you open the window? *Request or information-seeking question*
b. Can you please open the window? *Request only*

(37) a. Visitors will leave shoes at the door. *Statement or request*
b. Visitors will please leave shoes at the door. *Request only*

Although (37a) is more likely to be read as a request given that the reader must comply with the request for the proposition in the statement to be rendered true, the presence of *please* in (37b) makes it clear that the sentence is to be read as a request and comes with the kind of attenuating effect explained at the end of section 3.1.

Syntactically, the position of clause-medial *please* is fixed and is commensurate with the position in other languages of non-clause-initial items that express discourse relations. Clause-medial *please* is located on the edge of the vP above vP-edge adverbs like *always*, as in (38), or negation, as in (39).

(38) Parents should please always refrain from congregating inside the front entrance or on

53673-Thiruvananthapuram-Trivandrum.Kerala.html.

¹⁸This example is taken from <https://www.admin.cam.ac.uk/offices/hr/contracts/notification.doc>.

¹⁹This example is taken from <http://www.standard.co.uk/incoming/article9744071.ece/alternates/w620/womenposter1.jpg>

the benches in front of the office area during arrival and dismissal times.²⁰

- (39) Tell him that you're sorry, but he will have to wait in line like everyone else, and he should please not ask for special treatment. Schaar (1981:169)

It appears therefore that clause-medial *please* is a functional head like clause-initial *please* that has been adopted into certain social conventions. Its position high above vP is fixed in the clause, and there are some accounts of Mittelfeld particles that suggest that there is a discourse projection above vP like the one proposed in (25b) above CP (see for example Struckmeier (2014)).

It therefore seems that an analysis of clause-medial *please* following Struckmeier (2014) may capture both the discourse-related properties and also the wider distribution of clause-medial *please* with respect to the clause types in which it can appear. Clause-medial *please* is compatible with a wider range of clause types because only a subset of features on the heads in the C layer, in particular the IA head and Force, are spelled out in the Mittelfeld. It is proposed that in English, only the features of the IA head, and not those of the clause-typing Force head, are spelled out in the Mittelfeld. This may be different from the German situation described by Struckmeier, as he notes that some sentences can actually become degraded if the discourse particle is omitted, as (40) shows.

- (40) Wäre ich ?(doch) Millionär!
 Were.SUBJ.II I PRT millionaire
 "If only I were a millionaire!" Struckmeier (2014:30)

As this is not the case in English, it is suggested that the featural link between clause type and the Mittelfeld particle is present in German but not in English.

Moreover, the fact that *please* only combines with complex types accounts for the way in which it can combine with substructures within TP; the type of a VP, namely $\langle e, t \rangle$ is a valid input for *please*. However, if clause-medial *please* is exactly the same as clause-initial *please*, a type-crash will occur, as *please*'s output is of type e where the required output to compose the VP plus *please* with the remaining structure will be type $\langle e, t \rangle$.

I will claim here that clause-medial *please* is a slightly different function than clause-final *please*: it is not a sentence-level function that takes a clause and returns an utterance, but that it is a predicate-level function that modifies only the predicate, taking the predicate as its input and returning another modified predicate. It is clear that such predicate-level functions exist; the German discourse predicates examined by Struckmeier, for instance, may only occur clause-medially but are under the same kind of restrictions as clause-initial elements. This approach also accounts for the unavailability of clause-medial *please* with modal forces that cannot be interpreted as expressing necessity.²¹ Clause-medial *please* marks the predicate as being a request, so combining a predicate with requesting force with a modal that expresses a force other than obligation causes a crash in interpretation—in short, contradictory modal forces cannot

²⁰Taken from <http://www.framingham.k12.ma.us/mccarthy-documents/StudentHandbook2013.pdf>.

²¹Imke Driemel (p.c.) points out that in German the insertion of *bitte* ('please') into a sentence with a deontic possibility modal forces it to switch to a necessity reading. This is the case in English as well.

combine.

On the account proposed here, clause-medial *please* is a predicate-level version of the clause-level *please* outlined in the previous section 3.1. It modifies predicates to mark them as the core of a request, meaning that it can occur in only those declaratives that have the same modal force as a request; namely, declaratives that impose an obligation on their addressee.

3.3. Clause-final 'please'

It is clear that there is a clause-final *please* that behaves very differently from clause-initial and clause-medial *please*. Clause-final *please* has a much wider distribution than clause-initial *please*. It may occur with polar interrogatives and imperatives, but also with fragments such as 'yes' or standalone NPs, with declaratives such as those uttered as responses to questions, and with overt performative requests. It is also possible in non-speech act embedded contexts, such as (41) and with wh-questions, as in (42).

(41) I wonder if someone might please check the books.²² ICE-GB

(42) Johnny, who discovered the Bronx, please? Sadock (1974:121)

Clause-final *please* differs interpretively too. Examples like (29) have already illustrated that clause-final *please* is much more closely linked with politeness contexts. This is also noted by Sato (2008) in her analysis of *please* in American and New Zealand English corpora. It is also exemplified by the kinds of contexts in which only clause-final *please* can appear: responses to (overt) questions and indirect requests are much more heavily marked by context and subtext. Furthermore, the ICE-GB corpus data also show that clause-final *please* is less common with requesting strategies that tend to imply obligation, such as imperatives. Finally, it is clear that it is not only politeness that regulates the acceptability for *please*; its distribution in fragments suggests that some other factor is also at play. While "Yes please" is very common, "No please" as a single intonational phrase is odd to native-speaker ears.²³ This is clearly not due to politeness; there are many contexts in which a polite refusal may be required, contexts that are usually satisfied by "No thank you". Nor is it a direct result of refusal *per se*; it is possible to refuse while still using *please*, as in (43).

(43) A: Would you like a new fountain pen?
B: I think I'll just stick to my old one, *please/thanks*.

Please is perfectly acceptable in B's refusal and is most likely to occur in a situation where B is subordinate to A or has less authority in some way. What is more, it appears to be interchangeable with *thanks* in (43), while it clearly is not in the examples in (44).

(44) a. I don't want a drink, *please.

²²Note that this is not a counterexample to the discussion of modal force and clause-medial *please* in the previous section, as the embedded clause here is an interrogative and is marked as such despite the lack of subject-auxiliary inversion.

²³Thanks to Jon Ander Mendia for this observation.

- b. No, *please.
- c. Won't you leave the door open, *please.
- d. Patrons will (please) not walk on the grass (*please).

A tentative proposal that *please* is a positive polarity item (PPI) that is incompatible with negation. Note that if *please* is above the scope of negation it is available (as in the first *please* in (44d)) but not if it is scoped over by negation (as the second *please* in (44d) is). This fact helps us determine where clause-final *please* enters the derivation compared with the predicate-level clause-medial *please*. In particular, compare (44c) with the well-known example in (45) below.

(45) Won't you please, please help me? Lennon & McCartney (1965)

Unlike (44c), clause-medial *please* is acceptable with the negated modal verb. I propose that this is because clause-medial *please* is generated above negation and is not c-commanded by it in its original position, though negation is later moved with the auxiliary verb into a position above clause-medial *please*. In contrast, clause-final *please* must be generated inside the VP. As a result, it is always c-commanded by negation, leading to ungrammaticality.

For the reasons given in this section, clause-final *please* behaves much more like an adverb-like particle in the vein of Cardinaletti (2011). Adverb-like particles in Cardinaletti's sense do not enter into Agree relationships with any other element in the clause, they are not merged at phase boundaries but much earlier in the derivation—here within VP—and they may appear in a wider range of contexts than particles analysed as functional heads.²⁴

The proposal that there are two different types of syntactically-integrated *please*, one that encodes requesting force and one that is an adverbial marking politeness, is neither a stipulative nor a superfluous move. It not only explains different distributions of the different types of *please* but also explains different interpretive effects, which are unlikely to derive simply from a different surface position in the sentence.

4. Consequences for speech act theory

Having provided syntactic and interpretive reasons for the analysis of *please* as a speech act head, it is worth taking a closer look at whether *please* can add anything to the current understanding of what the illocutionary act projection looks like.

Firstly, this analysis of *please* adds weight to Hill's (2007) observation that illocutionary force is syntactically marked in a position above the clause. A method of testing this using *please* takes the paradigm in (28) and applies it to a different clause type. The postulation of *please* as an overt marker of requesting force predicts that when *please* appears in imperatives, that the clause will only be interpretable with requesting force, and not with the permissive

²⁴An anonymous reviewer asks if this analysis of clause-final *please* predicts that it should be able to be modified, unlike clause-initial *please*. I argue that it does not, as not all adverbial elements are modifiable—not only the particles Cardinaletti identifies, but also clausal adverbials, for example. However, the sentence-final distribution of 'pretty please', as detailed in 2.2.2, is suggestive of the fact that clause-final *please* is adverbial in a way that clause-initial *please* is not.

interpretation often available in imperatives.²⁵ This prediction is tested in (46).

- (46) a. Take a seat.
 b. Take a seat, please.
 c. Please take a seat.

Whilst the paradigm is not as striking as in (28), there is a sense in which (46b) is a suggestion or an expression of permission where (46c) is a request with some sense of obligation on the part of the addressee. This interpretation requires more investigation, perhaps from an experimental point of view.

However, whilst there is a clear relationship between illocutionary act head and illocutionary force, the data above suggest that there is not such a clear relationship between the illocutionary act head and clause type. It is worth, therefore, reviewing the proposal by Coniglio & Zegrean (2012) that C is split into illocutionary force and clause type projections separately from the particle. The original formulation of their proposal is shown in (47).

- (47) ILL [$\text{\textit{\textit{type}}}$] [val]/[$\text{\textit{\textit{i}}}$ intent] [val] \leftarrow intentionality valued
 CLAUSE TYPE [$\text{\textit{\textit{type}}}$] [val] \leftarrow clause type valued
 PRT [$\text{\textit{\textit{type}}}$] [val]/[$\text{\textit{\textit{type}}}$ intent] [val] Coniglio & Zegrean 2012:249

However, rather than postulating three separate heads, I propose an alteration whereby the particle is the head of the illocutionary force projection and that its role is to mark the illocutionary force of the sentence overtly (as outlined above). Furthermore, particles are not linked to clause type through feature sharing; the relationship is a matter of semantic composition as expressed in (26). This is only a small alteration to Coniglio and Zegrean's system, but it is one that streamlines their proposal.

This analysis of *please*, in conjunction with earlier work, may also begin to clarify the nature of the arguments of the speech act head. There appears to be a correlation between the availability of an overt speech act marker and the addressee being the centre of evaluation. This is not only true of English *please* but of languages such as German and Romanian, where particles that are available in interrogatives and imperatives pattern together to be unavailable in declaratives (see Coniglio (2009); Struckmeier (2014) for German and Hill (2007) for Romanian). There is also a correlation between the addressee as centre of evaluation with the availability of embedded speech acts in English, as only embedded root interrogatives and imperatives are possible; there do not appear to be any embedded root declaratives in English. The next question to investigate therefore is this: is it possible that this is evidence for (an updated version of) Chomsky's (1995) idea of weak declarative C, at least in English? To provocatively take this one step further - is the speaker ever projected in syntax, or is the addressee the only discourse participant that may be projected in syntax in English (when it is necessary)? It does seem possible (and indeed minimal) that the speaker need not be represented in syntax, as s/he is inalienably connected with the structure by virtue of having produced it, whereas the addressee has no such inalienable connection to the utterance, even in contexts in which there is only one person other than the speaker because the utterance may well be a rhetorical one. To phrase it another way,

²⁵Thanks to Imke Driemel for this observation.

nothing in (English) declarative sentences picks out the specific addressee, though it is important in interrogatives and imperatives that they are addressed to the correct person. This view is at odds with the work on Bavarian German and Canadian English particles conducted by Wiltschko et al. (2015), but these questions must remain for future research.

5. Conclusions

The distributional, interpretive and acquisition data in this paper suggest that there are minimally two types of syntactically-integrated *please* in addition to standalone *please* in English: they are functional head request-marking *please* and adverbial politeness marker *please* respectively. Request-marking head *please* has the following key characteristics: it is clause-initial (with a clause-medial variant) and it only occurs with imperatives and a restricted subset of interrogatives (and declaratives, in the case of clause-medial *please*). It overtly marks the requesting force of the sentence in which it appears and it is usually prosodically part of the clause it gives force to. In contrast, politeness marker *please* occurs clause-finally. It combines with a wider range of clause types, including fragments and declaratives and crucially, rather than marking requesting force, it marks politeness.

There are some important effects of the overt marking of requesting force by request-marking head *please*. This *please* is only possible with direct requests; indirect requests do not have grammatically-marked requesting force, but achieve the effect of a request through other factors such as context and subtext. It has been shown that *please* forces the clause it c-commands to be interpreted as a request and that the relationship between Force and IA head *please* is achieved through semantic composition.

Questions remain, however, over the representation of discourse participants in syntax. It was tentatively suggested that only the addressee is (when necessary) represented and that the speaker is not in syntax but connected with the syntactic structure inalienably (by virtue of being the producer of it), but further development of these ideas has been left for future research.

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Noun-Verb Complex Predicates In Kurmanji Kurdish

A syntactic account

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This paper analyzes the argument structure of N(oun)-V(erb) complex predicates in the Muş dialect of Kurmanji and makes three claims: (i) N-V complex predicates (CPrs) are like *unergative verbs* in the sense of Hale & Keyser (2002); they are underlyingly transitive structures in which an agentive light verb selects for (or incorporates into) its nominal object, (ii) the noun element in these CPrs is not a true direct object although it seems to saturate the argument requirements of the CPr, and (iii) the existence of unergative CPrs and the behaviors of their noun element point to a different objecthood status in Kurmanji syntax.

1. Introduction

The term *complex predicate* (CPr) is used for diverse phenomena including more than one predicate, such as morphologically simplex unergative verbs in English (e.g. ‘dance’), particle plus a verb lexeme (e.g. *reki rohan* ‘toward rush’ in Hungarian), predicates with a single morphologically complex word (e.g. causatives in Chichewa), serial verb constructions (e.g. V+V constructions in Urdu), auxiliary plus main verb constructions of some languages of Europe, noun/nonverbal element plus verb combinations (e.g. N+V in Hindi, Persian and Kurmanji Kurdish) (Haig 2002) and inherent complement verbs (ICV) found in West African languages (Korsah 2014). Considering these different types, Butt (1997) asserts that the argument structure of CPrs is complex but their grammatical function is like a simple predicate and their phrase structure may be simplex or complex. Similarly, Alsina et al. (1997) propose that CPrs are multi-headed constructions composing of more than one grammatical event and each of them contributes to the information associated with a head. In a very recent study, Karimi (2013) defines CPrs as structures with more than one element in which each component contributes to the predicate information that is generally encoded in a single verb in a language.

Kurmanji Kurdish, a Northwestern Iranian language, employs a large number of complex predicates that consist of a nonverbal element and a light verb to form a single predicate. CPrs are very common in Kurmanji; they outnumber the simplex predicates. Despite constituting the majority of verbs, CPrs in this language does not get much attention in the literature. This paper aims to fill this gap in the literature investigating Kurmanji CPrs based on the vast

literature on complex predicate formation in various languages (Mithun 1984; Baker 1988; Mohanan 1997; Massam 2001; Hale & Keyser 2002; Haig 2002; But 2003; Öztürk 2009; Folli et al. 2005; Megerdooian 2002, 2012 among many others).¹

This paper is organized as follows: Section 2 presents general information about complex predicates in the Muş dialect of Kurmanji, while Section 3 specifically deals with N-V CPrs, their structural properties, classification and the status of their noun element. Section 4 introduces our analysis and discusses its implications for Kurmanji syntax. Why other incorporation approaches fall short of explaining the structure of Kurmanji CPrs is argued in Section 5. Lastly, concluding remarks and issues for further studies are presented in Section 6.

2. Complex predicates in Kurmanji Kurdish: an overview

The non-verbal element of Kurmanji CPrs ranges over a number of categories such as nouns, adjectives, particles and PPs (1). This study focuses on Noun+Verb sub-group, which constitutes the largest group of CPrs in this language, as exemplified in (1a), investigating the argument structure of the N-V Kurmanji CPrs as well as the status of the noun element in these constructions.²

¹ CPr formation is highly productive in Iranian languages (e.g. Persian, Kurdish, Zazaki). Since noun-to-verb derivation is weak or lacking in these languages, new verbal expressions are created through CPr formation (Haig 2002). For instance, loan words productively enter into nominal complex predicate formation:

e.g.	<i>telefon kirin</i>	(telephone do, French ‘telephone’)	‘to telephone’
	<i>zilm kirin</i>	(cruelty do, Arabic ‘zlm’ ضلّم)	‘to persecute’
	<i>sağ bûn</i>	(alive become, Turkish ‘sağ’)	‘to heal’

Even in contact situations, an element is copied from the dominant language and used as the non-verbal element of the CPr; for instance, as an output of language contact with Turkish, I observe new verbs composed of a Turkish participle and a light verb in Kurmanji:

e.g.	<i>anlamiş kirin</i>	(understand do - Turkish ‘anlamiş’-)	‘to understand’
	<i>dinlemiş kirin</i>	(listen do - Turkish ‘dinlemiş’-)	‘to listen to’
	<i>evlenmiş bûn</i>	(marrying become - Turkish ‘evlenmiş’-)	‘to get married’

Bulut (2006) presents similar examples from Kurmanji spoken in Adana, and she calls them as compound verbs made of a Turkish verb stem + *mîş* and Kurdish auxiliary *kirin/bûn* ‘do/be’. She argues that copies of Turkic verbs + *mîş* in Iranian languages are common, especially in Persian, Northern Tajik, Kurmanji, Zazaki, Talish, and Tati.

² The data for this paper was taken from Zeynep Argün’s seminar project which she submitted to the Kurdish Language and Culture Master Program at Muş Alparslan University. She collected the verbs in Muş province from daily conversations and local Kurdish songs (mostly performed by a *dengbej* – a traditional Kurdish singer). The data includes 692 complex predicates; about 600 of them are nominal (noun/adjective) CPrs while the rest are CPrs with a particle or a prepositional phrase. Pointing out the imbalanced distribution among the types of CPrs, Haig (2002) argues that although in Indo-European languages particle CPrs are widespread, in Iranian and Indo-Aryan languages N+V CPrs have developed due to some structural properties such as OV-word order, lack of morphological means for verb-noun derivation, differential object marking and lack of articles in these languages. Similarly, Butt (2003) mentions that Old Indo-Aryan employed a set of preverbs which combined with the main verb and gave rise to a complex range of meanings, e.g.: *ati* ‘across beyond past, and *nis* ‘out forth’. However, the modern Indo-Aryan languages such as Urdu/Hindi and Bengali have lost these preverbs completely.

(1) a. Noun + V

<i>bal dan</i>	(attention give)	‘to pay attention’
<i>sond xwarin</i>	(oath eat)	‘to swear’
<i>şîn girtin</i>	(mourn hold)	‘to mourn’

b. Adjective + V

<i>acis bûn</i>	(bored become)	‘to get bored’
<i>acis kirin</i>	(bored do)	‘to bore’
<i>nexweş ketin</i>	(ill fall)	‘to get sick’

c. Particle (adposition) + V³

<i>daçûn</i>	(particle go)	‘to sink’
<i>derketin</i>	(particle fall)	‘to go out’
<i>jêkirin</i>	(particle do)	‘to cut’

d. Prepositional Phrase (PP) + V

<i>bi rê ketin</i>	(with road fall)	‘to set off (on a journey)’
<i>ji bîr kirin</i>	(from mind do)	‘to forget’
<i>li xwe kirin</i>	(to self do)	‘to dress’

The verbal element in CPrs also ranges over a number of typical simplex verbs (2).⁴

(2)	<i>bûn</i>	‘become’	<i>avetin</i>	‘throw’
	<i>kirin</i>	‘do’	<i>xwarin</i>	‘eat’
	<i>dan</i>	‘give’	<i>ketin</i>	‘fall’
	<i>girtin</i>	‘hold’	<i>hatin</i>	‘come’
	<i>xistin</i>	‘put’	<i>berdan</i>	‘release’

The verbal element of the complex predicates in various languages are usually referred to as light verbs (LV) since their semantic content is partially or completely bleached (Grimshaw & Mester 1988 for Japanese; Haig 2002 for Kurdish; Karimi-Doostan 2005; Folli et al. 2005 and Megerdooomian 2012 for Persian). In fact, the contrasts in (3) imply that the verbal element of the Kurmanji CPrs is semantically bleached and it is mostly the nonverbal element which determines the semantic content of the CPr.

³ A set of preverbal particles in Kurmanji such as the adpositions *da* and *ra* or absolute prepositions like *jê* and *lê* (which are the contracted forms of the prepositions *li/ji* plus third person singular pronoun in the oblique case *wî/wê*; *lê* = *li* + *wî/wê* and *jê* = *ji* + *wî/wê*) or adverbs such as *der* ‘out’ combines with light verbs to form new verbs (Bedirxan & Lescot 1997; Haig 2002; Thackston 2006). They are usually written together with the stem as a single item in the infinitival form as provided in (1c); however, when they are inflected with negation *na/ne-* or imperfective aspect *di-*, inflectional prefixes are inserted between the preverb and the light verb, as in *der-na-kev-e* ‘he is not going out’ or *der-di-kev-e* ‘he is going out’. Thus they are not incorporated forms.

⁴ The Kurmanji data used in this study adheres to the conventions of the Latin alphabet following the Modern Kurmanji orthography developed by Celadet Bedirxan. In this orthography, /i/ stands for the back high unrounded vowel [ɨ] while /î/ stands for the front high unrounded vowel [i]. Similarly, /û/ is the back high rounded vowel [u] whereas /u/ corresponds to two different sounds; namely [ʊ] as in English *put*, and [ə] as in English *bird*. Lastly, /ê/ is the mid front unrounded vowel [e] and /e/ corresponds to three different vowels: [ɛ], [æ] and the Arabic ‘ayn’ (ع).

- (3) a. *av dan* (water give) 'to water'
bal dan (attention give) 'to pay attention'
gire dan (knot give) 'to tie'
xeber dan (info/swear give) 'to speak'
- b. *acis kirin* (bored do) 'to bore'
pacî kirin (kiss do) 'to kiss'
ji bîr kirin (from mind do) 'to forget'
jêkirin (particle do) 'to cut'
- c. *acis bûn* (bored become) 'to get bored'
hêrs bûn (angry become) 'to get angry'
bi cîh bûn (with place become) 'to settle down'
vebûn (particle become) 'to become open'

Butt (2003) argues that LVs are not entirely devoid of semantic predicative power because there is a clear difference between *take a bath* and *give a bath*. She says that LVs do not have full semantic power but they are not completely depleted, either. Moreover, Mohanan (1997) states that LVs in Hindi contribute to valency and argument meanings of CPrs so they are not totally light as argued for Japanese *suru* 'do'. Considering the following pairs of Kurmanji CPrs, one can argue that LVs are not semantically empty because the choice of LV lends a slightly different sense to the construction (4).

- (4) a. *eşkere bûn* (obvious become) 'to become obvious'
eşkere kirin (obvious do) 'to make obvious/clear'
- b. *vebûn* (particle become) 'to get opened'
vekirin (particle do) 'to open'
- c. *bi rê ketin* (with road fall) 'to set off (on a journey)'
bi rê kirin (with road do) 'to see off'

These pairs show that although LVs do not predicate fully as main verbs do they still contribute to the agentivity as well as valency of the predicate in Kurmanji. This is because the first member of these pairs is non-agentive and intransitive whereas the second member is agentive and transitive. Each of the light verbs corresponds to a heavy (thematic) verb and they are form-identical to these verbs carrying aspect and negation morphology (5).

- (5) a. *xwarin* 'eat' = *dixwum* 'I'm eating'
*na**xwum* 'I'm not eating'
- b. *sond xwarin* 'to swear' = *sond dixwum* 'I'm swearing'
*sond na**xwum* 'I'm not swearing'

However, LVs do not have the same thematic content and argument structure as thematic verbs. For instance, the verb *xwarin* 'to eat' has semantically and syntactically a fully inflected direct object and expresses the meaning of *eating* action in (6a). However, the verb in (6b) has neither an object nor does it define the act of eating in a real sense but has a bare noun with which it expresses the meaning of the whole predicate, namely 'to swear'.

- (6) a. Ez sêv-an **di**-xw-um
 I.NOM apple-ACC.PL PROG-eat.PRS-1SG
 ‘I am eating apples.’
- b. Ez sond **di**-xw-um
 I.NOM oath PROG-eat.PRS-1SG
 ‘I swear.’

To sum up, I propose that LVs in Kurmanji CPrs do not have the same semantics and argument structure of their thematic counterparts, but they determine the agentivity and valency of the CPrs. In the next section, I will discuss the properties of the nonverbal elements of CPrs.

3. *N(oun)-V(erb) complex predicates in Kurmanji Kurdish*

In this section, I will discuss the properties of N-V CPrs with respect to transitivity and case alignment, which are closely related to Kurmanji verb system. First, I will present how transitivity and case alignment works in Kurmanji syntax and then I will show how N-V CPrs behave with respect to transitivity and case alignment. I will discuss its implications for complex predicate formation as well as the status of the noun within N-V CPrs in this language.

3.1. *Transitivity and ergative alignment in Kurmanji Kurdish*

Kurmanji is one of the Iranian languages that has preserved its ergative pattern (e.g. Zazakî, Balochî, Taleshi, etc.) and indeed possesses two alignment types: the nominative accusative pattern in the present tense and the ergative pattern in past tense transitive constructions (Dorleijn 1996; Haig 1998, 2004; Thackston 2006; Gündoğdu 2011, 2013; Karimi 2012). Therefore, transitivity and intransitivity of the verb in Kurmanji are assessed with respect to ergative alignment in the past tense constructions. The subject of an intransitive verb is always marked with the nominative (NOM) case (7). As for transitive constructions, their subject has NOM case and the object gets the accusative (ACC) case in present tenses (8a), whereas in past tenses their subject bears ergative (ERG) case marking and the object has NOM (8b) marking.⁵ The verb always agrees with the NOM case-marked argument.

⁵ Note that in Kurmanji there are two case markers, one is the direct case with zero marking and the other one is oblique with –ê (feminine) and –î (masculine) marking. The traditional Iranian name for what I am calling the nominative case is direct case, for ergative and accusative it is oblique case. However, following Gündoğdu (2011), I continue to call them nominative, ergative and accusative cases because they have the same syntax with respect to case checking properties. Instead, I will use oblique case for the case realized on arguments except for the subject and the object (e.g. the case on the complement noun in the possessive-genitive constructions).

- (7) a. Ez di-kev-im
 INOM PROG-fall.PRS-1SG
 ‘I am falling down.’
- b. Ez ket-im
 INOM fall.PST-1SG
 ‘I fell down.’
- (8) a. Ez te di-bîn-im
 INOM you(S).ACC PROG-see.PRS-1SG
 ‘I see you.’
- b. Min tu dît-î
 I.ERG you(SG).NOM see.PST-2SG
 ‘I saw you.’

However, in the Muş dialect of Kurmanji, I observe another ergative pattern where the subject gets ERG case while the object has ACC case, and neither of the arguments agrees with the verb but rather the verb is in the third person default form as given in (9) (Gündoğdu 2011, 2013).

- (9) Min te dît- Ø
 I.ERG you(SG).ACC see.PST-3SG
 ‘I saw you.’

Ergative alignment enables us to discuss the properties of CPrs more clearly with respect to syntactic transitivity as well as intransitivity and to understand the status of the non-verbal element within the CPrs, which I will cover in the following sub-section. Note that all sentences given in the past transitive constructions will reflect the ergative pattern in the Muş dialect of Kurmanji.

3.2. Syntax of N-V CPrs in Kurmanji

Almost all the N-V CPrs behave like a transitive predicate as they trigger the ergative alignment in the past tense. However, a more thorough analysis of their argument structure indicates that all transitive-like CPrs are not true transitive verbs because they do not govern a typical direct object just like a transitive verb does (10). Note that complex predicates are indicated in boldface.

- (10) a. Min dar-an **av** **da- Ø**
 I.ERG tree-PL.ACC water give.PST.-3SG
 ‘I watered the trees’
- b. Min **sond** **xwar- Ø**
 I.ERG oath eat.PST-3SG
 ‘I swore’

- | | | | | | | |
|------|----|----------------------------|-------------|-----------|-------------------|------------------------|
| (11) | a. | Ez | dar-an | av | di-d-im | |
| | | I.NOM | tree-PL.ACC | water | PROG-give.PRS-1SG | |
| | | 'I am watering the trees.' | | | | |
| | b. | Min | dar | av | da-n | |
| | | I.ERG | tree.PL.NOM | water | give.PST-3PL | |
| | | 'I watered the trees.' | | | | |
| | c. | Min | dar-an | av | da- Ø | (<i>Muş dialect</i>) |
| | | I.ERG | tree-PL.ACC | water | give.PST-3SG | |
| | | 'I watered the trees.' | | | | |

Also, direct objects in this language function as the subject of the sentence under passivization and *daran* ‘trees’ conforms to this pattern (12).

- (12) Dar hat-in **avdan** (passive form of 11b/c)
 tree.PL.NOM come.PST-3PL water.give
 ‘The trees were watered.’

Moreover, the direct object can scramble in its immediate clause (13a). Note that the noun element within the transitive CPRs is not free to scramble yet only the whole CPR can scramble as given in (13b).

- (13) a. Dar-an **av** **di-d-im** ez
 tree-PL.ACC water PROG-give.PRS-1SG I.NOM
 ‘I am watering the trees.’
- b. * Ez **av** dar-an **di-d-im**
 I.NOM water tree-PL.ACC PROG-give.PRS-1SG

The examples provided in (11-13) indicate that these CPRs govern a direct object, and the noun element in these CPRs is like an incorporated part of the CPR (Baker (1988). For instance, the noun of the transitive CPRs is always bare; it does not bear case (14a) nor is it modified (14b).

- (14) a. * Ez dar-an **av-ê** **di-d-im**
 I.NOM tree-PL.ACC water-ACC PROG-give.PRS-1SG
- b. * Ez dar-an **av-a** cemidî **di-d-im**
 I.NOM tree-PL.ACC water-EZF.F. cold PROG-give.PRS-1SG

The transitive N-V CPRs are smaller in number; some examples are provided in (15).

- (15) *av dan* (water give) ‘to water’
 bar kirin (load do) ‘to take on load’
 girê dan (tie give) ‘to tie’
 xwey kirin (salt do) ‘to salt’

3.3.2. Unergative CPRs

What Haig (2002) classifies as lexically transitive verbs in Kurmanji all include the complex predicates made of a noun and a verbal element, and they all trigger ergative alignment despite the lack of a direct object. Observing that all CPRs in this group contain a noun as their non-verbal element and a transitive LV, and also that the great majority of them semantically corresponds to an unergative verb such as *work*, *make a fire*, *fast*, *speak*, I propose that these CPRs are like unergative verbs in the sense of Hale & Keyser (1997, 1998, 2002); they are underlyingly transitive structures in which an agentive LV selects for (or incorporates into) its nominal object. However, unergative CPRs display some differences with respect to their subcategorizational properties and the behavior of their noun element. Haig (2002) calls these CPRs as ‘non-incorporating complex predicates’ (p. 26) and considering the behavior of their

noun element he classifies them into three groups; (i) ‘adpositional complement CPrs’, (ii) ‘possessor complement CPrs’, and (iii) ‘saturated CPrs’ (p. 29). I will refer to his classification while discussing each group.

3.3.2.1. Adpositional complement CPrs

The first type of unergative CPrs is subcategorized for an adpositional argument; this type requires an additional argument appearing in an adpositional phrase because this oblique argument is conventionally associated with the CPr (Bedirxan & Lescot 1997; Haig 2002). This additional argument must be introduced within an adpositional phrase otherwise the sentence would be ungrammatical (16c). Also, as (16d) shows, the PP is like the subcategorized argument of the CPr thus when it is omitted the sentence sounds strange, even ungrammatical for most native speakers.

- (16) a. Ez li televizyon-ê **temaşe** **di-k-im**
 I.NOM P television.OBL watch PROG-do.PRS-1SG
 ‘I am watching television.’
- b. Min li televizyon-ê **temaşe** **di-kir- Ø**
 I.ERG P television-OBL watch PROG-do.PST-3SG
 ‘I was watching television.’
- c. * Min televizyon-ê **temaşe** **di-kir- Ø**
 I.ERG television-OBL watch PROG-do.PST-3SG
- d. * Min **temaşe** **di-kir- Ø**
 I.ERG watch PROG-do.PST-3SG

A few examples of adpositional complement CPrs are given in (17). Underlyingly they pattern with unergative verbs as in *do work* ‘to work’, but they do not govern an overt direct object and their noun element is always bare.

- (17) *xeber dan* (info/swear give) ‘to speak’
 govend girtin (halay hold) ‘to dance the halay’
 tinaz kirin (joke do) ‘to joke’
 hez kirin (love do) ‘to love’
 bawer kirin (belief do) ‘to believe’

3.3.2.2. Possessor complement CPrs

These CPrs necessitate an additional argument in the form of a possessor linked to the noun element through an *Ezafe* marker (EZF). For instance, the verb *praise somebody* is expressed through *praise + possessor give* lit. ‘give one’s praise’.

- (18) a. Gundî zehf **pesn-a** wî kur-ê **di-d-in**
 villager.NOM very praise-EZF.F DEM.M boy-OBL PROG-give.PRS-3PL
 ‘The villagers praise that boy much.’ (lit. ... praise of that boy give)
- b. Gundî-yan zehf **pesn-a** wî kur-ê **di-da**
 villager-PL.ERG very praise-EZF.F DEM.M boy-OBL PROG-give.PST-3SG
 ‘The villagers were praising that boy much.’

Although the majority of these CPrs express a transitive proposition such as help someone, praise someone/something, listen to somebody/something or teach somebody/something, underlyingly they are like unergatives in the form of a possessor DP with an *ezafe* and an LV as in one’s help+do, one’s praise+give, one’s ear+give, or one’s teaching+do. Some of these CPrs are presented in (19).⁶

- | | | | |
|------|----------------------|-----------------|----------------|
| (19) | <i>pesn dan</i> | (praise give) | ‘to praise’ |
| | <i>guh dan</i> | (ear give) | ‘to listen to’ |
| | <i>alîkarî kirin</i> | (help do) | ‘to help’ |
| | <i>hîn kirin</i> | (teaching do) | ‘to teach’ |
| | <i>şîn girtin</i> | (mourning hold) | ‘to mourn’ |

3.3.2.3. Saturated CPrs

The third type of unergative CPrs also triggers the ergative alignment in the past tense despite the lack of a direct object (20).

- (20) a. Gundî **destnimêj** **di-gir-in**
 villager.PL.NOM ablution PROG-hold.PRS-3PL
 ‘The villagers are performing an ablution.’
- b. Gundî-yan **destnimêj** **girt**
 villager-PL.ERG ablution hold.PST-3SG
 ‘The villagers performed an ablution.’

The noun in some CPrs is totally bare as is not inflected for case, gender and number (21). On the other hand, the noun in other CPrs in this sub-group can be modified by a noun or by an adjective (22). This point will be discussed in detail in sub-section 3.3.3.

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|------|-------------------------|---------------------|-------------------------------|
| (21) | <i>baz dan</i> | (jump/running give) | ‘to run, to jump’ |
| | <i>bang dan</i> | (call/azan give) | ‘to call, to recite the azan’ |
| | <i>destnimej girtin</i> | (ablution hold) | ‘to perform an ablution’ |
| | <i>agir kirin</i> | (fire do) | ‘to make a fire’ |

⁶ Ezafes are found in a large number of West Iranian languages including Kurmanji Kurdish and refer to a marker/morpheme which occurs between a noun and an adjective or other nominal modifier, e.g. possessor. In Kurmanji, the Ezafe marker inflects for gender (feminine vs. masculine), number (singular vs. plural) and definiteness (indefinite vs. definite). The head noun of possessive and adjectival constructions is marked with the Ezafe marker and the complement noun is always in the oblique case (Bedirxan & Lescot 1997; Thackston 2006; Haig 2011; Gündoğdu 2011).

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|------|---------------------|-----------------|-----------------|
| (22) | <i>bîryar dan</i> | (decision give) | ‘to decide’ |
| | <i>rojî girtin</i> | (day hold) | ‘to fast’ |
| | <i>serma girtin</i> | (chilliness do) | ‘to catch cold’ |
| | <i>ceng kirin</i> | (war do) | ‘make war’ |

3.3.3. The status of the noun element within unergative CPrs

As presented in the previous sub-sections, the noun element within the unergative CPrs may be modified by a noun (23a), by an adjective (23b), by a possessor through an Ezafe marker (23c), or it may be bare (23d). Unlike direct objects they do not have an overt ACC case and despite the lack of an overt direct object, all sentences have ergative alignment in the past.

- (23) a. (e)wî **rojî-ya** Remezan-ê **girt- Ø**
 he.ERG day-EZF.F Ramadan-OBL hold.PST-3SG
 ‘He fasted Ramadan’ (lit. He held the day of Ramadan)
- b. Min **serma-yek-î** giran **girti-bû-Ø**
 I.ERG cold-INDF.-EZF.M heavy hold.PST-PRF-3SG
 ‘I got a bad cold’ (lit. I held a heavy cold)
- c. Min **behn-a** xwe **da- Ø**
 I.ERG breath-EZF.F self give.PST-3SG
 ‘I had a rest’ (lit. I gave my breath)
- d. Me **şevêqê** **destnimêj** **girt- Ø**
 We.ERG morning ablution hold.PST-3SG
 ‘We performed ablution(s) this morning’ (lit. We held ablution yesterday)

These noun elements do not carry the properties of the direct object in this language; for instance, they are not free to scramble in their immediate clause (24) unlike direct objects (recall the example in (13)).

- (24) a. * Ez **temaşê** li televizyon-ê **di-k-im**
 I.NOM watch P television.OBL PROG-do.PRS-1SG
 ‘lit. I watch at television do.’
- b. * **Pesn-a** wî gundî her dem **di-d-in**
 praise-Ezf.M he.OBL villager.PL.NOM every time PROG.-give.PRS-3PL
 ‘lit. his praise the villagers every time give.’
- c. * **destnimêj** gundî **di-gir-in**
 ablution villager-PL.ERG PROG.-hold.PRS-3PL
 ‘lit. ablution the villager hold.’
- d. * **serma-yek-î** giran min **girti-bû**
 cold-Indf.-Ezf.M heavy I.ERG hold.Past-Perf-1SG
 ‘lit. a heavy cold I hold.’

Furthermore, unlike direct objects (as illustrated in (12)) these noun elements cannot achieve subjecthood under passivization (25; Haig 2002, Gündoğdu 2011). Note that the passive is formed through the verb *hatin* ‘come’ acting as an auxiliary plus the infinitival form of the main verb in Kurmanji.

- (25) a. * **temaşe** hat **kirin**
 watch come.PST-3SG to do
 ‘lit. watch was done’
- b. * **pesn-a** wî hat **dan**
 praise-EZF.M he.OBL come.PST-3SG to give
 ‘lit. his praise was given’
- c. * **destnimej** hat **girtin**
 ablution come.PST-3SG to hold
 ‘lit. ablution was held.’
- d. * **serma-yek-î** giran hat Ø **girtin.**
 cold-INDF.-EZF.M heavy come.PST-3SG hold
 ‘lit. a heavy cold was held.’

The examples in (11-15) clearly show that the noun element of the transitive CPrs seems to be incorporated; it neither functions as a true direct object – as there is already a direct object in the sentence – nor does it influence the alignment pattern in the language. On the other hand, the properties and behavior of the noun element within the unergative CPrs (see (23-25)) indicate that the noun element in these CPrs is not a true direct object either, but rather it seems to saturate the argument requirements of the CPr, which results in triggering ergative alignment in the past. That the noun element displays such behavior supports our view that these CPrs are like unergative verbs which are, in turn, underlyingly transitive structures.

4. Analysis

This section introduces the analysis I posit for the argument structure of Noun-Verb complex predicates in Kurmanji and it also argues what this analysis says about other types of CPrs in this language.

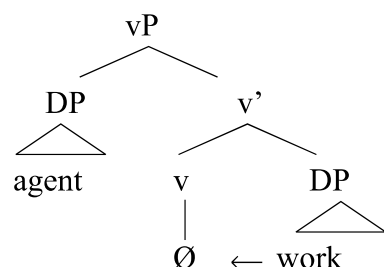
4.1. The argument structure of Noun-Verb CPrs in Kurmanji Kurdish

Hale & Keyser (1993) and their subsequent works (1997, 1998, 2002) argue that complex predicates are the norm rather than a special phenomenon because even simplex verbs in the lexicon are internally complex. In their framework, verbs are decomposed into basic *atomic units* that are put together by syntactic mechanisms such as complementation and adjunction, thus the argument structure is determined by the syntactic configurations depending on the properties of lexical items. The main outcome of their work is to eliminate lexical rules and generate all-argument structure alternations in the syntax. Therefore, the location and interpretation of each of the arguments in a verb phrase is going to be determined

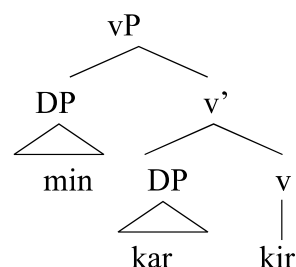
automatically when the verb is inserted into a particular syntactic structure. Their radical approach presupposes that verbs are not syntactically simplex items but rather they are composites of a non-verbal element and a verb nucleus which undergo incorporation in some languages, such as English, while remaining unincorporated in other languages, such as Basque (and Kurdish in our case). For instance, unergative verbs in English, as well as those in Basque, are underlyingly transitive structures wherein the N object is selected by and optionally incorporated into an agentive light verb. Since in Basque the light verb is morphologically visible, unergative verbs have analytic forms that directly reflect the underlying transitive structure as in *lan egin* ‘work do’ but the English counterpart is morphologically invisible, hence synthetic as it is in *work*, which is underlyingly ‘do work’.⁷ Furthermore, they reject the notion of theta roles and postulate that there are only the relations determined by the categories verb, noun, adjective, preposition and their projections; hence theta roles are just positionally defined within the structural configuration. I will claim that all Kurmanji CPrs provide striking confirmation for the structure of verb complexes in Hale & Keyser’s model.

Based on our findings, I argue that Noun-Verb CPrs in this group behave like unergative verbs in the sense of Hale & Keyser (2002); they are underlyingly transitive structures in which an agentive LV selects for its nominal object (the derivation is merged in the syntax). The difference is that Kurmanji has the unincorporated counterparts of English denominal unergative verbs. Due to the difference in head-directionality, the structures in English (head-initial) and Kurmanji (head final) are represented as reversed (26).

(26) a. English [denominal verbs]



b. Kurmanji [unergative CPrs]



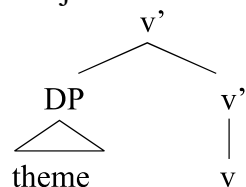
LVs of the unergative CPrs are already transitive verbs whose thematic counterparts always govern a direct object, which is in line with Hale & Keyser (2002) and Karimi-Doostan (2005) who propose that LVs such as ‘do’, ‘make’ or ‘give’ are transitive and must have an object. The fact that unergatives have a transitive underlying structure in this model lets us elaborate as to why these CPrs behave like transitive predicates. Triggering ergative alignment implies that even though the noun elements of unergative CPrs do not act as syntactic arguments, they are still associated with syntactic case. In line with Karimi-Doostan (2005), I argue that the LV in unergative CPrs in Kurmanji is transitive hence it has an ACC case to be checked. When no direct object is introduced into the system, the nominal element checks the case of the LV as a last resort strategy so that the derivation will converge.

⁷ However, as we know there are also unergative verbs in form of complex predicates (with an overt light verb) such as *make a fuss*, *make a claim* in English. In fact, Hale & Keyser (2002) adopt the term *root* for non-verbal element (compatible with Distributed Morphology approach by Halle and Marantz (1993)) and *verb nucleus* for light verb or verbalizing affix. When the verb nucleus is overt as a light verb, it must have an overt complement because light verbs cannot license a non-overt complement. Therefore, as an overt verb nucleus, *make* is a light verb requiring an overt object.

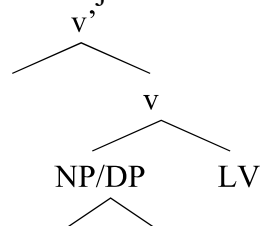
Gündoğdu (2011) argued that the little *v* head is responsible for ACC case checking in Kurmanji syntax so all transitive LVs sit in the *v* head position. Since the nominal element saturates the case feature of the LV, the structure is interpreted as transitive therefore ergative alignment is triggered in the past tense constructions.

However, the noun in these CPRs does not behave like a true direct object syntactically despite checking the case of the light verb; for instance, it cannot scramble (see (24)) and cannot achieve subjecthood under passivization (see (25)). From a semantic perspective, direct objects are the complements of the verb that express elements participating in a process in a special way, thus they have a thematic role. However, unlike direct objects, saturated objects simply determine the semantic content of the complex predicate. This raises the question as to what makes the noun in these CPRs different from the real direct objects in this language. The existence of unergative CPRs and the behaviors of their noun element are taken to be an implication for a different objecthood status in Kurmanji syntax. I suggest that that the noun of unergative CPRs is a part of the verbal domain whereas the real direct object is the internal argument of the thematic verb. Given that theta roles are not present in the system of Hale & Keyser (2002), but are instead defined positionally, I propose that real direct objects merge into the internal specifier position (27a), whereas the noun of the unergative CPR is introduced as the sister of LV within the CPR domain (27b). It saturates the case of the transitive LV thus they are saturated objects. The difference in structural positions of these items leads to different objecthood status (27).

(27) a. direct object



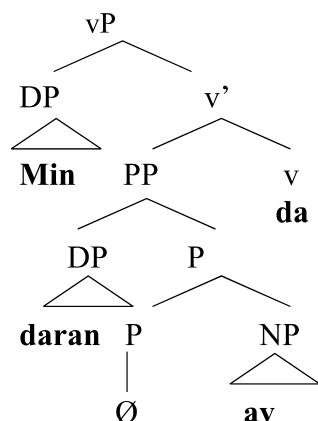
b. saturated object



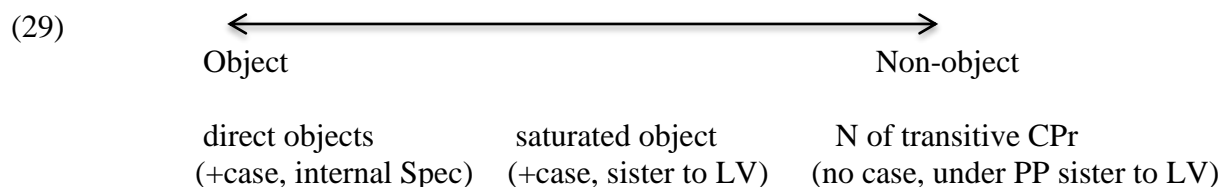
As for the transitive Noun-Verb CPRs which are fewer in number, they are all agent-manner verbs; they do not have intransitive counterparts and are externally caused hence only compatible with an agentive LV such as *kirin* 'to do', or *dan* 'to give'. The CPRs in a group such as *av dan* 'to water', *bar kirin* 'to take on load', *gire dan* 'to tie' underlyingly have a PP structure, which implicates a relation between the specifier and the complement (28). The P head in this structure is morphologically empty and it conflates with its NP complement (28).⁸

⁸ It is crucial to note that Hale & Keyser (2002) distinguish agent manner verbs such as *smear* from patient manner verbs such as *splash* by proposing that the latter group has a kind of adverbial semantic feature identifying a physical motion or an attitude denoted by the patient occupying the internal specifier position, while the former group has an adverbial feature describing the actions of entities denoted by an external argument, i.e. agent. Therefore, given that syntactic configurations with an internal specifier position belong to the alternating type, patient manner verbs enter into intransitive-transitive alternation whereas agent-manner verbs do not as they do not project an internal specifier.

(28) Min daran av da. 'I watered the trees' (like 'trees with water')



The next question relates to the reasons why the N of unergative CPrs has an objecthood status but the N of transitive CPrs does not. Our answer is that the difference is due to the structural position and the case properties; the N of unergative CPrs sits in the sister position of the LV and checks its case while the N of transitive CPrs is in the complement position of the P head (of PP in the sister position of the verb) and does not check any case. True direct objects, on the other hand, are the internal specifier of the verbal complex and they check case (see (27a)). This in turn points to a 'graded objecthood' status in Kurmanji. Example (29) illustrates the degree of objecthood depending on the syntactic position where they are merged and the case taken.

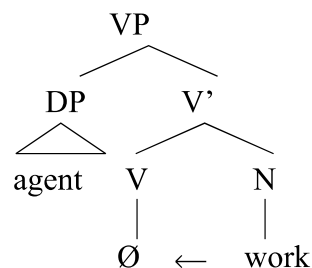
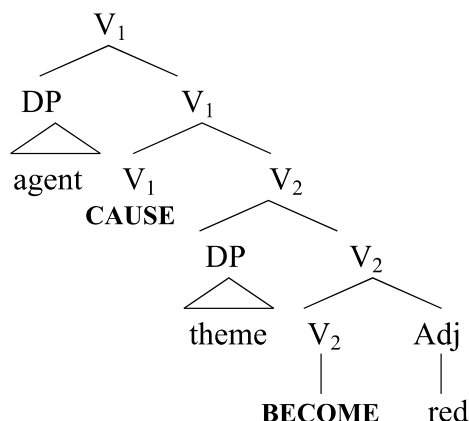


4.2. Hale & Keyser (2002) for other types of Kurmanji CPrs

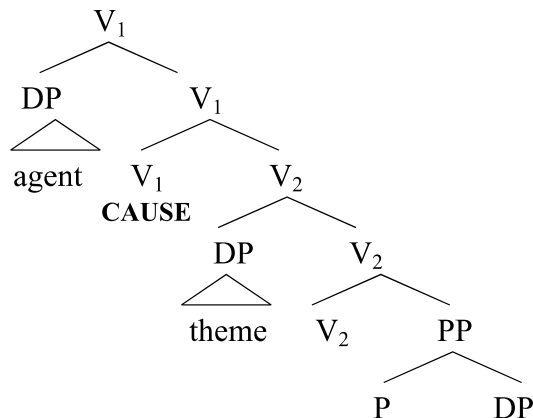
Hale & Keyser's (2002) approach posits monadic and dyadic structures with three kinds of non-verbal constituent, namely noun heads (30a), adjectival heads (30b), and prepositional small clauses (30c). Note that adjectives and prepositions are predicative thus they force the verb to project a specifier position for an internal subject. As such they have dyadic structure and can be transitivized, whereas nouns are entities thus they have monadic structure and cannot be transitivized (Hale & Keyser 2002).⁹

⁹ It is crucial to note that Hale & Keyser (2002) do not make a distinction between lexical V and little v but rather they use notations like V, V₁ and V₂. Instead of these notations, I adopt vP structure; VP stands for V₂ (intransitive) and vP for V₁ (transitive) structures.

(30) a. Denominal verbs (unergatives)

b. Deadjectival verbs (V₁ is transitive (causative), V₂ is intransitive (inchoative))

c. Denominal locatum/locational verbs (splash-type patient-manner verbs)



The argument structure of the verb phrase within H&K's model is reasonable and applicable to Kurmanji CPrs. Firstly, regardless of head directionality, the Kurmanji CPrs seem to have an obvious one-to-one mapping with the underlying argument structure of verb complexes proposed in this model, assuming that the non-verbal element is not incorporated into LV. Secondly, all Kurmanji CPrs that are classified as unergatives contain only a noun (or noun phrase) but not an adjective, particle or a prepositional phrase (PP), and this cannot be considered a coincidence. As discussed in the previous section these CPrs have the exact underlying correspondence to what H&K propose for unergative (denominal) verbs in general, e.g. *alîkarî kirin* 'to help' li. help do. Thirdly, almost all Kurmanji CPrs with an adjective, a particle or a PP have a transitive and an intransitive form which supports H&K's

proposal that adjectives and prepositions are predicative, with a dyadic structure (alternating type) and enter into intransitive-transitive alternation (31).

(31) Intransitive

Adj+LV	<i>eşkere bûn</i>	(obvious become)	‘to become obvious’
P+LV	<i>vebûn</i>	(particle become)	‘to get opened’
PP+LV	<i>bi rê ketin</i>	(with road fall)	‘to set off (on a journey)’

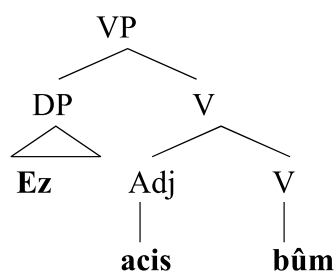
Transitive

Adj+LV	<i>eşkere kirin</i>	(obvious do)	‘to make obvious/clear’
P+LV	<i>vekirin</i>	(particle do)	‘to open’
PP+LV	<i>bi rê kirin</i>	(with road do)	‘to see off’

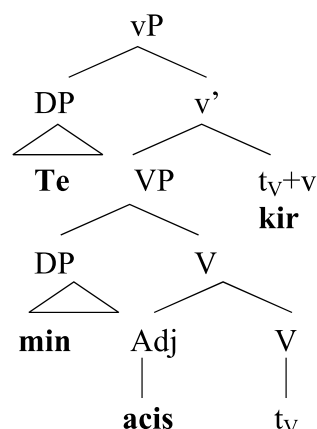
For these CPRs the nonverbal element which includes an adjective, particle or a prepositional phrase (31), H&K’s dyadic structure will translate directly into (32). The intransitive CPRs are within V head and their transitive counterparts are derived through incorporation of V head into the little v head. Before presenting their derivations, I would like to summarize some points: I argued that transitivity is determined by the LV and transitive LVs have ACC case to be checked. In fact, all transitive verbs sit in the v head position so in line with Gündoğdu (2011) it is little v head that is responsible for ACC case checking in Kurmanji syntax. Moreover, I showed that agentivity of the CPR depends on the LV (see examples in (4)). In the current Hale & Keyser system, theta roles are not considered as features to be checked in syntax but they are positionally defined thus following Hale & Keyser (2002), I assume that the specifier internal to the lexical argument structure is reserved for theme arguments while external arguments are introduced into the external specifier position which I will take as Spec of vP. The transitive variant of alternating pair is obtained through incorporation of V head into the little v head (32).

(32) Dyadic structure of Kurmanji CPRs in the form of Adj+LV / P+LV / PP+LV

a. intransitive = *Ez acis bûm*. ‘I got bored’



b. transitive = *Te min acis kir.* 'You bored me.'



So far I have tried to show that Kurmanji CPRs vary depending on the type of their non-verbal element as well as their syntactic structures, and that the Hale & Keyser model can successfully provide an explanation for their argument structure. In the next section I will present other syntactic analyses proposed in the literature regarding complex predicate formation and discuss the reasons why they fall short of explaining complex predicate formation in this language.

5. Why not other syntactic accounts?

Although the general assumption shared by syntactic approaches is the same (complex predicates are the product of syntax), each approach treats the formation process differently. The most famous approach to complex predicate formation in world languages is incorporation analysis. The influential work of Baker (1988, 1995, 2009) gives an account whereby complex predicates are the result of syntactic incorporation (specifically noun incorporation) driven by head movement, whereas Massam (2001) proposes a pseudo-noun incorporation analysis in which a verb phrase (complex predicate) is formed through ordinary syntactic Merge operation but not movement. In fact, an impressive body of literature has been built around these syntactic approaches through their application to various languages. That said, this section will only cover these two approaches and refer to their applications to different languages when necessary. In the following sub-sections, I will argue that incorporation analyses fall short of explaining CPRs in Kurmanji, unlike the argument structure model of Hale & Keyser (2002).

5.1. Head-incorporation analysis of Baker (1988)

The incorporation analysis of Baker is a subcase of Move-Alpha operation and states that an X^0 category moves into Y^0 which properly governs XP and theta-marks it, hence X^0 governs and chain-coindexes with its trace. For instance, the object is integrated into the verb and constitutes a complex predicate as a result of noun incorporation in syntax. Example (32a) illustrates an unincorporated object-verb construction in Onandaga (an Iroquoian language of eastern North America) in which the object nominal appears as a separate word that heads its own phrase and receives its theta role from the verb. Example (32b), on the other hand,

(33) a. Pet wa?-ha-**htu**-?t-a ne? o-**hwist**-a?
Pet PAST-3MS/3N-lost-CAUS-ASP the PRE-money-SUF
'Pat lost the money'

b. Pet wa?-ha-**hwist-ahtu**-?t-a
Pet PAST-3MS-**money-lost**-CAUS-ASP
'Pat lost money'

Lastly, and most importantly, incorporation is a transformational analysis which presupposes the existence of the unincorporated paraphrases, therefore all incorporation examples (i.e. noun/verb/preposition incorporation) provided by Baker have also unincorporated counterparts (as also illustrated in (32)). Moreover, Baker (1988) and similarly Mithun (1984) state that languages having noun incorporation also have their syntactic paraphrases with an unincorporated N head. However, in Kurmanji this is not the case because none of the CPrs in this language have another counterpart, for example, the CPr *avdan* 'to water' does not have a specific counterpart such as **avê dan* which would be ungrammatical (see (8d)). Given that CPrs outnumber the simplex verbs and CPr is a productive verb formation strategy adopted to create new verbal expressions in Kurmanji (and in all Iranian languages as per Haig (2002)), we do not expect to find such unincorporated cases.

Massam (2001), on the other hand, argues that what has been previously analyzed as a case of head incorporation in Niuean (Austronesian) is simply the result of forming a verb phrase through ordinary syntactic Merge (hence no movement), which she refers to as pseudo-noun incorporation. In contrast to the incorporation analysis, in Massam (2001)'s analysis, the incorporated part is not a bare noun, but an NP which is non-specific and non-referential.

When the direct object merges with the verb and fails to check object case, it cannot scramble or undergo object shift to a position out of the VP and remains adjacent to the verb in the same syntactic phrase and undergoes predicate fronting, yielding the predicate initial VOS word order in Niuean rather than the default VSO word order. Example (33a) illustrates the canonical VSO word order: V-particles-Subject-Object, while (33b) shows the pseudo-noun incorporated word order VOS wherein the object stands adjacent to the verb and precedes the particles, thus: V- Object-particles-Subject (Massam 2001:157).

(34) a. (Niuean VSO order)

Takafaga	tiimau	ni	e	ia	e	tau	ika
hunt	always	EMPH	ERG	he	ABS	PL	fish

‘He is always fishing.’

b. (Niuean VOS order)

Takafaga	ika	tuimau	ni	a	ia
hunt	fish	always	EMPH	ABS	he

‘He is always fishing.’

Massam (2001) also points out that the agent is ergative in (33a) but absolutive in (33b), which in turn indicates that a pseudo-noun incorporated sentence is intransitive.

Considering this pseudo-noun incorporation analysis with respect to Kurmanji CPRs, one can easily predict that this account by no means explains CPRs with adjectives, particles and PP since it only targets bare NP plus verb constructions. Nevertheless, it may provide an explanation only for CPRs with bare nouns/NPs. However, in Massam’s system, pseudo-noun incorporation turns a transitive verb into an intransitive predicate, but all Kurmanji CPRs with a noun are transitive as they trigger ergative alignment in the past tense; either they have an overt direct object (see the example (11)) or their nominal element behaves like an object (see the sentences in (16, 18, 20, 23)). Thus none of the CPRs in this language have an unincorporated counterpart - neither transitive nor intransitive.

Applying the analysis of Massam (2001) to Turkish a bit differently, Öztürk (2009) explains preverbal bare nouns and light verb constructions in Turkish through pseudo-incorporation. She shows that an immediately preverbal bare noun like *kitap okudum* ‘I did book reading’ has full NP status but it lacks case and referentiality hence it is predicative. According to her analysis, in pseudo-incorporation, the case feature is weak and is not compatible with referential NPs. Therefore, bare nouns that are merged as complements of the lexical verb check weak case of Theme head and they retain thematic interpretation via *in situ* case checking through Agree as a last resort strategy so that the derivation will not crash. Öztürk (2009:348) shows that although immediately preverbal bare nouns in Turkish pattern with unergatives, it is impossible to add an accusative marked direct object to the sentence (as in *Ali [*Romeo ve Juliet-i] kitap okudu* ‘Ali book-read Romeo and Juliet’) and to a causative construction (as in *Ayşe [*Ali-yi] balık tutturdu* ‘Ayşe made Ali go fishing’). This implies that they are associated with syntactic case and theme theta role though they are not true syntactic arguments, hence a pseudo-incorporated construction such as *kitap okudum* ‘I did book reading’ is transitive.

In fact, Öztürk’s treatment of pseudo-noun incorporation can provide an explanation for why unergative CPRs with a bare NP (adpositional and some saturated unergative CPRs) behave as a transitive predicate such that they trigger ergative alignment in the past tense and cannot take a direct object. If the transitive light verb has a case to be checked (assuming that

transitive light verbs assign case) and no direct object is introduced into the system, then the bare NP is going to check the case of the light verb as a last resort strategy so that the derivation will converge.

As for light verb constructions such as *redd-etmek* ‘reject’ in Turkish (35), she proposes that the light verb *et-* ‘do’ functions as true denominalizer because in the absence of the light verb the nominal element has the same arguments with the same theta-roles and case markers (Öztürk 2009:346).¹⁰

- (35) a. Meclis yasa-yı [NP redd] et-ti
 assembly law-ACC reject do-PST
 ‘The assembly rejected the law.’
- b. Meclis-in yasa-yı redd-i
 assembly-GEN law-ACC reject-3SG
 ‘The assembly’s rejecting the law.’

Öztürk (2009) argues that the bare NP in light verb constructions is not associated with a theta role thus unlike pseudo-incorporated verbs they allow the occurrence of an object; i.e. transitive. Nevertheless, light verb constructions and pseudo-incorporation share the same [NP+V] structure, so sisterhood to the lexical verb gives rise to complex predicate formation. At first sight, such an analysis of light verb constructions seems to explain the behaviors of transitive Kurmanji CPrs with bare NPs such as *avdan* ‘to water’, but upon closer inspection we can see that bare NPs of such CPrs cannot assign any case and theta role (35c), and they always have to be used with the light verb (35b). Therefore, this analysis fails to explain the behaviors of these CPrs.

- (36) a. Min dar-an av da- Ø
 I.ERG tree-PL.ACC water give.PST-3SG
 ‘I watered the trees’
- b. avdan-a daran zor e
 watering-EZF.F tree-PL.OBL difficult COP-3SG
 ‘Watering trees is difficult’
- c.* av-a daran zor e
 water-EZF.F tree-PL.OBL difficult COP-3SG
 Intended: ‘Watering trees is difficult’

Considering structural as well as language-specific differences, among the available analyses, making syntactic generalizations and proposing a uniform analysis for CPrs in Kurmanji is challenging. The analyses proposed in the literature on complex predicate formation mostly focus on N+V type CPrs (or V+V type CPrs which do not exist in Kurmanji), but in addition to N+V type CPrs, we have also Adj+V, Particle+V and PP+V type CPrs. As discussed in this section, the incorporation analyses of Baker (1988) and Massam (2001) fall short of

¹⁰ A similar assumption has been made by Key & Tat (2012) who proposes that in Type II complex predicates of Turkish (such as *davet etmek* ‘invite’, *ziyaret etmek* ‘visit’), transitivity is determined by the non-verbal element *davet* ‘invitation’/ *ziyaret* ‘visiting’ as it can take accusative argument on its own in the absence of the light verb.

explaining the properties and argument structure of Kurmanji CPRs in general, and even they cannot account for the Noun-Verb type. Incorporation is a transformational analysis and all incorporation examples provided in both analyses also have unincorporated counterparts; however, none of the Kurmanji CPRs have unincorporated syntactic paraphrases. Moreover, all types of incorporation proposed by Baker require a head category which is subject to movement operation and that proposed by Massam necessitates a bare NP, but the noun category of unergative CPRs in Kurmanji is mostly a phrase category in the form of DP as presented in Section 3.2. On the other hand, it is shown that the argument structure of the verb phrase within H&K's model is reasonable and largely explanatory for Kurmanji CPRs.

6. Conclusion

The current study investigated specifically the Noun-Verb complex predicates (CPRs) in the Muş dialect of Kurmanji Kurdish and discussed its implications for Kurmanji syntax. These CPRs were classified into two groups: (i) transitive, and (ii) unergative. The former group behaves like a typical transitive verb; they govern a typical direct object and trigger ergative alignment in the past. On the other hand, the latter group does not have a direct object although it also triggers ergative in the past. Considering their syntactic properties, I proposed that the CPRs in the latter group are *unergative verbs* in the sense of Hale & Keyser (2002); they are underlyingly transitive structures in which an agentive LV selects for its nominal object. I argued that the noun element in these CPRs is not a true direct object despite fulfilling the argument requirements of the CPR. The noun element checks the case of transitive LV as if it were its object, which in turn, points to a different objecthood status in Kurmanji syntax: the noun of unergative CPRs is a part of the verbal domain whereas the real direct object is the internal argument of the thematic verb. Moreover, this paper presented information about the properties of other types of Kurmanji CPRs and discussed that Hale & Keyser's (2002) model can also account for each type of CPRs in this language, where other proposals, e.g. incorporation, fall short of explaining CPRs overall. In fact, a thorough investigation of the various complex predicates in other related Kurdish and Iranian languages such as Sorani, Zazaki, Hawrami and Balochi and their comparison with each other could shed light on the internal structure of complex verbs in this language.

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Exclamatives and Factivity

A new test based on VERUM Focus

Imke Driemel

This paper explores the information structural status of exclamative utterances. Specifically, it addresses the issue of whether the propositional content of exclamatives is factive or not. I argue that standard factivity tests are not able to provide an answer to this question because either they are unreliable or they cannot be applied to exclamatives. I propose a new test that involves VERUM focus: exclamatives show the same kind of VERUM focus distribution as factive complements. Furthermore, focus on the illocution of exclamatives does not emphasize the truth of the proposition, contrary to illocution focus in assertions.

1. Introduction

Exclamatives come in a great variety of syntactic forms. In this paper I focus on *wh*-exclamatives, polar exclamatives and German *that*-exclamatives.

- | | | |
|-----|-----------------------------------------------------------------------------------------------------------|--------------------------|
| (1) | How tall Paul is! | <i>wh-exclamative</i> |
| (2) | Boy, is Syntax easy! | <i>polar exclamative</i> |
| (3) | Wie groß Paul ist!
how tall Paul is
'How tall Paul is!' | <i>wh-exclamative</i> |
| (4) | Mann, ist Syntax einfach!
boy is syntax easy
'Boy, is syntax easy!' | <i>polar exclamative</i> |
| (5) | Dass die immer Turnschuhe anzieht!
that she always sneakers wears
'That she always wears sneakers!' | <i>that-exclamative</i> |

All types of exclamatives share the illocutionary function exclamation. Exclamations are utterances that express an emotional attitude, e.g. surprise, shock or amazement at a certain state

of affairs, thus they belong to the speech act *expressive*. The emotional attitude is often directed at the high degree to which something holds. With (1) the speaker expresses his surprise towards the fact that Paul is extremely tall and not only tall to a standard degree. English *wh*-exclamatives are always SVO, i.e. they do not show subject-auxiliary inversion, whereas German *wh*-exclamatives can come with or without subject-auxiliary inversion.

- (6) a. What shoes she wears!
 b. *What shoes wears she!
- (7) a. Was für Schuhe die getragen hat!
 what for shoes she wears
 b. Was für Schuhe hat die getragen!
 what for shoes wears she
 ‘What shoes she wore!’

The main pitch accent typically falls on the d-pronoun¹, which frequently occurs in exclamatives, see (8), but it can also fall on the finite verb.

- (8) a. Wie lang DIE geduscht hat!
 how long she showered has
 b. Wie lang hat DIE geduscht!
 how long has she showered
 ‘How long she showered!’

Two puzzles arise with respect to sentence stress and verb position in German exclamatives²: (i) in V-final exclamatives main pitch accent is only accepted on the lexical verbs but not on the auxiliaries, see (9) vs. (10), and (ii) in V2-exclamatives main pitch accent is accepted on lexical verbs as well as auxiliaries, see (11) vs. (12).³ I claim that the unusual sentence stress distribution is due to the factivity of exclamatives.

- | | |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>(9) Wen die alles KENNT!
 who she all knows
 ‘How many people she knows!’</p> | <p>(11) Wen KENNT die alles!
 who knows she all
 ‘How many people she knows!’</p> |
| <p>(10) *Wen die alles getroffen HAT!
 who she all met has
 ‘How many people she met!’</p> | <p>(12) Wen HAT die alles getroffen!
 who has she all met
 ‘How many people she met!’</p> |

The propositional content of exclamatives is often claimed to be known by the speaker and the

¹In addition to personal pronouns, German also has d(emonstrative)-pronouns. D-pronouns are different from personal pronouns in that they cannot be coreferent with a *discourse topic*, i.e. they can only be resolved to antecedents which are given but not maximally salient (see Bosch & Umbach 2008; Hinterwimmer 2014).

²The stress pattern is consistent across different types of exclamatives. I will demonstrate the pattern on *wh*-exclamatives since it is the only exclamative type that can be V2 as well as V-final, and thus is suitable to provide the most minimal pairs.

³The main pitch accent distribution of auxiliaries patterns with the main pitch accent distribution of copular verbs.

hearer. This property is also known as *factivity*. While some theories take factivity to be an essential property of exclamatives (Grimshaw 1979; Portner & Zanuttini 2003; Roguska 2008; Abels 2010), others assume factivity either only for a certain type of exclamatives (D'Avis 2013) or for a certain part⁴ of exclamatives (Delsing 2010). Some theories even doubt the factivity status altogether (Rett 2011). In the following, I will show that most of the standard factivity tests either do not yield consistent results or are unapplicable to begin with. I will then show that the two puzzles presented above provide new evidence for the factivity of exclamatives.

2. Standard Factivity Tests

Standard factivity tests focus on the distinction between *asserted* propositions and *presupposed* propositions. With an assertion the speaker proposes to add a proposition to the common ground. In contrast, a presupposition is already part of the common ground when uttered. Tests that distinguish between assertions and presuppositions are *subsequent discourse moves*, *holes*, and *filters*. If exclamatives are factive, i.e. not assertive, then the next question that has to be answered is whether factivity is derived via a presupposition or via a conventional implicature. Since both types of inferences are very similar in their behaviour, some frameworks have subsumed the former under the latter (Karttunen & Peters 1979; Gazdar 1979; Chierchia & McConnell-Ginet 1990; Simons et al. 2010), and thus consider presuppositions as special cases of conventional implicatures, i.e. the ones that make propositions true. Accounts that argue for a difference between conventional implicatures and presuppositions (Stalnaker 1974; Karttunen 1974; Heim 1990; Potts 2005; Horn 2007) propose that difference to be anchored, again, in their relation to the common ground: conventional implicatures are added to the common ground as secondary assertions when uttered whereas presuppositions are already entailed by the common ground when uttered. Two tests can be used to figure out whether the hypothesized factivity of exclamatives is derived via conventional implicature or via a presupposition: *plugs* and *backgrounding*.

2.1. Subsequent discourse moves

Previous research has examined subsequent discourse moves (Rett 2011; Chernilovskaya et al. 2012; D'Avis 2013). If exclamatives are not factive, we would expect them to behave like assertions in discourse, i.e. the addressees should be able to question, confirm, or deny them. The dialogue in (13) provides an example for questioning while (14) additionally shows confirmation and denial.

- (13) A: How many people took part in the rally!
 B: Well, most of the people were just bystanders.

(Chernilovskaya et al. 2012:115)

⁴In this case the high degree that exclamatives often express is not assumed to be part of the fact:

- (i) How unbelievably tall he is! FACT: He is tall.

- (14) A: Hat der aber ein tolles Auto!
 has he aber a great car
 ‘Boy, does he have a great car!’
 B: Findest du? / Finde ich nicht. / Finde ich auch. / Ja, das stimmt.
 think you / think I not / think I too / yes that is true
 ‘You think? / I don’t think so. / I think so, too. / Yeah, that’s right.’ (D’Avis 2013:194)

These tests are unreliable, however, because there are other examples that seem to show that exclamatives cannot be questioned, confirmed, or denied by the addressee, see (15) for denial and (16) for confirmation and questioning as well as denial. Hence, subsequent discourse moves do not provide a consistent test for factivity.⁵

- (15) A: (My,) What delicious desserts John bakes!
 B: ?? No (he doesn’t), these are store-bought. John’s actually a terrible cook. (Rett 2011:414)
- (16) A: Dass die den geheiratet hat!
 that she him married has
 ‘That she has married him!’
 B: #Findest du? / #Das finde ich auch.
 think you / that think I too
 ‘You think? / I don’t think so.’ (D’Avis 2013:195)

Furthermore, these tests are highly problematic if one takes into consideration that presuppositions can be *accommodated* (Karttunen 1974). The discourse moves following an exclamative are appropriate reactions in case the propositional content is asserted as well as in case it is accommodated as a presupposition. Either the speaker asserts the propositional content and, therefore, expects the hearer to update the CG accordingly, or he presupposes it and, therefore, relies on the hearer’s willingness to accommodate the presupposition into the CG. Subsequent discourse moves do not tell us whether the speaker chose the first or the second option. Similar presupposition tests such as the *Wait a minute* test (von Stechow 2004) are notoriously unreliable (Potts 2012).

2.2. Holes and Filters

Another prominent test in the literature on factivity is based on the projection behavior of presuppositions. In order to distinguish between inferences that are asserted and those that are presupposed contexts with entailment-canceling operators can be taken into consideration, e.g. negation, modals, or questions. Presupposed information (\neg) projects over these operators to the global level, they act as *holes* (Karttunen 1973). In contrast, asserted information (\models) is canceled by these operators. In (17) e.g. the verb *stop* triggers the presupposition that Carla has previously smoked. This presupposition survives the entailment-canceling operators in (18)–(20). The main problem with the application of tests involving entailment-canceling operators

⁵The differences between (13)–(14) and (15)–(16) require more attention. Due to space, however, this paper will not focus on this matter.

is that they occur inside the presupposition that exclamatives come with. They have no chance to project through operators like negation, modals, or question since the exclamative status itself acts as the presupposition trigger. By hypothesis, (21) presupposes its propositional content. However, this presupposition does not grow through, see (22)-(24).

- | | | | |
|------|---------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------|
| (17) | Carla stopped smoking.
\models Carla stopped smoking
\neg Carla has previously smoked | (21) | How many guys John knows!
\models ?
\neg John knows a lot of guys |
| (18) | Carla did not stop smoking.
$\not\models$ Carla stopped smoking
\neg Carla has previously smoked | (22) | How many guys John does not know!
$\not\models$?
\nrightarrow John knows a lot of guys |
| (19) | Carla possibly stopped smoking.
$\not\models$ Carla stopped smoking
\neg Carla has previously smoked | (23) | [How many guys John might know!
$\not\models$?
\nrightarrow John knows a lot of guys |
| (20) | Did Carla stop smoking?
$\not\models$ Carla stopped smoking
\neg Carla has previously smoked | (24) | How many guys does John know?
$\not\models$?
\nrightarrow John knows a lot of guys |

Abels (2010) uses *filters* to provide evidence for the factivity presupposition in exclamatives. Filters, e.g. conditionals, are said to block presuppositions from projecting to the global level if they are triggered in the consequent and entailed by the antecedent (Karttunen 1973), see (25).

- (25) a. Fred will kiss Cecilia again.
 \neg Fred has kissed Cecilia.
 b. If Fred has managed to kiss Cecilia, Fred will kiss Cecilia again.
 Fred has managed to kiss Cecilia \models Fred has kissed Cecilia
 \nrightarrow Fred has kissed Cecilia.

(Karttunen 1973:177)

Turning now to exclamatives, it can be observed that they cannot embed under question predicates – a property that D’Avis (2001, 2002) has taken as an argument in favor of factivity: the speaker cannot know the answer and ask for it at the same time, see (26-b). To make sure that the embedded *wh*-clause is exclamative and not interrogative, typical exclamative intensifiers like *extremely* are used.

- (26) a. I am surprised how extremely tall Mary is.
 b. *I want to know how extremely tall Mary is.

If we apply the filter test, i.e. if *wh*-exclamatives are contained in the consequent of a conditional clause and entailed by the antecedent, their factivity presupposition is blocked so that they can embed under question predicates, see (28).

- (27) *Unsere Hörer möchten wissen, was für eine Bullenhitze dort im Sommer herrscht.
 our listeners want know what for a unbearable.heat there in summer
 is
 ‘Our listeners wonder what unbearable heat there is there during the summer.’
- (28) Wenn die Temperaturen in Gujarat schon im Winter 30 Grad übersteigen, fragen sich unsere Hörer natürlich, was für eine Bullenhitze dort im Sommer herrscht.
 if the temperature in Gujarat already in winter 30 degrees exceed ask themselves our listeners of.course what for a unbearable.heat there in summer
 is
 ‘If the temperature in Gujarat is above 30°C even in winter, our listeners of course wonder what unbearable heat there is during the summer.’ (Abels 2010:143)
- i. The temperature in Gujarat is above 30°C in winter \Vdash In Gujarat there is an unbearable heat during the summer
- ii. \nVdash In Gujarat there is an unbearable heat during the summer

The projection behavior of exclamatives with respect to filters provides convincing evidence for the factivity presupposition. However, Abels has to rely on the premise that the factivity presupposition that comes with embedded exclamatives is the same as the one that comes with matrix exclamatives. He has to assume that exclamatives can be embedded – an idea that is highly problematic especially with respect to the embedding behaviour of English *wh*-exclamatives (see Rett 2011).

2.3. Plugs and Backgrounding

Plugs come in the form of *verba dicendi*, e.g. *say* or *tell*, or performatives, e.g. *promise*, and they are said to block any presupposition that is triggered in their complement to project to the global level (Karttunen 1973). In contrast to presuppositions conventional implicatures project to the global level even under plugs (Potts 2005). A minimal pair is given in (29): the factive verb *realize* in (29-a) presupposes the truth of its complement *it was raining* whereas the parenthetical *as Sue predicted* in (29-b) triggers the conventional implicature *Sue predicted the rain*. Both inferences are embedded under the plug *say* but only the conventional implicature projects to the global level since it is the only inference which cannot be denied in the following discourse.

- (29) a. Ed said that Sue realized that it was raining. Later we found out that Ed’s report was wrong. Sue can’t have realized it was raining, because it wasn’t.
- b. Ed says that, as Sue predicted, it is raining. # But in fact Sue didn’t predict the rain.

Potts (2005:36)

Potts (2005, 2013) analyzes the projective behaviour of conventional implicatures as a consequence of their complete independence of the truth-conditional content of the sentence they are

triggered in. In this regard, they behave very different from presuppositions, which furthermore shows that the two inferences cannot be reduced to one category. If an exclamation is embedded under a plug, e.g. *tell*, its truth can be denied in the following discourse, see (30-a) vs. (30-b). Exclamatives thus clearly pattern with presuppositions in this respect.

- (30) a. What a wonderful cook I am! # But it is the ingredients I use and not my skills as a cook.
 b. Friends often tell me what a wonderful cook I am – I always tell them it is the ingredients, not my skill as a cook. (Abels 2010:153)

Another possible way to distinguish conventional implicatures and presuppositions is by taking backgrounding into account. While all types of presuppositions can contain information that has been previously uttered, at least one type of conventional implicatures, i.e. *supplements*, has to contain information that is entirely new. They then quietly impose this new information on the common ground. The parenthetical *a cancer survivor* in (31-a) triggers the conventional implicature *Lance Armstrong is a cancer survivor* while the factive verb *know* in (31-b) triggers the presupposition *Lance Armstrong is a cancer survivor*, only the latter is appropriate since the information is already part of the common ground.

- (31) Lance Armstrong survived cancer.
 a. #When reporters interview Lance, a cancer survivor, he often talks about the disease.
 b. And most riders know that Lance Armstrong is a cancer survivor. (Potts 2005:34)

Importantly, exclamatives pattern with presuppositions, see (32). The exclamation expresses information that was already introduced in the preceding clause.

- (32) I didn't expect us to have such a nice day at the park.
 What fun we had!

This intuition is shared cross-linguistically, see (33) for German and (34) for French. Both exclamatives, *Oh my god, was I happy!* as well as *How beautiful she is!* can contain information that is already part of the background.

- (33) Dann habe ich mich furchtbar über den Lottogewinn gefreut. Mein Gott, habe
 then have I myself extremely about the lottery.win be.happy my god have
 ich mich gefreut! Ich hab mich vielleicht gefreut!
 I myself be.happy I have myself vielleicht be.happy
 'Then I was extremely happy about the lottery win. Oh my god, was I happy! I was so
 happy!' (Altmann 1993:33)
- (34) Comme elle est belle, comme elle est belle!
 'How beautiful she is, how beautiful she is!' (Beyssade 2009:32)

Whether or not information can be backgrounded depends on its relation to the common ground. Presuppositions are entailed by the common ground. This makes them capable of containing information that is already in the common ground. Conventional implicatures enter the common

ground at the moment they are uttered; thus they usually give rise to redundancy violations in case the information is already part of the common ground.

However, when it comes to expressives, e.g. *damn* in (35), we have to admit that their ability to repeat is, according to Potts (2007), a rather defining criterion because the repetition intensifies the expressive attitude and hence does not lead to redundancy.

- (35) Damn, I left my damn keys in the damn car. (Potts 2007:182)

Since exclamatives are closely connected to the concept of expressives, we can attribute their ability to pick up previously uttered information not to their presuppositional status but rather to them being expressive.⁶

3. VERUM Focus: New Evidence for Factivity

Most of the presuppositions tests we have looked at so far were more or less inconclusive. Another way to determine the relation of an utterance to the common ground is by looking at its information structural properties, e.g. focus. In languages like German and English, focus is realized via pitch accents. Going back to the puzzle introduced in (9) to (12) recall that German exclamatives show a very unexpected accent distribution with respect to auxiliaries and their positions in the clause. In verb-final exclamatives an accent on an auxiliary is not acceptable whereas an accent on the verb is fine. In contrast, lexical verbs can be accented in V2-position as well as in V-final position. That the acceptance might not only be due to the V2-position but to the C head in general is suggested by (36) and (37).

- (36) a. *[_{CP} [_C Dass] [_{TP} der mich angelogen HAT!]]
 that he me lied has
 b. [_{CP} [_C DASS] [_{TP} der mich angelogen hat!]]
 that he me lied has
 ‘That he lied to me!’
- (37) [_{CP} [_C HAT] [_{TP} die viele Leute kennengelernt!]]
 has she many people got.to.know
 ‘Boy, did she get to know many people!’

⁶Schlenker (2007:240) criticizes the repeatability feature of expressives since it can result in different truth values: while (35) indicates that the speaker has a negative attitude towards his car and his keys, (i) only indicates the latter but not the former.

- (i) Damn, I left my damn keys in the car.

Judgements are far from clear. If there is a truth-conditional difference between (35) and (i) then (ii) is probably very unlikely to be uttered out of the blue. Porsche owners usually have a positive attitude towards their cars. If every occurrence of *damn* comes with a negative attitude towards the constituent it modifies, then one would expect for (ii) to be felicitous additional context is necessary, e.g. the owner mentioning that, lately, he is not happy with his Porsche anymore.

- (ii) Damn, I left my damn keys in the damn Porsche.

3.1. Focus in alternative semantics

Following Rooth (1992), I assume that focus indicates the presence of alternatives in the context. The basic idea of alternative semantics is that syntactic objects possess a *focus* semantic value in addition to their *ordinary* semantic value. If a syntactic object is F-marked, e.g. carries pitch accent, then its focus semantic value denotes a set of possible alternatives to its ordinary semantic value with the same type, including the ordinary semantic value itself. A sentence then denotes a set of propositions that can be derived from the ordinary semantic value by substituting the focused element with a variable of the appropriate type.

$$(38) \quad \llbracket [\text{MARY}]_F \text{ likes Sue} \rrbracket^f = \left\{ \begin{array}{l} \text{Mary likes Sue,} \\ \text{John likes Sue,} \\ \text{Paul likes Sue,} \\ \dots \end{array} \right\}$$

For syntactic objects to be alternatives to each other, they both have to be elements of the focus semantic value they share, and they have to be different from each other with respect to their ordinary semantic value. To capture these ideas, Rooth (1992:86) defines the *squiggle operator* \sim that introduces a free variable that is restricted in the sense described above. This free variable needs to find an antecedent in the discourse in order for focus to be licensed. The restrictions are formulated in the *Focus Interpretation Principle* (FIP).

- (39) FIP (for contrastive alternative sets containing individuals):
 If a phrase α is construed as in contrast with a phrase β , then
- $\llbracket \beta \rrbracket^o \in \llbracket \alpha \rrbracket^f$ and
 - $\llbracket \beta \rrbracket^o \neq \llbracket \alpha \rrbracket^o$
- and β is matching α in type.

(adapted from Rooth 1992:86)

F-Marking in a discourse like (40) is licensed because there is an antecedent for the free variable that satisfies both constraints of the FIP. The squiggle operator applies at the level on which focus is interpreted, shown in (41). The first constraint of the FIP is satisfied in (42) and the second is satisfied in (43).

- (40) A: Mary likes Sue.
 B: No, JOHN likes Sue.

- (41) A: $[\text{Mary likes Sue}]_7$
 B: No, $[\text{JOHN}_F \text{ likes Sue}] \sim v_7$

$$(42) \quad \llbracket [\text{JOHN}]_F \text{ likes Sue} \rrbracket^f = \left\{ \begin{array}{l} \text{Mary likes Sue,} \\ \text{John likes Sue,} \\ \text{Paul likes Sue,} \\ \dots \end{array} \right\}$$

$$\llbracket \text{Mary likes Sue} \rrbracket^o \in \llbracket [\text{JOHN}]_F \text{ likes Sue} \rrbracket^f$$

- (43) $\llbracket \text{Mary likes Sue} \rrbracket^o \neq \llbracket [\text{JOHN}]_F \text{ likes Sue} \rrbracket^o$
 $\lambda w. \text{Mary likes Sue in } w \neq \lambda w. \text{John likes Sue in } w$

3.2. VERUM focus and its licensing conditions

VERUM *focus* (or *polar focus* as it is termed cross-linguistically) is a type of focus that emphasizes the truth of a proposition (Höhle 1992), which is thus called the VERUM *effect*. As such VERUM focus usually occurs in contexts in which the truth of the proposition is either undecided or explicitly denied. The former I call an *uncertainty* context the latter a *denial* context. (44) gives an example of an uncertainty context, (45) for a denial context. In German VERUM focus is realized as focus on the C head and in English via the insertion of emphatic *do*.

- (44) A: Ich frage mich, ob Paul ein Drehbuch schreibt.
 I wonder myself if Paul a screenplay writes
 ‘I wonder if Paul writes screenplays.’
 B: Ja, er SCHREIBT ein Drehbuch.
 yes he writes a screenplay
 ‘Yes, he DOES write screenplays.’
- (45) A: Sue hat ihren Mann nicht verlassen.
 Sue has her husband not left
 ‘Sue didn’t leave her husband.’
 B: Doch, sie HAT ihren Mann verlassen
 doch she has her husband left
 ‘You’re wrong – she DID leave her husband.’

3.3. VERUM focus as focus on the illocution

For languages like German, it can be argued that the VERUM effect is caused by the focus on either a covert VERUM operator (Höhle 1992) or the sentence/illocutionary type operator itself (Büring 2006; Stommel 2011; Lohnstein 2012). The second option is supported by the observation that the VERUM effect can only occur if the C head is focussed and C is typically thought to host this operator.

- (46) A: I wonder if Paul writes books.
 B: #Ich denke, [_{CP} [_C dass] [_{TP} er Bücher SCHREIBT]]
 I think that he books writes
 ‘I think, he WRITES books.’
 B’: Ja, [_{CP} er [_C SCHREIBT] [_{TP} Bücher]]
 yes he writes books
 ‘Yes, he DOES write books.’
 B’’: Ich denke, [_{CP} [_C DASS] [_{TP} er Bücher schreibt]]
 I think that he writes books
 ‘I think he DOES write books.’

The argument is based on the observation that assertions can be paraphrased in a way that the truth value or the discourse function is included in the utterance. The focus then merely focuses what is already part of the assertion, thus causing the VERUM effect.

- (47) Paul writes books.
 ~→ *It is true* that Paul writes books (covert VERUM operator)
 ~→ *I want to add to the common ground* that Paul writes books (illocution type operator)

For non-assertive speech acts like exclamations, it seems rather counterintuitive to argue for a covert VERUM operator. It is more likely that VERUM focus in C focuses an illocutionary operator. Since exclamatives do not function as assertions, focus on the C head should not give rise to the VERUM effect, compare (49) to (51).

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| (48) Paul hat viele Leute getroffen.
Paul has many people met
‘Paul has met many people.’
... but I am not sure about that. | (50) Wen hat Paul alles getroffen!
who has Paul all met
‘How many people Paul met!’
... but I am not sure about that. |
| (49) Paul HAT viele Leute getroffen.
Paul has many people met
‘Paul DID meet many people.’
... but I am not sure about that. | (51) Wen HAT Paul alles getroffen!
who has Paul all met
‘How many people Paul met!’
... but I am not sure about that. |

The exclamative focus in C does not result in a VERUM effect because exclamatives are not about adding a true proposition to the common ground. Note, that it is still an open question what kind of focus alternatives one could assume for an illocutionary operator. One idea could be the relevant illocutions of the other participants in the discourse (see Lohnstein 2012). However, this idea is rather difficult to implement since alternatives have to be distinguished with respect to different addressees. More work needs to be done here in order to provide a complete picture of the VERUM focus distribution.

The focus on the illocution in C explains why there is no difference in acceptability of focus marking between auxiliaries and copulars on the hand and lexical verbs on the other. For the focus on the illocution, it does not matter what C is filled with, even complementizers can serve as a host.

- (52) a. In wie vielen Ländern IST der schon gewesen!
 in how many countries is he already been
 ‘How many countries he DID travel to!’
 b. Wie viele Seiten HAT die pro Tag geschrieben!
 how man pages has she per day written
 ‘How man pages she wrote daily!’
 c. Wie viele Seiten SCHREIBT die pro Tag!
 how many pages writes she per day
 ‘How many pages she writes daily!’

However, the differences in acceptability with respect to V-final positions still require an expla-

nation. In order to solve the rest of the puzzle, we need to look at VERUM focus in embedded structures.

3.4. VERUM focus as polar focus

Since the illocutionary type operator is located in C, narrow focus on the verb-final position is predicted not to cause a VERUM effect. However, already Höhle (1992:129) has observed that there are embedded sentences in which at least the focus on an auxiliary or a copular verb leads to a VERUM effect, see (53) and (54). In contrast, the focus on the lexical verb leads to standard narrow verb focus, see (55).

- (53) A: I wonder if Paul wrote a book.
 B: Ich denke, dass Paul ein Buch geschrieben HAT.
 I think that Paul a book written has
 'I think that Paul DID write a book.'
- (54) A: I wonder if Paul is in Rome.
 B: Ich denke, dass Paul in Rom IST.
 I think that Paul in Rome is
 'I think that Paul IS in Rome.'
- (55) A: I wonder if Paul writes books.
 B: #Ich denke, dass Paul Bücher SCHREIBT.
 I think that Paul books writes
 'I think that Paul WRITES books.'

Lohnstein (2012) argues that VERUM focus in V-final position is only a side effect of the lack of lexical alternatives to the focussed verb. The poorer the lexical semantics of the verb, the fewer alternatives there are to produce contrast, the extreme case being copular verbs and auxiliaries for which the only alternative that is available is the verb's negation. If there are no alternatives to begin with except the negated version of the verb itself then the VERUM interpretation follows automatically. Lohnstein has to include negated versions into the focus semantic value in order for his argument to hold. If we follow this line of thought, we can potentially include tense alternatives as well. But this means that auxiliaries and copulars in fact do have alternatives other than their negation.

In order to avoid these problems, I would like to argue that the reason for the VERUM effect with auxiliaries and copulars and but not with lexical verbs lies in the general semantics of the syntactic objects. Now, what does it mean for an auxiliary or a copular to have poor lexical semantics? It means that they do not contribute any meaning to the proposition. This effect is traditionally derived via the identity function, shown for a copular verb in (57). The copular takes a property and gives back a property.

- (56) $\llbracket \text{ist}_{\text{COP}} \rrbracket = \lambda P[P]$

- (57) (dass) $\llbracket \text{Paul in Rom ist} \rrbracket$ ‘that Paul is in Rome.’
 $= (\llbracket \text{ist}_{COP} \rrbracket)(\llbracket \text{in Rom} \rrbracket)(\llbracket \text{Paul} \rrbracket)$
 $= (\lambda P[P](\lambda x \lambda w[x \text{ ist in Rom in } w]))(\llbracket \text{Paul} \rrbracket)$
 $= \lambda x \lambda w[x \text{ ist in Rom in } w](\llbracket \text{Paul} \rrbracket)$
 $= \lambda w[\text{Paul ist in Rom in } w]$

Since the identity function takes a semantic object and delivers the same semantic object, the only alternative that these items can have is the negation of that semantic object. The focus semantic values for copular verbs shown in (58-a). A similar suggestion can be made for auxiliaries. They take a proposition and deliver a proposition; the focus semantic value is given in (58-b).

- (58) a. $\llbracket [\text{ist}_{COP}]_F \rrbracket^f = \{ \lambda P[\lambda w[P(w)]], \lambda P[\lambda w[\neg P(w)]] \}$
 b. $\llbracket [\text{hat}]_F \rrbracket^f = \{ \lambda p[\lambda w[p(w)]], \lambda p[\lambda w[\neg p(w)]] \}$

The focus semantic values of copulars and auxiliaries reflect the intuition that the whole proposition is given and that only the polarity is focussed.

Now, let us see how (58) derives the focus alternatives for F-marked auxiliaries and copulars.⁷

⁷Note, that the complementizer *dass* is equally poor in terms of lexical alternatives. If the F-marker in (59) and (60) is shifted to the complementizer, the focus alternatives do not change.

- (i) Ich denke, $\llbracket [\text{DASS}]_F \text{ Paul ein Buch geschrieben hat} \rrbracket^f =$
 $\left\{ \begin{array}{l} \text{it is true that Paul wrote a book,} \\ \text{it is false that Paul wrote a book} \end{array} \right\}$
 (ii) Ich denke, $\llbracket [\text{DASS}]_F \text{ Paul in Rom ist} \rrbracket^f =$
 $\left\{ \begin{array}{l} \text{it is true that Paul is in Rome,} \\ \text{it is false that Paul is in Rome} \end{array} \right\}$

One could argue that the complementizer denotes an identity function as well since it does not contribute to the overall meaning of the sentence.

- (iii) $\llbracket \text{dass} \rrbracket = \lambda p[p]$
 (iv) $\llbracket \text{dass } [_{TP} \text{ Paul in Rom ist}] \rrbracket = \llbracket \text{dass} \rrbracket(\llbracket [_{TP}] \rrbracket)$
 $= \lambda p[p](\lambda w[\text{Paul ist in Rom in } w])$
 $= \lambda w[\text{Paul ist in Rom in } w]$

The focus semantic value is given below:

- (v) $\llbracket [\text{dass}]_F \rrbracket^f = \{ \lambda p[\lambda w[p(w)]], \lambda p[\lambda w[\neg p(w)]] \}$

This point is not crucial for the VERUM focus distribution in exclamatives but it provides a complete picture for VERUM effects in German embedded sentences in general. The main argument that is put forward against VERUM focus as illocution focus is based on the occurrence of VERUM effects in embedded sentences where there is most likely no such operator present. If we can derive VERUM effects in embedded sentences solely via contrastive alternatives of the identity function than we can avoid assuming an illocutionary operator for these sentences.

- (59) $\llbracket \text{dass Paul in Rom [IST]}_F \rrbracket^f$ ‘that Paul IS in Rome’
 $= \{ \lambda w [\text{Paul is in Rome in } w], \lambda w \neg [\text{Paul is in Rome in } w] \}$
 $= \left\{ \begin{array}{l} \text{it is true that Paul is in Rome,} \\ \text{it is false that Paul is in Rome} \end{array} \right\}$
- (60) $\llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^f$ ‘that Paul DID write a book’
 $= \{ \lambda w [\text{Paul wrote a book in } w], \lambda w \neg [\text{Paul wrote a book in } w] \}$
 $= \left\{ \begin{array}{l} \text{it is true that Paul wrote a book,} \\ \text{it is false that Paul wrote a book} \end{array} \right\}$

The focus semantic value of an utterance with an F-mark on a lexical verb with rich lexical semantics is given in (61) for comparison.

- (61) $\llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^f$ ‘that Paul WRITES books’
 $= \{ \lambda w. f(\text{Paul}) \text{ in } w \mid f \in D_{\langle e, st \rangle} \} = \left\{ \begin{array}{l} \text{that Paul writes books,} \\ \text{that Paul corrects books,} \\ \text{that Paul reads books,} \\ \dots \end{array} \right\}$

Following the FIP (Rooth 1992), focus is licensed if the free variable, which is introduced by the squiggle operator, finds an antecedent in the discourse that (i) is an element of the focus semantic value of the F-marked phrase and (ii) is different from the ordinary semantic value of the F-marked phrase. In other words, VERUM focus in embedded contexts is licensed if the polar alternative can be found as an antecedent in the discourse. This is obviously the case in denial contexts where the negative alternative is explicitly mentioned, as in (45). But it is also implicitly given in contexts where the truth of a proposition is still undecided, as in (44). The VERUM effect is the result of the established contrast to the negative alternative in the discourse. In contrast, focus on a lexical verb should not be licensed because it does not create polar alternatives in the first place. Let us see how this works out in detail.

3.4.1. Denial contexts

A denial context with focus on a lexical verb is given in (62). The squiggle operator which marks the focus domain applies at the sentence level, shown in (63).

- (62) A: Paul schreibt keine Bücher.
 Paul writes no books
 ‘Paul does not write books.’
 B: #Doch, ich denke, dass er Bücher SCHREIBT.
 doch I think that he books writes
 ‘I think he WRITES books.’
- (63) A: [Paul schreibt keine Bücher]₃
 B: #Doch, ich denke, [dass er Bücher [SCHREIBT]_F] $\sim v_3$

The second constraint of the FIP is satisfied because the meaning of the antecedent is different from the meaning of the clause containing the F-marked phrase.

- (64) $\llbracket \text{Paul schreibt keine Bücher} \rrbracket^o \neq \llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^o$
 $= \lambda w. \neg [\text{Paul writes books in } w] \neq \lambda w. \text{Paul writes books in } w$

However, the first constraint is not satisfied, see (65).

- (65) $\llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^f =$
 $\{ \lambda w. f(\text{Paul}) \text{ in } w \mid f \in D_{\langle e, st \rangle} \} = \left\{ \begin{array}{l} \text{that Paul writes books,} \\ \text{that Paul corrects books,} \\ \text{that Paul reads books,} \\ \dots \end{array} \right\}$
 $\llbracket \text{Paul schreibt keine Bücher} \rrbracket^o \notin \llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^f$

Since the first constraint of the FIP is violated, focus on a lexical verb is not licensed in (62).

A denial context with focus on an auxiliary is given in (66). The level of the squiggle operator is shown in (67).

- (66) A: Paul hat kein Buch geschrieben.
 Paul has no book written
 ‘Paul did not write a book.’
 B: Doch, ich denke, dass er ein Buch geschrieben HAT.
 doch I think that he a book written has
 ‘I think he DID write a book.’
- (67) A: $[\text{Paul hat kein Buch geschrieben}]_3$
 B: Doch, ich denke, $[\text{dass er ein Buch geschrieben [HAT]}_F] \sim v_3$

The first as well as the second constraint of the FIP are satisfied. Thus, focus on the auxiliary in (66) is licensed.

- (68) $\llbracket \text{Paul hat kein Buch geschrieben} \rrbracket^o \neq \llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^o$
 $= \lambda w. \neg [\text{Paul wrote a book in } w] \neq \lambda w. \text{Paul wrote a book in } w$
- (69) $\llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^f$
 $= \{ \lambda w [\text{Paul wrote a book in } w], \lambda w \neg [\text{Paul wrote a book in } w] \}$
 $= \left\{ \begin{array}{l} \text{it is true that Paul wrote a book,} \\ \text{it is false that Paul wrote a book} \end{array} \right\}$
 $\llbracket \text{Paul hat kein Buch geschrieben} \rrbracket^o \in \llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^f$

3.4.2. Uncertainty Contexts

An uncertainty context with focus on a lexical verb is given in (70). The focus domain is shown in (71).

- (70) A: Ich frage mich, ob Paul Bücher schreibt.
 ‘I wonder if Paul writes books.’
 B: #Ja, ich denke, dass er Bücher SCHREIBT.
 ‘I think he WRITES books.’

- (71) A: Ich frage mich, [ob Paul Bücher schreibt]₃
 B: #Ja, ich denke, [dass er Bücher [SCHREIBT]_F] $\sim v_3$

The embedded interrogative clause denotes a set of the form $\{p, \neg p\}$, viz. $\{\lambda w[\text{Paul writes a b. in } w], \lambda w \neg[\text{Paul writes a b. in } w]\}$. Only the second element in the set serves as an antecedent for the free variable that is introduced by the squiggle. Thus, the antecedent is implicitly given, shown in (72).

- (72) A: Ich frage mich, $\{p, [\neg p]_3\}$
 B: #Ja, ich denke, [dass er Bücher [SCHREIBT]_F] $\sim v_3$

Under the assumption that we can identify implicit antecedents with Rooth (1992), (73) shows that the second constraint of the FIP is satisfied.

- (73) $\llbracket \text{Paul schreibt keine Bücher} \rrbracket^o \neq \llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^o$
 $= \lambda w \neg[\text{Paul writes books in } w] \neq \lambda w. \text{Paul writes books in } w$

As we can see in (74) the first constraint of the FIP is again not satisfied. Thus, focus is not licensed in (70).

- (74) $\llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^f =$
 $\{\lambda w. f(\text{Paul}) \text{ in } w \mid f \in D_{\langle e, st \rangle}\} = \left\{ \begin{array}{l} \text{that Paul writes books,} \\ \text{that Paul corrects books,} \\ \text{that Paul reads books,} \\ \dots \end{array} \right\}$
 $\llbracket \text{Paul schreibt keine Bücher} \rrbracket^o \notin \llbracket \text{dass Paul Bücher [SCHREIBT]}_F \rrbracket^f$

An uncertainty context with focus on an auxiliary is given in (75). The focus domain is shown in (76).

- (75) A: Ich frage mich, ob Paul ein Buch geschrieben hat.
 I ask myself if Paul a book written has
 'I wonder if Paul wrote a book.'
 B: Ja, ich denke, dass er ein Buch geschrieben HAT.
 yes I think that he a book written has
 'I think he DID write a book.'

- (76) A: Ich frage mich, $\{p, [\neg p]_3\}$
 B: #Ja, ich denke, [dass er ein Buch geschrieben [HAT]_F] $\sim v_3$

As we can see in (77) and (78), both constraints of the FIP are satisfied. Hence, focus is licensed in (75).

- (77) $\llbracket \text{Paul hat kein Buch geschrieben} \rrbracket^o \neq \llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^o$
 $= \lambda w. \neg[\text{Paul wrote a book in } w] \neq \lambda w. \text{Paul wrote a book in } w$

- (78) $\llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^f$
 $= \{ \lambda w [\text{Paul wrote a book in } w], \lambda w \neg [\text{Paul wrote a book in } w] \}$
 $= \left\{ \begin{array}{l} \text{it is true that Paul wrote a book,} \\ \text{it is false that Paul wrote a book} \end{array} \right\}$
 $\llbracket \text{Paul hat kein Buch geschrieben} \rrbracket^o \in \llbracket \text{dass Paul ein Buch geschrieben [HAT]}_F \rrbracket^f$

3.4.3. VERUM focus in factive complements and exclamatives

With the focus semantic values proposed in (58) we can explain why auxiliaries and copulars but not lexical verbs can carry VERUM focus in embedded clauses. Up until now, we have looked at clauses that are embedded under non-factive verbs. Factive verbs should change the predictions for the distribution of VERUM focus since they presuppose the truth of their complement. In an uncertainty context factive complements should not license VERUM focus because the factivity presupposition already makes sure that the proposition is true. Since the truth of the propositional content is already entailed by the common ground at the moment of utterance, factive complements will not be able to find their antecedent, i.e. the negative alternative, in the discourse. As is shown in (79), neither the auxiliary nor the complementizer can be focussed in factive complements if they are preceded by an uncertainty context (see also Stommel 2011:108).

- (79) A: I wonder if it's Peter's birthday today.
 B: #Ja stimmt, mensch, ich hab' doch tatsächlich vergessen, dass er heute
 yes true gosh I have doch indeed forgotten that he today
 Geburtstag HAT.
 birthday has
 'Right, gosh, I completely forgot that it IS his birthday today.'

The only possible occurrence of VERUM focus in factive complements is a denial context – a context in which the speaker wants to substitute the negative alternative with the positive one. This is a case of correction focus, i.e. CG revision (Steube 2001; Umbach 2004; Karagjosova 2006).

- (80) A: Hanna likes company when she visits the opera, which is why she is angry about the fact that her daughter did not go with her this time.
 B: You're wrong – Hanna likes it most when she goes alone.
 Sie ärgert sich darüber, dass ihre Tochter gestern mit ihr in der Oper
 she is.angry herself about that her daughter yesterday with her in the opera
 WAR.
 was
 'She is angry that her daughter DID accompany her.'

Under the assumption that exclamatives are factive, we can now make the prediction that they pattern with factive complements, i.e. they can only license narrow focus on auxiliaries and copulars in V-final exclamatives if they occur in denial contexts.

- (81) A: Were you surprised that you didn't get the job?
 B: Nein, ich war überrascht, dass ich ihn bekommen HABE.
 no I was surprised that I it gotten have
 'No, I was surprised that I DID get the job.'
- (82) A: Peter is not a big traveller. The places he has not been to!
 B: Aber wo der auch schon gewesen IST!
 but where he also already been is
 'But the places he HAS been to already!'
 Just think about the time before he started studying.

Uncertainty contexts like those in (83) and (84) do not license VERUM focus because the factivity of the exclamatives prevents the propositions to find their negative alternative in the context.

- (83) A: How did her interview go? Do you know if she got the job?
 B: You know I was completely surprised.
 #Dass die den Job bekommen HAT!
 that she the job gotten has
 'That she DID get the job!'
- (84) A: I'm not an expert on traveling. But ask Peter, maybe he has been to many of the places that you want to know about.
 B: Yes, I already talked to him and I was pretty surprised.
 #Wo der schon gewesen IST!
 where he already been is
 'The places he HAS been to already!'

Both uncertainty and denial contexts license V-final narrow focus on auxiliaries and copulars if they are embedded under non-factive predicates. In factive complements as well as in root-exclamatives V-final narrow focus on auxiliaries and copulars is only licensed by denial contexts. The only reasonable explanation that captures this VERUM focus distribution is to assume that auxiliaries and copulars denote the identity function whose only focus alternative is its negation. The negative alternative can be found in uncertainty as well as in denial contexts if the clause is embedded under a non-factive predicate. However, factive complement clauses are not licensed in uncertainty contexts because the factivity presupposition already makes sure that the proposition is true so that the negative alternative cannot be found in the discourse as an antecedent. If the negative alternative is explicitly present, as it is the case in the denial context, then VERUM focus can be used as correction focus by which the speaker signals that he wants to substitute the negative alternative with the positive one and thus revises the common ground. Exclamatives behave exactly like factive complements; therefore they have to be factive.

Lexical verbs are not affected by the VERUM focus distribution because they have other lexical alternatives that can serve as focus alternatives. Focus licensing for lexical verbs does not depend on whether the verb is embedded in a factive or non-factive complement since it only needs one of its lexical alternatives in the discourse, in (85) the alternative is *win*.

- (85) A: I wonder if Peter has won the competition.
 B: Ich bin überrascht, dass er überhaupt TEILGENOMMEN hat!
 I am surprised that he at.all participated has
 'I am surprised that he PARTICIPATED at all!'
 B': Ich denke, dass er überhaupt nicht TEILGENOMMEN hat!
 I think that he at.all not participated has
 'I think that he did not PARTICIPATE at all!'

Neither is it important whether the preceding context is one of uncertainty or denial, see (86) and (87).

- (86) A: I wonder how many books Peter reads per year.
 B: Ich finde es viel beeindruckender, wie viele Bücher er im Jahr SCHREIBT!
 I find it a.lot more.impressive how many books he in.a year writes
 'I find it a lot more impressive how many books he WRITES in a year!'
- (87) A: Peter does not read a lot of books per year.
 B: I doubt that.
 Ich weiß zumindest und finde es ziemlich beeindruckend, wie viele Bücher er
 I know at.least and find it pretty impressive how many books he
 im Jahr SCHREIBT!
 in.a year writes
 'I at least know and find it pretty impressive how many books he WRITES in a year!'

The data on V-final VERUM focus clearly show that exclamatives are factive and not assertive. But can it also provide an argument in favour of a presupposition and against a conventional implicature? I think it can. As mentioned above, the difference between presuppositions and conventional implicatures lies in their relation to the common ground: while the former is already entailed by the common ground at the moment of utterance, the latter enters the common ground as a secondary proposition when uttered. For focus to be licensed, the alternative has to be found as an antecedent in the context, i.e. in the common ground. Factive clauses cannot find their negative antecedent (unless it is a case of correction focus); thus VERUM focus is not licensed. This reasoning does not apply to conventional implicatures since information entering the common ground as a secondary proposition cannot simultaneously serve as an antecedent for the information entering the common ground as a primary proposition. So, on theoretical grounds, factivity must be derived as a presupposition in order to yield the proper VERUM focus effects.

4. Conclusion

The distribution of VERUM focus provides a novel test for factivity – one that is, crucially, also applicable to exclamatives. It gives consistent results, unlike other presupposition test such as subsequent discourse moves or the *wait-a-minute* test discussed above. Furthermore, it does not have to rely on the premise that the factivity presupposition that comes with embedded

exclamatives is the same as the one that comes with matrix exclamatives which is what Abels (2005, 2010) has to assume in order to apply plugs and filters as relevant presupposition tests. Since V-final exclamatives can also be used as matrix exclamatives, VERUM focus can be tested independent of embedding, see e.g. (82)-(84). A final advantage of the VERUM focus test is that it gives an explanation for what otherwise would be a completely mysterious verb stress pattern in German exclamatives.

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Phonological Phrases in Kikuyu

Siri Gjersøe

This study examines two different floating L tones ($\textcircled{\text{L}}$) in Kikuyu (Bantu E51): A lexical $\textcircled{\text{L}}$ and a phrasal $\textcircled{\text{L}}$ which appears in assertive utterances. Based on previous studies, this paper proposes a unified analysis of the domain of the two floating L tones within the syntax-phonology interface. The main claim is that they attest different strategies to trigger downstep at the right edge of a phonological phrase while no downstep is triggered internally of this domain. New data and different configurations with nominal modifying adjectives is discussed with the outcome that adjectives which follow other modifiers phrase alone. This is conform with the proposed analysis when taking the syntax of adjectives in Kikuyu into consideration.

1. Introduction

Kikuyu is a Bantu language spoken in the Central Province of Kenya. It is one of the largest languages in Kenya with more than 6.6 million speakers (Lewis *et al.* 2015). There are five dialects in Kikuyu. This study is based on Southern Kikuyu and Northern Kikuyu.

Kikuyu is an SVO language in which modifiers follow the head. It is a highly agglutinative language with noun class prefixes which agree in gender. The verb is composed by a root, subject- and object prefix and combining morphemes for tense and aspect. Kikuyu is a tone language with an underlying /H L Ø/ tonal distinction and with rising and falling contour tones.¹ The syllable is the Tone Bearing Unit (TBU) and every TBU in Kikuyu has a surface tone. The syllable can be V, CV, NCV, NCGV.² Two adjacent vowels can either count as one syllable or as two syllables. To disambiguate, I follow Clements (1984b) in annotating only the latter vowel for tone when they form one syllable. Thus, VV́ should be considered *one* H-toned syllable (as opposed to a LH sequence). The underlying Ø tones are annotated with a L tone on the surface.

Most of the data in this study is based on recordings of two Kikuyu speakers. The data cited from Clements (1984b) or Clements & Ford (1981) was also reproduced and recorded

¹ H(igh) tones are annotated with an acute accent, L(ow) tones with a grave accent, rising tones with a circumflex and falling tones with a caret. Toneless syllables are not annotated in underlying representation.

² Abbreviations are V(owel), C(onsonant), N(asal) G(lide).

With an assertive verb, downstep is triggered after the object to the immediate right of the verb if there is one. In (4)⁵, downstep appears on the first syllable of the adjunct *ǫéínè*... ‘inside’. The source of the downstep is the asserting floating L tone of the verb.

- (4) /ndò:nìré(Ⓛ) moɣèràniá ǫéínè wá pòmbǎ/
 nd-ǫm-iré mó-ɣèràniá ¹ǫéínè wá póm̩bà
 SM-see-PFV.FV 1-examiner inside CONN 9.house
 ‘I saw the examiner inside the house.’ (Clements & Ford 1981:327)

The tone patterns of Kikuyu have previously been examined by Clements & Ford (1979, 1981); Clements (1984b); Philippson (1991), among others. Based on the work of these authors, this paper proposes a unified analysis for floating L tones and the surface positioning of downstep from a syntax-phonology approach within the framework of Optimality Theory. The analysis will account for the positioning of both the lexical floating L tone as well as the assertive one which appears with the verb. The claim of this study is that the two floating L tones, which are underlyingly in different positions in the clause, only trigger downstep at the right edge of a phonological phrase (p-phrase). P-phrase medially they either get deleted (= lexical Ⓛ) or they shift (= assertive Ⓛ). From the shifted position, the assertive Ⓛ can trigger downstep. In this sense, both of the floating L tones are domain-sensitive in that they can get deleted or shift according to constituency.

This paper is structured as follows: In section 2, data will be shown where the different surface patterns of the floating L tones are described in detail. Section 3 goes systematically through the different configurations where syntactic downstep is triggered and where it does not appear. Section 4 gives a brief introduction to the syntax-phonology interface. Section 5 proposes a unified analysis for the syntactic distribution of the two floating L tones. Section 6 presents some apparent problems regarding the phrasing of the adjectives and attempts to account for this regarding the structure of the Determiner Phrase (DP). Section 7 concludes the paper.

2. Three Effects of floating L tones

The data was recorded in Berlin in 2014 and comes from a southern and a northern Kikuyu speaker. The recordings were made in a phonetic laboratory with an anechoic chamber. The microphones used for the recording were a Sennheiser ME 64, an MKH 20-P48 and a Beyerdynamics Opus 54.16. The sampling rate was 44.1 KHz with 16-bit quantization. The recorders which were used were a Tascam DA-20 MKII and a Behringer Ultragain MIC 2000.

The recordings were made to examine the properties of the two floating L tones in Kikuyu. Firstly, they interact with surrounding tones. Secondly, they can trigger downstep on both surface H and L tones. Thirdly, they are domain sensitive. Downstep in Kikuyu affects tones by bringing their F0 values down to a perceivable lower tone. Clements & Ford (1981) found that downstep can be triggered on surface H and L tones and cause a pitch lowering which results in

⁵ For reasons of consistency, the examples deviate from this source in that /oa/ is annotated as /wa/, /c/ as /s/, and /j/ as /ɟ/.

a one level drop: a downstepped H tone will correspond to the pitch height of a L tone and the pitch drop between a L tone and a downstepped L tone will be as big as the difference between a H and a L tone. This has been referred to as *total downstep* (cf. Meeussen 1970).

There are three phenomena which indicate the presence of the underlying floating L tones in Kikuyu: (i) Downstep, (ii) Blocking of the rule NON-FINALITY, and (iii) Unbounded HTS. These phenomena are all based on Clements (1984b); Clements & Ford (1981); Philippon (1991) and will be described below.

2.1. Downstep

A floating L tone can trigger downstep on both H and L tones in the sequences H_H, L_H, and L_L. As will be shown in section 2.3, the sequence H_L is banned in Kikuyu. In (5), downstep appears in a H tone sequence: H_H and lowers the H tone of the copula *ní* to the level of a L tone. This results in a register lowering so that the following L tone *mwè*- also drops and contrasts with the downstepped copula.

- (5) /ɲɔ̀ðyóná(Ⓛ) ní(Ⓛ) mwèyá/ *Downstep on H tone (H_↑H)*
 ɲɔ̀ðyóná ↑ní mw-èyá
 Njũgũna COP 2-good
 ‘Njũgũna is good.’

Downstep in a L_H sequence is found in (6). Downstep lowers the initial H tone of the noun *ɲɔ́átá* ‘star’ to the register of the preceding L. The effect of this is that downstep evens out the L-H F0 contrast between the L-toned *-kì* and H-toned *ɲɔ́átá*.

- (6) /áhèiré(Ⓛ) mwà̀nèkì(Ⓛ) ɲɔ́átá(Ⓛ)/ *Downstep on H tone (L_↑H)*
 á-he-iré mwà̀nèkì ↑ɲɔ́átá
 SM-give-PFV.FV Mwanĩki 9.star
 ‘He gave Mwanĩki a star.’ (Clements and Ford 1981:315)

Finally, downstep applies in a L tone sequence: L_L. In (7) downstep is triggered on the L-initial *hwà:é* by an underlying floating L tone.⁶ In the recorded data, the F0 drop between the downstepped L tone and the preceding L tone correspond roughly with a HL pitch drop. This is conform with Clements & Ford (1981).

- (7) /ndèrà:yórìrè(Ⓛ) ɲòmbè(Ⓛ) hwà:é/ *Downstep on L tones (L_↑L)*
 ndè-rà:-yór-irè ɲòmbè ↑hwà:é
 SM-NPST-buy-PFV.FV 9.cattle yesterday.evening
 ‘I bought cattle yesterday evening.’

⁶ The source of downstep is both lexical and assertive, i.e., both tones are predicted to trigger downstep here as will be explained later, but only one downstep surfaces.

2.2. Non-finality

The second evidence for an underlying floating L tone comes from interaction with another tone process which I will refer to as NON-FINALITY. This constraint corresponds to the originally proposed rule ‘Flattening’ (Clements & Ford 1981; Clements 1984b). NON-FINALITY is an OT constraint which bans H tones on a domain edge (Yip 2002; Cassimjee and Kisseberth 1998). In Kikuyu, NON-FINALITY is active in that it lowers a H tone in a prosodic domain which is higher than the p-phrase, i.e. the Intonation Phrase (i-phrase) or the Prosodic Utterance (p-utterance).⁷

Words pronounced in isolation will be affected by NON-FINALITY as they are i-phrase-final/p-utterance-final. Thus, words ending in a H tone or a rising tone will be lowered to L. This applied in (4) to the noun *jòmbă* which lowered its final rising tone to L. The same process is shown below. The noun *wàmbòyó* retains its underlying H tone in sentence-medial position (8). NON-FINALITY applies to the sentence-final word *mwèyá* which lowers its final H tone. In (9a), the H tone of *wàmbòyó* is lowered to L when pronounced in isolation. Crucially, when a lexical (L) is final in a word, NON-FINALITY does not apply. The same goes for the assertive (L). The explanation for this is that NON-FINALITY only applies to H tones which are domain-final. When a floating L tone follows the final H tone such as (...H(L)) in (9b) where the proper noun *kàmàú* is followed by a lexical (L), NON-FINALITY will be blocked. The reason for this is that the H tone no longer counts as the final item, the floating L tone does (Clements 1984b).

- (8) /yòrèrá wàmbòyó moyèká mwèyá/ *H tone retained sentence medial*
 yòr-èr-á **wàmbòyó** mó-yèká mw-èyá
 IMP:buy-for-FV Wambōgō 3-rug 3-good
 ‘Buy Wambōgō a good rug!’ (Clements 1984b:288)

- (9) a. /wàmbòyó/ *Application of NON-FINALITY*
 wàmbòyò
 ‘Wambūgū’
 b. /kàmàú(L)/ *Blocking of NON-FINALITY*
 kàmàú
 ‘Kamau’ (Clements 1984b:288)

2.3. Unbounded HTS

The third indication of a floating L tone regards HTS. In Kikuyu, HTS is binary and a H tone can spread one syllable to the right but not further. Data shows that binary HTS applies across word boundaries in a domain which is larger than the p-phrase.⁸ This is shown in (10a) where the underlying L-toned coordinator *nà* is raised to H by the preceding H-final *ḡàḡá*. The H tone spreads no further and the following noun *ḡzòyóná* remains L-initial. This contrasts to

⁷ According to Clements (1984b), Flattening applies in clause-final position and the exact domain of this rule/constraint is not clear

⁸ Generally it applies from a head onto a complement but also from a primary object onto a secondary object or onto an adjunct. Whether the domain of HTS is the i-phrase or the p-utterance remains open for future research.

the example in (10b), where the assertive (L) is now present underlyingly. Due to a separate rule which will be explained later, (L) shifts and shows up after the primary object *ηàηά*. Thus, the intermediate step in the derivation is: /ndèrà:rórìrè ηàηά(L) nà μζòγóná(L)/ where the floating tone appears in the sequence H_L. The crucial point here is that downstep is *not* triggered on the L tone. Instead, (L) triggers downstep on the H-toned *ó* in *μζòγóná* and HTS has applied to both *ná* and *μζò-* exceeding the canonical binary HTS. Clements & Ford (1981) refer to this as ‘Downstep Displacement’ or ‘Block Raising’ which they say applies in correlation with downstep. Philippson (1991) analyzes this as an effect of the floating L tone which moves rightwards until it finds a H tone deleting the underlying L tones on the way. This allows for unbounded HTS as oppose to the canonical binary HTS which normally only applies to one syllable. When there is no underlying H tone for the floating L tone to trigger downstep on like in *μζòγóná*, unbounded HTS applies until clause-final position. In this case no downstep will be triggered but unbounded HTS is an indicator of the presence of an underlying floating L tone (cf. Philippson 1991). Examples of this come in section 6.

- (10) a. /ηàηά nà μζòγóná(L)/ *Binary HTS without (L)*
 ηàηά **ná** μζòγónά
 Ng’ang’a and Njũgũna
 ‘Ng’ang’a and Njũgũna’
- b. /ndèrà:rórìrè(L) ηàηά nà μζòγóná(L)/ *Unbounded HTS with (L)*
 ndè-rà:-rór-ìrè ηàηά **ná** μζόγ⁺ónά
 SM-NPST-watch-PFV.FV Ng’ang’a and Njũgũna
 ‘I watched Ng’ang’a and Njũgũna.’

The unbounded HTS in correlation with a floating L tone (lexical or assertive) can be seen as a strategy to avoid the double pitch drop which arises with downstep on a L tone when a H is preceding (Clements & Ford 1981). Indeed, the following sequence is unattested: [H⁺L]. For this paper, it will only be relevant that unbounded HTS is an indication of an underlying floating L tone. My claim here is that whether downstep or unbounded HTS is triggered is only conditioned by surrounding tones.

Overall, downstep, NON-FINALITY, and unbounded HTS are three possible indicators of an underlying floating L tone. This makes it possible to keep track of where it moves due to constituency as will be shown in section 4. In the next section, a short description of the two different floating L tones will be given.

3. Two different floating L tones

There are two different floating L tones in Kikuyu which are domain-sensitive and can trigger the three tone processes described in section 2: a lexical (L) and an assertive (L). These will be described below.

3.1. Lexical floating L

The presence of a final lexical $\textcircled{\text{L}}$ depends on the tonal pattern of a word. The contrast between a noun with a lexical $\textcircled{\text{L}}$, and one without is visible in (11). In (11a), the noun *ḡàḡá* has no underlying floating L tone and therefore no downstep is triggered on the copula. In (11b) (also showed in (5)), the noun *ḡḡòḡóná* does have an underlying floating L tone at the end of its tonal pattern which triggers downstep on the following H-toned copula *né*. The downstep lowers the pitch of the H-tone *né* while in (11a) the H tone has the same level as the final H tone of the preceding word *ḡàḡá*. The reader should note that both sentences in (11) have an assertive $\textcircled{\text{L}}$ final in the copula. This is irrelevant for this example but its appearance will be explained in the next subsection.

- (11) a. /ḡàḡá né $\textcircled{\text{L}}$ mwèḡá/ No lexical $\textcircled{\text{L}}$
 ḡàḡá **né** mw-èḡá
 Ng'ang'a COP 2-good
 'Ng'ang'a is good.'
- b. /ḡḡòḡóná $\textcircled{\text{L}}$ né $\textcircled{\text{L}}$ mwèḡá/ Lexical $\textcircled{\text{L}}$
 ḡḡòḡóná ⁺**né** mw-èḡá
 Njũḡũna COP 2-good
 'Njũḡũna is good.'

3.2. Assertive floating L

Data from Clements & Ford (1981) as well as new data from this study gives evidence of a phrasal floating L tone which appears in correlation with assertive speech acts. Clements & Ford (1981) have previously described it as a suffix which appears with affirmative verbs. Their terminology is somewhat indirect as they say that downstep appears in 'affirmative main clauses' and they consider assertion to be a main clause affirmative feature (c.f. Clements 1984b). Because this floating L tone appears in negative as well as affirmative verbs (cf. Gjersøe 2015:56). My proposal is that the phrasal floating L tone is an assertive tonal affix. It does not occur in imperative clauses, ex-situ wh-questions or polar questions. Indeed these are speech acts of quest and order. An example from an imperative clause was shown above in (8) where the verb has no underlying $\textcircled{\text{L}}$.⁹ There is also absence of the floating L tone in subordinate clauses: in the subjunctive, conditional, relative and consecutive verb forms. This is conform with the standard assumption that assertion is canonically a property of the main clause (c.f. Hooper & Thompson 1973; Green 2000, among others). In (12), the contrast between a main clause assertion, where the assertive $\textcircled{\text{L}}$ is present (12a), and a relative clause, where the assertive $\textcircled{\text{L}}$ is absent (12b), can be observed. In both examples, the object noun *mò-kàndá* is H-final and also lacks a lexical $\textcircled{\text{L}}$ in its tone pattern. The difference to be noted regards its final H tone which is retained in (12a) because of the underlying assertive $\textcircled{\text{L}}$ in the verb. In (12b) on the other hand, *mò-kàndá*

⁹ See Gjersøe (2015) for examples of ex-situ wh-questions and polar questions.

is subject to NON-FINALITY.¹⁰ NON-FINALITY applies in (12b) because there is no assertive (L) in the relative clause (and also no lexical (L)). (12a) can be explained by a rule in Clements & Ford (1981) where the assertive (L) shifts and is placed after a following object if there is one (the same applied in (4), (5), (6), (7), (10b) and (11a)). With this rule in mind, there is evidence for the assertive (L) if one looks at the final tone of the primary object: *mó-kàndá*. This noun is not subject to NON-FINALITY and the only thing that can block this is an underlying floating L tone. Because this noun does not have a lexical (L), it must be the assertive (L). The reason why it shifts and appears after the object will be accounted for in section 6. For now, it should just be noted that verbs which appear in assertion have a (L).¹¹ Another important point is that if a floating L tone appears utterance final, it will only block NON-FINALITY (in case of a H-final word). It will not associate to any TBU nor will it trigger downstep on any tone to the left.

- (12) a. /né máràràyà(L) mokàndá/ Assertive (L)
 né má-ràr-à yà mó-kàndá
 FM SM-look.at-IPFV.FV 3-rope
 ‘They look at a rope.’
- b. /àndò(L) màròràyà mokàndá/ No assertive (L)
 à-ndò †mà-ròr-à yà mó-kàndá
 2-people SM;REL-look.at-IPFV.FV 3-rope
 ‘People who look at a rope.’ (Clements 1984b:316)

The example in (13) below is an apparent counterexample which actually strengthens the claim that (L) marks assertion. Here, downstep is triggered on the adjunct *ðéínè*.... The only possible source of this downstep is an assertive (L) because the noun *moyèràniá* does not have a lexical (L) in its tone pattern (cf. Clements & Ford 1981:320).¹² Indeed, this downstep is triggered by the assertive (L) which appears underlyingly in the subordinated verb *ndó:niré*. It was just stated that subordination is typically not considered assertions and therefore a (L) would not be expected in a subordinate verb. However, because of the matrix verb (*è:sí:rià* ‘think’), the subordinated verb is an assertion: A verb such as ‘think’ in (13) may be referred to as ‘adsentential bridge verbs’ which can take sentential complements (cf. Bresnan 1968). Hooper and Thompson (1973) claim that such verbs are non-factive and belong to a group of verbs which take complements and can express an assertion. In this sense, the meaning of the main clause verbs just reflects the speakers attitude and the subordinate clause expresses the assertion.

- (13) /mwànèkì(L) è:sí:rià(L) àtè né ndó:niré(L) moyèràniá ðéínè wá pòmbă/
 mwànèkì †è:sí:ri-à †àtè né nd-ó:n-iré mó-yèràniá †ðéínè wá póm-bà
 Mwanĩki SM-think-FV that FM SM-see-PFV.FV 1-examiner inside CONN 9.house
 ‘Mwanĩki thinks that I saw the examiner inside the house.’ (Clements & Ford 1981:327)

¹⁰ The relative form is marked with tone.

¹¹ An alternative analysis of this pattern has been proposed where the assertive (L) is present underlyingly, independent of speech acts, and it is then claimed to be deleted as a reflex of movement (cf. Clements 1984a; Murphy (2015))

¹² The two other floating L tones in the main clause are not possible sources of the downstep in the subordinate clause because they are in another domain. Indeed they trigger downstep on their adjacent syllables.

This section showed the difference between the lexical $\textcircled{\text{L}}$ s and the assertive $\textcircled{\text{L}}$ s. The next section gives a brief introduction to the syntax-phonology interface and p-phrases.

4. P-phrases

The data given so far indicates that the two different floating L tones in Kikuyu are domain-sensitive. Between a noun and a modifier, the lexical $\textcircled{\text{L}}$ is deleted and no downstep appears. Contrastingly, the assertive $\textcircled{\text{L}}$ is underlyingly associated with the verb and its positioning is determined by constituency. In other words, the assertive $\textcircled{\text{L}}$ is domain-sensitive in that it shifts position and triggers downstep in a position which can differ from where $\textcircled{\text{L}}$ is underlyingly. The lexical $\textcircled{\text{L}}$ is domain-sensitive in that it gets deleted or not depending on constituency.

In the work on syntax-phonology interface, phonological rules have proved to be domain-sensitive in a number of languages cross-linguistically. As discussed by Kisseberth & Odden (2003), many Bantu languages attest tonal processes which are domain-sensitive. In several cases tone sandhi can indicate the phrasal relations between words. For example Zinza (E23) attests tone sandhi in that a H tone on a verb is deleted if the following word is a complement (Odden 2000). In Tsonga (S53) along with many Bantu languages, HTS applies between the verb and the following object (Kisseberth 1994).

A way to account for such patterns has been the Edge-based approach in the indirect syntax-phonology interface (Selkirk 1986, 1995, 2000; Kanerva 1990; Truckenbrodt 1995, 1999). This theory assumes the existence of a prosodic hierarchy (c.f. Selkirk 1980a, 1980b, 1986; Nespor & Vogel 1986). Prosodic phonology is structured in different levels below and above the word. The prosodic constituents correspond to different syntactic constituents. I follow the standard assumption for this theory that there is an indirect mapping between syntax and phonology. This is stated in the *Indirect Reference Hypothesis* in (14).

- (14) *Indirect Reference Hypothesis* (Inkelas 1989)
Phonological rules refer to only prosodic constituent structure.

The Indirect Reference Hypothesis ensures that there is an indirect mapping between syntactic constituents and prosodic constituents. The prosodic constituent relevant for this study is the p-phrase. The p-phrase is above the word-level in the prosodic hierarchy and it maps with the syntactic phrase. This is stated in (15).

- (15) *XP-to-P Mapping Condition* (Truckenbrodt 1999)
Mapping constraints relate XPs to p-phrases, but do not relate XPs to other prosodic entities.

The essential criteria for determining a prosodic constituent is the notion of edges. It is assumed that the edge of a syntactic constituent maps with the edge of a prosodic constituent. For p-phrases it is the the maximal projection (XP) which triggers a prosodic boundary. In the syntax-phonology interface, Selkirk (1995) proposes alignment constraints based on the Generalized Alignment family in OT (c.f. McCarthy and Prince 1993).

- (16) a. *Align-XP,R*: ALIGN(XP, R; P, R)
 “For each XP there is a P such that the right edge of XP coincides with the right edge of P.”
 b. *Align-XP,L*: ALIGN(XP, L; P, L)
 “For each XP there is a P such that the left edge of XP coincides with the left edge of P.”

The final matter which is important for the analysis in Kikuyu regards the nature of the constituents which trigger a prosodic boundary. Selkirk (1995) states that only lexical categories are visible for prosodic boundaries. This means that functional projections do not relate to the syntax-prosody mapping. This is stated in the *The Lexical Category Condition* in (17).

- (17) *The Lexical Category Condition (LCC)* (Truckenbrodt 1999)
 Constraints relating syntactic and prosodic categories apply to lexical syntactic elements and their projections, but not to functional elements and their projections, or to empty syntactic elements *and their projections*.

The next section attempts to provide an analysis for the domain of floating L tones.

5. Analysis

In this section, I will argue that floating L tones in Kikuyu appear at the right edge of a p-phrase. Data in the sections above strongly suggest that floating L tones do not trigger downstep between a head and a complement. More specifically, no downstep intervenes between a noun and a right-adjacent modifier. This pattern is attested when a postnominal modifier follows the head noun. In (18), the noun *mòndò* has a lexical $\textcircled{\text{L}}$ underlyingly. Because downstep is not triggered, $\textcircled{\text{L}}$ has clearly been deleted. Other examples with this pattern is (2) and (3) from section 1.

- (18) /mondò $\textcircled{\text{L}}$ mokòrò/ *noun - modifier*: $\textcircled{\text{L}} \rightarrow \emptyset$
mò-ndò mò-kòrò
 1-person 1-old
 ‘old person’

Evidence for an underlying $\textcircled{\text{L}}$ in *mòndò* in (18) comes from (19) where a verb follows instead of a modifier. This triggers downstep on the initial syllable of the verb (subject prefix *à-*). This shows that the lexical $\textcircled{\text{L}}$ does not get deleted when a verb follows. Similar examples where downstep appears either after the subject noun on the following verb or on a coordinator were given in (1), (11b), (12b) and (13).

Regarding the vP, (19) also shows that no downstep appears between a verb and an object. There is an assertive $\textcircled{\text{L}}$ ar in the verb of (19) which does not trigger downstep on its following object. Instead it appears after the object where it blocks NON-FINALITY. Evidence for this is that the rising tone of *mòβàkě* is retained. This noun has no lexical $\textcircled{\text{L}}$ and without a preceding verb the rising tone would have been lowered. This tone process applied in (4) (section 1)

with the noun *pómbă*. As for (19), the expected form would be: [mò-βàkě] if no floating L tone followed. Thus, NON-FINALITY is blocked. The tone which blocks NON-FINALITY is the assertive (L) of the verb which has shifted and appears after the object noun. This is represented in (20).

- (19) /mondò(L) àrà:hándirè(L) mòβàkě/
 mò-ndò †à-rà:-hánd-irè mò-βàkě
 1-person SM-NPST-plant-PFV.FV 3-tobacco.plant
 ‘The person planted a tobacco plant.’

- (20) /mondò(L) àrà:hándirè mòβàkě(L)/ *Intermediate underlying form*

If no object follows but rather a subordinate clause, downstep is triggered on the conjunction. This was already shown in (13) above and is repeated below in (21). This gives evidence for the claim that the assertive (L) is domain-sensitive in that it does not simply shift and appear after *any* following item. Instead it triggers downstep on a following item which is *not* a complement, like a subordinate clause.

- (21) /mwànèkì(L) è:sí:rià(L) àtè né ndó:niré(L) moyèràniá ðeínè wá pòmbă/
 mwànèkì †è:-sí:ri-à †àtè né nd-ó:n-iré mó-ýèràniá †ðeínè wá póm̩bà
 Mwanĩki SM-think-FV that FM SM-see-PFV.FV 1-examiner inside CONN 9.house
 ‘Mwanĩki thinks that I saw the examiner inside the house.’ (Clements & Ford 1981:327)

Example (7) from section 2.1, repeated in (22), shows a transitive clause with the adjunct *hwà:é* which is subject to downstep. The underlying assertive (L) (or the lexical (L) of *pòmbè*) trigger downstep on the first syllable of the adjunct. A similar pattern is also attested in the previous examples; (4) and (6).

- (22) /ndèrà:yó:rìrè(L) ɲòmbè(L) hwà:é/
 ndè-rà:-yó:r-irè ɲòmbè †hwà:é
 SM-NPST-buy-PFV.FV 9.cattle yesterday.evening
 ‘I bought cattle yesterday evening.’

The data indicates that downstep appears at the edge of a domain which corresponds to the p-phrase. For the distribution of downstep, I propose the generalization in (23).

- (23) The two floating L tones in Kikuyu: lexical (L) and assertive (L) are domain-sensitive and trigger downstep at the right edge of a p-phrase. P-phrase medial, no downstep is triggered.

Second, I claim along with Selkirk (2000) that Kikuyu has a high ranking of ALIGN(XP,R). Other Bantu languages with a similar phrasing pattern are Chaga, Kimatumbi, Kinyambo and Mwi:ini (cf. Selkirk *ibid.*: 233, 1986). (24) illustrates formation of p-phrases in Kikuyu.

$$(24) \quad [N \text{ XP}]_{NP} \downarrow [V \text{ XP} \downarrow \text{ YP}]_{VP}$$

$$(\quad)_{\phi} (\quad)_{\phi} (\quad)_{\phi}$$

The projections DP, vP, TP, CP etc. have been omitted in (24) as they are functional projections and therefore irrelevant for the p-phrase boundaries. What we see is that every maximal projection which is lexical will trigger a p-phrase boundary. Here, downstep is triggered depending on whether there is a floating L tone underlyingly or not. Within the p-phrase, no downstep will be triggered. The positioning of downstep indicates that it is the *right* edge of an XP which triggers a p-phrase boundary in Kikuyu. If it were the left edge of an XP which would trigger a p-phrase break, it would be expected to find downstep between the verb and the object as in (25).

$$(25) \quad /mondò(\underline{L}) \ àrà:hándìrè(\underline{L}) \quad mo\beta àkě/ \quad \text{Unattested pattern}$$

$$*mò-ndò \ ^{'}\grave{a}-rà:-hánd-ìrè \quad ^{'}mò-\beta àkè$$

1-person SM-NPST-plant-PFV.FV 3-tobacco.plant
‘The person planted a tobacco plant.’

Instead the pattern that was shown in (19) (along with other examples) is found where no downstep intervenes between a verb and following object. Since (25) is not attested in Kikuyu, neither in data from Clements & Ford (1981), Clements (1984b) nor in my own data, it can be concluded that it is the constraint ALIGN-XP,R which applies for Kikuyu. Another constraint which applies is *P-PHRASE (26) and is part of the constraint family *STRUC (cf. Prince & Smolensky 1993).

$$(26) \quad *P-PHRASE \text{ (Truckenbrodt 1999)}$$

Assign a violation mark for every formation of a p-phrase.

The suggested ranking for p-phrases in Kikuyu is stated in (27).

$$(27) \quad \text{ALIGN-XP,R} \gg *P-PHRASE$$

Tableau 1 below shows the phrasing for (19) (repeated here as (28)).

$$(28) \quad /mondò(\underline{L}) \ àrà:hándìrè(\underline{L}) \quad mo\beta àkě/$$

$$mò-ndò \ ^{'}\grave{a}-rà:-hánd-ìrè \quad mò-\beta àkě$$

1-person SM-NPST-plant-PFV.FV 3-tobacco.plant
‘The person planted a tobacco plant.’

	$[mòndò]_{NP}$ the.person	$[^{'}\grave{a}-rà:-hánd-ìrè]$ planted	$[mò-\beta àkě]_{NP}$ a.tobacco.plant	ALIGN-XP, R	*P-PHRASE
a.	() _φ	() _φ	() _φ		***!
b.	() _φ	() _φ	() _φ		**
c.	() _φ	() _φ	() _φ	*!	**
d.	() _φ	() _φ	() _φ	*!	*

Tableau 1: ‘The person planted a tobacco plant.’

In tableau 1, the NP of the subject and the one of the object are lexical XPs which trigger a p-phrase boundary. ALIGN-XP,R demands a p-phrase boundary after these two XPs. The candidates in (c) and (d) do not have this: (c) lacks a p-phrase boundary after the subject NP and (d) lacks two p-phrase boundaries as all the constituents have been phrased together. The p-phrase boundary after the verb in (c) does not satisfy ALIGN-XP,R because the verb alone is not an XP and does therefore not trigger a p-phrase boundary. In candidate (a), the subject, the verb and object have all been phrased separately while in candidate (b), the subject forms one p-phrase while the verb and the object form another. Both these candidates satisfy ALIGN-XP,R because there is a p-phrase boundary after each NP. The constraint which determines the winner is therefore *P-PHRASE which prefers (b) over (a) because the former has less p-phrases. Ranking ALIGN-XP,R over *P-PHRASE is necessary to predict the right phrasing pattern in Kikuyu. If ALIGN-XP,R would be ranked below *P-PHRASE, then candidate (d) would win. Such a phrasing pattern would predict that no downstep appears after the subject NP. As this is however the case, the ranking in (27) predicts the correct phrasing pattern for Kikuyu.

Tableau 2 derives the phrasing pattern for the sentence in (7), repeated again in (29), which has an adjunct following the primary object. There are two (lexical) XPs: the NP of the object and the Adverbial Phrase of the adjunct.

- (29) /ndè-rà:yó-rìrè(L) ɲ̀d̀mbè(L) hwà:é/
 ndè-rà:-yó-rìrè ɲ̀d̀mbè ⁴hwà:é
 SM-NPST-buy-PFV.FV 9.cattle yesterday.evening
 ‘I bought cattle yesterday evening.’

	[ndè-rà:-yó-rìrè] [ɲ̀d̀mbè] _{NP} ⁴ [hwà:é] _{AdvP}	ALIGN-XP, R	*P-PHRASE
	I-bought cattle yesterday.evening		
a.	() _φ () _φ () _φ		***!
b.	() _φ () _φ	*!	**
c.	() _φ () _φ		**
d.	() _φ	*!	*

Tableau 2: ‘I bought cattle yesterday evening.’

Candidate (b) and (d) both violate ALIGN-XP,R as there is no p-phrase boundary after the object NP *ɲ̀d̀mbè*. In (b), both the object NP and the AdvP form a single phrase. In (d) the whole clause forms a single p-phrase including the verb, the object NP and the AdvP. Candidate (c) and (a) both fulfill ALIGN-XP,R as there is a p-phrase boundary after each XP. As in tableau 1, *P-PHRASE determines the winner which is (c) because there are less p-phrases than in (a).

The remaining phrasing pattern to be evaluated is the DP with a noun and a following modifier (18) (repeated in (30)). I assume that the adjective is embedded inside the NP.

- (30) /mondò(L) mokòrò/
 mò-ndò mò-kòrò...
 1-person 1-old
 ‘old person’

	[[_N mò-ndò] person]	[mò-kòrò] _{AP}]NP old]	ALIGN-XP, R	*P-PHRASE
a.	() _φ	() _φ		**!
b.	() _φ	() _φ		*

Tableau 3: ‘old person’

In tableau 3, only two phrasing patterns are possible. In (a), the head and the modifier form separate p-phrases while in (b), they form one p-phrase. Since the adjective is embedded in the NP, both candidates satisfy ALIGN-XP, R as there is a p-phrase boundary after the NP/AP. *P-PHRASE determines the winner preferring the candidate with fewest p-phrases which is candidate (b). This formation of p-phrases implies that no downstep will occur between the head noun and the following modifier. This prediction is borne out.

The derivation in the tableaux 1-3 generated a pattern conform with the generalization in (23) stating that downstep appears on the right edge of a p-phrase while no downstep appears inside a p-phrase. The two floating L tones are different in fulfilling the predictions of (23). While the lexical \textcircled{L} will be deleted, the assertive \textcircled{L} will shift in order to avoid triggering downstep in a position which deviates from the right edge of a p-phrase. Thus, the surface tones of lexical \textcircled{L} and assertive \textcircled{L} can be accounted for if p-phrases is the prosodic domain which they are sensitive to and they are determined by the ranking ALIGN-XP,R << *P-PHRASE. The reader should note that this analysis only predicts in which position downstep is *not* triggered (p-phrase medial) and it does not predict whether downstep will actually be triggered on the right edge of a p-phrase because this depends on two conditions: (i) whether there is a floating L tone underlyingly, and (ii) the surrounding tones.¹³ To conclude the section, the third cue of underlying floating L tones will be discussed (cf. section 2) which is unbounded HTS. In section 2.3, example (10b), repeated as (31) below, demonstrated how unbounded HTS applies in correlation with a floating L tone. In this example, the floating L tone triggers downstep in a position which only partly depends on p-phrases. The other determining factor is the surrounding tones. Following Gussenhoven (2004), I assume that H(#)¹L is banned in Kikuyu. Therefore, a floating L tone (either lexical or assertive) will move to the right when being preceded by a H tone and followed by a L tone to prevent triggering downstep in this position. This is an independent tone restriction and in a different tone sequence of the same syntactic configuration, a floating L tone would trigger downstep according to ALIGN-XP,R. This is shown in (32) where a floating L tone on a p-phrase edge is in a L tone sequence.¹⁴ Here downstep is triggered as expected.

- (31) /ndèrà:rórìrè \textcircled{L} nàjá nà ɲɔ̀ɔ́óná \textcircled{L} / *Unbounded HTS with \textcircled{L}*
 (ndè-rà:r-ór-ìrè nàjá)_φ (ná ɲɔ̀ɔ́¹óná)_φ
 SM-NPST-watch-PFV.FV Ng’ang’a and Njũgũna
 ‘I watched Ng’ang’a and Njũgũna.’

¹³ A full analysis of the two floating L tones as well as their interaction with and HTS is discussed in the author’s MA thesis (2015) where the pattern is accounted for in a Stratal OT analysis.

¹⁴ The noun *mbòrí* should have a final floating L tone according to the description of Armstrong which predicts that it should be H-final (NON-FINALITY is blocked). The southern Kikuyu speaker of this study however showed variation for this pronouncing it L-final (indication of no lexical \textcircled{L}).

- (32) /ndèrá:kámírè(Ⓛ) ṣòmbè(Ⓛ) nà mbòrí/ *Downstep in a L tone sequence*
 (ndè-rá:-kám-írè ṣòmbè)_φ ⁺(nà mbòrí)_φ
 SM-NPST-milk-PFV.FV 9.cattle and 9.goat
 ‘I milked cattle and goat.’

ALIGN-XP,R predicts a p-phrase boundary after the first conjunct (ṣòmbè). This shows that examples like (31) do not deviate from the analysis, but rather the tone context must be considered. I propose the generalization formalized in (33). This generalization implies that a floating L tone which is positioned at the right edge of a p-phrase will either trigger downstep or, if it is preceded by a H tone and followed by a L tone, unbounded HTS applies. The difference depends on the surrounding tones. The crucial point here is that the constituent which is subject to unbounded HTS belongs to another p-phrase and this is a tone effect which has been induced by a floating L tone in a H_L sequence.

- (33) A lexical or an assertive floating L tone in Kikuyu only induces a tone change (downstep, unbounded HTS, or blocking of NON-FINALITY) at a p-phrase boundary. P-phrase internal, a floating L tone does not interact with other tones.

The next section examines the phrasing pattern of nominal modifiers and attempts to account for some apparent contradictory data.

6. Phrasing pattern with modifiers

The proposed analysis from the previous section predicts that embedded modifiers within an NP (of a DP) will form a p-phrase together with the head noun. The phrasing of a noun and a following adjective was shown in (30) where they formed one p-phrase. The same phrasing pattern is expected for a verb and its primary object which itself is modified by an adjective or other determiners. (34) below shows this kind of configuration. Here, there are several floating L tones but they only induce two tone processes: (i) Triggering of downstep which appears on the initial tone of *hwà:é*; (ii) Blocking of NON-FINALITY of the underlying H tone of the adverb (induced by the final lexical Ⓛ). It is unclear which of the first three floating L tones triggers downstep but for the analysis, this is not a determining factor. What is important is the absence of downstep within the p-phrases and the presence of downstep at the right edge of a p-phrase.

- (34) /ndèrò:nírè(Ⓛ) morèmi(Ⓛ) moritò(Ⓛ) hwà:é(Ⓛ)/ *[noun – adjective] as object*
 (ndè-rò:n-írè mò-rèmi mò-rìtò)_φ ⁺(hwà:é)_φ
 SM-PST;see-PFV.FV 1-farmer 1-heavy yesterday.evening
 ‘I saw the heavy farmer yesterday evening.’

The structure of (34) is given in (35). The NP with the head noun *mòrèmi* triggers a p-phrase boundary. The adjective *mòritò* is assumed to be either in a complement position of the noun or adjoined inside the NP and therefore, no p-phrase boundary is predicted between the noun and the adjective.

- (35) a. [[V [N [A]_{AP}] NP]_{VP} [Adv] AdjP]_{VP}]_{TP}
 b. (V N A)_φ (Adv)_φ

Example (2) in section 1, repeated below in (36), shows a phrase consisting of a noun, a possessive and a following adjective. Here, the lexical \textcircled{L} of the noun *pòmbè* gets deleted when a modifier follows. Because the possessive does not have a lexical \textcircled{L} , there is no indication of whether the adjective phrases together with the noun and the possessive or whether it phrases alone. It is only clear that the noun and the possessive phrase together, because if they did not, the lexical \textcircled{L} of *pòmbè* would trigger downstep on the possessive.

- (36) /*pòmbè*(\textcircled{L}) *yàké hòrèrì*/ *noun - modifier: $\textcircled{L} \rightarrow \emptyset$*
pòmbè yà-ké hòrèrì
 9.cattle 9-3SG gentle
 ‘his gentle cattle’

In order to see whether the adjective forms a p-phrase together with the noun and the possessive, it has to follow a verb because unlike the lexical \textcircled{L} , the assertive \textcircled{L} will not get deleted but will shift to the right edge of a p-phrase. In (37), the same modifier structure appears as in (36) but as an object following an assertive verb. What can be observed is that the adjective is subject to unbounded HTS (compared to the adjective in (36) which undergoes binary HTS). As shown in section 2.3 (and discussed in the end of the previous section), this is a cue of an underlying floating L tone which must have preceded the adjective in order for the unbounded HTS to apply on the adjective (cf. Philippson 1991)¹⁵. This indicates an intermediate step in the derivation where the lexical \textcircled{L} tone of *pòmbè* has been deleted and the assertive \textcircled{L} is placed in front of the adjective. Here, it triggers unbounded HTS because it appears between a H and a L tone. The intermediate step is given in (38).

- (37) /*ndò:nìré*(\textcircled{L}) *pòmbè*(\textcircled{L}) *yàké ndító*(\textcircled{L})/ *[noun – poss – adj] as object*
nd-ò:n-ìr-é *pómbè y-àké ndító*
 SM-CURRPST;see-PFV.FV 9.cattle 9-3SG heavy
 ‘I saw his heavy cattle.’
- (38) *ndò:nìré pómbè yàké* (\textcircled{L}) *ndító*. *Intermediate underlying form*

As was argued in section 5, the positioning of downstep depends on the surrounding tones. Therefore, it can be assumed that if the adjective in (37) was preceded by a L tone instead of a H, downstep would be triggered on the initial syllable of the adjective. The p-phrase structure of (37) is shown in (39) where the adjective forms a separate p-phrase.

- (39) (*ndò:nìré pómbè yàké*)_φ (*ndító*)_φ

Another configuration in which the adjective phrases alone is when it follows another postnominal adjective. This was shown in the introduction in (3) and is repeated below in (40) with the full sentence. The underlying tones of *ndító* are LL(\textcircled{L}) and downstep is triggered on the follow-

¹⁵ Alternatively, it can be considered H tone overlay.

ing adjective. This indicates that the second modifying adjective forms a separate p-phrase.¹⁶

- (40) /ŋðmbè(Ⓛ) nditò(Ⓛ) hðrèrì(Ⓛ) éré ðéínè wá nómǎ/
 (ŋðmbè nditò)_φ (ʰhðrèrì)_φ ʰéré ðéínè wá nómǎ
 9.cattle 9.heavy gentle COP.PL inside CONN 9.house
 'A heavy gentle cattle is inside the house.'

The phrasing pattern of modifiers has been discussed for Chichewa in Downing & Mtenje (2011). In this language, every nominal modifier triggers a prosodic phrase except for clitic-like modifiers. This is not a regular pattern in Kikuyu. The phrasing pattern seems to depend on both the syntactic position and the number of modifiers that follow. From the available data, it seems that the first modifier always phrases together with the noun while a second following modifier will either form a separate phrase or it will phrase together with the noun and the preceding modifier. For the adjective, I argue that the fact that it forms a separate p-phrase is due to its properties as a modifier, and not to the fact that it follows another modifier. If a non-adjectival modifier follows a noun and a possessive, it should be possible that all three words form one p-phrase, depending on the syntax of this modifier/determiner. This prediction is born out in (41). Here, a head noun is followed by a possessive, a numeral and an adjective. The possessive and the numeral are not affected by floating L tones because downstep is not induced on any of their tones. If the numeral would have been affected here, it would have the surface tones *kómwé*¹⁷. Because it does not have these surface tones, it can be assumed that the lexical floating L tone of *yuðkó* has been deleted and the assertive (Ⓛ) shifts affecting only the adjective *yòðò:kú*. This adjective is subject to downstep on the final underlying H tone and the preceding L tones are raised to H. Its underlying tones have changed from LLH to HH¹H in order to avoid downstep between a H and a L tone. According to the generalization (33), the fact that the adjective undergoes a tone process triggered by (Ⓛ) indicates that it forms a separate p-phrase.

- (41) /ndð:niré(Ⓛ) yuðkó(Ⓛ) ywàké komwé(Ⓛ) yòðò:kú rémwé(Ⓛ)/
 (nd-ð:n-iré yu-ðkó ywà-ké kó-mwé)_φ (yó-ðó:¹kú)_φ (ʰrémwé)_φ
 SM-CURRPST;see-PFV.FV 15-arm 15-3SG 15-one 15-bad once.
 'I saw his one bad arm once.' (Clements & Ford 1981:329)

It will now be discussed why adjectives form separate p-phrases in Kikuyu. Firstly, the possibility that this phrasing pattern is a matter of maximal prosodic length can be excluded. A prosodic constraint such as BINMAX (cf. Selkirk (2000)) which penalizes p-phrases which are longer than two prosodic words does not apply for Kikuyu. Evidence for this is the sentence in (34) above where three prosodic words: verb, noun and adjective, form one p-phrase.

Another explanation regards the syntax of adjectives following a head noun and other modifiers. Regarding the configurations in (36)/(37) with a noun followed by a possessive and an adjective, the first question which arises is what the structure of the possessor is. The morphology of possessors in Kikuyu is composed by a connective article, which agrees with the head none in gender, and a stem as shown in (42).

¹⁶ The lexical/grammatical tones of the plural copula is not listed in the literature but based on the recordings, I assume that they are underlying H and undergo downstep (induced by the lexical (Ⓛ) of *hðrèrì*).

¹⁷ The final tone of *kómwé* is lowered due to a separate rule.

- (42) *ɲoŋgo ya-kɛ nɛnɛ*
 9.pot 9-3SG 9.big
 ‘her big pot’

(Mugane 1997:108)¹⁸

The connector (*ya-* for class 9) can also be used alone to connect phrases as in (43a). In (43b) the possessive association has been pronominalized by *kɛ*.

- (43) a. *ɲoŋgo ya soso*
 9.pot 9.CONN grandmother
 ‘grandmother’s pot’
 b. *ɲoŋgo ya-kɛ*
 9.pot 9.CONN-3SG
 ‘her pot’

(Mugane 1997:98)

This possessive construction is found in many other Bantu languages and Hyman et al. (2013) give the structure of a connective phrase (44).

- (44) [_{ConnP} [_{NP}] [_{Conn'} [_{NP}]]]

(Hyman et al. 2013)

I assume that the configurations shown in (42) and (43b) have a similar structure as in (44). Here, the noun (the complement of ConnP') is replaced with a pronoun (the stem *-kɛ*) which fuses with the connective particle *ya-*. In this construction, the N head takes a ConnP as a complement. The ConnP then consists of the fused connective particle and the stem. The structure is given in (45). This structure predicts that there is no internal p-phrase boundary between the noun and the possessive.

- (45)
-
- ```

graph TD
 NP_phi["NP)φ"] --- ɲɔmbɛ["ɲɔmbɛ"]
 NP_phi --- N_prime["N'"]
 N_prime --- N["N"]
 N_prime --- ConnP["ConnP"]
 N --- ɲɔmbɛ_p["<ɲɔmbɛ>"]
 ConnP --- Ø["Ø"]
 ConnP --- ConnP_prime["ConnP'"]
 ConnP_prime --- Conn["Conn"]
 ConnP_prime --- NP_complement["NP"]
 Conn --- ya_minus["yà-"]
 NP_complement --- kɛ_minus["-kɛ"]

```

The interesting question is in which syntactic position the adjective is when it follows other modifiers. The word order of the NP gives some indication of this. In Kikuyu, the order of the modifiers is relatively fixed and reordering can lead to dislocation. There are several indications of the adjective having a more remote syntactic position compared to the other modifiers. The linear (neutral) order of modifiers in the DP is in (46). The canonical position of the adjective is at the right periphery of the DP. An example is given in (47).

<sup>18</sup> All examples from Mugane have been changed to IPA.

(46) [noun – demonstrative – possessive pronoun – quantifier – adjective] (Barlow 1951)

(47) *ɲoŋgo isi si-ake si-oðe ndune*  
 10.pot 10.DEM 10-3SG 10-all 10.red  
 ‘all these red pots of hers/his’ (Mugane 1997:39)

If the order of the modifiers is changed, an intonation break is needed. In (48a) the noun is omitted and the modifiers are anaphoric. The adjective still appears at the right periphery. In (48b), the order is changed and the adjective is no longer in this position. This induces a comma intonation (Mugane 1998:39). The same can be observed in (49) where the adjective has been moved to a position immediately adjacent to the noun while the possessive follows. This also results in a comma intonation. This intonation pause indicates syntactic dislocation of the possessive. The neutral order was given in (42). This suggests that the syntactic position of the adjective is relatively fixed outside of the projection heading the noun and the possessive. In order for the adjective to be linearly adjacent to the noun, the possessive has to be dislocated outside this projection.

(48) a. *isi si-ake si-oðe ndune*  
 10.DEM 10-3SG 10-all 10.red  
 ‘all these red (things) of her’s/his’  
 b. *isi si-ake ndune, si-oðe*  
 10.DEM 10-3SG 10.red 10-all  
 ‘these red (things) of her’s/his, all’ (Mugane 1997:39)

(49) *ɲoŋgo nɛnɛ, ya-ke*  
 9.pot 9.big 9.CONN-3SG  
 ‘her big pot’ (Mugane 1997:108)

Another indication of the fixed syntactic positioning of the adjective in Kikuyu regards compounds. Other modifiers such as demonstratives have a less fixed position in that they can prepose the noun. In this position, they modify the head of a compound.

(50) *oyo [mo-end-a a-ndo]*  
 1.DEM 1-love-NZER 2-people  
 ‘this lover of people’ (Mugane 1997:77)

Adjectives on the contrary, cannot modify the head of a compound alone as seen by the ungrammaticality in (51a). In this configuration they must follow the compound (51b).<sup>19</sup> In this position they modify the whole compound.

(51) a. *\*mo-end-a mo-piji a-ndo a-piji*  
 1-love-NZER 1-young 2-people 2-young  
 ‘a young lover of young people’  
 b. *mo-end-a a-ndo a-piji mo-piji*  
 1-love-NZER 2-people 2-young 1-young  
 ‘a young lover of young people’ (Mugane 1997:80)

<sup>19</sup> Mugane (1997) annotates the class 1 prefix *mo-* as AGENT but this is omitted here for the sake of consistency.

Turning back to the phrase with a noun and two adjectives as shown in (40), the speakers for this study produced the following order: *ɲòmbè nditò ʰòrèrì* ‘a heavy gentle cattle’. With a reversed order of the adjectives, the sentence was judged ungrammatical with the explanation that *nditò* ‘heavy’ describes a property of the noun in a larger scale than the adjective *hòrèrì* ‘gentle’ does. The fact that *nditò* must be positioned immediately after the noun indicates that this position is reserved for adjectives which are semantically more closely connected to the head. This difference could be interpreted as an alienable/inalienable distinction of modifiers.

- (52) \**ɲòmbè hòrèrì ʰnditò ʰéré ðeínè wá ɲómbà*  
 9.cattle 9.heavy gentle COP.PL inside CONN 9.house  
 ‘A gentle heavy cattle is inside the house.’

The fact that the adjective which is semantically further away from the noun cannot be adjacent to it and also phrases separately is an interesting fact. A somewhat similar phenomenon is attested in Ojibwe. This language attests phase-sensitive phonological processes. Regarding modifiers, there is avoidance of obstruent-nasal sequences. Two different strategies are employed in possessive constructions depending on whether it is an alienable possessive construction or an inalienable one. In the latter case, consonant deletion applies (argued to be phase-internally), while in the former case, the nasal assimilates to the preceding obstruent (noun and possessor interpreted between different phases) (Newell & Piggot 2014). A similar phenomenon is also attested in the Dogon languages where tone overlay is sensitive to the alienable-inalienable distinction of constituents in the DP (McPherson & Heath 2015). Another language where adjectives form a separate p-phrase is the Bantu language (P23) Símákonde (Manus 2010). This language has a phrase-final stress rule where the penultimate syllable of every prosodic phrase is lengthened. The phrasing pattern with nominal modifiers is similar to Kikuyu in that a nominal modifying possessive forms a prosodic phrase with the noun while an adjective phrases separately. Optionally a possessive can phrase separate from the noun but the adjective can not phrase together with the noun. When a noun is followed by a possessive and an adjective, the noun forms a prosodic phrase with the possessive and the adjective phrases alone (Manus 2010).<sup>20</sup>

Although the DP structure of Kikuyu needs more investigation, the data shown in this section gives some indication that adjectives are syntactically higher than other nominal modifiers. The main indicator of this is that they have a fixed position at the right periphery of the DP. As for configurations where two adjacent adjectives follow a noun, there is only semantic and prosodic evidence which can indicate their syntactic position. Based on this, I propose that a modifier which follows the head noun is either in a complement position or adjoined within the NP. Indication for this is that adjectives which are semantically close to the head must stand in this position. When adjectives follow a head and another modifier (either another adjective or another modifier), it is possible that it is adjoined to a projection above the NP. Regarding the possessive, the structure was given above in (45) where a head noun of the NP selects a connective phrase headed by the possessive with the connected *ya-* as the head which again selects either a NP as a complement or a pronoun. In the latter case it will be a stem such as *-ké*.

<sup>20</sup> Again there is optionality in the phrasing pattern so that when there are more modifiers each modifier can also constitute a separate prosodic phrase.

The adjective which linearly follows the possessive is assumed to be adjoined to the NP of the noun or to another projection above it. This NP triggers a p-phrase boundary and the separate phrasing of the adjective follows from this. The possessive is embedded as a complement to the head noun and therefore no p-phrase boundary is triggered.

The phrasing patterns are generated with the constraint ranking ALIGN-XP, R << \*P-PHRASE from section 5.

|    | nd-ò:n-ìré [ <sub>N</sub> ṽómbè ] [ ConnPyà-ké ] <sub>NP</sub> [ndító] <sub>AP</sub> | ALIGN-XP, R | *P-PHRASE |
|----|--------------------------------------------------------------------------------------|-------------|-----------|
|    | I-saw cattle POSS heavy                                                              |             |           |
| a. | ( ) <sub>φ</sub> ( ) <sub>φ</sub> ( ) <sub>φ</sub> ( ) <sub>φ</sub>                  |             | ****!     |
| b. | ( ) <sub>φ</sub>                                                                     | *!          | *         |
| c. | ( ) <sub>φ</sub> ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                   |             | ***!      |
| d. | ( ) <sub>φ</sub> ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                   | *!          | ***       |
| e. | ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                                    | *!          | **        |
| f. | ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                                    |             | **        |

Tableau 4: ‘I saw his heavy cattle.’

Tableau 4 shows the example from (37). The NP boundary is after the possessive because it is embedded in this projection. Candidate (b) has all four constituents included in one p-phrase. This only violates the lower-ranked \*P-PHRASE constraint one time but violates the undominated constraint ALIGN-XP, R because no p-phrase boundary is formed after the NP of the head noun. Candidate (d) and (e) also violate ALIGN-XP, R. Candidate (c), (a) and (f) all have a p-phrase break after the NP boundary. The lower-ranked constraint \*P-PHRASE prefers (f) as this has fewest p-phrases.

|    | [ ṽómbè ] <sub>cattle</sub> [ ndító ] <sub>heavy</sub> ] <sub>NP</sub> [ <sup>+</sup> hòrèrì ] <sub>gentle</sub> ] <sub>AP</sub> | ALIGN-XP, R | *P-PHRASE |
|----|----------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| a. | ( ) <sub>φ</sub> ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                                                               |             | ***!      |
| b. | ( ) <sub>φ</sub>                                                                                                                 | *!          | *         |
| c. | ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                                                                                |             | **        |
| d. | ( ) <sub>φ</sub> ( ) <sub>φ</sub>                                                                                                | *!          | **        |

Tableau 5: DP ‘A heavy gentle cattle.’

Tableau 5 shows the example in (40) with two adjectives following a noun. There are two XP boundaries of lexical nature which follow the adjective *ndító*. These are AP of *hòrèrì* and NP of the head noun (together with AP of *ndító* itself). Candidate (b) and (d) are therefore ruled out by ALIGN-XP, R. The winner is (c) which has fewest p-phrases. The suggested constraint ranking generates the correct p-phrase pattern in Kikuyu where a nominal modifier which is right-adjacent to the noun phrases with it, and a following adjective phrases alone.

## 7. Summary

This paper presented new data on tone in Kikuyu and proposed a unified analysis for the surface pattern of two different floating L tones. As previous studies have shown, the lexical (L) and the assertive (L) are both domain-sensitive. This study proposed that their domain of application is the p-phrase. The floating L tones can trigger a downstep, block NON-FINALITY or trigger unbounded HTS depending on the surrounding tones. The proposed analysis predicted that these three tone processes only apply at the right edge of a p-phrase. The p-phrases were determined by the ranking ALIGN-XP,R << \*P-PHRASE. This constraint ranking generated a p-phrase boundary after each maximal projection of lexical constituents. The analysis has accounted for the data of SVO(Adv) sentences and DPs with one modifier. As for more complex DPs, an apparent contradiction to the analysis was discussed where an adjective phrase alone when following another nominal modifier. It was shown that this pattern is also conform with the p-phrase analysis when the syntactic position of such adjectives is taken into account.

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# Stress as a morphological edge

Guillaume Enguehard

In this paper, I argue that stress is not a phonological primitive. In the CVCV framework, both stress and boundaries have a skeletal exponent that conditions the realization of the segments. I show that in Old Norse, there is an equivalence between the skeletal exponent of stress and the skeletal exponent of the word boundary. By arguing that stress results from the word boundary, the fixed initial stress of Old Norse can be accounted for. Then, I support this hypothesis by showing that Proto-Germanic post-coda voiceless fricatives cannot be accounted for if we do not assume that stress is an internal boundary.

## 1. Introduction<sup>1</sup>

This paper deals with the representation of stress in Proto-Germanic and Old Norse. My purpose is to argue that stress is not a phonological primitive. To this end, I address a problem noticed in Williams (1907) about Verner's Law. Indeed, Williams points out that in Proto-Germanic, stress (underlined nuclei) prevents the voicing of a following fricative (second column of 1a), but it does not in Old Norse (third column of 1a-b).

(1)<sup>2</sup>

|    | PIE                                           | Early PGrm       | ON              | gloss          |
|----|-----------------------------------------------|------------------|-----------------|----------------|
| a. | *b <sup>h</sup> <u>r̥</u> eH <sub>2</sub> ter | *br <u>ō</u> per | br <u>ó</u> ðir | <i>brother</i> |
| b. | *p <u>H</u> t̃er                              | *fa <u>ð</u> er  | fa <u>ð</u> ir  | <i>father</i>  |

In order to account for this contrast, I show that Proto-Germanic stress and Old Norse stress have different representations. More specifically, I argue that Old Norse stress corresponds to the left-edge of the word, while in Proto-Germanic it results from an internal boundary.

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<sup>1</sup> The traditional transcriptions of Proto-Indo-European, Proto-Germanic and Old Norse are used instead of IPA. Proto-Germanic *p*, *b*, *g* = IPA *θ*, *β*, *ɣ*. However, IPA is used for underlining representations. With a view to maintaining uniformity, the stressed nuclei are underlined throughout the paper. Indeed, the acute accent traditionally used in Proto-Indo-European and Proto-Germanic refers to vowel length in Old Norse. Because these languages were never recorded, I chose not to use brackets for surface forms. When a derivation is illustrated, the surface form is represented after an '→' arrow.

<sup>2</sup> PIE = Proto-Indo-European; PGrm = Proto-Germanic; ON = Old Norse.

This paper is organized as follows. In Section 2, I give an overview of the representation of stress in CVCV and its application to Verner's Law proposed in Scheer (2000). In Section 3, I introduce Williams' problem and I show that the representation of Old Norse stress corresponds to the representation of the word boundary. Finally, I argue in Section 4 that this hypothesis makes correct predictions in the representation of Proto-Germanic stress.

## 2. Representation of stress

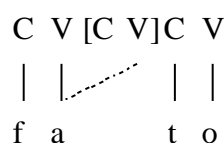
### 2.1. Framework

I conduct this study within the CVCV framework introduced in Lowenstamm (1996). I assume Government Phonology as developed in Kaye et al. (1990), and I adopt its recent development proposed in Scheer & Ziková (2010).

I follow Larsen (1994, 1998) in assuming that stress inserts a [CV] unit directly to the right (2a) or to the left (2b) of the stressed nucleus (underlined throughout this paper). This representation accounts for Tonic Lengthening (2a) and the fortition of consonants in tonic context (2b) (see Scheer 2000).

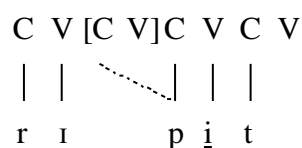
(2)

a. right-inserted stress [CV]



Italian: faato 'fate'

b. left-inserted stress [CV]

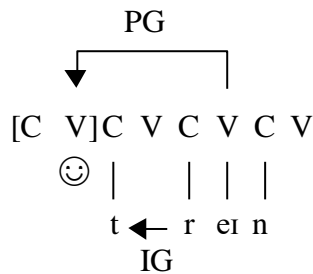


English: rɪp<sup>h</sup>iɪt 'repeat'

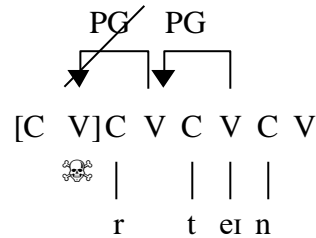
Moreover, following Lowenstamm (1999), I assume that the left-edge (i.e. the word boundary #) is represented as an empty [CV] unit inserted at the beginning of the word (3). This representation accounts for the restriction in the inventory of initial consonant clusters in languages such as Germanic languages. Germanic languages can have TR type initial clusters (where T = obstruent and R = sonorant) (3a), but not RT type initial clusters (3b). Lowenstamm (1999) proposes to represent the left-edge as a [CV] unit, the V position of which is properly governed in the first case (3a), given that the initial TR type cluster forms a domain (see Scheer 1996) over which government can apply. In the second case, however, the V position of the left-edge [CV] is not governed (3b): proper government targets the empty nucleus embedded in the RT cluster. As a consequence, following the Empty Category Principle (ECP) (3c), the configuration in (3b) is ill-formed and cannot be derived.

(3)

a. governed left-edge

English: *trem* 'train'

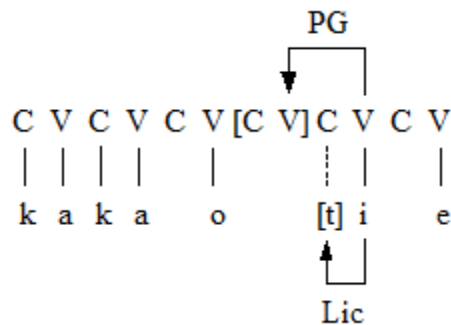
b. ungoverned left-edge

English: \**rtem*

- c. Empty Category Principle: A nucleus may remain phonetically unexpressed iff it is:
- properly governed,
  - enclosed within a domain of infrasegmental government,
  - domain-final. (Scheer 2004:67)

In Pagliano (2003), this representation of the word boundary is extended to internal boundaries. The representation of some internal boundaries as empty [CV] units accounts for the emergence of an epenthetic [t] in French words like *cacao*[t]-*ier* 'cacao tree' (Pagliano 2003:786-788). This epenthesis is supposed to be due to the fact that the suffix -ier governs an empty V position on its left (4). As a consequence, the C position on its left is only licensed and must surface as strong (Ségéral & Scheer 2001a; Scheer & Ziková 2010). Hence an epenthesis.

(4)



Now, if we assume a language with fixed initial and left-inserted stress [CV] (illustrated in [5]), we expect a merge of the [CV] units inserted respectively by stress and the left-edge. Indeed, given the Empty Category Principle (3c), we cannot have both, because the leftmost V position would not be properly governed.

(5)

$$\begin{array}{c}
 \# = [\text{str}] \\
 [\text{C} \text{ V}] \text{C} \text{ V} \text{C} \text{ V} \\
 \begin{array}{cccc}
 | & | & | & | \\
 \text{c} & \underline{\text{v}} & \text{c} & \text{v}
 \end{array}
 \end{array}$$

In such a language, there is no contrast between the [CV] unit provided by stress and the left-edge. Hence the questions phrased in (6).

(6)

- a. Does stress insert a [CV] unit?
- b. Does stress result from a [CV] unit provided by a boundary?

I address the questions in (6) in Sections 3 and 4 by analysing the conditioning of Verner's Law which is traditionally assumed to be related to stress (Verner 1877:114).

## 2.2. Presentation of Verner's Law

Verner (1877) proposes the following generalization: the change undergone in Proto-Germanic by a Proto-Indo-European voiceless plosive depends on its position with respect to stress.<sup>3</sup>

On the one hand, Proto-Indo-European voiceless plosives correspond to (Early) Proto-Germanic voiced fricatives (note that these fricatives are then occluded in Late Proto-Germanic) when they are assumed to follow an unstressed nucleus (e.g. *\*pHtēr* > *\*faðer* 'father'). Compare the Proto-Indo-European voiceless plosives (in bold) in the first column of (7) with their Proto-Germanic reflexes in the second column of (7). The Proto-Indo-European voiceless plosives corresponding to a voiced fricative in Proto-Germanic are always located after an unstressed nucleus.

(7)

|         |                            | PIE                             | PGrm          | gloss         |
|---------|----------------------------|---------------------------------|---------------|---------------|
| [-str]_ | p > <b>b</b> (> <b>b</b> ) | <i>*sept<u>m</u></i>            | <i>*sebun</i> | <i>seven</i>  |
|         | t > <b>ð</b> (> <b>d</b> ) | <i>*pHt<u>ēr</u></i>            | <i>*faðer</i> | <i>father</i> |
|         | k > <b>g</b> (> <b>g</b> ) | <i>*sek<sup>w</sup><u>ₑ</u></i> | <i>*sago</i>  | <i>saw</i>    |

<sup>3</sup> 'Indogermanisch k, t, p gingen erst überall in h, þ, f über; die so entstandenen tonlosen fricativae nebst der vom indogermanischen ererbten fricativa s wurden weiter inlautend bei tönender nachbarschaft selbst tönend, erhielten sich aber als tonlose im nachlaute betonter silben.' [*Indo-European k, t, p first shifted to h, þ, f in all environments; the voiceless fricatives thus originating, together with the voiceless fricatives inherited from Indo-European, then became voiced medially in voiced environments, but remained voiceless when they were the final sounds of accented syllables.*] (Verner 1877:114).

On the other hand, when they are assumed to follow a stressed nucleus, Proto-Indo-European voiceless plosives correspond to voiceless fricatives in Proto-Germanic (e.g. *\*b<sup>h</sup>reH<sub>2</sub>ter* > *\*brōþer* ‘brother’). They are not voiced. Compare the Proto-Indo-European voiceless plosives (in bold) in the first column of (8) with their Proto-Germanic reflexes in the second column of (8).

(8)

|         |       | PIE                                            | PGrm                  | gloss          |
|---------|-------|------------------------------------------------|-----------------------|----------------|
| [+str]_ | p > f | <i>*ne<b>p</b>ot-</i>                          | <i>*ne<b>f</b>-</i>   | <i>nephew</i>  |
|         | t > þ | <i>*b<sup>h</sup>reH<sub>2</sub><b>t</b>er</i> | <i>*brō<b>þ</b>er</i> | <i>brother</i> |
|         | k > h | <i>*de<b>k</b>m</i>                            | <i>*te<b>h</b>un</i>  | <i>Ten</i>     |

It should be moreover observed that the Proto-Indo-European voiceless plosives standing in initial position also correspond to voiceless fricatives in Proto-Germanic (e.g. *\*pHtēr* > *\*faðer* ‘father’).<sup>4</sup> Compare the Proto-Indo-European initial voiceless plosives in the first column of (9) with their Proto-Germanic reflexes in the second column of (9). These are voiceless fricatives.

(9)

|    |       | PIE                   | PGrm                  | gloss         |
|----|-------|-----------------------|-----------------------|---------------|
| #_ | p > f | <i>*<b>p</b>Htēr</i>  | <i>*faðer</i>         | <i>father</i> |
|    | t > þ | <i>*<b>t</b>rei-</i>  | <i>*<b>p</b>rij-</i>  | <i>three</i>  |
|    | k > h | <i>*<b>k</b>ortu-</i> | <i>*<b>h</b>arðu-</i> | <i>hard</i>   |

In conclusion, Verner (1877) shows that the evolution of Proto-Indo-European voiceless plosives to Proto-Germanic voiceless fricatives or voiced plosives is stress sensitive. It is important to note that Verner’s Law describes the conditioning of the voicing only. The spirantization is described by Grimm’s Law, and it is supposed to occur earlier.

### 2.3. Scheer’s representation of Verner’s Law

Scheer (2000) shows that the CVCV framework gives an interesting account of the dual conditioning of Verner’s Law, after stress and in initial position.

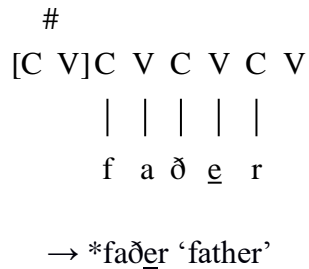
In the CVCV framework, stress and the word boundary share a common property: they both involve the insertion of a [CV] unit. The left-edge [CV] is inserted at the beginning of the word, and the stress [CV] is inserted to the left or to the right of the stressed nucleus. Accordingly, stress and the word boundary are expected to affect the neighbouring segments alike.

In Proto-Germanic, stress affects the consonant on its right. For this reason, Scheer (2000) assumes that the stress [CV] is right-inserted in this language (10b). Consequently, the phonological representations of the context after stress and the initial context turn out to share a representational property: they are both preceded by an empty [CV]. In (10a), the initial voiceless fricative f of *\*faðer* follows a left-edge [CV] unit. In (10b), the post-stress voiceless fricative þ of *\*brōþer* follows a stress [CV] unit too.

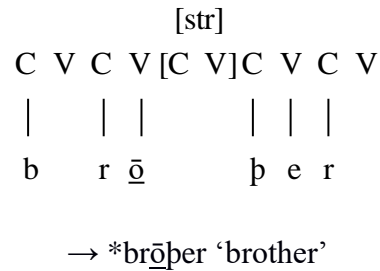
<sup>4</sup> See Saussure (1916:200-201). This case is already mentioned in Scherer (1868:82), but implicitly.

(10)

a.



b.



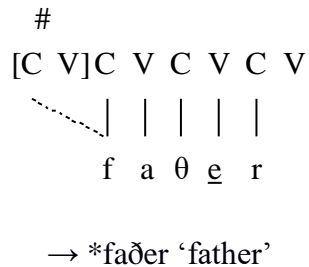
On the basis of this analysis, Scheer (2000) proposes that a fricative cannot be voiced in the two respective contexts because it spreads to a preceding empty C position. There results an underlying fricative geminate that escapes voicing, exactly as the geminate *ss* does (Ségéral & Scheer 2014:12). This assumption is confirmed by the fact that Proto-Germanic has geminates, but no surface geminates \*ff, \*þþ or \*hh.

In initial context (11a) and after stress (11b), the left-edge and stress provide a site for spreading. As a consequence, the following fricatives are virtual geminates (i.e. underlying geminates that surface as single consonants, see Ségéral & Scheer 2001b).

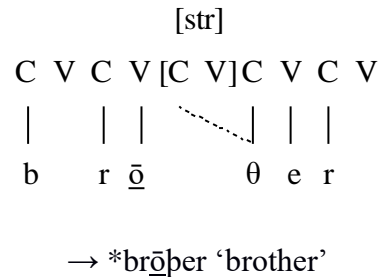
By contrast, after an unstressed nucleus, the conditions are not met for a voiceless fricative to spread, and, as a consequence, a voiced fricative surfaces. For instance, consider the underlying fricative /θ/ of /faθer/ in (11a). The underlying singleton /θ/ is realized as [ð] phonetically.

(11)

a.



b.



To conclude, CVCV makes it possible to capture the fact that Proto-Germanic fricatives behave alike in two different contexts: after stress and in initial position. This is due to the fact that both the stress and the word boundary # have the same skeletal effect in CVCV. In the following section, I argue that stress in fact does not insert any skeletal unit, but it results from the skeletal unit provided by a word boundary.

### 3. Stress as a word boundary: the case of Old Norse

#### 3.1. The problem of Williams (1907)

Williams (1907) points out that Proto-Germanic post-tonic voiceless fricatives became voiced (except *h* which is dropped intervocalically, see [12c]) in Old Norse, Old English, Old Saxon and Old Frisian (henceforth *Northern Sea Germanic Languages*). Compare the Proto-Germanic

roots in the first column of (12) with their respective reflexes in Northern Sea Germanic Languages in the last columns of (12).

(12)<sup>5</sup>

|    | Proto-Germanic | Old English | Old Norse | Old Saxon | Old Frisian | gloss          |
|----|----------------|-------------|-----------|-----------|-------------|----------------|
| a. | *brōþer        | brōðor      | bróðir    | brōðar    | brōther [ð] | <i>brother</i> |
|    | *morþa-        | morð        | morð      | morð      | n/a         | <i>murder</i>  |
| b. | *nefan         | nefa [v]    | nefi [v]  | n/a       | n/a         | <i>nephew</i>  |
|    | *lōfan-        | ME lōve     | lófi [v]  | n/a       | n/a         | <i>hand</i>    |
| c. | *sehwan-       | sēon        | sjá       | sean      | sīa         | <i>to see</i>  |
|    | *þauh          | þeah        | þó        | thōh      | thāch       | <i>though</i>  |

The observation of Williams (1907) is as follows. If we accept that the post-stress context (and not a rule restricted to Proto-Germanic, like ‘voicing is prevented in post-stress context’) is a sufficient phonetic condition for excluding voicing, then we do not expect any voicing of fricatives after a stressed syllable in Northern Sea Germanic Languages. This issue, which concerns the causality of sound changes in general, is already mentioned in Wells (1905).<sup>6</sup>

Following the CVCV representation of Verner's Law presented in Scheer (2000), voicing is not prevented by a rule, but by spreading to a preceding stress [CV]. The fact that geminates resist voicing is not odd, it is widely attested (Scheer 2000). Thus, if voicing is prevented by propagation to the preceding stress [CV] unit (13a), then, by contraposition, the voicing of post-tonic fricatives observed in Northern Sea Germanic Languages implies that these fricatives do not spread anymore to a preceding stress [CV] (13b).

(13)

|    |      | sufficient condition |      | necessary condition             |
|----|------|----------------------|------|---------------------------------|
| a. | IF   | $x$ spreads to [CV]  | THEN | <u>no</u> voicing of $x$        |
| b. | ⇔ IF | voicing of $x$       | THEN | $x$ <u>does not</u> spread [CV] |

The problem of Williams (1907) can also be formulated in terms of phonotactic contrast between the initial position and the position after stress. In Proto-Germanic, the initial position and the context after stress equally affect the segments (compare the two columns of 14a). It is widely assumed that the reason for this parallel behaviour is a property shared by the two contexts (Lerchner 1971; Collinge 1985; Scheer 2000). However, Northern Sea Germanic Languages shed a new light on this assumption. In those languages, the two contexts happen to behave differently (14b). Fricatives remain voiceless in initial position (e.g. \*þunaraz > þórr ‘Thor’), but they are voiced after stress (e.g. \*brōþer > bróðir ‘brother’). Consequently, the

<sup>5</sup> ME = Middle English. Intervocally, < th > encodes ð in Old Frisian (Bremmer 2009:50), < f > encodes v in Old English (Mitchell & Robinson, 1982) and in Old Norse (Gordon, 1927). Note that the final h is dropped only in Old Norse.

<sup>6</sup> ‘The great weakness of most attempted explanations of phonetic laws is their offense to the laws of causality; their failure to show why under identical conditions elsewhere the same change does not result.’ (Wells 1905:527).

common property by the two contexts observed in Proto-Germanic is not shared anymore in Old Norse, for instance.

(14)

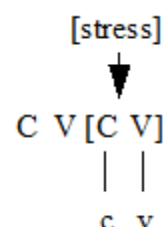
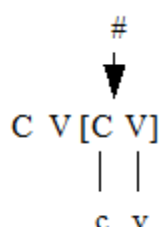
|                   | initial           | post-stress      |
|-------------------|-------------------|------------------|
| a. Proto-Germanic | * <u>p</u> unaraz | *br <u>ō</u> þer |
| b. Old Norse      | <u>p</u> órr      | Br <u>ó</u> ðir  |

In CVCV terms, the common property of the Proto-Germanic initial position and the context after stress is a [CV] unit, inserted at the beginning of the word (15a) and to the right of the tonic nucleus (15b), respectively.

(15)

a. initial context

b. post-stress context



Given that initial fricatives are still unvoiced in the Northern Sea Germanic Languages, I deduce that the condition preventing the voicing process (i.e. spreading to a preceding [CV] unit) must have remained unchanged. It was simply lost in post-stress context. Hence the question in (16).

(16) What is the representation of stress in the Northern Sea Germanic Languages?

In order to tackle this issue, I will analyse the representation of stress in Old Norse.

### 3.2. From one accentual type to another

In the case of a dead language, it is unsafe to determine the accurate pronunciation of the segments. Thus, in order to propose a CVCV representation of the Old Norse stress, I do not focus on the pronunciation of these segments, but on their contrasted evolutions in stressed and unstressed contexts respectively.

For this purpose, I consider the words in Table (17). These words are stressed in Old Norse, but they came to lose stress in Continental Scandinavian. Compare the first two columns of (17): the vowels marked in bold are neither dropped nor shortened in Old Norse (length is represented by an acute accent in Old Norse) (e.g. *mīke* > *mīk* 'me'). Consequently, they are stressed (compare with the unstressed vowels in *\*þumfeti* > *þopt* 'homestead' and *\*dagōz* > *dagar* 'days'). Then, compare the second column with the last three columns of (17): the short cardinal vowels are reduced in Continental Scandinavian (e.g. *mīk* > [maj, mæj, mēj] 'me'), and the long vowels are shortened (e.g. *þū* > [du] 'you.sg'). This vowel reduction shows that these



words came to be unstressed at a given stage in the evolution of Old Norse. Note however that the words in (17) can be stressed again in Modern Continental Scandinavian (e.g. [maj] 'me').<sup>7</sup>

(17)<sup>8</sup>

| Proto-Germanic | Old Norse | Danish      | Norwegian     | Swedish        | gloss            |
|----------------|-----------|-------------|---------------|----------------|------------------|
| *mike          | mīk       | [maj, ma]   | [mæj, mæ]     | [mɛj:, mɛj]    | <i>me</i>        |
| *þeke          | þīk       | [daj, da]   | [dæj, dæ]     | [dɛj:, dɛj]    | <i>you.acc</i>   |
| *þū            | þū        | [du]        | [dʉ:]         | [dʉ:]          | <i>you.nom</i>   |
| *hi-           | hinn      | [æ] (dial.) | n/a           | n/a            | <i>def. art.</i> |
| *þat           | þat       | [dɐ, də]    | [dɛ:, de, də] | [dɛ:t, dɛ, də] | <i>that</i>      |
| *auk           | ok        | [ɔw, ɔ]     | [ɔ:g, ɔ:, ɔ]  | [ɔk:, ɔ:, ɔ]   | <i>and</i>       |

In co-occurrence with loss of stress, the data in (17) also show two atypical consonant lenitions (18). For the sake of clarity, the qualitatively reduced vowels, which differ in Danish ([maj]), Norwegian ([mæj]) and Swedish ([mɛj]), are henceforth represented with V ([mVj]).

First, the voiceless fricatives þ and h are respectively voiced (18ai) and dropped (18aii)<sup>9</sup> before a Continental Scandinavian unstressed nucleus. Second, the voiceless plosives k and t are occasionally lenited after a Continental Scandinavian unstressed nucleus (18b). Note that these two types of lenition can co-occur in the same word (e.g. *þat* > [dV(t)]).

(18)

|              | Old Norse | CScand      |                     | Old Norse | CScand  |
|--------------|-----------|-------------|---------------------|-----------|---------|
| a. i. #þ > d | þū        | [du, dʉ:]   | b. i. k# > (g), (j) | mīk       | [mV(j)] |
|              | þīk       | [dV(j)]     |                     | þīk       | [dV(j)] |
|              | þat       | [dV(t)]     |                     | ok        | [ɔ(:g)] |
| ii. #h > Ø   | hinn      | [æ] (dial.) | ii. t# > (t)        | þat       | [dV(t)] |
|              |           |             |                     | at        | [ɔ, ad] |

These lenitions illustrated in (18) are stress-sensitive in the sense that they occur only in words that become unstressed in Continental Scandinavian.

<sup>7</sup> Note that the long vowel ʉ of Norwegian and Swedish dʉ: does not stem from Proto-Germanic: the stressed vowels occurring in open stressed syllables are lengthened in these languages (Riad 2013:168-169; Kristoffersen 2000:155).

<sup>8</sup> The data in Danish, Norwegian and Swedish are from Brink et al. (1991), Vanvik (1985) and Hedelin (1997), respectively.

<sup>9</sup> About hinn > inn > æ, I assume following Jónsson (1921:315) and Noreen (1904:§511) that inn is a variant of hinn after h-dropping. It should be mentioned that some analyses argue that hinn and inn are not the same word (e.g. Skrzypek 2009). However, both can be used as definite articles preceding an adjective, and while inn is the most common clitic form of the definite article after a noun, Jónsson (1901:79) also notices an occurrence of hinn in *æigi hin* (= enginn 'no one') (contra Skrzypek 2009). Moreover, it has to be noticed that the initial h of the personal pronouns hann 'he' and hans 'his' is also dropped in the cliticized forms an, an, ans (Noreen 1904:§312; Brøndum-Nielsen 1932:§379).

Only the left-sided lenitions illustrated in (18a) (e.g. *pū* > [du]) seem to be relevant for the representation of stress in Old Norse. First, they are not optional (unlike *pat* > [dV(t)]). Second, they are pan-Germanic: the other Germanic languages show the same lenition of *p* and *h* in cognates (19a, b).<sup>10</sup> This is confirmed by the fact that the fibula of Bülach (Switzerland, 3/6th century) displays early the form *du* 'you.sg' from Proto-Germanic *\*pū*, i.e. a form with lenition (Looijenga 1997:135). For this reason, the left-sided lenition can be assumed to occur early in Old Norse.

(19)

|    | Proto-Germanic                   | Dutch                | W. Frisian          | English             | C. Scand.       |
|----|----------------------------------|----------------------|---------------------|---------------------|-----------------|
| a. | <i>*pū</i> 'you' <sup>nom</sup>  | <i>du</i> /dy/ (MD)  | <i>do</i> [du]      | <i>thou</i> [ðau]   | <i>du</i>       |
|    | <i>*pa-</i> 'this'               | <i>dat</i> [dat]     | <i>de</i> [də]      | <i>that</i> [ðæt]   | <i>de</i>       |
|    | <i>*pauh</i> 'though'            | <i>doch</i> [dɔx]    | <i>dochs</i> [dɔxs] | <i>though</i> [ðəʊ] | <i>dɔk</i>      |
| b. | <i>*hi-</i> 'this' <sup>11</sup> | <i>het</i> [ət, hɛt] | <i>it</i> [ət]      | <i>it</i> [It]      | <i>æ</i> (Jut.) |

Moreover, the definite article *hinn/inn* evidences the fact that the left-sided lenition is synchronic in Old Norse. Following Jónsson (1921), I assume that *hinn* and *inn* are two variants of the same word. Jónsson (1921) gives the variants of the definite article in (20). The form *inn* results from *hinn* after initial *h* drops (about *h*-dropping, see Noreen 1904:§312 and Brøndum-Nielsen 1932:§379), and the form *enn* shows a vowel reduction *i* > *e* related to the absence of stress (Jónsson 1921:315).

(20)

|     | [i]         | [ə]          |
|-----|-------------|--------------|
| #h- | <i>hinn</i> | <i>*henn</i> |
| #Ø- | <i>inn</i>  | <i>enn</i>   |

The important fact is that when the vowel is reduced to *e* (i.e. *enn*), initial *h* does not occur (i.e. *\*henn*).<sup>12</sup> The reduced vowel guarantees that the form is unstressed. Consequently, *h* may not surface in an unstressed word in Old Norse. Note that the form *inn* does not imply that the initial *h* can be dropped before a stressed vowel. Indeed, the presence of the plain vowel [i] does not guarantee the presence of stress. Reduction of unstressed vowels applies earlier in some dialects (Jutland) than in others (Sweden, Norway) (Brøndum-Nielsen 1932:406).

Another evidence comes from the enclitic use of the definite article *hinn/inn*. When the definite article is employed as an enclitic, it never shows any initial /h/ (see 43). Since a clitic

<sup>10</sup> Following Howe (1996:87), the evolution *p* > *ð* in initial position is due to the absence of stress.

<sup>11</sup> Following Weekley (192), the change *h* > Ø is due, in Old English *hit* > English *it* 'it', to the absence of stress. The same change can be found in *him* [im]. Note that in Dutch, an alternation between initial *h* and Ø is also attested in *hij* [hei, i] 'he' (Howe 1996).

<sup>12</sup> There are only two counter-examples to this generalization: Old Swedish *hæn* and Old Icelandic *henni* (dative singular of *\*henn*). Both are attested only once (Noreen 1884, 1904). However, as noticed in Noreen (1904:§510), these forms could result from the influence of the demonstrative *þann* (Old Swedish *þæn*). Moreover, I suppose that the initial *h* could also be exclusively orthographic in this case, like in Old Danish *hoc* (= *ok* < *\*auk* 'and'), *hæftir* (= *eptir* < *\*aftiri* 'after') (Brøndum-Nielsen 1932:§379).

is supposed to be unstressed (Zwicky 1985)<sup>13</sup>, example (21) confirms that *h* does not appear before an unstressed vowel.

- (21) *h*undr-inn                      *the dog*

In conclusion, the lenition of an initial *h* is not only a diachronic phenomenon: *h* is underlyingly present in the morpheme /*hinn*/ but it never surfaces before an unstressed vowel. Accordingly, I assume that the attested unstressed forms *ðu*, *ðat* and *ðar*, which are supposed in Noreen (1884:§221) to be reflexes of the stressed forms *þú*, *þat* and *þar*, are in fact variants of the latter forms (22) in Old Norse.

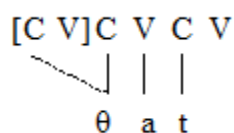
(22)

| stressed form | unstressed form | gloss                   |
|---------------|-----------------|-------------------------|
| <i>hinn</i>   | <i>inn, enn</i> | <i>definite article</i> |
| <i>þú</i>     | <i>ðu</i>       | <i>you.sg</i>           |
| <i>þat</i>    | <i>ðat</i>      | <i>that</i>             |
| <i>þar</i>    | <i>ðar</i>      | <i>there</i>            |

Thus, the stress-sensitive lenitions observed at the left-edge are relevant in Old Norse as an effect due to the absence of a stress [CV]. Accordingly, I deduce that, in Old Norse, a [CV] unit is inserted to the left of the stressed nuclei only and this is responsible for the fact that the fricatives followed by a stressed nucleus are not lenited (compare 23a and 23b). At this stage of the analysis, I assume this [CV] unit to be an exponent of stress (i.e. to be inserted by stress) as the lenition is correlated to the absence of stress (Noreen 1884:§221).

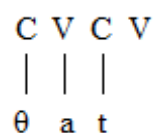
(23)

a.



→ *þat* 'that'

b.



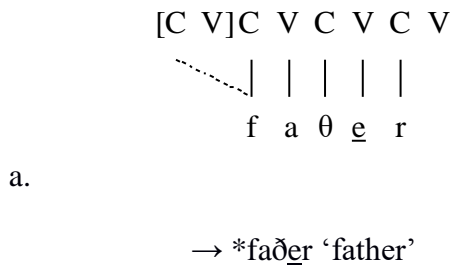
→ *ðat* > *de*

I now turn to the resolution of Williams' problem. The representation of Old Norse stress given in (23) accounts for the different behaviours of voiceless fricatives in the initial and post-stress contexts (Williams 1907).

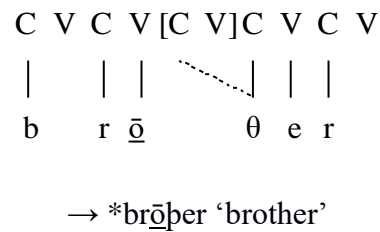
Recall the Proto-Germanic situation. Proto-Germanic has a left-edge [CV] unit inserted at the beginning of the word (24a), and a stress [CV] unit inserted to the right of the stressed nucleus (24b). The fricatives following an empty [CV] resist voicing because they spread. Consequently, we expect fricatives to be voiceless in both contexts, initial and after stress.

<sup>13</sup> Note that the reflex of this enclitic form in Continental Scandinavian always shows a reduced vowel (e.g. *hunden*).

(24)

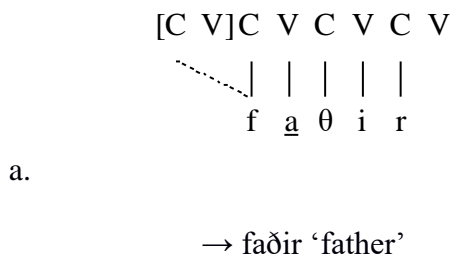


b.

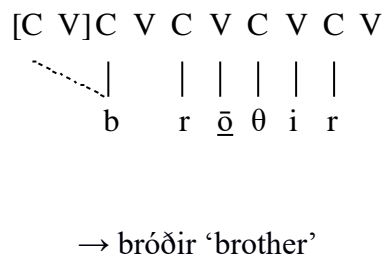


In Old Norse, stress inserts a [CV] unit to the left of the stressed nucleus (25). There is no empty [CV] unit to the right of the stressed nucleus anymore (compare 24b and 25b). Accordingly, we expect the surface realizations of the fricatives to contrast in the initial and post-stress contexts. In initial context, the fricatives are preceded by an empty [CV] unit (its status will be discussed later), and thus resist voicing. After stress, the fricatives are not preceded by an empty [CV] anymore, and are consequently likely to be voiced.

(25)



b.

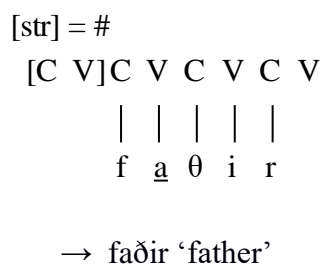


In sum, I have proposed a solution to Williams' problem based on an external argumentation about the representation of stress in Old Norse. Both Williams' problem and the lenition of initial fricatives in unstressed context involve a [CV] exponent of stress inserted to the *left* of the stressed nucleus. Despite the fact that this left-inserted [CV] unit is definitely correlated to stress, its status remains unclear. In principle, two options are available: it could be a left-edge [CV] or a stress [CV]. In the following section, I argue that the underlying representation of stress is nothing but a left-edge [CV].

### 3.3. Stress as a word boundary

In the previous section, we saw that the [CV] exponent of stress is inserted to the left of the stressed nucleus in Old Norse. This implies that the respective exponents of stress and the left-edge do not contrast in this language. Indeed, Old Norse stress is initial and fixed. In a word like *faðir*, this [CV] unit coincides with the one inserted at the beginning of the word (26).

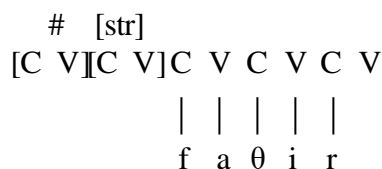
(26)



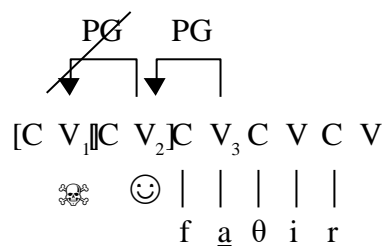
By virtue of ECP (3c), the CVCV model predicts that there cannot be two empty [CV] units inserted at the beginning of the word (27a). Indeed, in (27b),  $V_3$  (the nucleus identified by the vowel /a/) properly governs  $V_2$  (the nucleus of the position inserted by stress), but  $V_1$  is not properly governed. Accordingly, we do not expect a word to have two consecutive initial [CV].

(27)

a.



b.



Consequently, only one [CV] unit may be inserted to the left of the stressed nucleus. This unit is either the exponent of stress, or that of the left-edge. It cannot be both, because these [CV] units are not inserted by the same mechanisms (i.e. prosodic vs. morphological).

Moreover, the data in (22) show a correlation between the absence of stress and the absence of word boundary: when the word is unstressed, we observe none of them (23b), since there is *no* initial [CV] (e.g. *þat* / *ðat*). Thus, there is an equivalence between stress and the word boundary in Old Norse.

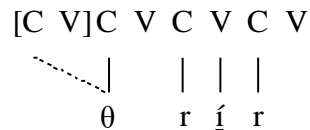
I argue that this initial [CV] unit is the exponent of the left-edge because: (i) this accounts for the fact that stress is initial in Old Norse; and (ii) the initial [CV] does not correspond to the CVCV definition of stress (Larsen 1994). Following Larsen (1994:133), the [CV] unit provided by stress is ‘immediately’ adjacent to the position tonic nucleus. But the data in (28) are not compatible with an interpretation of the initial [CV] as the exponent of stress.

(28)

| Old Norse | Gloss        |
|-----------|--------------|
| þrír      | <i>Three</i> |
| frú       | <i>Lady</i>  |
| hringr    | <i>Ring</i>  |
| hnot      | <i>Nut</i>   |

The words in (28) have initial onsets the first constituent of which is a voiceless fricative. Following the analysis of Scheer (2000) and extending it to Old Norse, the voiceless fricatives involve a preceding [CV] unit (29). However, this [CV] unit is not directly inserted to the left of the stressed nucleus: in other words, it is not adjacent to the CV slot hosting the stressed nucleus. Thus, it does not correspond to Larsen's definition of stress (see 29) (see Larsen 1994).

(29)



Consequently, the initial [CV] unit is, by definition, an exponent of the left-edge. Since entities should not be multiplied beyond what is necessary, it is inaccurate to state that the initial [CV] is inserted by stress in (23a), and by the left edge in (29). Thus, the initial [CV] is always inserted by the left-edge in Old Norse.

Given the equivalence between this [CV] unit and stress, I conclude that stress is a phonetic phenomenon conditioned by the [CV] unit inserted by the left-edge.

In sum, Old Norse stress does not insert any [CV] unit in Old Norse. Conversely, the realization and the placement of stress are conditioned by a left-edge. Accordingly, if stress can be underlyingly represented by a left-edge, this implies that it is not a universal phonological item and, consequently, not a primitive. Stress turns out, in the case of Old Norse, to be the phonetic expression of a left-edge.

In the following, I verify this conclusion in Proto-Germanic.

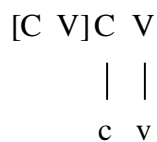
#### 4. Stress as an internal boundary: the case of Proto-Germanic

##### 4.1. Problem with Scheer's representation of Verner's Law

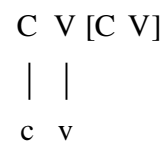
I now turn to a problem pertaining to the CVCV analysis of Verner's Law. This problem affects the CVCV definition of stress in Scheer's (2000) representation. I mentioned in the last section that stress inserts a [CV] unit *immediately* to the adjacency of the stressed nucleus (Larsen 1994:133). That is, the stress [CV] must precede (30a) or follow (30b) the CV slot containing the stressed nucleus.

(30)

a.



b.



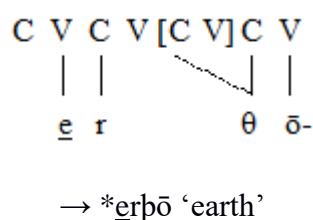
The data in (31) are problematic for this analysis. Indeed, in Proto-Germanic, we find post-stress voiceless fricatives not only immediately after the stressed nucleus, but also after the coda consonant, i.e. in a position that is not adjacent to the stressed nucleus.

(31)<sup>14</sup>

|      | Proto-Germanic    | Example   | gloss           |
|------|-------------------|-----------|-----------------|
| a. þ | * <u>e</u> rpō-   | OE earþ   | <i>earth</i>    |
|      | *fer <u>p</u> u-  | OHG furt  | <i>firth</i>    |
|      | *h <u>u</u> lþa-  | ON holr   | <i>inclined</i> |
|      | *g <u>u</u> lþa-  | ON gull   | <i>gold</i>     |
|      | *w <u>a</u> lþu-  | ON vǫllr  | <i>forest</i>   |
|      | *f <u>e</u> nþan- | ON finna  | <i>find</i>     |
|      | *m <u>u</u> nþa-  | ON munnr  | <i>mouth</i>    |
|      | *t <u>a</u> nþ-   | ON tǫnn   | <i>tooth</i>    |
| b. f | *w <u>u</u> lfa-  | OHG wulpa | <i>wolf</i>     |
|      | *f <u>e</u> mf-   | NHG fünf  | <i>five</i>     |
| c. h | * <u>a</u> rhwō-  | OE earh   | <i>arrow</i>    |
|      | *m <u>e</u> lha-  | ON melr   | <i>dune</i>     |
|      | *s <u>e</u> lha-  | OE seolh  | <i>seal</i>     |
|      | *t <u>a</u> nhu-  | OE tōh    | <i>tough</i>    |

Scheer (2000) does not consider these data. Trying to adapt his argument to them, we must hypothesize the representation given in (32). An empty [CV] unit is located after the coda r.

(32)



This empty [CV] unit does not correspond to the CVCV representation of stress given in Larsen (1994:133). Unlike the [CV] unit provided by stress, it is not inserted directly to the right of the stressed nucleus.

Faced with this situation, one could think of analyzing these data as the result of a post-coda strengthening. However, the data in (33) show that the voicing is not systematically prevented in this context. Consequently, the post-coda voiceless fricatives of Proto-Germanic cannot be accounted for without assuming a stress-related [CV] unit preceding them.

<sup>14</sup> In Old Norse, the voiceless fricative þ is assimilated to a preceding l or n (\*munþa- > munnr). This is not the case with the voiced fricative ð (\*lanða- > land) (Gordon 1927:283).

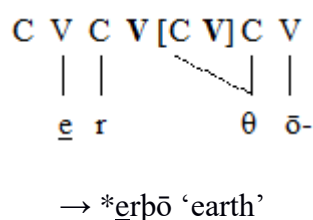
(33)

| Proto-Indo-European     | Proto-Germanic                | Old English  | gloss           |
|-------------------------|-------------------------------|--------------|-----------------|
| *pel-t <u>o</u> -       | *fal <u>ð</u> an              | fealdan      | <i>to fold</i>  |
| *k <u>o</u> rt <u>u</u> | *har <u>ð</u> u               | heard        | <i>hard</i>     |
| *sel <u>p</u> -         | *sal <u>b</u> o <u>j</u> anan | sealfian [v] | <i>to salve</i> |

As a conclusion, the phonetic derivation of the post-coda fricatives definitely seems to be stress-sensitive, but the actual CVCV definition of stress (Larsen 1994) does not account for it.

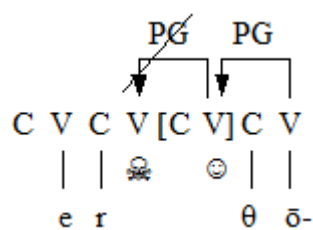
Moreover, the representation in (32) implies two consecutive empty nuclei: the first one follows the coda, and the second one is the V position of the inserted [CV] (in bold in [34]).

(34)



According to the Government Phonology introduced in Kaye et al. (1990), in such a configuration, the empty nucleus following the coda is not properly governed (35). Following ECP (3c), it cannot remain unexpressed. Accordingly, the representation in (35) is ill-formed.

(35)

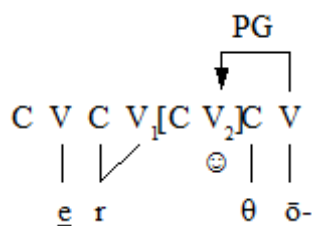


Two options have been proposed in the literature to avoid similar problems. The first one relies on the observation that the coda of the stressed syllable is always a sonorant (see 31). We can assume that it spreads to the V position located to its right (36a) (see Pöchtrager 2001:63). Thus, V<sub>1</sub> is not empty, and it does not need to be governed.

As a second option, one could assume that the geminates of Proto-Germanic are domains, in the sense that the V position located between the two branches of the geminate need not be properly governed. The representation satisfies ECP, since proper government applies directly from the last vowel to V<sub>1</sub> (36b). Note that this solution is not generally accepted in CVCV (see Scheer 2004:279).



a.



$$\begin{array}{ccccccc}
 & & & & \text{PG} & & \\
 & & & & \downarrow & & \\
 \text{C} & \text{V} & \text{C} & \text{V}_1 & [\text{C} & \text{V}_2] & \text{C} & \text{V} \\
 | & | & \ominus & \swarrow & \searrow & & | \\
 \text{e} & \text{r} & & \theta & & & \bar{o}
 \end{array}$$

(37)

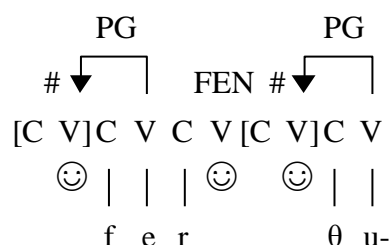
| Proto-Germanic | gloss                  |
|----------------|------------------------|
| *knappa        | <i>terse</i>           |
| *kubba         | <i>something round</i> |
| *attan         | <i>father</i>          |
| *hakkōn        | <i>hack</i>            |
| *knagga        | <i>thick piece</i>     |
| *gellan        | <i>shrill</i>          |
| *kverru        | <i>quiet</i>           |
| *granna        | <i>thin</i>            |
| *ammōn         | <i>mother</i>          |
| *ajja          | <i>egg</i>             |
| *dawwa         | <i>dew</i>             |

In fact, I showed that the CVCV representation of stress cannot account for these data. Now, I will show that this issue can be solved if we assume that the CV unit that involves gemination is not provided by *stress* (*contra* Scheer 2000), but it is provided by *morphology* (i.e. it is a boundary), just like in Old Norse.

If we assume that the [CV] unit inserted to the left of the post-coda fricative is an internal boundary (see Pagliano 2003), then the preceding empty nucleus is in the final position of a

domain (38). Following ECP (see 3c), final empty nuclei (FEN) may remain unexpressed even if they are not properly governed. Consequently, the analysis of stress as an edge accounts for the post-coda voiceless fricatives of Proto-Germanic and for the consecutive empty nuclei involved in this configuration.

(38)



→ \*ferþu-

The representation in (38) does not imply that Verner's Law is not correlated to stress: Verner (1877) very convincingly showed that it is. However, this analysis supposes that stress is not the *cause* of Verner's Law. Following the representation in (38), the phenomenon that triggers resistance to voicing is a CV boundary, not a stress CV. As a consequence, if Verner's Law and stress are correlated, but assuming that the cause of Verner's Law is a CV boundary, then stress is a phonetic effect of (i.e. it is deductible from) this morphologically provided CV too (that is why it is not represented in the underlying form in 38).

This analysis implies that a word like \*ferþu- is parsed as follows: \*fer-þu-. Note that this verified by the parsing of the Proto-Indo-European roots in (39).

(39)

| PIE       | PGrm             | gloss        |
|-----------|------------------|--------------|
| *er-t-    | * <u>er</u> pō-  | <i>earth</i> |
| *pr-tu-   | *f <u>er</u> þu- | <i>firth</i> |
| *ghel-to- | *g <u>ul</u> pa- | <i>gold</i>  |

To conclude, I showed that the analysis of stress as an edge is not only available for Old Norse, but it also accounts for the post-coda voiceless fricatives in Proto-Germanic. The difference between Proto-Germanic and Old Norse is parametric: (i) in Proto-Germanic phonetic stress is realized on the vowel that precedes an internal boundary; while (ii) in Old Norse, it is realized on the vowel that follows the left-edge CV. This parametrization of stress position regarding to boundaries is comparable to the parametrization of stress CV position in (2).

The question now is: why is this boundary retained in some words (e.g. \*b<sup>h</sup>reH<sub>2</sub>-ter > \*brō#*þer*), but not in all (e.g. \*faH-ter > \*faðer 'father')? My opinion (although this issue requires more research) is the following: suffixes that did not retain the boundary in Proto-Germanic were in fact realized as *internal* suffixes (suffixes situated in the inner domain of the morphological tree). Such a morphological conditioning of Verner's Law could be verified in Gothic. Gothic underwent the voicing of fricatives after an unstressed nucleus, except in a

specific morphological context: in strong verbs (e.g. \**falðan* > got. *falpan*) (Hirt 1931; Prokosch 1939; Bennett 1968).

### 5. Conclusion

In this paper, I argued that stress is not a phonological primitive. It does not insert, but results from an empty [CV] unit. In the case of Old Norse and Proto-Germanic, this [CV] unit is provided by a boundary in the sense of Lowenstamm (1999) and Pagliano (2003).

I focused on the representation of stress in Old Norse. I showed that, in this language, there is a correlation between the absence of stress and the absence of word boundary. If we assume that stress results from a word boundary, we account for both this correlation and the fact that stress is initial and fixed in Old Norse.

Finally, I showed that the hypothesis that stress may be underlyingly represented by a boundary predicts Proto-Germanic phonotactic properties that were previously excluded in Scheer's proposition: post-coda voiceless fricatives.

From the empirical point of view, I pointed out the correlation between stress and the edge. From the theoretical point of view, I proposed that stress is the expression of an edge. As a consequence, Verner's Law is *edge-sensitive*, not stress-sensitive. In fact, the analysis proposed in this paper supposes that *both* Verner's Law and stress are phonetic effects of the morphological insertion of a CV boundary.

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# English participle allomorphy as inflection classes

Johannes Hein

Based on English participial allomorphy, Embick (2003) proposes a division of vocabulary insertion into an inner cycle targeting root-attached and an outer cycle targeting all other terminal nodes. However, this division leads to (i) a weakening of the notion of syncretism and (ii) a blurring of structural vs. linear locality. In this paper, I propose an account couched in a slightly extended version of Keine's (2013) variant of Distributed Morphology which makes use of 'accessibility relations' between exponents such that only a subset of all exponents competes for insertion. This has two advantages: on the one hand, it correctly accounts for English participial allomorphy but avoids split insertion and its theoretically problematic implications. On the other hand, it is able to deal with inflection classes that have been notoriously problematic for post-syntactic morphology.

## 1. Introduction

Distributed Morphology usually distinguishes *l*-morphemes and *f*-morphemes with insertion of lexical stems applying to the former and insertion of inflectional exponents applying to the latter (cf. Halle 1992; Embick 1997; Marantz 1997; Harley & Noyer 1998, 1999). Marantz (1997) regarded lexical stems to be the part of a word which is not a realisation of morphosyntactic features while nowadays lexical stems are assumed to be themselves composed of a category-neutral root and category-assigning head (Marantz 2001; Embick & Noyer 2007; Embick & Marantz 2008).

The latter hypothesis is what underlies the analysis of English participle allomorphy in Embick (2003). In English, past/passive participles can show different morphological realisations depending on the identity of the lexeme itself (1-a vs. b vs. c) and/or its structural environment, i.e. attributive (1-c-i) or predicative use (1-c-ii).

- (1) a. (i) The clos-*ed* window.  
(ii) The window was clos-*ed* (by John).
- b. (i) The brok-*en* window.  
(ii) The window was brok-*en* (by John).

- c. (i) The rott-*en* apple.
- (ii) The apple was rott-*ed*.

He proposes two cycles of vocabulary insertion, one into root-attached terminals and the other into all other terminals. The structural difference between attributive and predicative participles then lies exactly in root-attachment vs. non-root-attachment. For both cycles, the identity of the root must be visible in order to determine that *-en* is inserted in attributive participles for  $\sqrt{\text{break}}$  and  $\sqrt{\text{rot}}$  but that it is only inserted in the predicative participle for  $\sqrt{\text{break}}$  not for  $\sqrt{\text{rot}}$ . Embick is forced to weaken the notion of syncretism considerably if e.g. the *-en* that attaches to  $\sqrt{\text{break}}$  and  $\sqrt{\text{rot}}$  in the attributive cases is to be regarded as identical to the *-en* that attaches to  $\sqrt{\text{rot}}$  only in the predicative cases. Additionally, for the root to influence the insertion into a non-root-attached terminal it has to be linearly adjacent to it (all intervening material has to be phonologically null). However, the actual phonological shape of a vocabulary item should not play a role for its insertion or the insertion of other vocabulary items. These problems will be discussed in detail in section 3. I argue that these drawbacks can be avoided in a variant of Distributed Morphology developed by Keine (2013) that assumes a structured inventory of exponents. At any given point in the derivation of a participle only a subset of the vocabulary items compete for insertion, namely those that are ‘accessible’ from the vocabulary item inserted in the directly preceding derivational step or from the root itself. In this framework, there is no need for two cycles of insertion and the modifications of the notions of syncretism and adjacency that these entail. A root can influence which participle allomorph it occurs with because only these allomorphs are accessible from it. One and the same exponent (e.g. *-en*) might be accessible from different roots (e.g.  $\sqrt{\text{break}}$  and  $\sqrt{\text{rot}}$ ) but its competition is different for each root. This is because other exponents (e.g. *-ed*) are accessible from some of these roots (e.g.  $\sqrt{\text{rot}}$ ) but not from others (e.g.  $\sqrt{\text{break}}$ ).

In section 2 of this article, I will first present the allomorphy pattern of English participles and then give a brief outline of Embick’s analysis. I will point out its problematic entailments in section 3 and argue for their implausibility. Section 4 will introduce a new view of the data and some basics of Keine’s variant of Distributed Morphology. Subsequently, an analysis of the English participles in this variant of DM will be presented that accounts for the data and avoids the problems identified in section 3.

## 2. Embick (2003)

Embick (2003) presents an analysis of the morphology of English participles in Distributed Morphology where – contrary to the original framework – *l*-morphemes are regarded as category-free roots that need to be categorised by a particular functional head (*v*, *n*, *a*) in syntax (see e.g. Marantz 1996, 1997, 2001; Arad 2003; Harley 2005; to name only a few). Based on the allomorphy pattern of the participles it is argued that (i) syntactic adjacency has a direct influence on morphological Spell-Out, that (ii) insertion of vocabulary items takes place in cycles, that (iii) due to these cycles the notion of syncretism needs to be refined and that (iv) alongside syntactic adjacency phonological adjacency of vocabulary items plays a role, too.

### 2.1. The phenomenon

The argumentation is based on the observation that the actual morphological form of a participle is dependent, on the one hand, on the underlying root and, on the other hand, on the status of the participle as ‘adjectival’ or ‘passive’. The first point is exemplified by the pair *broken/closed* in (2).<sup>1</sup>

- (2) a.  $\sqrt{\text{break}}$   
       (i) The broken window.  
       (ii) The window was broken (by John).  
       b.  $\sqrt{\text{close}}$   
       (i) The closed window.  
       (ii) The window was closed (by John).

In the adjectival as well as the passive environment the participle of  $\sqrt{\text{break}}$  is realised by *-en* and that of  $\sqrt{\text{close}}$  by *-ed*. As evidence for the second point, Embick (2003) cites roots such as  $\sqrt{\text{rot}}$ ,  $\sqrt{\text{sink}}$  or  $\sqrt{\text{open}}$  whose adjectival form (i) is different from their passive form (ii) as shown in (3).

- (3) a.  $\sqrt{\text{sink}}$   
       (i) The sunken ship.  
       (ii) The ship was sunk.  
       b.  $\sqrt{\text{rot}}$   
       (i) The rotten apple.  
       (ii) The apple was rotted.  
       c.  $\sqrt{\text{open}}$   
       (i) The open door.  
       (ii) The door was opened.

Embick (2003) deduces two questions from the above:

1. How can the allomorphy between adjectival and passive (verbal) participles of one and the same root be derived (i.e. *rotten* vs. *rotted*)?
2. Are same forms in different roots like *-en* in *rotten* vs. *-en* in *broken* syncretic or accidentally homophonous?

### 2.2. Embick's (2003) analysis

Embick (2003) argues that the allomorphy mentioned in question 1 can be derived with recourse to structural configurations. Adjectival and passive participles can be assigned different underlying syntactic structures based on their different semantic properties as exemplified by particular tests (Kratzer 1996; Embick 2004). Adjectival participles have no eventive reading (4) and can hence be identified as statives.

<sup>1</sup>Here, potential phonological changes of the root like *break*→*broke* are abstracted away from.



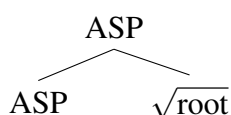
- (4) a. \*The package remained carefully open. (eventive reading)  
 b. The door was built open. (stative reading) (Embick 2004)

Passive participles on the other hand have (two different) eventive readings but no stative reading and can thus be identified as eventives.

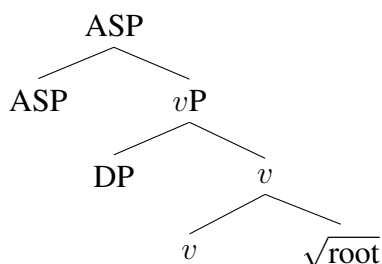
- (5) a. The package remained carefully opened.  
 b. \*The door was built opened.

Under the assumption that different interpretations of participles go hand in hand with different underlying syntactic structures, particularly that eventive readings presuppose the existence of a verbalising head *v*, he can distinguish three participial structures: stative (6-a), resultative (6-b), and eventive passive (6-c)

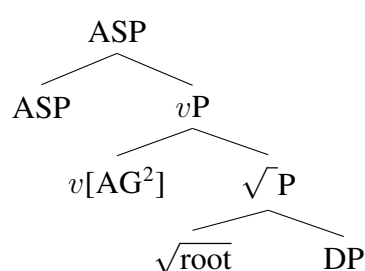
- (6) a. *stative*



- b. *resultative*



- c. *eventive passive*



The ASP head is the locus of insertion of the participial endings. In resultatives and eventive passives the ASP head selects a verbaliser phrase *vP* containing the root, whereas in statives it is merged directly with the root.<sup>3</sup> The allomorphy between adjectival and verbal participles (*v*-participles) as exemplified in (5), is hence reduced to the structural property of the ASP head to be ‘root-attached’ (6-a) and (5-i) vs. ‘*v*-attached’ (6-b, c) and (5-ii). From this follows the allomorphy generalisation in (7).

<sup>2</sup>AG = agentive

<sup>3</sup>According to core assumptions of Distributed Morphology, insertion into ASP can only be sensitive to the root if there are no other heads intervening between the two. However, as one can see when comparing the two eventive participles in (2-a-ii) and (2-b-ii), the choice of exponent is in fact dependent on the identity of the root even though *v*[AG] intervenes. As will be discussed in section 3, this leads Embick to postulate that vocabulary insertion is sensitive to the root not only under structural adjacency (as in (6-a)) but also under linear adjacency (as in (6-c) with a  $\emptyset$ -realisation of *v*[AG]).

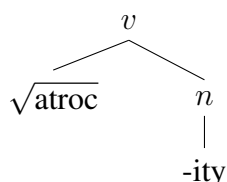
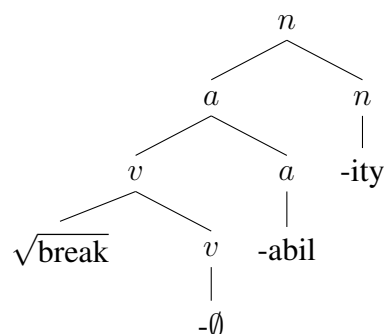
(7) *Allomorphy Generalisation* (Embick 2003:150)

A “stand-out” participial allomorph, like the *-en* in *rott-en* as opposed to perfect and passive *-ed*, is found only in the stative syntactic structure.

This means that a pattern with a resultative participle being different from the respective stative and eventive passive participle of the same root is impossible as only the stative is structurally different in the relevant sense (i.e. it does not have *v*). This is a generalisation that seems to hold for English.

Concerning the second question, whether same forms in different roots are syncretic (i.e. *-en* in *rotten* vs. in *broken*), Embick (2003) follows a principle that is either implicitly or explicitly assumed in many morphological analyses (cf. the Syncretism Principle, Müller 2005:237). This principle states that exponents with the same morphological form have the same morphological function, i.e. are identical, unless there is proper evidence to the contrary. He calls it AVOID ACCIDENTAL HOMOPHONY and argues convincingly that the ASP head in statives is the same syntactic head as the ASP head in resultatives and eventive passives. Its name is arbitrary but importantly, this head is associated with stativity and is present in statives as well as in *v* participles. This means that both *-en* in the stative participle of  $\sqrt{\text{rot}}$  and *-en* in the stative and *v*-participle of  $\sqrt{\text{break}}$  can be regarded as having the same function, i.e. realising the same functional head ASP, thereby being syncretic.

The fact that ASP can attach to roots as well as projections of *v* is a general property of derivational morphology (Marantz 2001). ASP is comparable to Marantz’s *n* in words like *atroc*ity and *break*ability which can also select both bare and already categorised roots as shown in (8) where *n* merges with a bare root in (8-a) but with an structure labelled *a* in (8-b).

(8) a. *Structure of atroc*ityb. *Structure of break*ability

A second point evinced by (8) is that one and the same vocabulary item (here: *-ity*) can be inserted into both root-attached and non root-attached nodes.

A very similar situation obtains with participles where one and the same vocabulary item (e.g. *-en* in *broken* or *-ed* in *closed*) can be inserted into a root-attached ASP head (stative) and into a non root-attached ASP head (resultative and eventive passive). One exception is posed by those participles that show different vocabulary items in different environments. In order to derive these under the above mentioned assumptions about structures and syncretisms, Embick (2003) devises a process of insertion that applies cyclically. In the first cycle, insertion happens only to root-attached heads (Root Cycle) and in the second cycle, insertion applies to all the other

heads (Outer Cycle). The inventory of vocabulary items in both cycles is the same, however, the content of the lists (i.e. information about the roots in whose context a certain VI can be inserted) that can be accessed during insertion may vary. Furthermore, information about the root has to be accessible in the Outer Cycle, because *v*-participles can show root-dependent allomorphy.

An analysis of the English participles adhering to those assumptions leads to the postulation of the following vocabulary items (Embick 2003:161).<sup>4</sup>

- (9) a. Insertion into ASP: Root Cycle  
 ASP  $\leftrightarrow$  -en/\_\_\_{ $\sqrt{\text{rot}}$ ,  $\sqrt{\text{shrink}}$ , ...}  
 ASP  $\leftrightarrow$  - $\emptyset$ /\_\_\_{ $\sqrt{\text{open}}$ ,  $\sqrt{\text{empty}}$ , ...}  
 ASP  $\leftrightarrow$  -t/\_\_\_{ $\sqrt{\text{bend}}$ , ...}  
 ASP  $\leftrightarrow$  -èd/\_\_\_{ $\sqrt{\text{bless}}$ ,  $\sqrt{\text{allege}}$ ,  $\sqrt{\text{age}}$ , ...}  
 ASP  $\leftrightarrow$  -ed/\_\_\_{ $\sqrt{\text{close}}$ ,  $\sqrt{\text{obstruct}}$ , ...}  
 b. Insertion into ASP: Outer Cycle  
 ASP  $\leftrightarrow$  -en/\_\_\_{ $\sqrt{\text{break}}$ ,  $\sqrt{\text{speak}}$ , ...}  
 ASP  $\leftrightarrow$  - $\emptyset$ /\_\_\_{ $\sqrt{\text{hit}}$ ,  $\sqrt{\text{sing}}$ ,  $\sqrt{\text{shrink}}$ , ...}  
 ASP  $\leftrightarrow$  -t/\_\_\_{ $\sqrt{\text{bend}}$ ,  $\sqrt{\text{bought}}$ , ...}  
 ASP  $\leftrightarrow$  -ed

This gives rise to the question whether vocabulary items such as ASP  $\leftrightarrow$  -en/\_\_\_{ $\sqrt{\text{rot}}$ ,  $\sqrt{\text{shrink}}$ , ...} and ASP  $\leftrightarrow$  -en/\_\_\_{ $\sqrt{\text{break}}$ ,  $\sqrt{\text{speak}}$ , ...} are actually syncretic or just two accidentally homophonous elements. Embick (2003) argues for the former view because the two are identical and only differ with respect to the content of their lists. He refers to Marantz's (2001) observation that a combination like (10-a) often has an idiomatic interpretation, meaning that a list (the encyclopedia) is consulted, whereas this is not the case in (10-b). Nevertheless, neither the root nor *x* are different in both cases.

- (10) *Abstract structure* (cf. Embick 2003:162)

- a.  $\sqrt{\text{root-}x}$   
 b.  $\sqrt{\text{root-}y-x}$

From this he derives the general principle in (11).

- (11) *Listedness* (Embick 2003:163)

Listed information is cycle-dependent. Whether a list is accessed for insertion, and the particular contents of that list, are determined by whether or not the node to be spelled out is in the Root or Outer Cycle.

He then goes on to define two types of morphological identity, an intracyclic one corresponding to the common perception of syncretism, and an intercyyclic one which he calls Substantive Identity (12).

<sup>4</sup>The present participle exponent *-ing* also realises an ASP head, though one that bears the tense feature [pres]. The vocabulary item ASP[pres]  $\leftrightarrow$  /-ing/ is not listed here because ASP[pres] would always be realised by *-ing* due to specificity and therefore plays no role in the allomorphy pattern.

(12) *Substantive Identity* (Embick 2003:163)

Two vocabulary items show *substantive identity* when (1) the features responsible for insertion are the same, and (2) these features are paired with identical exponents.

This definition excludes differences in the content of lists as a reason for two otherwise identical vocabulary items to be regarded as different from each other. Under this view, the VIs  $ASP \leftrightarrow -en/\_\{\sqrt{\text{rot}}, \sqrt{\text{shrink}}, \dots\}$  and  $ASP \leftrightarrow -en/\_\{\sqrt{\text{break}}, \sqrt{\text{speak}}, \dots\}$  in the two cycles in (9) are syncretic. The same holds for other VIs that only differ with respect to their lists.

Lastly, Embick (2003) is concerned with the question of global visibility of the root. Since there is root dependent allomorphy in the Outer Cycle, too, features of the root must be visible even if there is no structural adjacency between the root and the head that is the target for insertion. However, he argues against global visibility of the root based on the observation that whenever there is root dependent allomorphy in the Outer Cycle the head and the root are linearly adjacent. He thus proposes that a linearisation operation applies before each insertion cycle and that a principle of  $\emptyset$ -transparency holds which states that phonologically empty vocabulary elements are invisible after linearisation. The derivation of the *v*-participle *broken* according to Embick (2003) looks like (13) (\* is the linearisation operator).

(13) *Derivation of broken* (Embick 2003:166)

|                  |                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------|
| INPUT:           | $[[\sqrt{\text{break}} v] \text{ ASP}]$                                                           |
| Linearisation 1: | $[(\sqrt{\text{break}} * v) \text{ ASP}]$                                                         |
| Insertion 1:     | $[(\sqrt{\text{break}} * -\emptyset) \text{ ASP}]$                                                |
|                  | $\emptyset$ -transparency: $(\sqrt{\text{break}} * -\emptyset) \rightarrow (\sqrt{\text{break}})$ |
| Linearisation 2: | $(\sqrt{\text{break}} * \text{ ASP})$                                                             |
| Insertion 2:     | $(\sqrt{\text{break}} * -en)$                                                                     |

It must then be ensured that the whole sequence  $\sqrt{\text{break}}*-en$  is spelled out as *broken* (possibly by some readjustment rule). To conclude this section, Embick (2003) has succeeded in providing an account of English participle allomorphy that correctly derives the data and regards all form-identical exponents as syncretic.

### 3. Critique of Embick (2003)

However, in order to achieve the correct derivation of the English participles, Embick (2003) is forced to accept some assumptions and their entailments that are not unproblematic. These will be discussed in what follows.

#### 3.1. Cycles of insertion and substantive identity

By formulating the structure that underlies the participles with recourse to roots and categorising heads, Embick (2003) is able to ascribe allomorphy patterns like that of  $\sqrt{\text{rot}}$  to structural configurations, hence avoiding a hardly possible distinction of *rotted* vs. *rotten* based solely on

morphosyntactic feature specifications. Nevertheless, it is exactly those structural differences between stative and *v*-participles that pose a problem for a standard morphological account of how these structures translate into their surface form. Exponents such as *-en*, which occur as bare stative markers with certain roots (e.g.  $\sqrt{\text{rot}}$ ,  $\sqrt{\text{sink}}$ ), but as stative and *v*-participle markers with others (e.g.  $\sqrt{\text{break}}$ ,  $\sqrt{\text{write}}$ ), cannot be derived as syncretic under the given conditions. To avoid lists that refer to the property ‘root-attached’ as a visible morphosyntactic feature and thus are inhomogeneous<sup>5</sup>, Embick (2003) has to introduce insertion cycles. Since there are now two cycles of insertion that by and large use the same set of exponents, in addition, he has to introduce the notion of substantive identity (12). Under this definition of syncretism, vocabulary items that differ solely with regard to their contextual features (lists) are deemed identical. However, basically all features of a vocabulary item that restrict its insertion are formulable as contextual features. Consider for instance the two formulations of the VI for the English 3rd person singular agreement affix *-s* in (14). The VI in a. realises the features  $[-1]$ ,  $[-2]$ ,  $[-\text{plural}]$ ,  $[+\text{present}]$ , and  $[+\text{active}]$  directly, while the largely equivalent VI in b. realises an empty set of features in the context of exactly those features.

- (14) a.  $/-s/ \leftrightarrow [-1, -2, -\text{pl}, +\text{pres}, +\text{act}]$   
 b.  $/-s/ \leftrightarrow [\emptyset]/[-1, -2, -\text{pl}, +\text{pres}, +\text{act}]$

Therefore, this conception of identity undermines the whole notion of syncretism as identity of form and function and diminishes its value in gaining insights into the workings of (universal) grammar.

For both problematic ad-hoc assumptions about insertion and syncretism Embick (2003) presents independent evidence supposedly supporting the exceptionality of direct root attachment: (i) under reference to Fabb (1988) and Plag (1999) (cited in Marantz 2001) it is mentioned that a majority of derivational affixes in English can exclusively be combined with roots. (ii) Only direct attachment of a functional morpheme with a root permits an idiomatic interpretation of the resulting complex (also Marantz 2001).

Point (i) refers to Fabb (1988) who presents an examination of cooccurrence restrictions of 43 English derivational suffixes. For 28 of these – which he classifies as group 1 – he claims that they never attach to already suffixed bases. However, some of the examined suffixes only differ in the category of the stem that they can be affixed to. If, following Marantz (2001) and Embick (2003), the suffixes actually realise categorising heads which can be merged with phrases of different categories or bare roots anyway (see (8)), then these suffixes should be regarded as identical. The suffixes *-age*, *-ful*, *-ify*, *-ly*, and *-y* which are listed twice should thus be counted only once under the given assumptions. Furthermore, the data in Fabb (1988) are actually already weakened by Plag (1999) who argues based on examples from a much bigger corpus than Fabb’s that many of the suffixes in group 1 can very well be attached to already suffixed bases or that there are phonological or semantic reasons for their inability to do so. For the suffixes *-hood*, *-ism*, *-y*, and *-age*, for example, he lists the grammatical forms *farm-er-hood*, *expans-ion-ism*, *arch-er-y*, and *light-er-age*. Though Plag mentions that these suffixes most often occur directly adjacent to the stem, there is no grammatical condition restricting them to this position. Hence

<sup>5</sup>Here, a list is inhomogeneous if its elements are not of the same type. Therefore, a list containing only roots is homogeneous, while a list containing roots as well as roots combined with the feature ‘root-attached’ is not.

they do not bear on the above argumentation. “To conclude our review of Fabb’s group 1 suffixes we can state that many of Fabb’s empirical claims are wrong” (Plag 1999:84).

The proportion of suffixes that never attach to an already suffixed word is actually not as big as it is claimed to be in Fabb (1988), Marantz (2001), and Embick (2003). Furthermore, their cooccurrence restrictions can in many cases be allocated to phonological or semantic properties. There is no need for any exceptionality of insertion into a directly root-attached head.

Concerning point (ii) it should be mentioned that there are also idiomatic interpretations of structures larger than the first root attachment (see e.g. Nunberg et al. 1994; McGinnis 2002; Svenonius 2005). Following the argumentation in Panagiotidis (2011), the impression that idiomatic interpretation is restricted to root attachment is given because there is no compositional meaning possible in this step. If roots only have a radically underspecified, if any, semantic content, a compositional meaning can simply not arise when a head is merged with a bare root. Hence it must be the case that accessing a list is possible whenever a head is merged with a phrase or a root, but it is due to the special semantics of bare roots that the system is forced to do so in root-attachment structures. *Listedness* (11) in the formulation of Embick (2003) thus cannot hold.

Since the independent evidence brought forward is, in my view, quite weak I regard bicyclic insertion and substantive identity as ad-hoc assumptions due alone to the analysis presented by Embick (2003).

### 3.2. Linear adjacency

A further concession that Embick has to make which results from reducing allomorphy to structural configurations is that linear adjacency plays a role for vocabulary insertion. It must be guaranteed that the identity of the root is visible when insertion into a non root-attached ASP head takes place because that head shows root controlled allomorphy. Compare, for instance, the *v*-participle of  $\sqrt{\text{close}}$  in (15-a) with that of  $\sqrt{\text{break}}$  in (15-b).

- (15)    a.    The window was clos-**ed** (by John).  
           b.    The window was brok-**en** (by John).

In both participles, the ASP head that is realised by the exponent in boldface is separated from the root by *v* and thus undergoes Outer-Cycle insertion. Since categorizers, such as *v*, are usually phases (Marantz 2001) the identity of the root should not be visible to this insertion process. Nonetheless, a different exponent is chosen for each root. Hence, while in one case – *rotten* vs. *rotted* – allomorphy is controlled by structural locality (root-attachment), it has to be independent of exactly this locality. In a sense this undermines the whole account which Embick himself notices: “The analysis [...] is based directly on a notion of locality [...]. [...] the patterns of allomorphy found in English participles seem to display some apparently non-local properties.” (Embick 2003:165). To avoid the problem he reduces the Outer Cycle root-controlled allomorphy to linear instead of structural adjacency. For this he needs a linearisation operation that is not further specified to apply cyclically and before insertion. Stative vs. *v*-participle allomorphy is thus dependent on structural adjacency to the root while root-controlled allomorphy is dependent

on linear adjacency to the root. Absurdly enough, first, a distinction of ASP heads is made based on structural locality to the root while this very distinction is neutralised by linear locality.

Embick himself calls this an “apparently negative result” (Embick 2003:167) because linear adjacency as a concept of the PF module of the classical Y model of grammar should not play a role in the morphology/syntax module. I agree with this view and develop an alternative analysis of the English participle allomorphy in the next section that avoids the problems discussed above.

#### 4. *An alternative analysis*

The concept of root has been used and discussed in many recent works on morphosyntax as well as semantics. The structures proposed by Embick (2003) are well suited to account for the different semantic (eventive vs. non-eventive interpretation) and syntactic (external argument possible vs. not possible) properties of the English participles. An analysis of their morphology based on these structure thus seems desirable. Hence in what follows I will adopt Embick’s proposal that stative vs. *v*-participles have the underlying structures in (6) where *v*-participles are characterised by a *v* head intervening between the head that is the locus of participle morphology and the root while stative participles are characterised by *v*’s absence.

Also, I will concur with Embick in that this structural difference is the reason for stative vs. *v*-participle allomorphy. I will, however, differ in the treatment of root-controlled allomorphy. Vocabulary insertion will be understood as a finite state automaton with the exponents constituting different states. Different groups of roots will then represent different initial states of the automaton and only certain transitions will be possible from those different initial states. Basically, insertion of a root determines a subset of all exponents (namely those that are accessible from this root’s initial state) which compete for insertion. This subset will then be different for e.g.  $\sqrt{\text{close}}$  and  $\sqrt{\text{break}}$ .

##### 4.1. *Participle allomorphy as inflection classes*

If one takes a fresh look at the English participles unburdened by a certain theoretical mindset about underlying structures, one can take note that besides the *-ing* form, which will not be discussed further here, each participle exhibits at least one, maximally two different forms. For those participles that show only one form, there is lexeme-dependent variation between the exponents *-ed*, *-en*, *-t*, and  $\emptyset$ . For those with two forms, one would assume that each distinct form of the same lexeme realises different morphosyntactic features. Apart from the four exponents already mentioned there is a fifth one *-èd*. The participles thus choose a subset of exponents from these five which realises some kind of participle feature. This subset is different for each participle although groups of participles can be formed that choose the same subset (as already partly noted by Embick 2003). An inflection class is according to (Aronoff 1994:64) “a set of lexemes whose members each select the same set of inflectional realizations.” In this sense, the English participles can be assigned to the eight inflection classes in (16).

(16) *Inflection classes of participles (with sample verb)*

| Class | 1     | 2     | 3   | 4    | 5      | 6   | 7    | 8      |
|-------|-------|-------|-----|------|--------|-----|------|--------|
| ADJ   | ed    | en    | ∅   | t    | əd     | en  | ∅    | en     |
| PASS  | ed    | en    | ∅   | t    | ed     | ed  | ed   | ∅      |
|       | close | write | hit | bend | allege | rot | open | shrink |

Classically, however, participle formation is not inflection but derivation since a change of category from verb to adjective occurs. The exponents in (16) are thus not inflectional but derivational affixes. Participle formation should accordingly happen in the lexicon (cf. Levin & Rappaport 1986)

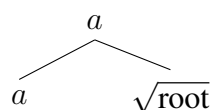
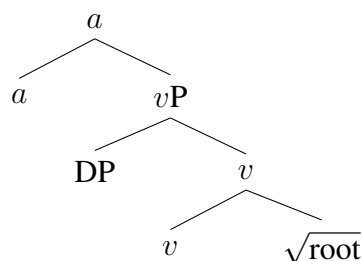
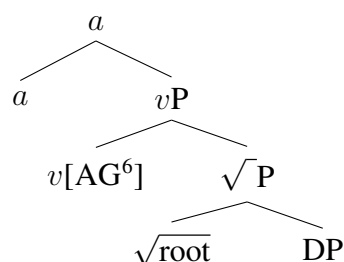
Marantz (1997), Baker (1988), Pesetsky (1995), among others, argue against such a distinction between inflection and derivation and for a unified (syntactic) word formation. The concept of root is quite closely connected with these approaches because it allows the treatment of classical derivational morphology in the syntax (see Marantz 1996, 2001).

At this point, we again consider Embick's proposed structures which explicitly contain roots. Roots allow for the treatment of derivation as inflection in the syntax. Hence, provided the structures are correct, the difference between derivation and inflection plays no role for English participle allomorphy and a treatment of the allomorphy patterns as inflection classes is unproblematic.

The structures further provide the feature that is responsible for the occurrence of different exponents in the first place: the little *v* head. For example, it distinguishes ADJ from PASS in the table in (16). An analysis regarding the exponents in the PASS row as realisations of *v* and those in the ADJ row as realisations of ASP, however, seems implausible. On the one hand, four of the five exponents show up in both rows and on the other hand there is no agglutinative morphology in any of the eight classes even though there are two realisable heads *v* and ASP in the PASS row. As already mentioned by Embick (2003), all exponents seem to realise the same syntactic node which he arbitrarily called ASP. In the following, I will regard this head as an adjectiviser *a* which has no deeper consequences ("It [the ASP head] could equally well be labelled *a* for adjective' [...]", Embick, 2003:157) but makes the subsequent argumentation more transparent. I will further assume that categorising heads bear a corresponding morphosyntactic feature [*a*] for adjectiviser, [*v*] for verbaliser, and [*n*] for nominaliser that is realised upon insertion.

Obviously, both heads *a* and *v* (through their features [*a*] and [*v*] respectively) affect the choice of exponent of the participle. This situation is far from exceptional in morphological systems (see e.g. Müller 2005; Alexiadou & Müller 2008). This kind of inflection is called fusional inflection and is accounted for in Distributed Morphology by a postsyntactic operation 'Fusion' which takes two terminal nodes and melts them into one node that contains the features of both. An analogous approach is imaginable for the English participles. After syntax has generated the structures in (6) repeated below as (17), Fusion applies before vocabulary insertion and fuses *a* and *v* into one terminal node that is root adjacent structurally. The root would hence be visible for insertion in both stative and *v* participles leading to root-controlled allomorphy while the distinguishing [*v*] feature still accounts for the stative vs. *v* participle allomorphy.



(17) a. *stative*b. *resultative*c. *eventive passive*

Unfortunately, such an approach is suboptimal for two reasons. First, the problem that nearly all exponents show up in both environments  $[a]$  and  $[a,v]$  is left unaccounted for. Also, an analysis that only makes use of decomposed (binary) inflection class features (as in Alexiadou & Müller 2008) and the two (privative) category features  $[a]$  and  $[v]$  runs into the problem that some of the syncretisms are overlapping, so-called bidirectional syncretisms. In Distributed Morphology these are (if at all) only derivable if one accepts a group of additional (problematic) modifications (see the discussion of one such problem in Bonan, Baerman et al. 2005).

And second, there are participles of roots whose verbaliser is realised by its own vocabulary item as in *categor-is-ed*, *real-is-ed*, ... In these participles the  $v$  head is realised separately from the  $a$  head by *-is(e)*. Assuming that the  $v$  realised by *-is(e)* is different from the  $v$  head in the structures in (6), i.e. that there are two adjacent verbalising  $v$  heads, seems unattractive for conceptual reasons. The reason for postulating a categorising head is that it assigns a category to its complement (complement = root) or changes its category (complement = categoriser phrase). A complex that is already categorised as a verb by a verbalising head should not be selected by yet another verbalising head. Another peculiarity of participles with an overt verbaliser is that they only ever show *-ed* as their participle exponent. This is accounted for by linear adjacency in Embick (2003): an overt realisation of the  $v$  head intervening between the ASP head and the root results in them no longer being linearly adjacent which is a prerequisite for root-controlled allomorphy. Hence, only the default exponent *-ed* can be inserted into ASP.

Accordingly, an analysis of the participles as syntactic word formation in Distributed Morphology does not seem to be possible without non-trivial modifications as Embick (2003) has rightly recognised. However, in what follows, I will present a variant of DM that diverges from the standard in only a small way, namely the assumption of a structured inventory of exponents, and that is able to derive correctly the forms of the participles and resolve the majority of syncretisms without encountering the problems of Embick's analysis. The view of participle allomorphy as inflection classes will be taken up in the analysis after a short presentation of the basics of the framework.

## 4.2. Syntagmatic constraints

Keine (2013) develops a variant of Distributed Morphology based on the idea that not all vocabulary items are available for insertion at any given time in the derivation even if they fulfill the subset and specificity principle. The set of available exponents is constrained by accessibility relations defined between the single exponents. A morphological inventory then consists of a set of exponents  $\Gamma$  and an accessibility relation  $R$  defined over this set ( $R \subset (\Gamma \times \Gamma)$ ) where the relation itself is a set of ordered pairs of exponents.

(18) *Morphological inventory* (Keine 2013:203–204)

Morphological inventories are ordered pairs  $\langle \Gamma, \Delta \rangle$  with  $\Gamma$  a set of exponents and  $\Delta$  an accessibility relation defined over  $\Gamma$ .

a. *Exponent*

An exponent  $\mathcal{A}$  is an ordered pair  $\langle \sigma, \pi \rangle$ , where  $\sigma$  is a set of morpho-syntactic features and  $\pi$  is a phonological string.

b. *Accessibility relation*

The accessibility relation is a set of ordered pairs of exponents. If  $\langle \mathcal{A}, \mathcal{B} \rangle \in \Delta$ , then  $\mathcal{A}, \mathcal{B} \in \Gamma$ .  $\langle \mathcal{A}, \mathcal{B} \rangle \in \Delta$  will be notated as ' $\mathcal{A} \rightarrow \mathcal{B}$ ' for convenience.

The exponents themselves are defined as states by Keine (2013).

(19) *State* (Keine 2013:204)

A state is an ordered triple  $\langle \mathcal{A}, \Sigma, \Pi \rangle$  such that  $\mathcal{A}$  is an exponent,  $\Sigma$  is a set of morphosyntactic features, and  $\Pi$  is a phonological string.

An abstract example of an inventory of exponents is given in (20) where ' $/\dots/$ ' denotes a phonological string and ' $[\dots]$ ' a set of morphosyntactic features.

(20) *Inventory of vocabulary items:*

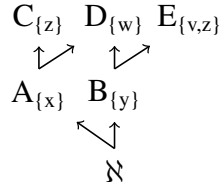
$\Gamma = \{ \langle [x], /A/ \rangle, \langle [y], /B/ \rangle, \langle [z], /C/ \rangle, \langle [w], /D/ \rangle, \langle [z], /E/ \rangle \}$

Over this inventory, the following accessibility relation  $R$  is defined ( $\aleph$  denotes the initial state to be defined below).

(21) *Accessibility relation:*

$R = \{ \langle \aleph, \langle [x], /A/ \rangle \rangle, \langle \aleph, \langle [y], /B/ \rangle \rangle, \langle \langle [x], /A/ \rangle, \langle [z], /C/ \rangle \rangle, \langle \langle [x], /A/ \rangle, \langle [w], /D/ \rangle \rangle, \langle \langle [y], /B/ \rangle, \langle [w], /D/ \rangle \rangle, \langle \langle [y], /B/ \rangle, \langle [z], /E/ \rangle \rangle \}$

The inventory with its accessibility relation can be visualised as in (22). Vocabulary items are written in the format 'Phonological string<sub>{Morphosyntactic features}</sub>'. An ordered pair  $\langle \langle [x], /A/ \rangle, \langle [y], /B/ \rangle \rangle$  of exponents that is part of the accessibility relation is then notated as  $A_{\{x\}} \rightarrow B_{\{y\}}$ .

(22) *Visualisation of accessibilities:*

Using a modified finite state automaton, vocabulary insertion is modelled as transition from one state to another with the initial state representing the stem with all its morphosyntactic features. Upon insertion, the morphosyntactic features of the initial state that are realised by the inserted exponent are deleted and the phonological string associated with the exponent is added to that of the stem. The resulting state contains the morphosyntactic features of the initial state modulo those of the exponent and the phonological string of the initial state plus that of the exponent.

(23) *Insertion* (Keine 2013:204, 206)

Given a morphological inventory  $\langle \Gamma, \Delta \rangle$ ,

a. *initial state:*

$\langle \aleph, \Sigma, \Pi \rangle$ , with  $\Sigma$  being some syntactically well-formed set of morpho-syntactic features and  $\Pi$  being some lexically determined phonological string;

b. *transition ‘ $\triangleright$ ’:*

given some state  $\langle \mathcal{A}, \Sigma, \Pi \rangle$  and an exponent  $\mathcal{B} = \langle \sigma, \pi \rangle$  a well-formed transition into  $\mathcal{B}$  subtracts  $\sigma$  from  $\Sigma$  and adds  $\pi$  to  $\Pi$ :  $\langle \mathcal{A}, \Sigma, \Pi \rangle \triangleright \mathcal{B} \equiv \langle \mathcal{B}, \Sigma \setminus \sigma, \Pi \oplus \pi \rangle$ .

c. *final state:*

a state  $\langle \mathcal{A}, \Sigma, \Pi \rangle$  is final if for all exponents  $\mathcal{B} \in \Gamma$  with  $\mathcal{B} = \langle \sigma, \pi \rangle$ , either  $\mathcal{A} \rightarrow \mathcal{B}$  or  $\sigma \not\subseteq \Sigma$  or both.

By slightly adapting the subset principle it is guaranteed that at step  $n$  of the derivation only those exponents compete for insertion that are directly accessible from the exponent inserted at step  $n - 1$ .

(24) *Wellformedness Restriction on Transitions* (Keine 2013:205)

Given a state  $\Omega = \langle \mathcal{B}, \Sigma, \Pi \rangle$ , transition into an exponent  $\mathcal{A} = \langle \sigma, \pi \rangle$  is wellformed if

a.  $\mathcal{A}$  is accessible from  $\mathcal{B}$ :  $\mathcal{B} \rightarrow \mathcal{A}$ ,b. the morpho-syntactic features of  $\mathcal{A}$  are a subset of the morpho-syntactic features of  $\Sigma$ :  $\sigma \subseteq \Sigma$ ,c. for all exponents  $\mathcal{C} = \langle \sigma', \pi' \rangle$ , such that  $\mathcal{B} \rightarrow \mathcal{C}$  and  $\sigma' \subseteq \Sigma$ ,  $\mathcal{A}$  is more specific than  $\mathcal{C}$ .

Coming back to the abstract example from above, assume we start with a stem  $/\Pi/$  that has the morphosyntactic feature set  $\{x, v, z\}$ . This situation is the initial state  $\aleph$  in (22). Now, insertion proceeds from the initial state (23-a) via ‘transition’ (23-b). The two VIs  $A_{\{x\}}$  and  $B_{\{y\}}$  compete for insertion since they are the only two VIs accessible from the initial state, hence fulfilling condition a. of the Subset Principle (24). Of these two, only  $A_{\{x\}}$  fulfills condition b. and, trivially, c. Therefore, by (23-b), its morphosyntactic feature  $x$  is removed from the stem’s set

of morphological features, and its phonological string is attached to that of the stem, yielding a new string /IIA/ with the morphosyntactic feature set  $\{v, z\}$ . Insertion continues because no final state (23-c) is reached yet. In this step, the VIs  $C_{\{z\}}$  and  $D_{\{w\}}$  compete due to their being accessible from the exponent  $A_{\{x\}}$  that has been inserted in the previous step. Of these two, only  $C_{\{z\}}$  fulfills all conditions of the Subset Principle and is thus inserted, i.e. its morphosyntactic feature  $z$  is removed from the feature set of /IIA/ and its phonological string is attached to it yielding /IIAC/. Note that even though, globally, there is a more specific exponent  $E_{\{v, z\}}$ , it is not inserted because it is not accessible from  $A_{\{x\}}$ . With /IIAC/, a final state is reached: there are no further exponents accessible from  $C$  and the derivation terminates.

The influence of an exponent on the choice of an exponent in the next step of the derivation is strictly local. It also follows from the above definitions that feature that have already been realised by insertion of an exponent cannot be realised again in the same derivation because they have been deleted (theorem of strict feature discharge Keine 2013:5). As Keine (2013) shows, this variant of Distributed Morphology is able to account, in a simple and transparent way, for morphological systems whose analysis hitherto either made necessary the introduction of additional operations such as feature introduction/change and impoverishment or were not analysable at all (extended exponence).

### 4.3. English participles in Keine's 2013 variant of DM

#### 4.3.1. Syntagmatic constraints and 'derivational' morphology

Although Keine (2013) is concerned exclusively with inflectional morphology, the way the dependencies between exponents are modelled in his system seems to be optimally suited to capture the selectional restriction of derivational morphemes like *-ity* or *-ness* in a system that makes use of roots. (Keine 2013:4) mentions that the  $\aleph$  in the definition of initial state can be understood as insertion of the root which is governed by different constraints than that of other vocabulary items. Under the above assumption that categorising heads bear a respective feature  $[a]$ ,  $[v]$ , or  $[n]$  that is available for realisation, one could implement possible selectional restrictions of derivational affixes as accessibility relations. For example, there would exist an accessibility from the vocabulary item  $[a] \leftrightarrow -(i)ous$  zu  $[n] \leftrightarrow -ness$  but not to  $[n] \leftrightarrow -ity$  which would derive *gloriousness* but not *\*gloriosity* (from Marantz 2001). Whether all selectional restrictions of derivational affixes are implementable as easily is of course to be shown and needs more research. Nevertheless, there is no question that 'derivational' morphology is derivable in Keine's variant of DM.

#### 4.3.2. Fusion and inflection class features

The basic idea of the analysis is to derive root-controlled allomorphy as a consequence of inflection class membership and stative vs. *v* participle allomorphy as that of absence vs. presence of a *v* head (entailing a  $[v]$  feature) in the structure. In section 4.1 it was already suggested to fuse both heads *a* and *v* in *v*-participle structures leading to problems for standard Distributed Morphology. In Keine's DM, however, all relevant features that are distributed over several heads

need to be present on one single head that is the target of insertion in order for accessibility relations to have an effect at all (cf. Keine 2013:footnote 9). Hence, an operation of fusion or head movement is necessary anyway. Also, insertion applies to a head as long as no accessible exponent fulfills the subset principle anymore. Therefore, the targeted head needs to be fissioned in the sense of Noyer (1997). Fusion of *a* and *v* turns from being a problem for a successful analysis of English participle allomorphy to a prerequisite of it.

Keine (2013) makes no statement about inflection classes. He only states that contextual features are excluded by the system as it is formalised now. Formulating the root dependency in the form of a list that is a contextual feature of a vocabulary item is therefore not possible.

Generally, there is a problem when trying to combine the concept of root with the phenomenon of inflection classes. Usually, inflection class membership is encoded by (possibly decomposed) features on the stem of a lexeme and is hence, just like gender, an idiosyncratic property and part of its lexical entry. The different exponents of a morphological system must then be specified for the various inflection class features. However, inflection class features on stems are problematic in a postsyntactic model of morphology like DM if the syntax is assumed to be modelled according to the Minimalist Program (Chomsky 1995) because they violate the legibility condition (Chomsky 2000, 2001) and the inclusiveness condition (Chomsky 1995, 2000, 2001). (For a detailed discussion of this problem see Alexiadou & Müller 2008.) Furthermore, there is yet another problem as Acquaviva (2009) points out. In most cases where the form of a morphological exponent is dependent on features of the root the latter is equipped with a diacritic class feature (cf. Harris 1999; Embick & Halle 2005; amongst others). But “if a root has a feature that presupposes a category, then it is not really category-free. Positing an invisible class marker on a root in order to make sure that it ends up in the right nominal or verbal inflectional class simply states the observed correlations (if noun, class X, if verb, class Y), treating them as part of the root itself. But then the root has nominal or verbal information, which is precisely what the lexical decomposition hypothesis is meant to exclude” (Acquaviva 2009:2).

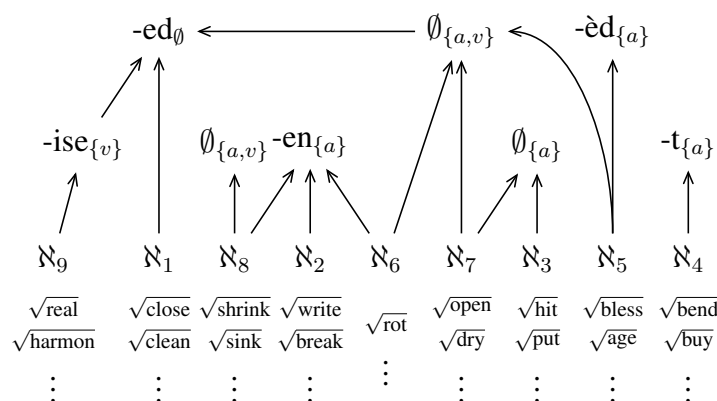
A simple solution for combining roots and inflection classes presents itself, if one unites Keine’s idea that at any given point in the derivation there is only a subset of all exponents available for insertion with the definition of an inflection class as being a set of roots that each select the same subset of exponents. One has to make sure that from certain roots only certain exponents are accessible while from other roots other exponents are accessible. In detail, one needs several initial states that differ with respect to (i) the roots that can be inserted into the *l*-morpheme and (ii) the exponents that are accessible from them. Nonetheless, the set of morphosyntactic features of these initial states has to be identical. Also, each initial state has to contain a list of roots of which it is allowed to be the initial state. Under these assumptions, the idiosyncratic information about inflection classes is neither encoded on the root nor does it have to be present in the syntax. It is entirely contained within the morphological system alone.

#### 4.3.3. *Final analysis*

Now everything is in place to analyse English participle allomorphy in Keine’s variant of DM enriched by plurality of initial states. Since eight inflection classes have been identified (16), eight initial states are needed which I will distinguish with numerical indices on their *N*s. The analysis is shown in (25) where accessibilities are represented by arrows pointing to the vocabulary

item that is accessible from the vocabulary item at the base of the arrow. Vocabulary items are represented as their phonological string with their morphosyntactic features subscripted.

(25) *Marker specifications and accessibilities of English participles*



In this analysis nearly all form-identical exponents can be derived as syncretic. Only with the zero markers in classes 3, 7, and 8 this was not possible. However, it is debatable in what sense zero markers can be homophonous at all. The verbaliser *-ise* is included in order to show that there is actually a ninth inflection class containing the verbs with overtly realised  $[v]$  feature. Since only *-ed* is accessible from *-ise* those participles never show allomorphy.

Different roots show different participle exponents (root-controlled allomorphy) because only subsets of exponents are accessible from the different initial states. Consider the different participle allomorphs for the roots  $\sqrt{\text{close}}$  (class 1) and  $\sqrt{\text{break}}$  (class 2) from example (2), repeated below as (26).

- (26) a.  $\sqrt{\text{break}}$   
       (i) The broken window.  
       (ii) The window was broken (by John).  
       b.  $\sqrt{\text{close}}$   
       (i) The closed window.  
       (ii) The window was closed (by John).

The root  $\sqrt{\text{close}}$  can only ever form its participle with *-ed* because this is the only exponent that is accessible from the initial state of class 1 roots. Whether the participle is stative with only the feature  $[a]$  or passive with  $[a, v]$  it is always the exponent *-ed<sub>∅</sub>* that is attached because it is the only exponent that fulfills all conditions of the Subset Principle: (i) it is accessible, (ii) its morphosyntactic feature set is a subset of the morphosyntactic feature set of the initial state (i.e.  $[a]$  for statives,  $[a, v]$  for *v*-participles), and (iii) there is no other exponent that fulfills (i) and (ii) and realises more features than it. The same holds for  $\sqrt{\text{break}}$ . Only *-en<sub>{a}</sub>* is accessible from the initial state of class 2 roots. Since  $[a]$  is part of the morphosyntactic feature set of both participles, it fulfills all conditions of the Subset Principle and is thus inserted in stative and *v*-participles of  $\sqrt{\text{break}}$ . The difference between  $\sqrt{\text{close}}$  and  $\sqrt{\text{break}}$  is that only *-ed<sub>∅</sub>* is accessible from the former and only *-en<sub>{a}</sub>* is accessible from the latter.

We can now turn to cases where one and the same root takes two distinct allomorphs depending on the underlying structure as in example (3) repeated below as (27).

- (27) a.  $\sqrt{\text{sink}}$   
       (i) The sunken ship.  
       (ii) The ship was sunk.  
       b.  $\sqrt{\text{rot}}$   
       (i) The rotten apple.  
       (ii) The apple was rotted.  
       c.  $\sqrt{\text{open}}$   
       (i) The open door.  
       (ii) The door was opened.

Consider first (27-a-i) whose initial state is  $\aleph_8$  with the feature set  $[a]$ . Accessible exponents are  $\emptyset_{\{a,v\}}$  and  $-en_{\{a\}}$  of which only the latter fulfills condition b. and c. of the Subset Principle because the former is specified for the feature  $[v]$  in addition to  $[a]$  which is not part of the initial state's feature set. Hence, the output form is *sunken*.<sup>7</sup> In (27-a-ii), however, the initial state contains  $[v]$  and thus  $\emptyset_{\{a,v\}}$  wins the competition which results in the output *sunk*. The derivations (27-b-i) and (27-c-i) proceed in parallel to the derivation of (27-a-i). From both roots,  $\sqrt{\text{rot}}$  and  $\sqrt{\text{open}}$ , there are two different exponents accessible,  $-en_{\{a\}}$  and  $\emptyset_{\{a,v\}}$  for  $\sqrt{\text{rot}}$ ;  $\emptyset_{\{a\}}$  and  $\emptyset_{\{a,v\}}$  for  $\sqrt{\text{open}}$ . When only  $[a]$  is present on the respective initial state  $\aleph_7$  or  $\aleph_6$ ,  $\emptyset_{\{a,v\}}$  can never fulfill the Subset Principle due to the additional  $[v]$  feature. Therefore, the respective other exponent wins the competition in stative participles and the output forms are *rotten* and *open*, respectively. The derivations of (27-b-ii) and (27-c-ii), however, are a bit different from that of (27-a-ii). When  $[a]$  and  $[v]$  are present on the initial state of each of the two roots, it is  $\emptyset_{\{a,v\}}$  that wins the competition over  $-en_{\{a\}}$  and  $\emptyset_{\{a\}}$  respectively because it is more specific than them. However,  $\emptyset_{\{a,v\}}$  is not a final state since there is a further exponent  $-ed_{\emptyset}$  accessible from it which realises a subset of the morphosyntactic feature set that is left after insertion of  $\emptyset_{\{a,v\}}$ . Although the feature set after insertion of  $\emptyset_{\{a,v\}}$  is empty because the features  $[a, v]$  have been removed upon its insertion  $-ed_{\emptyset}$  fulfills the Subset Principle since it realises an empty set of features which is a subset of every set. The derivations of the *v*-participles for  $\sqrt{\text{rot}}$  and  $\sqrt{\text{open}}$  thus proceeds through  $\emptyset_{\{a,v\}}$  to  $-ed_{\emptyset}$ . The outputs of these derivations therefore are *rotted* and *opened*, respectively.

One and the same exponent (e.g.  $-en$ ) can occur in both environments (stative and *v*-participle) for one root (e.g.  $\sqrt{\text{break}}$ ) but only in one environment for another root (e.g.  $\sqrt{\text{rot}}$ ) because it partakes in different competitions. It may be blocked by another exponent (e.g.  $\emptyset$ ) that is accessible (and thus competes for insertion) from one root but not from the other. Due to its underspecification it occurs in both environments if it is not blocked by a higher specified competing exponent. In this approach, all form-identical exponents are also identical with regard to the morphosyntactic features that they realise. There is no need for an additional notion of *substantive identity* as Embick employs it because the different combinations of syncretic exponents with different roots are not encoded directly with the exponent (i.e. as different lists which made the identical exponents different in the first place in Embick's approach). Rather,

<sup>7</sup>Recall that phonological changes of the stem, such as  $/\text{sink}/ \rightarrow /sunk/$ , are abstracted away from.

this information is encoded in the initial states and the accessibility relation of the overall morphological system of English. The influence of the root on vocabulary insertion is modelled by the different initial states. It is passed on in every step of the derivation by the accessibilities. Thus, the choice of initial state directly affects only the choice of exponent in step 1 of the derivation but it indirectly influences all following steps as well even though information about the root itself is not accessible at this point anymore. This obviates the need for linear adjacency.<sup>8</sup>

All in all it should be kept in mind that the above analysis is in this variant of DM understood to be only a little part of a much larger network of accessibilities. For example, there should be an accessibility from *-ise* to the nominaliser *-ation* and probably also to the third person singular marker *-s*. However, ideally, this analysis should effortlessly fit into a complete analysis of accessibilities between the classically derivational affixes of English.

### 5. Summary and conclusions

The presented analysis of English participle allomorphy regards it as basically a system of inflection classes. It is based on a variant of Distributed Morphology that assumes an exponent inventory that is structured by accessibilities between single exponents. Not only does it avoid postulating a bicyclic insertion process with an exceptional status for direct root attachment which as argued above is not supported by the independent evidence presented in Embick (2003), it also obviates the need for a second notion of syncretism called substantive identity. Furthermore, it does not make reference to linear information at all. The problems of the analysis given in Embick (2003) which were discussed above thus do not present themselves here.

In addition, the analysis is able to solve a long standing problem of inflection class features and roots. First, inflection class information (in the form of diacritics or features) does not show up in the syntax but is exclusively contained in the morphological module which circumvents problems with the legibility and inclusiveness condition. Second, the inflection class is not encoded on the roots themselves which would undermine their categorilessness but rather the roots are listed at the respective initial state of each inflection class. Also, it is a step in the direction of true unification of word building and inflectional morphology as envisaged in Marantz (1997).

A minor drawback is the need for three zero exponents that basically mimic the effects of impoverishment rules. An overall issue for Keine (2013) in general which carries over to this analysis is the question of what actually restricts the accessibilities. This is most definitely a guiding question for future research in this particular framework.

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<sup>8</sup>Since all information of the functional heads has to be collected on the root anyway, i.e. by the abovementioned Fusion, in order for Keine's accessibilities to have an effect, adjacency in the structural sense does not play a role at all anymore. Structural intervention by *v* between the root and *a* has been translated into the presence vs. absence of the feature [*v*] in the present analysis.



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