

Multiple faithfulness relations in Fox (Central Algonquian) reduplication

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This paper presents an Optimality Theoretic analysis of a bisyllabic reduplication pattern found in the Central Algonquian language Fox (discussed by Dahlstrom 1997 in a pre-OT analysis), utilizing the framework of Correspondence Theory (McCarthy & Prince 1995). It suggests the need for a large arsenal of faithfulness constraints within Correspondence Theory - i.e., the need not only for Input-Base Faithfulness and Base-Reduplicant Faithfulness, but also for Input-Reduplicant and Output-Output Faithfulness, thus contributing to two major debates within recent reduplicative morphology. The role of the latter two constraints will be discussed in detail.

1. Introduction

Reduplication has been a central theme within current research in Prosodic Morphology within OT. Assuming the model of Correspondence Theory (McCarthy & Prince 1995), this paper presents an analysis of a bisyllabic reduplication pattern found in the Central Algonquian language Fox (discussed by Dahlstrom 1997 in a pre-OT analysis) and crucially suggests the need for a large arsenal of faithfulness constraints within Correspondence Theory - i.e., the need not only for Input-Base and Base-Reduplicant Faithfulness, but also for Input-Reduplicant and Output-Output Faithfulness. As a consequence, the Fox data challenge two controversies within recent reduplicative morphology:

The first controversy has evolved around the status of Input-Reduplicant Faithfulness. Correspondence Theory states that the elements of a representation exhibit mutual faithfulness relations, i.e. faithfulness constraints apply to the relation of input and base, input and reduplicant, as well as base and reduplicant. The existence of Input-Base Faithfulness and Base-Reduplicant Faithfulness are widely accepted (e.g., McCarthy & Prince 1995 (henceforth MP 1995); Kager 1999; Struijke 1998). However, the status of Input-Reduplicant Faithfulness is controversial, in that it has been suggested that 'the reduplicant can never be more faithful to the input than the base is' (MP 1995). As a consequence of this metacondition on ranking, Input-Reduplicant Faithfulness should never dominate Input-Base Faithfulness in the

constraint hierarchy. However, the data presented below indicate that Input-Reduplicant Faithfulness must be ranked above Input-Base Faithfulness in Fox.

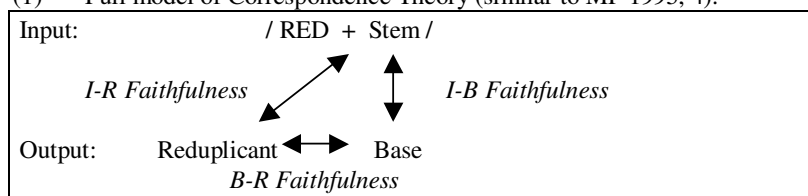
Second, Benua (1997/2000) introduced Output-Output Faithfulness to the Correspondence Theory debate. This faithfulness constraint represents the relation between two paradigmatically related surface forms: an output base is evaluated with respect to an already derived word. Not only is the mere existence of this constraint highly controversial (e.g., Hale, Kisseck, & Reiss 1997; Reiss 1997), but also its position within a constraint hierarchy. Yet, the Fox data reveal the need for a highly ranked Output-Output Faithfulness.

This paper supplies a full Correspondence-based analysis of the Fox reduplication pattern and discusses general implications for correspondence relations in OT that may be drawn from the data. In light of the two controversial debates mentioned above, it provides data that first support the need for Output-Output Faithfulness and secondly suggest that faithfulness constraints governing roots (e.g., Input-Base Faithfulness) do not always have to dominate faithfulness constraints that govern affixes (e.g., Input-Reduplicant Faithfulness).

2. Correspondence Theory

Correspondence Theory (MP 1995) states that the elements of a representation exhibit mutual faithfulness relations, and as a consequence they strive to preserve identity and resist change. In particular, faithfulness conditions within a Correspondence-based model are applied to input-output relations ‘and indeed to any domain where identity relations are imposed on pairs of related representations’ (MP 1995: 4). The latter statement might be taken to validate the introduction of Output-Output Faithfulness (O-O F) (Benua 1995), but see below for a detailed discussion of this constraint. The full model of Correspondence Theory comprises Input-Base Faithfulness (I-B F), Input-Reduplicant Faithfulness (I-R F), and Base-Reduplicant Faithfulness (B-R F):

(1) Full model of Correspondence Theory (similar to MP 1995, 4):



Of these constraints, B-R F (e.g., MP 1995; Struijke 1998) and I-B F (e.g., MP 1995; Kager 1999) are the most widely accepted.¹ The status of Input-

¹ One of the few divergent theories on B-R F is provided by Inkelas & Zoll (1998), who propose to abandon B-R F. They suggest that reduplication is not a phonological process, but a morphosyntactic one, where morphosyntactic feature bundles are doubled (i.e. concatenation of two

Reduplicant Faithfulness within the constraint hierarchy is controversial. In the following, the general argument that has emerged around I-R F and O-O F will be outlined, before presenting an analysis of the bisyllabic reduplication pattern in Fox and its implication for the correspondence relations.

2.1. The status of Input-Reduplicant Faithfulness

Input-Reduplicant Faithfulness represents the relation between the stem in the input and the reduplicant in the output:

(2) Input-Reduplicant Faithfulness relation:

Input:	/ RED + Stem /	
Output:	Reduplicant Base	<i>I-R Faithfulness</i>

The necessity for I-R F is uncontroversial. This has for instance been illustrated in Klamath (Clements & Keyser 1983), where in one particular reduplication pattern, the reduplicant is more faithful to the input than the base is, which in an OT-framework is motivated by I-R F outranking B-R F (MP 1995:112). However, the position of I-R F within a given constraint hierarchy has been claimed to be restricted relative to other faithfulness constraints. Here, it has been proposed that there is a ‘universal metacondition on ranking’ (MP 1995: 4) that requires Input-Base correspondence to dominate Input-Reduplicant correspondence. This assumption has been formalized by introducing the Root-Affix Faithfulness Metaconstraint (MP 1995:116), in which I-R F is considered to be the subordinate affix-faithfulness constraint:

(3) Root-Faith >> Affix-Faith

The underlying presumption for this metaconstraint is that morphological affixes are always unmarked relative to roots. As a consequence of this metacondition on ranking, I-R F should never dominate I-B F in the constraint hierarchy. This dominance of the root over the affix is also alluded to in the presentation of Correspondence theory, in which McCarthy & Prince distinguish between a Basic Model and a Full Model, where the former does not include I-R F, implying the low-ranked nature of this constraint. However, as examples from Klamath indicates (and as the authors state themselves (MP 1995:111)), the reduplicant can be more faithful to the input than the base is. In addition to the pattern in Klamath, the Fox data provide evidence for the inevitability of a Full Model and substantiate the overall need for I-R F.

Yet, even though the Full Model allows for I-R F, the Root-Affix Faithfulness Metaconstraint in (3) above enforces restrictions on the constraint

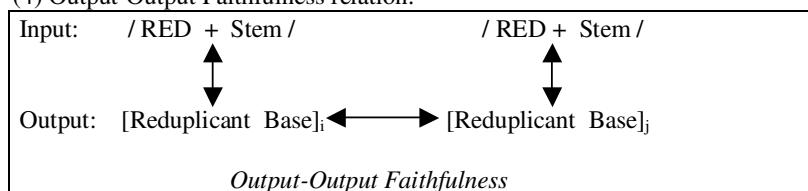
stems with identical feature bundles). A reduplicated form is thus derived from two (identical) input stems. Misapplication phenomena are explained in terms of ‘co-phonologies’, which specify distinct constraint ranking for each of the stems.

hierarchy and the relative ranking of I-R F. However, it will be shown that this does not hold for the analysis of the Fox reduplication pattern, and the conditions for McCarthy & Prince's proposed metaconstraint need to be revisited in order to consolidate the theoretical claims with the empirical data.

2.2. The status of Output-Output Correspondence

The second faithfulness constraint that needs to be considered in more detail for the purposes of this paper is Output-Output Faithfulness, which has become widely known through Benua's (1997)² work on transderivational identity relations (but see also Kager (1999) for further references on O-O relations). O-O F draws a correspondence relation between surface forms that are paradigmatically related with each other: a potential output candidate is evaluated with respect to an already successfully derived output, such that the two forms that are compared are paradigmatically related. The principle notion underlying this paradigmatic O-O correspondence is that morphologically related words are required to be phonologically identical (Benua 2000:29). This idea is compatible with the concept known as paradigm uniformity or uniform exponence (e.g., Kenstowicz 1997).

(4) Output-Output Faithfulness relation:³



Evidently, the interplay of phonology and morphology leads to the misapplication of phonological processes. In cases of overapplication, a process applies in an environment that does not license the structural requirements under which the process may occur. Classical cases of overapplication have been discussed for nasal harmony in Sundanese (Benua 2000) and Malay (e.g., Kager 1999 and references therein). Another interesting example of overapplication will be presented in the Fox reduplication pattern. In contrast, in underapplication, a linguistic process does not take place even though the structural environment licenses its application. A classical example for underapplication occurs in the truncation of names in English (e.g., *Lærry-Lær*) (Benua 2000; inter alia). In general, over- and underapplication have been analyzed as instances of phonological identity preservation.

² The following citations refer to Benua (2000), the published version of her 1997 dissertation.

³ The corresponding output is a reduplicated form in this figure (/RED+stem/) to illustrate the process that is observed for Fox below. It is also possible that the corresponding output for a reduplicated form represents an unreduplicated base.

Phonological theories have tried to capture the misapplication phenomena by means of derived environment rules and cyclicity (e.g., Mascaró 1976; Kiparsky 1982), in which the derivation proceeds in stages, and rules are applied repeatedly to newly formed identities. Contrary to these approaches, transderivational correspondence and O-O F do not operate in cycles or stages, but represent a parallel process without intermediate stages, which is a core characteristic of OT at large. Benua (2000) points out that this parallelism posits an advantage of a transderivational approach over a cyclic theory, since it is more restricted and because the output directly corresponds to the input (whereas in a cyclic derivation, access to the original input is lost the more cycles are added). However, these benefits are overshadowed by the need to refer to an external output correspondent and by the problem of how to select and define this correspondent. In the analysis below, the corresponding output represents the ‘least marked’ form within the paradigm and is further specified in the lexical entry of the reduplication pattern.

3. Bisyllabic reduplication in Fox

3.1. Fox

Fox is a central Algonquian dialect spoken in Iowa, Oklahoma and on the Eastern Kansas-Nebraska border. It is also referred to as Mesquakie or Sauk-Fox. According to the 1990 census (*Ethnologue*), there are 673 Fox speakers including two monolinguals. (No estimates exist for the more recent census.)

3.2. Fox reduplication

Reduplication is a prominent element in Fox’s morphology and is found in verbs, adverbs, quantifiers, and numbers. Its semantic distribution stretches from expressing intensity, continuity, and repetition of action, to customary action, plurality, duration, quantity, and onomatopoeia (Jones 1911:814-5). Different patterns of copying exist in Fox. This paper concentrates on a pattern of reduplication on verbs that involves the prefixation of a bisyllabic reduplicant, with a left-to-right mapping of the initial foot of the base.⁴ Semantically, this pattern expresses iteration, signifying either the repetition of an action over time or action distributed over a group (Dahlstrom 1997: 206).

The following are examples of this prefixation process; /-wa/ represents the third person marker.⁵ For notational purposes, the base is underlined and the reduplicant is italicized:

⁴ The data is primarily based on the description of Fox reduplication by Dahlstrom (1997). Additional examples are taken from Jones (1911) and Goddard (1994).

⁵ Some notational preliminaries: (i) Fox has short and long vowels. The latter are transcribed with (*). (ii) Fox has a complex inflectional system. The following inflectional markers will be seen: animate 3rd person singular proximate subject of intransitive is /-wa/, animate 3rd person singular proximate subject acting on animate third person obviative object is /-e*wa/, and 1st person singular is /ne(t)-/. (The stop serves the function to avoid onsetless syllables word-internally.)

- | | | |
|--------|----------------|--------------------------------|
| (5) a. | nepe·wa | <i>nepe<u>nepe</u>·wa</i> |
| | sleep-3RD | RED-sleep-3RD |
| | ‘he sleeps’ | ‘he sleeps repeatedly’ |
| b. | kanawiwa | <i>kan<u>kan</u>awiwa</i> |
| | speak-3RD | RED-speak-3RD |
| | ‘he speaks’ | ‘he speaks repeatedly’ |
| c. | nakiškawe·wa | <i>naki<u>naki</u>škawe·wa</i> |
| | meet-3RD/TRANS | RED-meet-3RD/TRANS |
| | ‘he meets him’ | ‘he meets him repeatedly’ |

The first syllable of the melody is mapped entirely onto the template. The second syllable, however, is subject to two language-specific constraints, in which a long vowel is reduced to a short vowel (e.g. *nepenepe·wa* vs. **nepe·nepe·wa*) and in which codas undergo deletion (e.g. *nakinakiškawe·wa* vs. **nakišnakiškawe·wa*). This indicates that the second syllable of the reduplicant must be a light syllable (σ_μ). The following chart summarizes the morphological characteristics of this reduplication pattern:

- | | | |
|--------|------------------------|----------------------------|
| (6) a. | template: | Ft ($\sigma\sigma_\mu$) |
| b. | mapping: | left-to-right |
| c. | melody: | base |
| d. | WFR(prefixation): | verb → RED verb-root |
| e. | semantic contribution: | iteration (‘X repeatedly’) |

An additional alternation within this pattern is found with vowel-initial stems:

- | | | |
|--------|-----------------|--------------------------------|
| (7) a. | atame·wa | <i>ata<u>h</u>atame·wa</i> |
| | smoke-3RD | RED-h-smoke-3RD |
| | ‘he smokes’ | ‘he smokes repeatedly’ |
| b. | i·tepihe·wa | <i>i·<u>tehi</u>·tepihe·wa</i> |
| | go-3RD | RED-h-go-3RD |
| | ‘he goes there’ | ‘he goes there repeatedly’ |

An epenthetic /h/ is inserted between the reduplicant - which due to the lightness of the second syllable ends in a vowel - and the vowel-initial base.⁶

⁶ Epenthesis occurs extensively in Fox: onsetless syllables are allowed only word-initially, and therefore inflectional and derivational processes that attach a prefix to the base trigger the insertion of a consonant to form an onset. Fox thus has a relatively high-ranked constraint prohibiting word-internal onsetless syllables (ONSET). For the current analysis, the concrete ranking of ONSET is not relevant as well as the violation of DEP-IO by the epenthesis. The two constraints do not affect this particular analysis, since they are violated in every output form that is considered below.

Note further that the nature of the epenthetic consonant varies and is closely linked to the involved morphological process. It is for instance /n/ after the temporal particle, or /t/ ‘in an inanimate relation’ (Jones 1911:750), or /h/ for the bisyllabic reduplication pattern.

3.3. Reduplication and /e/-initial bases

A specific alternation within this bisyllabic reduplication pattern is the main focus of this paper. It primarily discusses verbs with /e/-initial bases, which are subject to a language-specific alternation between /e/ and /i/ (Bloomfield 1925:231; Dahlstrom 1997:216).⁷ Fox does not permit /e/ in word-initial position, which gives rise to the structural constraint in (8.a). In a rule-based framework, this is expressed as a phonological rule of the form in (8.b):

- (8) a. No word-initial /e/: *#e
 b. Phonological rule for /e/ ~ /i/: [e] → [i] / # _⁸

The interesting observation about this alternation is that in combination with bisyllabic reduplication, the constraint on word-initial /e/ expands to the (word-internal) base, thus violating the rule in (8.b), which is confined to the left edge of a word. While the base over applies, the reduplicant satisfies the constraint *#e as the examples for /ena-pi/ ('look [there]') and /ešawi/ ('do [thus]') indicate - for additional examples see Dahlstrom (1997:216):

- (9) a. net-ena-h-ina-pi
 1ST-RED-h-look
 'I look [there] repeatedly'
 b. ina-h-ina-pi-wa
 RED-h-look-3RD
 'he looks [there] repeatedly'
 c. net-eša-h-išawi
 1ST-RED-h-do
 'I do [thus] repeatedly'
 d. iša-h-išawi-wa
 RED-h-do-3RD
 'he does [thus] repeatedly''

The constraint *#e refers only to word-initial instances of /e/, and it is therefore not expected to find a form like (9.b), but rather *inahena-piwa, where the word-internal base remains unaltered. However, the data do not support this anticipated pattern, and the correct output form, where *#e expands to the (word-internal) base, thus illustrates an instance of overapplication. Notice also, that examples (9.a) and (9.c) with the first person marker reveal an even

⁷ Fox has a 4-vowel system and distinguishes between short and long vowels (a, a:, e, e:, i, i:, o, o:). The language-specific restriction analyzed in the following occurs with initial short /e/ only.

⁸ Dahlstrom (1997:216) illustrates the /e/-/i/ alternation in a stem such as /ena-pi/ ('look [there]') with prefixation of the first person marker /ne(t)-/ in (i) and suffixation of the third person marker /-wa/ in (ii), where only the process of suffixation forces the /e/-/i/ alternation:

- | | |
|------------------|--------------------|
| (i) ne-t-ena-pi | (ii) ina-pi-wa |
| 1ST - look | look - 3RD |
| 'I look [there]' | 'he looks [there]' |

more striking pattern, where the word-internal base undergoes vowel raising, while the reduplicant (which this time is not word-initial, because of the prefixed person marker) keeps the vowel as it is in the input stem.

In the following, an analysis of these patterns is approached from an Optimality Theoretic point of view, and it will be shown that a constraint-based grammar can account for the output forms by invoking multiple correspondence relations.

4. /e/-initial bisyllabic reduplication in OT

We can now turn to a thorough analysis of the bisyllabic reduplication of forms with /e/-initial bases and introduce a number of faithfulness constraints that play an important role in selecting the best candidate. This will be demonstrated by first concentrating on a morphologically less marked form and then examining a more marked form within the reduplicative paradigm.

An example of a less marked form is the third person singular marker, which involves suffixation of /-wa/ to the verb stem. For instance, 'he looks [there] repeatedly', which has the input /RED-ena-pi-wa/, surfaces with the output *inahina-piwa* (9.b). The tableau in (10) demonstrates how the structural constraint *#e and two correspondence constraints - B-R F and I-O F - contribute to the selection of the optimal output candidate. The input-output constraint that is introduced into the hierarchy in (10) is defined broadly, in the sense that output is understood as referring to both base and reduplicant at this point, while it will be distinguished later in the analysis (into I-B F and I-R F).

(10) /RED - ena-pi-wa/, *#e >> B-R F >> I-O F

Candidates	*#e	B-R F	I-O F
a. <i>enahena-piwa</i>	*!		
b. <i>enahina-piwa</i>	*!	*	*
c. <i>inahena-piwa</i>		*!	*
d. <i>inahina-piwa</i>			**

The candidates of (10.a) and (10.b) are immediately ruled out by the structural constraint from (8.a) prohibiting word-initial /e/; the constraint is fatal for these two output candidates. (10.c) and (10.d) exhibit the initial vowel change from /e/ to /i/, but they differ in the form of the base. To select the correct output candidate, two distinct correspondence conditions may be called upon. The base could either be required to agree with the reduplicant or, alternatively, with the input. The former scenario requires a highly ranked B-R Faithfulness, which demands a correspondence between the base and the reduplicant. The latter scenario can be represented in a constraint hierarchy that includes a dominant I-O Faithfulness constraint, where the base is required to correspond directly with the input stem rather than with the reduplicant.

Invoking a dominant I-O F constraint, it would be relevant for the constraint hierarchy that the base of (10.c) uses the stem /*ena-pi*/ faithfully, while (10.d) violates the general constraint on input-output correspondence. However, as the tableau in (10) illustrates, I-O F cannot be the crucial constraint for the current analysis, because if it were only ranked with *#e (i.e., *#e >> I-O F), it would select the incorrect output (10.c) *inahena-piwa*, since (10.d) violates I-O F to a greater extent than (10.c) does, with two output correspondents (the base and the reduplicant) violating the input features.

This suggests that B-R F must outrank I-O F in the constraint hierarchy, as indicated in the tableau in (10). B-R F asks for a featural identity between base and reduplicant. It thus rules out candidate (10.c), which fails to exhibit the required congruence, as it carries a segment that is not identical between the base (i.e., /e/) and the reduplicant (/i/), while in (10.d) the features of the base correspond entirely with the features of the reduplicant. As a consequence, the application of B-R F is successful in selecting the correct output (10.d). This is sufficient evidence for postulating a partial ranking *#e >> B-R F >> I-O F, in which I-O F is irrelevant for the selection of the optimal output since the best candidate is already found by evaluating *#e and B-R F successively.

If we analyze the paradigmatically related, but more marked form ‘I look [there] repeatedly’ (*netenahina-pi* in (9.a)), which contains the first person singular prefix /*ne-(t)*/, the ranking *#e >> B-R F >> I-O F does not generate the expected output as shown in (11) below. However, it has also been established above that a reranking of these three constraints is not feasible, and that in particular the partial ranking B-R F >> I-O F must be maintained.

(11) /*ne-t-RED-ena-pi*/, *#e >> B-R F >> I-O F⁹

Candidates	*#e	B-R F	I-O F
a. * <i>netenahena-pi</i>			
b. <i>netenahina-pi</i>		*!	*
c. <i>netinahena-pi</i>		*!	*
d. <i>netinahina-pi</i>			**!

The candidates in (11) are not at all affected by the constraint *#e because of the morphological process of prefixation of the person marker, due to which an /e/-initial environment is not created. Furthermore, I-O F eliminates candidate (11.d), and B-R F is fatally violated by (11.c) and, more importantly, by the desired output (11.b). Therefore, other faithfulness constraints need to be taken into consideration that dominate B-R F and rule out the selection of (11.a). One option that might serve to accomplish this is the introduction of I-R F. This constraint should be high-ranked, since the desired output candidate (11.b) does not violate I-R F. In what follows in (12), the broad I-O F constraint, which so far has referred to both base and reduplicant as outputs, is

⁹ In tableaux where the ranking selects the wrong candidate, the correct candidate found in the language is highlighted in bold, while the candidate selected by the hierarchy is preceded by ‘*’.

divided into I-R F (signifying the correspondence between stem and reduplicant) and I-B F (denoting the correspondence between stem and base only):

(12) /ne-t-RED-ena-pi/, I-R F >> B-R F >> I-B F¹⁰

Candidates	I-R F	B-R F	I-B F
a. * $\text{netenahena}\cdot\text{pi}$			
b. $\text{netenahina}\cdot\text{pi}$		*!	*
c. $\text{netinahena}\cdot\text{pi}$	*!	*	
d. $\text{netinahina}\cdot\text{pi}$	*!		*

However, this does not bring us significantly closer to selecting the correct output. Even though I-R F rates (12.c) and (12.d) less optimal than (12.a) and (12.b), the desired output (12.b) violates both B-R F and I-B F. It thus seems inaccurate to merely concentrate on the correspondence of the input with the elements constituting the candidate, because any input-X faithfulness favors (12.a), in which both base and reduplicant faithfully reflect the stem, while the other candidates fail to correspond to the stem in at least one instance.

Another faithfulness constraint is O-O F, which - as indicated in 2.2 - draws a correspondence relation between paradigmatically connected words. In the case of Fox, the O-O correspondence then links *inahina-piwa* ('he looks [there] repeatedly') and *netenahina-pi* ('I look [there] repeatedly'), where the former represents the least marked form of the paradigm and hence qualifies as the output correspondent in the O-O F evaluation:¹¹

(13) /ne-t-RED-ena-pi/, I-R F >> O-O F >> B-R F >> I-B F

Candidates	I-R F	O-O F [inahina-piwa]	B-R F	I-B F
a. $\text{netenahena}\cdot\text{pi}$		**!		
b. * $\text{netenahina}\cdot\text{pi}$		*	*	*
c. $\text{netinahena}\cdot\text{pi}$	*!	*	*	
d. $\text{netinahina}\cdot\text{pi}$	*!			*

¹⁰ The constraint *#e will not appear in the subsequent tableaux because it is not violated by a candidate that is prefixed with /net-/. Nevertheless, *#e is a highly ranked constraint in Fox and must be ranked above the correspondence constraints in the complete framework.

¹¹ The selection of the corresponding output might be considered a problem. In response to this, Benua (2000) first points out that O-O relations are restricted to paradigmatically related words and to specific morphological processes. This concentration of a particular O-O F on one morphological process reduces the span for potential output correspondents significantly. Furthermore, additional restrictions are imposed on the choice of the corresponding output form. Specifically, within a paradigm, the least complex form is chosen, to which the other forms are required to be faithful. This form might be an inflected word (as is the case for Fox): 'Often, the base is the word that is minimally less morphologically complex than the derived word, so that the base consists of a subset of the derived word's morphemes. But this kind of subset relation does not always hold. An obligatorily-inflected word can serve as the base of another inflected word, and the base's inflection is neither morphologically nor phonologically present in the derived word.' (Benua 2000:31)

This ranking finally generates (13.b) as the optimal candidate, because the application of O-O F based on the least marked element of the verbal paradigm results in the selection of (13.b) over (13.a).

The remaining questions are how O-O F and I-R F are ranked with regard to the other constraints. From the analysis of the third person form, it is already known that B-R F must dominate I-B F, as the former constraint is crucial in eliminating the undesirable outputs, while I-B F would rule out the optimal output, whose base does not agree with the input stem, but rather with the reduplicant. In addition, O-O F must outrank the (partial) ranking B-R F >> I-B F to guarantee that (13.a) is not selected as optimal output, since O-O F is the only constraint that determines (13.a) as being non-faithful.

As far as the ranking of I-R F is concerned, it occurs that I-R F must dominate all three constraints in the partial hierarchy O-O F >> B-R F >> I-B F. The primary reason for this claim is that O-O F is violated by all candidates except for (13.d), so if I-R F did not dominate O-O F, the preference would wrongly go to (13.d). Independent from O-O F, evidence for a high ranking of I-R F comes further from the observation that I-R F should dominate B-R F and I-B F because both constraints have the potential to rule out the correct candidate (13.b). Thus it appears that I-R F must be forced at the expense of the other correspondence constraints, as the tableau in (13) presents. These observations give rise to the following final constraint hierarchy:

(14) *#e >> I-R F >> O-O F >> B-R F >> I-B F¹²

To conclude, the analysis of the bisyllabic reduplication pattern in Fox has revealed that both I-R F and O-O F are crucial and must be highly ranked for the selection of the correct output candidate. Furthermore, the final constraint hierarchy suggests that there are languages where I-R F must dominate I-B F. In the next section, the particular issues that have evolved around I-R F and O-O F will be revisited in light of these new findings.

5. Faithfulness revisited

The reduplication pattern presented above strongly suggests to reconsider the claim of the ‘universal metacondition on ranking’ which states that I-R F must

¹² At last, this final ranking also succeeds in generating the correct output candidate for the less marked third person singular form as shown in (i) - as well as for non-/e/-initial stems:

(i) /RED-ena-pi-wa/, *#e >> I-R F >> O-O F >> B-R F >> I-B F

Candidates	*#e	I-R F	O-O F	B-R F	I-B F
a. <i>enahena-piwa</i>	*!				
b. <i>enahina-piwa</i>	*!			*	*
c. <i>inahena-piwa</i>		*		*!	
d. *# <i>inahina-piwa</i>		*			*

be of less importance than I-B F, since the ‘faithfulness constraints on the stem domain always dominate those on the affixal domains’ (1995:4). This metacondition cannot be validated for Fox.

As indicated in 2.1, the absence of I-R correspondence in the Basic Model of Correspondence Theory implies only that the application of this constraint is less likely cross-linguistically and suggests that I-R F is often low-rated in a constraint hierarchy. Evidence for the reality of I-R F comes from reduction/syncope and laryngeal neutralization in Klamath (MP 1995). And the Fox data presented here supply further proof for the need of I-R F and the Full Model.

Yet, even though the Full Model allows for I-R F, the Root-Affix Faithfulness Metaconstraint enforces restrictions on the constraint hierarchy and the relative ranking of I-R F. These do not hold for the current analysis, as it has been shown that I-R F must dominate I-B F. A closer look at the conditions for the proposed metaconstraint reveals that it is not necessarily the dominance of one correspondence constraint over another that McCarthy & Prince (1995) are concerned with, but the interplay of these constraints with a structural constraint. What they dub pathological rankings are rankings that are primarily concerned with the position of a structural constraint (C) relative to the correspondence constraint, such that ‘any phonological constraint C that stands between the two types of faithfulness will hold true of the affixes in a language but not of the roots.’ (MP 1995:117) Likewise the metacondition Root-Faith >> Affix-Faith focuses on the interaction of root or affix with a structural constraint; thus it is claimed that an affix can never have a stricter or richer marking than a root with regard to a particular structural constraint.

In the final ranking for Fox, even though I-R F is a high-ranking constraint, the structural constraint **#e* is always superior to I-R F (in fact, to every correspondence constraint). Furthermore, the data indicate that the reduplicant never violates the structural constraint and is always faithful to the constraint on /e/-initial vowels. In addition, it reflects a strong allegiance with the stem, while the output base fails to comply with the input stem and reflects overapplication of the structural constraint. Thus, the part of the output that behaves extraordinarily is the base and not the reduplicant. It might therefore be more appropriate to focus on the question why I-B F is so low-ranked, instead of why I-R F must be high ranked.

Finally, the Fox data put forward the notion that the reduplicant has immediate access to the features of the input stem. This is contradictory to the statement that ‘[t]he absence of a direct relation between reduplicant and input in the Basic Model entails that the reduplicant can never be more faithful to the input than the base is, since the output reduplicant has no access to the input stem, except through the output base.’ (MP 1995:110) On the basis of the analysis provided above, however, I suggest that the reduplicant needs to correspond directly to the input, while the orientation of the base is focused on a related output form. This then advocates further that the reduplicant is not entirely dependent on the base (via B-R F), but that normal application occurs with a partial ranking of I-R F >> B-R F, which makes the input more powerful.

In sum, the hierarchy for Fox implies that the Root-Affix Faithfulness Metaconstraint needs to be redefined in a broader context of constraint interaction and that additional rankings need to be considered. McCarthy & Prince postulate that '[b]ecause of this metaconstraint, no I-R faithfulness constraint can ever dominate its I-B cognate, and the pathological interactions can never occur.' (1995:117) This however does not hold in its entirety. The first part of this statement, that I-R F can never dominate I-B F, must be disclaimed on the basis of the findings from Fox bisyllabic reduplication. Even though the so-called pathological rankings might be found impossible cross-linguistically, the Fox data suggest that in connection with a number of other factors (such as the position of a structural constraint or the orientation of base and reduplicant towards their correspondents), I-R F can be superior to I-B F. The Metaconstraint should hence be reassessed in a more exhaustive way.

Fox further provides striking evidence for the importance of O-O correspondence. Yet, the existence of O-O F has been contested in the literature. A critical evaluation of O-O F can be found in Hale, Kisser, & Reiss (1997) and Reiss (1997). The authors argue that OT can do without O-O correspondence constraints. In general terms, their criticism is directed at the opportunistic selection of the data, the maltreatment of generalizations (due to oversimplification or neglect), and improper predictions. More specifically, the basic problem identified with O-O F is that by comparing outputs of two independent words, the system is forced to look at a form that lies outside the generative function of the input-output relation represented within a single tableau. This is not preferable in an OT framework, for it removes a certain degree of generalization from the constraint system. The process of generation and evaluation of well-formedness conditions is not expected to be capable of networking with an output that has already gone through the evaluation process. Nonetheless, advocates of O-O F argue that this correspondence relation enables us to evaluate one single process, instead of being forced to adhere to a cyclic approach. Another potential problem is how the grammar picks the output form to which a good candidate must correspond.

For the Fox data, O-O F seems to provide an effective solution to select the correct output. The base appears to be strongly oriented towards paradigm uniformity, seeking to agree with other outputs in the reduplication paradigm. Alternative phonological constraints cannot account easily for the overapplication phenomenon.¹³ And improper or too far reaching predictions do not arise from the introduction of O-O F as long as the lexical entry for the reduplicant is specified as suggested in Benua (2000:31-2), where the question of how to formalize and restrict O-O F from applying randomly is solved by the proposal to mention O-O correspondences in the subcategorization frame of

¹³ An alternative analysis has been suggested to me, in which the raising observed on the base might be ascribed to a word boundary between base and reduplicant. One problem that arises from this is to substantiate why /h/-epenthesis would still be required and how /h/ is syllabified. A related problem concerns the prosodic parsing and to which prosodic constituent person markers attach (i.e., since pre- and suffixation occur, it is difficult to identify a single common prosodic level). The present analysis is thus favored over such analyses.

morphological operations. This appears to be a reasonable solution in order to restrict the system's generative power. The drawback is that it increases the complexity of the lexical information associated with a linguistic process.

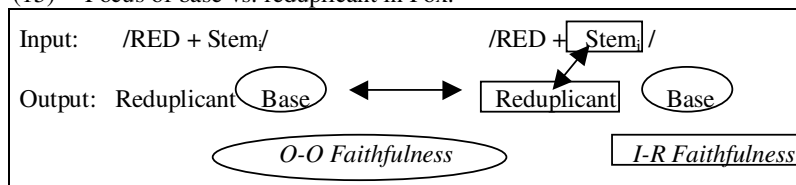
For the reduplication pattern in Fox, this implies that the process of bisyllabic reduplication is specifically linked to the (least marked) derived output of the third person singular in an O-O relation. The lexical entry for this process then has to include a reference to the correspondent, such as 'O/O correspondent: /RED-verb-wa/'. These specifications need to be added to the morphological description of the bisyllabic reduplication in (6).

In spite of a lot of criticism regarding the role of O-O F, the evidence from Fox implies that it should be an inherent constraint of a universal grammar. It might be argued that if structural constraints can generate a correct form, the application of such a constraint should take precedence over O-O F (e.g., Rotuman (McCarthy 1995 vs. 2000)). Nonetheless, even though O-O F might not represent a constraint that is rated high in many language-specific grammars, there seem to be languages that rely on this kind of correspondence, and it thus should not be excluded from a grammar. Furthermore, the motivation for the alternations in the /e/-initial verb forms in Fox stems strongly from a process of paradigm leveling that by its very nature has an 'external' correspondent. This relationship is not randomly established, and the restriction to paradigmatically related comparisons minimizes the range of potential correspondents drastically. These observations make the request for O-O F more plausible.

6. Conclusion: Base vs. reduplicant correspondence

The analysis presented here proposes that both O-O F and I-R F are relevant for the selection of the optimal candidate. In general, the data suggest that reduplicant and base behave differently relative to the individual correspondence constraints. The reduplicant is primarily faithful to the input stem (and to the structural constraint *#e), whereas the base is primarily faithful to a corresponding output to achieve phonological identity via paradigm leveling:

(15) Focus of base vs. reduplicant in Fox:



As the figure illustrates, the base of an output candidate is oriented towards a corresponding base of a less marked output, while the reduplicant focuses on the stem of its input. This reveals that base and reduplicant are not in

competition with each other (which might be implied from the Metaconstraint on ranking), but that they seek to be faithful to constituents at different levels.

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The behaviour of /j/, /v/ and /h/ in Hungarian voice assimilation - an OT analysis

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The purpose of this paper is to give a unified account of Hungarian voice assimilation phenomena in the framework of Optimality Theory (Prince & Smolensky 1993). The discussion focuses on the sounds /j/, /v/ and /h/, which sometimes behave as sonorants and sometimes as obstruents with respect to voice assimilation. The OT model presented here is capable of accounting for the ‘exceptional’ as well as the ‘regular’ cases of voice assimilation. Apart from dealing with the Hungarian data, the paper also examines the question whether faithfulness constraints on [voice] apply to output obstruents with a sonorant input.

1. The data¹

1.1. Voice assimilation in Hungarian

Obstruent clusters in Hungarian agree in voicing, their voicing properties being determined by the last obstruent in the cluster, while sonorants² can cluster with both voiced and voiceless obstruents. All word-initial consonant clusters consist of either voiceless obstruents (1a) or voiceless obstruents and sonorants (1b). The only exception to this is /v/, which is traditionally analysed as a voiced obstruent and can, in spite of this, appear in word-initial clusters (1c).

- (1) a) *stop* ‘stop’ b) *tréfa* ‘joke’ c) *tviszt* ‘twist’
 pszeudo ‘pseudo’ *gnóm* ‘gnome’ *kvarc* ‘quartz’

Morpheme-internal and morpheme-final obstruent clusters consist of either voiced or voiceless consonants only (2a,c and 2b,d respectively).

¹ All examples are given with Hungarian spelling; transcription is used only where pronunciation differs from what is suggested by the spelling.

² I will use the term *sonorant* meaning ‘sonorant consonant’ in this paper.

- | | | | | | | |
|-----|----|-------------------|-------------|----|-----------------|-----------|
| (2) | a) | <i>macska</i> | ‘cat’ | b) | <i>barack</i> | ‘apricot’ |
| | | <i>szeptember</i> | ‘September’ | | <i>test</i> | ‘body’ |
| | c) | <i>labda</i> | ‘ball’ | d) | <i>smaragd</i> | ‘emerald’ |
| | | <i>mozdul</i> | ‘move’ | | <i>pünkösöd</i> | ‘Whitsun’ |

Sonorants neither trigger nor undergo voice assimilation:

- | | | | |
|-----|----|--------------------------------------|----------------------------|
| (3) | a) | <i>kala</i> [p] – <i>kala</i> [pn]ak | ‘hat’ – ‘of the hat’ |
| | | <i>ké</i> [z] – <i>ké</i> [zr]e | ‘hand’ – ‘onto the hand’ |
| | b) | <i>sze</i> [m] – <i>sze</i> [mt]ől | ‘eye’ – ‘from the eye’ |
| | | <i>ő</i> [r] – <i>ő</i> [rt]ől | ‘guard’ – ‘from the guard’ |

1.2. The phonemes /j/, /v/ and /h/ in voice assimilation

As mentioned above, the phonemes /j/, /v/ and /h/ do not behave according to the pattern outlined in Section 1.1. Let us now look at their behaviour one by one.

1.2.1. /j/

In Hungarian, /j/ is realised as a palatal approximant in most cases (4a). Word-finally following a consonant³ it is realised as a palatal fricative, which is voiced after sonorants and voiced obstruents (4b) and voiceless after voiceless obstruents (4c).

- | | | | | | | |
|-----|----|-------------------------------|-----------------|----|-------------------------------|----------------|
| (4) | a) | [j] | | b) | [j]/C ^[+voice] _## | |
| | | <i>jár</i> | ‘walk’ | | <i>dobj</i> | ‘throw Imp.’ |
| | | <i>új</i> | ‘new’ | | <i>fogj</i> | ‘hold Imp.’ |
| | | <i>ajtó</i> | ‘door’ | | <i>óvj</i> | ‘protect Imp.’ |
| | | <i>fejbe</i> | ‘into the head’ | | <i>szomj</i> | ‘thirst’ |
| | | <i>fejre</i> | ‘onto the head’ | | <i>férj</i> | ‘husband’ |
| | c) | [ç]/C ^[-voice] _## | | | | |
| | | <i>kapj</i> | ‘get Imp.’ | | | |
| | | <i>döfj</i> | ‘stub Imp.’ | | | |
| | | <i>rakj</i> | ‘put Imp.’ | | | |

1.2.2. /v/

/v/ shows a two-faced behaviour with respect to voice assimilation: it serves as a target of it (5a) but does not trigger it (5b).

³ Voice assimilation across word boundaries is not examined in this paper, therefore *word-final* always means *pre-pause* as well.

- | | | | |
|-----|----|---|--------------------------|
| (5) | a) | <i>szí</i> [v] – <i>szí</i> [f] <i>telen</i> | ‘heart’ – ‘heartless’ |
| | | <i>é</i> [v] – <i>é</i> [f] <i>től</i> | ‘year’ – ‘from the year’ |
| | b) | <i>cson</i> [t] – <i>cson</i> [t] <i>velő</i> | ‘bone’ – ‘bone marrow’ |
| | | <i>csa</i> [k] – <i>csa</i> [k] <i>nem</i> | ‘only’ – ‘almost’ |

Another oddity of the behaviour of /v/ is that this is the only sound traditionally analysed as an obstruent which can occur in word-initial clusters (1c) – a unique distributional property within the group of voiced obstruents in Hungarian.

Therefore, following Siptár (1994), I hypothesize that /v/ surfaces as an obstruent in coda position and as a sonorant – a labiodental approximant, to be precise – in onset position. The obstruent allophone of /v/ will, of course, be subject to voice assimilation, that is, it will be voiced before voiced obstruents and voiceless preceding voiceless ones:

- | | | | | | | |
|-----|----|-----------------------|----|-------------------------------|----|---------------------------------|
| (6) | a) | [v]/_V | b) | [v]/_C ^[+voice] | c) | [f]/_C ^[-voice] |
| | | <i>vak</i> ‘blind’ | | <i>évből</i> ‘from the year’ | | <i>óvtam</i> ‘I protected’ |
| | | <i>hatvan</i> ‘sixty’ | | <i>szívben</i> ‘in the heart’ | | <i>szívtől</i> ‘from the heart’ |

1.2.3. /h/

Prevocally, /h/ is realised as a glottal fricative, which is voiced in post-sonorant position (7b), and voiceless after obstruents and word-initially (7a). Preconsonantly and before a strong morpheme boundary (#) it is either deleted (7d) or surfaces as a velar fricative (7c).

- | | | | | |
|-----|----|-------------------------|----|------------------------------------|
| (7) | a) | [h]/{[-son],#}_V | c) | [x]/_C,# |
| | | <i>hat</i> ‘six’ | | <i>potroh</i> ‘abdomen’ |
| | | <i>adhat</i> ‘can give’ | | <i>potrohól</i> ‘from the abdomen’ |
| | b) | [ɦ]/[+son]_V | d) | [ø]/_C,# |
| | | <i>zuhany</i> ‘shower’ | | <i>cseh</i> ‘Czech’ |
| | | <i>konyha</i> ‘kitchen’ | | <i>Csehország</i> ‘Czech Republic’ |

There are three important observations to be made in connection with the table above. First, we can describe the distribution of the allophones of /h/ more straightforwardly if we refer to the place they occupy within the syllable: /h/ is realised as a glottal fricative in onset position and it either deletes or turns into a velar fricative in coda position.

Second, we can not distinguish between (7c) and (7d): whether /h/ deletes or is realised as a velar in coda position is unpredictable;⁴ moreover, variation among speakers can be detected. Therefore, either the *potroh*-group or the

⁴ Certain regularities can be observed; for instance that /h/ never deletes when following an /o/, because this would result in a word-final short [o], which is not allowed by Hungarian phonotactics (see Törkenczy 1994).

cseh-group has to be marked as exceptional in the lexicon (this is beyond the scope of this paper, for discussion see Törkenczy 1994: 297-299).

The third fact is that [x] remains voiceless before voiced obstruents:

- (8) *potro*[x] – *potro*[x]*ból* **potro*[γ]*ból*

These are the data that I wish to account for in this paper. I will present the model serving as the basis of my analysis in the next section.

2. An OT typology of voice assimilation

In this section, I present the model of voice assimilation phenomena developed by Petrova et al. (2000), with two major simplifications. First, the representations I adopt in this paper are based on binary features of the SPE-type (Chomsky & Halle 1968), while Petrova et al. use autosegmental representations.⁵ Second, as the present paper deals with Hungarian voice assimilation, I will concentrate on the relevant parts of Petrova et al. (2000) only.

The fact that obstruent clusters must agree in voicing is expressed by the following constraint:

- (9) **Agree**⁶ Obstruent clusters agree in voicing.

Petrova et al. have this constraint highest ranked, as, they claim, there are no surface forms violating it. However, on the basis of the data in (8), we can see that this is untenable.

Considering the data in section 1.1, it is also clear that the voicing of clusters is determined by the last obstruent in the cluster. In other words, it is the last member of clusters whose output form is faithful to the input in terms of the feature [voice]. The obstruent in question is either followed by a pause or a [+sonorant] segment (a vowel or a sonorant consonant). Therefore Petrova et al. introduce the following faithfulness constraints:

- (10) **ID-wf-voi** Word-final obstruents are faithful to their input in terms of the feature [voice].
- (11) **ID-preson-voi** Obstruents preceding [+sonorant] segments are faithful to their input with respect to the feature [voice].

Two more constraints relevant for the present discussion are introduced in Petrova et al. (2000):

⁵ I will return to the question of representation in Section 4.

⁶ Petrova et al. have the constraint **SHARE**. The distinction has to do with the use of an autosegmental vs. an SPE-type model.

- (12) ***[+voice]** Voiced obstruents are prohibited.
- (13) **ID-voi** Obstruents are faithful to their input in terms of the feature [voice].

According to Petrova et al. (2000), the ranking of these constraints in Hungarian is as follows:

- (14) **Agree, ID-wf-voi, ID-preson-voi >> ID-voi >> *[+voice]**

Let us now see how this model accounts for the Hungarian data.

(15)

a. ra/kd/	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
ra[kd]	*!				*
☞ra[gd]				*	**
ra[kt]		*!		*	
ra[gt]	*(!)	*(!)		**	*

b. gé/zt/	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
gé[zt]	*!				*
gé[zd]		*!		*	**
☞gé[st]				*	
gé[sd]	*(!)	*(!)		**	*

c. ker/tb/e	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
ker[tb]e	*!				*
☞ker[db]e				*	**
ker[tp]e			*!	**	
ker[dp]e	*(!)		*(!)	*	*

d. ra/bt/ól	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
ra[bt]ól	*!				*
☞ra[pt]ól				*	
ra[bd]ól			*!	*	**
ra[pd]ól	*(!)		*(!)	**	*

As we can see in (15) above, the model produces the right results when /j/, /v/, and /h/ are not involved. The tableaux in (16), (17) and (18) illustrate that it fails to do so when these phonemes are examined.

(16)

a. fé/rj/	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
? fé[rj]					
fé[rç]					
? fé[r̥]					*!

b. do/bj/	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
⊕do[bj]					*
do[b̥]					**!
do[pç]				*!	

c. ka/pj/	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
? ka[pj]					
ka[b̥]				*!	**
? ka[pç]					

(17)

a. ha/tv/an	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
ha[tv]an	*!				*
? ha[tv]an					
ha[dv]an				*!	**
? ha[tf]an					
ha[ɒv]an			*!		*

b. szí/vt/ól	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
szí[vt]ól	*!				*
szí[vd]ól			*!	*	**
? szí[ft]ól					
? szí[ut]ól					

(18)

a. a/dh/at	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
a[th]at				*!	
? a[tx]at				*!	
? a[t]at				*!	
a[d̥i]at			*!	*	**
a[d̥y]at			*!	*	**
a[dh]at	*!				*

b. do/hb/ól	Agree	ID-wf-voi	ID-preson-voi	ID-voi	*[+voice]
do[xb]ól	*!				*
do[xp]ól			*!	*	
⊕do[b]ól					*
do[fb]ól				*!	**

do[hb]ól	*!	:	:	:	*
do[ɣb]ól		:	:	*!	**
do[hp]ól		:	*!	*	

Examining tableaux (16) and (17), the question arises whether the faithfulness constraints introduced so far apply in the case of obstruents with a sonorant input. In these tableaux, voiceless obstruents with a sonorant input ([ç] and [f]) do not violate the [voice] faithfulness constraints. I will postpone dealing with this issue until the next section.

Thus, the model needs modification in order to be able to account for the behaviour of /j/, /v/ and /h/. I will outline a possible solution by introducing additional constraints and modifying the ranking in the next section.

3. Further constraints

3.1. /j/

To account for the distribution of the allophones of the phoneme /j/, we need to examine a condition on the well-formedness of syllables: **Sonority Sequencing** (SS), which requires that the sonority of segments decrease towards syllable peripheries. The sonority scale of Hungarian consonants (based on Törkenczy 1994) is as follows:

- (19) **sonority hierarchy**
 stops, affricates < fricatives << nasals << v << l << r << j
 where < marks a small sonority difference, << marks a big sonority difference

SS is a universal principle; nevertheless, languages can choose to employ a less restrictive variant of it. Törkenczy, when examining word-final consonant clusters, states that in Hungarian, SS allows for segments of the same sonority to stand next to each other.

We can thus formulate Sonority Sequencing as a constraint:⁷

- (20) **Sonority Sequencing** (final version) Progressing from the nucleus toward syllable peripheries, great sonority increase is not allowed.

As there is great sonority difference between /j/ and all the other consonants, all forms containing postconsonantal, pre-pause [j] violate SS. This constraint is thus assumed to be highest ranked in Hungarian.⁸

⁷ I owe this idea to Csirmaz (2000) – and thereby to Katalin Balogné Bérces -, who also explains the distribution of the allophones of /j/ by referring to Sonority Sequencing, employing the constraint *SONRISE. Nevertheless, my analysis differs significantly from hers.

Let us now return to the question whether the faithfulness constraints introduced above apply to obstruents with a sonorant input or not. Let us examine the former alternative first:

(21)

a. fé/rj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
fé[rj]				*!		
☞ fé[rj]						*
fé[rç]		*!			*	

b. do/bj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
do[bj]				*!		*
☞ do[bj]						**
do[pç]		*!			*	

c. ka/pj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
ka[pj]				*!		
⊗ka[bj]					*	*
ka[pj]	*!					*
ka[pç]		*!			*	

(21c) shows that this assumption leads to a dead end, as the model would predict the victory of the grammatical candidate in one of the following cases only:

1. if there were a constraint dominating all others introduced so far, which were only satisfied by ka[pç] among the relevant candidates.
2. if there were a highest ranked constraint, not ranked with respect to the other highest ranked ones, which is satisfied by ka[pç] and violated by ka[bj].

Both of these can be shown to be untenable.

Let us therefore examine the possibility that the faithfulness constraints introduced only apply to obstruents with an obstruent input.

(22)

a. fé/rj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
fé[rj]				*!		
fé[rj]						*!
⊗fé[rç]						

b. do/bj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
do[bj]				*!		*

⁸ The constraint does more than account for the distribution of the allophones of /j/: it correctly predicts which word-final sonorant clusters are permitted in Hungarian (see Törkenczy 1994).

do[bj]						*!*
⊗do[pç]						
c. ka/pj/	Agree	ID-wf-voi	ID-preson-voi	SS	ID-voi	*[+voice]
ka[pj]				*!		
ka[bj]					*!	**
ka[pj]	*!					*
⊗ka[pç]						

As (22a) shows, the winner is fé[rç], an ungrammatical candidate. A further oddity of the model is that it is *[+voice] that decides between the second and the third candidate, a constraint that is claimed to have no effect in Hungarian. Thus, there has to be a constraint which is fairly low ranked but dominates *[+voice] and gives preference to fé[rj] over fé[rç]. I hypothesise that it is a faithfulness constraint on the feature [voice] which applies to candidates with their [sonorant] value being different from that of their input:

- (23) **ID[voi][~son]** Obstruents are faithful to their input in terms of the feature [voice] even if this is not true for the feature [sonorant].

Tableau (24) illustrates the effects of **ID[voi][~son]** (the constraints **Agree**, **ID-wf-voi**, **ID-preson-voi** and candidates violating them are not included).

(24)

a. fé/rj/	SS	ID-voi	ID[voi][~son]	*[+v]	b. do/bj/	SS	ID-voi	ID[voi][~son]	*[+v]
fé[rj]	*!				do[bj]	*!			*
⊗fé[rj]				*	⊗do[bj]				*
fé[rç]			*!		do[pç]		*!	*	
c. ka/pj/	SS	ID-voi	ID[voi][~son]	*[+v]					
ka[pj]	*!								
ka[bj]		*!	*	**					
⊗ka[pç]			*						

The assumption that **ID-voi** dominates **ID[voi][~son]** is supported by two considerations. First, as **ID-voi** is a special subcase of **ID[voi][~son]**, this is the only ranking that shows the effect of **ID-voi** (if the constraints were unranked or **ID[voi][~son]** were ranked above **ID-voi**, there would be no need to formulate **ID-voi** an independent constraint). Second, if these two constraints were ranked in the opposite way, the model would predict the candidate containing the voiced palatal fricative as optimal in (24c); if they were not ranked, the decision would be left to *[+voice], which would be the only case where this constraint had an effect in Hungarian.

To prevent input sonorants from having obstruent outputs anytime, the following constraint needs to be introduced:

- (25) **ID-son** Segments are faithful to their input in terms of the feature [sonorant].

This constraint is obviously ranked below **SS** in Hungarian. The tableaux below illustrate its effect.

(26)

a. fé[rj]/	Agr	ID-wf- voi	ID-ps- voi	SS	ID-son	ID-voi	ID[voi] [~son]	*[+voi]
fé[rj]				*!				
☞ fé[r̥j]					*			*
☞ fé[rç]					*		*!	

b. do[bj]/	Agr	ID-wf- voi	ID-ps- voi	SS	ID-son	ID-voi	ID[voi] [~son]	*[+voi]
do[bj]				*!				*
☞ do[b̥j]					*			**
☞ do[pç]					*	*!	**	

c. ka[pj]/	Agr	ID-wf- voi	ID-ps- voi	SS	ID-son	ID-voi	ID[voi] [~son]	*[+voi]
ka[pj]				*!				
ka[b̥j]					*	*!	*	*
ka[p̥j]	*!				*			*
☞ ka[pç]					*		*	

d. a[j]tó	Agr	ID-wf- voi	ID-ps- voi	SS	ID-son	ID-voi	ID[voi] [~son]	*[+voi]
☞ a[j]tó								
a[j̥]tó	*!				*			*
a[ç]tó					*!		*	

e. /j/ár	Agr	ID-wf- voi	ID-ps- voi	SS	ID-son	ID-voi	ID[voi] [~son]	*[+voi]
☞ [j]ár								
[j̥]ár					*!			*
[ç]ár					*!		*	

3.2. /v/

As Siptár (1994) states, /v/ is unlike the other Hungarian obstruents in terms of both its phonetic properties and its phonological behaviour. Phonetically, it is

the least ‘noisy’ fricative. Its double-faced phonological behaviour is manifest both in its resistance to triggering voice assimilation and in that it is the only segment traditionally analysed as a voiced fricative which can occur as second member of word-initial clusters – an environment occupied by non-nasal sonorants in Hungarian, as we saw in (1). It is thus reasonable to assume that /v/ is sonorant [v] in this environment.

Following Szentgyörgyi (1997), I assume that /v/ is not specified for the feature [sonorant] in the underlying representation. A constraint is then needed to determine the value of this feature in allophones of /v/. Szentgyörgyi employs the following one:

- (27) **v-[son]** /v/ is [+sonorant] if and only if it is followed by a [+sonorant] segment.

According to this, /v/ is realised as an obstruent word-finally and when followed by an obstruent and as a sonorant before vowels and sonorant consonants. This, however, is not correct phonetically, as /v/ surfaces as an obstruent before sonorant consonants.

Therefore I reformulate **v-[son]**, in accordance with what has been said in 1.2.2:

- (28) **v-[son] (final)** /v/ is realised as a sonorant in onset position and as an obstruent in coda position.

This constraint is also highest ranked. It does not conflict with any of the constraints introduced so far, thus it does not need to be ranked with respect to them. As my analysis employs binary features, none of the forms with an underspecified input violate **ID-son**.

The model now produces the following results:

(29)

a. szí/ŷt/ól ⁹	Agr	ID-wf- voi	ID-ps- voi	v-[son]	ID- son	ID- voi	ID[voi] [~son]	*[+v]
szí[vd]ól			*!			*	*	**
☞ szí[ft]ól							*	
szí[vt]ól				*!				
szí[ŷt]ól				*!				*
szí[vd]ól			*(!)	*(!)		*	*	*

b. szí/ŷb/ól	Agr	ID-wf- voi	ID-ps- voi	v-[son]	ID- son	ID- voi	ID[voi] [~son]	*[+v]
☞ szí[vb]ól								**
szí[fp]ól			*!			*	**	
szí[vb]ól				*!				*

⁹ ŷ denotes /v/ unspecified for the feature [sonorant].

szí[<u>vb</u>]ól			*!	*!				*
szí[<u>vp</u>]ól				*!		*	*	

As we can see in (29), the winner is the candidate with a fricative as the output correspondent of the input v. The candidate with an underspecified v violates **v-[son]**, thus the model does not allow for an underspecified v to surface.

3.3. /h/

/h/, too, is outside the pale of the Hungarian consonant system. If we adopt the SPE definition of the feature [consonantal], /h/ will receive the value [-cons] indeed. However, this is only true for the glottal allophones of /h/ ([h] and [ɦ]), not for the velar one ([x]). As we saw in 1.2.3, the [-consonantal] allophones of /h/ are the ones that can appear in onset position only. Therefore, I propose the following constraint:

- (30) ***Co[-cons]** [-consonantal] segments in coda position are prohibited.

This excludes the glottal allophones of /h/ from coda position. As mentioned before, the different behaviour of the *potroh*-type and the *cseh*-type words must be coded in the lexicon, therefore I will not deal with this issue in this paper. Note, however, that both types of words satisfy the constraint in (30), as [x] is not [-cons], and if /h/ deletes, the coda will remain empty.

To prevent segments from changing their [cons] value, we need the following constraint:

- (31) **ID-cons** Segments are faithful to their input with respect to the feature [consonantal].

Naturally, ***Co[-cons]** must dominate **ID-cons**, as *potroh*-type words violate **ID-cons** in order to satisfy ***Co[-cons]**. Tableau (32) illustrates how these two constraints regulate the distribution of the allophones of /h/ (disregarding voice assimilation for a moment).¹⁰

(32)

a. /h/at	*Co[-cons]	ID-cons	b. zu/h/any	*Co[-cons]	ID-cons
☞ [H]at			zu[x]any		*!
[x]at		*!	☞ zu[H]any		
c. do/h/	*Co[-cons]	ID-cons	d. ad/h/at	*Co[-cons]	ID-cons

¹⁰ Whether the glottal fricative is voiced or voiceless is determined by whether it is preceded by a [+sonorant] segment or not (see section 1.2.3). As it is voiced only if following a [+sonorant], it seems as if it assimilated to the preceding segment (András Cser's suggestion). However, I do not wish to deal with this in this paper. Therefore I will use H to indicate both a voiced and a voiceless glottal fricative.

do[H]	*!		ad[H]at		
do[x]		*	ad[x]at		*!

We have accounted for the distribution of the allophones of /h/. The next issue at hand is that [x] remains voiceless even if followed by a voiced obstruent. According to the universal markedness hierarchy, [ɣ] is more marked than all the other voiced fricatives in Hungarian. It is therefore reasonable to introduce the following constraint:

- (33) * γ The voiced velar fricative and all voiced fricatives above it in the markedness hierarchy are prohibited.

This constraint, too, is highest ranked, as no surface forms violate it.¹¹ It is also clear that it must dominate **Agree**, as [x]+voiced obstruent clusters do not agree in voicing. This means that **Agree** is not highest ranked in Hungarian.

Let us now see how the model supplemented by these three constraints accounts for the distribution of the allophones of /h/ (v[-son], **SS**, **ID-son** and **ID[voi][~son]** are irrelevant in this respect, therefore they are left out from the following tableaux).

(34)

a. do/hb/ól	ID-wf- voi	ID-ps- voi	* γ	*Co [-cons]	Agree	ID- cons	ID- voi	*[+v]
do[hb]ól				*!				*
do[xb]ól					*	*		*
do[ɣb]ól			*!			*	*	**
do[xp]ól		*!				*	*	

b. do/ht/ól	ID-wf- voi	ID-ps- voi	* γ	*Co [-cons]	Agree	ID- cons	ID- voi	*[+v]
do[ht]ól				*!				
do[xt]ól						*		
do[ɣt]ól			*!			*	*	*
do[ɣd]ól		*(!)	*(!)			*	**	**

The only thing left is to explain why /h/ triggers voice assimilation. We can achieve this by specifying the class of segments subject to **Agree**:

- (35) **Agree** (specified) Clusters of [-sonorant] segments agree in terms of the feature [voice].

¹¹ This is not true for fast or careless speech, as [ɣ] does occur here intervocalically as a positional variant of /g/ (as András Cser was kind to point out). Constraint ranking obviously varies according to speed and register; * γ then gets ranked lower.

(36)

a/dh/at	ID-wf- voi	ID-ps- voi	* γ	*Co [-cons]	Agree	ID- cons	ID- voi	*[+v]
a[dh]at					*!			*
⊗ a[th]at								
a[tx]at						*!		
a[d γ]at		*(!)	*(!)			*	*	**

4. Summary and further issues

My aim in this paper was to account for the behaviour of the phonemes /j/, /v/ and /h/ in Hungarian voice assimilation in the framework of Optimality Theory. By modifying the analysis developed by Petrova et al. (2000), I have succeeded in providing a unified account of these phenomena, which have been regarded exceptional in traditional analyses.

One major weakness of my analysis, however, is the representation adopted. Not only does it employ binary features, it also allows for underspecification, making the model far too strong, enabling the theorist to formulate constraints of questionable universality, even constraints never to be found operative in human languages.

The shortcomings of the SPE-type binary feature model have long been recognised and it has been replaced by several alternatives – the most convincing of these is element theory, advocated primarily by Government Phonology (cf. Kaye et al. 1990). Attempts have been made to develop element-based analyses of voice assimilation phenomena in Hungarian (Szigetvári 1998a, 1998b, for instance), and laryngeal contrasts in general, providing valuable insights but unable to offer a comprehensive solution. I claim that two crucial reasons for this are the neglect GP shows for derivation (or ‘non-derivation’, as in OT) and the lack of a unified and acceptable theory of consonantal elements.

I strongly believe that a solution can be found by adopting the combined framework of OT and GP developed and applied successfully to vowel interaction phenomena by Krisztina Polgárdi (1998). However, considerable further research work is required in this area.

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On the semantics of indefinite free relatives

Ivano Caponigro

Unlike Germanic, Italian and many other languages from different language families allow *wh*- clauses to occur as the complement of existential predicates and be interpreted as indefinites. I call these *wh*- clauses *indefinite free relatives*. A compositional semantics will be given for indefinite free relatives that is based on Jacobson's (1995) proposal for the semantics of *wh*- words. In a nutshell, I will argue that indefinite free relatives denote a singleton set which contains only a maximal plural individual. The matrix predicate takes this set as its complement and asserts its non-emptiness.

1. Introduction

The examples in (1) from Italian show that what looks like the same embedded *wh*- clause is interpreted in three different ways: as a (singular or plural) indefinite in (1a), as a (singular or plural) definite in (1b) and as a question/answer denoting expression in (1c).

- (1) a. C'è [chi dice sempre di sì].
there's who says always of yes
'There is somebody/people who always says/say yes.'
- b. Non sopporto [chi dice sempre di sì].
not stand.1SG who says always of yes
'I can't stand the person/people who always says/say yes.'
- c. So [chi dice sempre di sì].
know.1SG who says always of yes
'I know who always says yes.'

These facts are partially unsurprising. The bracketed *wh*- clause in (1c) is clearly an embedded *wh*- interrogative clause: it occurs as the complement of a

predicate that selects for a question/answer denoting expression and is interpreted as such. The bracketed *wh*- clause in (1b), instead, is an example of what has been traditionally called a free or headless relative clause (henceforth, FR), that is an embedded *wh*- clause which resembles a DP containing a headed relative clause because of its internal gap and its DP-like distribution and interpretation. Jacobson (1995) convincingly argues that FRs are semantically equivalent to definite descriptions. Henceforth, I will call these *wh*- clauses *definite FRs*. I will do so to distinguish definite FRs from the *wh*- clauses of the kind in (1a), which also have an internal gap and can be replaced and paraphrased with headed relative clauses. Nevertheless, they have a much more restricted distribution, as we will soon see, and are interpreted as indefinites. This is why I label them *indefinite FRs*.

Unlike the other two *wh*- constructions, indefinite FRs have been largely ignored in both the syntactic and semantic literature.¹ This paper is about their semantic properties and how they can be compositionally derived.

The structure of the paper is as follows. I will start with a precise definition of indefinite FRs (§2). Then, I will make use of this definition to show that indefinite FRs are a productive construction in Italian and in many other languages from different language families (§2 and §3). Once the non-idiosyncratic nature of indefinite FRs has been established, I will briefly compare indefinite FRs with definite FRs and *wh*- interrogatives. It will turn out that these three constructions are syntactically and semantically different, but crucially they make use of the same *wh*- words (§4). Finally, I will give a compositional semantics for indefinite FRs that capitalizes on Jacobson's (1995) semantics for *wh*- words in definite FRs and *wh*- interrogatives (§5).

2. Indefinite FRs: a definition

I assume indefinite FRs to be all and only the strings that satisfy the following three conditions:

(2) Indefinite FRs:

- i. are *wh*- clauses;
- ii. occur as the complements of existential verbs (mainly the equivalents of

¹ Indefinite FRs in French and Spanish are briefly mentioned in Hirschbühler (1978: 168-170), where they are called infinitival FRs. Grosu (1994: 137-142) discusses the syntactic properties of indefinite FRs, which he calls irrealis FRs, in Spanish, Romanian and Modern Hebrew. Grosu & Landman (1998: 155-158) mention indefinite FRs as an example of a *wh*- construction that does not show maximality, since, according to them, indefinite FRs are just open formulas. Finally, Pancheva Izvorski (2000: Ch.2) discusses indefinite FRs in Slavic and Romance to conclude that they do not show maximality and therefore they must be *wh*- interrogatives.

- existential *be* and existential *have*);
 iii. can be replaced and paraphrased with indefinite DPs.

It is easy to see how the bracketed string in (1a), repeated as (3a) below, satisfies the definition in (2). First, it has the wh- word *chi* ‘who’ in clause initial position, that is it looks like a typical wh- clause in Italian. Second, it is the complement of existential *essere* ‘be’. Finally, it can be replaced and paraphrased with a (complex) indefinite DP, as shown in (3b).

- (3) a. C’è [_{indefinite FR} *chi dice sempre di sì*].
 there’s who says always of yes
 ‘There is somebody/people who always says/say yes.’
 b. Ci sono [_{indefinite DP} (*delle*) *persone che dicono sempre di sì*].
 there are (some) people that say always of yes
 ‘There are people who always say yes’

Another example of an indefinite FR in Italian is given in (4a). The bracketed string is a wh- clause headed by the wh- word *dove* ‘where’, it occurs as the complement of existential *avere* ‘have’, and it can be replaced and paraphrased with an indefinite DP, as shown in (4b).

- (4) a. Non aveva [_{indefinite FR} *dove nascondersi*] in caso di pericolo.
 not had.3SG where to-hide-himself in case of danger
 ‘He didn’t have a place/places where he could hide in case of danger.’
 b. Non aveva [_{indefinite DP} *un posto in cui nascondersi*] in caso di
 not had.3SG a place in which to-hide-himself in case of
 pericolo
 danger
 ‘He didn’t have a place where he could hide in case of danger.’

The examples in (3a) and (4a) also show that indefinite FRs in Italian are a productive construction that can take different wh- words (*chi* ‘who’ and *dove* ‘where’, respectively) and be introduced by more than one existential predicate (*essere* ‘be’ and *avere* ‘have’, respectively).

3. Cross-linguistic distribution

Indefinite FRs are found in other Romance languages, in Slavic, Finno-Ugric, Modern Greek and Modern Hebrew. Examples are given below.

- (5) *Spanish* (Heriberto Avelino, p.c.)
 Tengo [con quién hablar] quando estoy triste.
 have.1SG with whom to-speak when am sad
 'I have somebody to talk to when I am sad.'
- (6) *Portuguese* (Móia 1992: 94; Jazon Santos p.c.)
 O Paulo não tem [a quem pedir ajuda].
 the Paulo not has to whom ask-for.INF help
 'Paulo doesn't have anybody to ask for help.'
- (7) *French* (Hirschbühler 1978: 168; Dominique Sportiche p.c.)
 J'ai [de quoi écrire].
 I-have of what to-write
 'I have something to write with.'
- (8) *Romanian* (Grosu 1994: 138)
 Maria are [cu cine vota].
 Maria has with whom to-vote
 'Maria has somebody to vote for.'
- (9) *Russian* (Pancheva Izvorski 2000: 26; Ora Matushansky p.c.)
 Est' [s kem pogovorit'].
 be.PRES with whom to-talk
 'There is somebody with whom one could talk.'
- (10) *Serbo-Croatian* (Alexandra Perovic p.c.)
 Nemam [ga kome dati].
 not-have.1SG it.ACC whom.DAT give.1SG
 'I have no-one to give it to.'
- (11) *Bulgarian* (Rudin 1986: 190)
 Toj ima [s kogo da govori].
 he has with whom PARTICLE talk.3SG
 'He has somebody to talk to.'
- (12) *Hungarian* (Anikó Lipták p.c.; Anna Szabolcsi p.c.)
 Van [kivel beszélni].
 is who.INS to-talk
 'There is/are someone/people to talk to.'

(13) *Modern Greek* (Maria Baltazani p.c.)

Exo [me pion na miliso] otan ime lipimenos.
have.1 SG with whom. ACC PARTICLE talk.1 SG when am sad
'I have somebody to talk to when I am sad.'

(14) *Modern Hebrew* (Grosu 1994: 138; Daphna Heller p.c.)

eyn li [im mi le-daber].
not-is to-me with who to-talk
'I don't have anybody to talk to.'

For reasons that are not known to me, indefinite FRs are not found in any Germanic language, except Yiddish:

(15) *Yiddish* (Adam Albright p.c.)

Ikh hob nit [mit vemen ikh ken reden], az ikh bin troyerik.
I have not with who. DAT I can speak, when I am sad
'I don't have anybody to talk to when I am sad.'

(16) *Yiddish* (Koysef n.d.)²

[...] nisht vayil es iz nisht geven [mit vemen tsu redn].
not because it has not been with whom to speak
'[...] not because there wasn't anyone to talk to.'

(17) *English* (Carson Schütze p.c., Harold Torrence p.c.)

*I have [who(m) to talk to] when I am sad.

(18) *German* (Daniel Buring p.c.)

*Ich habe [mit wem ich sprechen kann], wenn ich traurig bin.
I have with whom I speak can, when I sad am

(19) *Dutch* (Hilda Koopman p.c.)

*Ik heb [met wie te praten] als ik me triest voel.
I have with who to talk if I me sad feel

In conclusion, the examples above show that indefinite FRs are not an idiosyncrasy of Italian, but they are a productive construction which is attested in many languages from different language families.

² Thanks to Adam Albright for pointing this out to me.

4. Indefinite FRs, definite FRs and wh- interrogatives

Can indefinite FRs be considered just a sub-case of either definite FRs or wh- interrogatives? They are introduced by the same wh- words and, as we saw in (1), they can look identical in form. Nevertheless, there is syntactic and semantic evidence that shows that indefinite FRs are crucially different. In this section, I will briefly go over some of the most important differences between these constructions.

4.1. Indefinite FRs are not definite FRs

Let us go back to the examples of Italian indefinite and definite FRs in (1a) and (1b). They are repeated below in (20a) and (21a), respectively.

- (20)a. C'è [_{indefinite FR} chi dice sempre di sì].
 there's who says always of yes
 'There is somebody/people who always says/say yes.'
- b. Ci sono [_{indefinite DP} (delle) persone che dicono sempre di sì].
 there are (some) people that say always of yes
 'There are people who always say yes.'
- (21)a. Non sopporto [_{definite FR} chi dice sempre di sì].
 not stand.1 SG who says always of yes
 'I can't stand the person/people who always says/say yes.'
- b. Non sopporto [_{definite DP} le persone che dicono sempre di sì].
 not stand.1 SG the people that say always of yes
 'I can't stand the people that always say yes.'

Among the similarities, indefinite and definite FRs are introduced by the same wh- words and they may look identical, as one can see in the examples above. Also, they both have a DP-like distribution and receive a DP-like interpretation, as made clear by the English translation. The sentences in (20b) and (21b) show that both indefinite and definite FRs can be replaced and paraphrased with a DP.

Nevertheless, important differences distinguish these wh- constructions. First of all, indefinite FRs can be paraphrased with indefinite DPs, but not with definite DPs. Definite FRs, instead, exhibit the opposite behavior: definite DPs can replace them without changing the truth conditions of the sentence, while indefinite DPs cannot. Second, there are languages that have definite FRs, but not indefinite FRs (e.g. Germanic). This would be even more unexpected if we were dealing with exactly the same construction. Third, definite FRs have syntactic restrictions that indefinite FRs do not (they exhibit categorial and case matching effects and they do not allow infinitives or subjunctive; cf. Appendix). Finally, indefinite FRs occur only as complements of a very small class of predicates, while definite FRs can occur more freely as arguments or

adjuncts. In conclusion, indefinite FRs are not definite FRs. Nevertheless, they make use of the same *wh*- words.

4.2. Indefinite FRs are not *wh*- interrogatives

Let us now compare indefinite FRs and *wh*- interrogatives. Indefinite FRs are introduced by a subset of the *wh*- words that introduce *wh*- interrogatives. They have similar syntactic properties (they can both be infinitival and neither show case or categorial matching effects; cf. Appendix).

Nevertheless, no language seems to have indefinite FRs with the equivalents of *wh*- words like *why* or *what/which*+NP. This would be totally unexpected if indefinite FRs were *wh*- interrogatives. Also, they are selected by different classes of predicates. Indefinite FRs occur with existential predicates which never select for an interrogative, as shown by the ungrammaticality of (22).

- (22) * C'è _[yes/no interrogative] se Harold dice sempre di sì].
 there's if Harold says always of yes

Last but not least, they are interpreted in a completely different way. Indefinite FRs are paraphrased with indefinite DPs, as we just saw in 4.1. *Wh*- interrogatives, instead, cannot usually be replaced by DPs, but they may be paraphrased with declarative clauses. For instance, the *wh*- interrogative in (23a) is more or less equivalent to the embedded declarative clause in (23b), if they are evaluated in a situation in which Harold is the only person who always says yes.

- (23)a. So _[wh- interrogative] chi dice sempre di sì].
 know.1 SG who says always of yes
 'I know who always says yes.'
- b. So _[declarative clause] che Harold dice sempre di sì].
 know.1SG that Harold says always of yes
 'I know that Harold always says yes.'

In conclusion, indefinite FRs are not *wh*- interrogatives (contra Pancheva Izvorski 2000). Nevertheless, indefinite FRs make use of a subset of the *wh*- words that are found in *wh*- interrogatives.

5. The semantics of indefinite FRs

So far, we have concluded that indefinite FRs are an independent linguistic object. Their syntactic and semantic properties cannot be reduced to either

definite FRs or *wh*-interrogatives. Nevertheless, we saw that all three *wh*-constructions share the same *wh*-words.

In this section, I will give a compositional semantics for indefinite FRs which capitalizes on Jacobson's (1995) proposal concerning the semantics of *wh*-words in definite FRs and *wh*-interrogatives. First, I will briefly introduce Jacobson's (1995) proposal. Then, I will show how it can be applied to indefinite FRs in order to compositionally derive a meaning for indefinite FRs that makes them equivalent to indefinites.

5.1. *The meaning of wh- words (Jacobson 1995)*

According to Jacobson (1995), the *wh*-words in definite FRs and *wh*-interrogatives in English are the same lexical items and, therefore, their semantic contribution is the same in both constructions. The basic intuition is that *wh*-constructions convey maximality and maximality is lexically encoded in the meaning of *wh*-words. More precisely, *wh*-words denote a function that applies to a set *P* of individuals and returns the singleton set containing the maximal plural individual of *P*. A theory of plurality like the one in Link (1983) is assumed, where a formally defined sum operation applies to the denotation of certain predicates (most likely at the level of the lexicon) to form plural individuals starting from atomic ones.

Let us go over the example in (24) and see how Jacobson's proposal works.

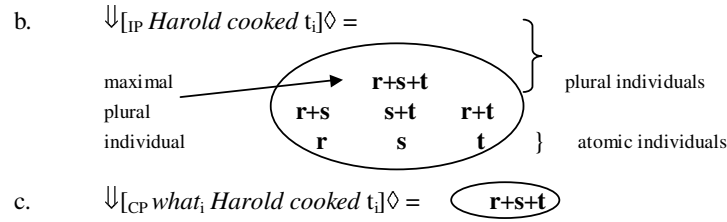
(24) I know/tasted [_{CP} *what*_i [_{IP} *Harold cooked t_i*]]

The *wh*-clause in (24) [*what*_i *Harold cooked t_i*] can be either a definite FR or *wh*-interrogative depending on the matrix predicate. This is not crucial because the basic meaning of both *wh*-CPs is identical. They both denote the set containing the maximal plural individual that results from the sum of all the atomic individuals that Harold cooked (if Harold cooked just one thing, the only atomic individual and the maximal plural individual coincide).

For instance, if Harold cooked Tuscan soup, risotto, and salmon, then the *wh*-clause will denote a set containing just the plural individual that is made up of all those three atomic individuals together (risotto+salmon+soup). This is shown graphically in (25). (25a) lists the atomic individuals or things that Harold cooked. (25b) illustrates the denotation of the IP [_{IP} *Harold cooked t_i*]: the set containing all the atomic individuals that Harold cooked plus all the plural individuals resulting from all the possible "sums" of the atomic individuals Harold cooked. When the *wh*-word is combined with the IP, its semantic contribution changes the denotation of the clause from the set in (25b) to a singleton set which contains only the maximal plural individual of the set in (25b), as shown in (25c).

(25)a. Atomic individuals that Harold cooked:

- r**: risotto
- s**: salmon
- t**: Tuscan soup



A more formal version of the semantic derivation of the example in (24) that has just been sketched is given in (26) and (27).

- (26) X, Y : variables over atomic and plural individuals
h : individual constant
P : variable over sets of atomic and plural individuals
* : operator that closes a predicate under sum formation (Link 1983)
 \leq : part-of relation ($a \leq c$ iff $c = a+b$)

(27) *wh- CP*

- a. $[IP \textit{Harold cooked } t_i] \rightsquigarrow \lambda Y[*\textit{cooked}'(Y)(\mathbf{h})]$
- b. $[\textit{what}] \rightsquigarrow \lambda P[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]]$
- c. $[CP \textit{what}_i \textit{Harold cooked } t_i] \rightsquigarrow$
 $\lambda P[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]] (\lambda Y[*\textit{cooked}'(Y)(\mathbf{h})])$
 $= \lambda X[*\textit{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\textit{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)]$

As we already briefly discussed, definite FRs and *wh-* interrogatives do not have the same meaning. Jacobson (1995) accounts for this difference starting from the identical meaning of *wh-* CPs and applying to it two different semantic operations. If the *wh-* CP *what Harold cooked* is the complement of a DP-selecting predicate like *taste* in (28a), then it turns into a FR and a type-shifting operation will apply to its denotation which will lower it to an object of type $\langle e \rangle$ rather than of type $\langle e, t \rangle$. In other words, a FR will end up denoting the maximal plural individual itself and not the set containing it (28b).

(28) *Definite FR*

- a. I tasted $[_{\textit{definite FR}} \textit{what Harold cooked}]$.
- b. $[_{\textit{definite FR}} \textit{what Harold cooked}] \rightsquigarrow$
 $tX[*\textit{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\textit{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)]$

If the *wh*-CP, instead, is the complement of an interrogative predicate like *know* (29a), it turns into a *wh*-interrogative and a semantic operation will apply to it so that its final denotation will be the unique true proposition that asserts that Harold cooked all the things that he cooked. In a situation like (25a) above, it would be a proposition that asserts that Harold cooked Tuscan soup, risotto and salmon.

(29) *Wh*-interrogative

- a. I know [_{wh-interrogative} what Harold cooked].
- b. [_{wh-interrogative} what Harold cooked] \rightsquigarrow
 $\text{tp}[\exists X(\text{p} \wedge \text{p} = [*\text{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\text{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)])]$

5.2. Proposal: the semantics of indefinite FRs

In this section I will give a compositional semantics for indefinite FRs that captures two crucial facts: first, the *wh*-words in indefinite FRs are morphologically identical to the *wh*-words in definite FRs and *wh*-interrogatives; second, indefinite FRs can always be paraphrased with indefinite DPs. In order to do this, I will make further semantic and syntactic assumptions.

Assumption I: the meaning of wh-words. I assume that the morphological identity of *wh*-words implies that we are dealing with the same lexical items in all three *wh*-constructions. Therefore, the meaning of *wh*-words in indefinite FRs is the same as the meaning that Jacobson (1995) assigns to *wh*-words in definite FRs and *wh*-interrogatives: they are functions that apply to a set and return the singleton set containing the unique maximal plural individual of the argument set (cf. 5.1 above).

Assumption II: the meaning of existential predicates. Following Milsark (1974) and Grosu & Landman (1998), I assume that the existential predicates that allow indefinite FRs as their complements (*be*, *have*, etc.) take a set denoting complement and lexically introduce existential quantification over that set, or, more precisely, assert the non-emptiness of that set.

Assumption III: the syntax of indefinite FRs. Following Grosu (1994), I assume that indefinite FRs have the same syntactic structure as *wh*-interrogatives: they are bare CPs. This would also account for the syntactic similarities between indefinite FRs and *wh*-interrogatives we briefly discussed in 4.2.

Given the assumptions above, we can now move to the semantic proposal for indefinite FRs. The basic idea is that indefinite FRs are just *wh*-CPs and denote what *wh*-CPs denote, namely a singleton set containing a maximal plural individual. The matrix existential predicate takes this set as its argument and existentially closes it. In other words, the existential matrix predicate simply asserts that the set denoted by the indefinite FR is not empty. Given the

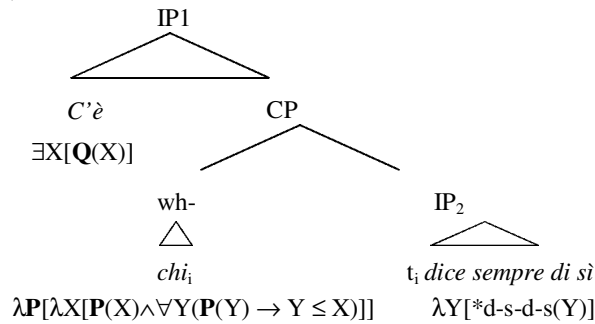
lexical property of wh- words, if the set is not empty, it can only contain a maximal individual. Thus, the matrix predicate indirectly asserts that there is a maximal plural individual that has the property expressed by the indefinite FRs.

Let us go back to the example of an indefinite FR we started with, which I repeat in (30) below, and see how my proposal accounts for it.

- (30) C'è [_{indefinite FR} chi_i t_i dice sempre di sì].
 there's who says always of yes
 'There is somebody/people who always says/say yes.'

A simplified syntactic structure for (30) is given in (31), together with the translation of the wh- word and the IP of the indefinite FR. A more detailed translation is given in (32).

(31)



- (32)a. $IP_2 \rightsquigarrow \lambda Y[*d-s-d-s(Y)]$
 (from the lexicon, by function application and λ abstraction)
- b. $wh- \rightsquigarrow \lambda P[\lambda X[P(X) \wedge \forall Y(P(Y) \rightarrow Y \leq X)]]$
 (from the lexicon)
- c. $CP \rightsquigarrow \lambda P[\lambda X[P(X) \wedge \forall Y(P(Y) \rightarrow Y \leq X)]] (\lambda Y[*d-s-d-s(Y)])$
 $\equiv \lambda X[*d-s-d-s(X) \wedge \forall Y(*d-s-d-s(Y) \rightarrow Y [X])]$
 (from a. and b. by function application)
- d. $IP_1 \rightsquigarrow \exists X[*d-s-d-s(X) \wedge \forall y(*d-s-d-s(Y) \rightarrow Y \leq X)]$
 (from c., d., and the lexicon by function application)

Informally, what (32d) says is that there is a group of people (maybe just one person) who always say yes and everybody who always says yes is in that group.

From the definition of the * operator in Link (1983), it follows that if there exists a maximal plural individual, then there also necessarily exist the atomic individuals it is made of. In other words, the equivalence in (33) holds.

$$(33) \exists X[*d-s-d-s(X) \wedge \forall Y(*d-s-d-s(Y) \rightarrow Y \leq X)] \leftrightarrow \exists X[d-s-d-s(X)]$$

The right member of the equivalence in (33) is identical to what is standardly assumed to be the denotation of a sentence like (3b), repeated in (34) below.

- (34) Ci sono _[indefinite DP] (delle) persone che dicono sempre di sì.
 there are (some) people that say always of yes
 'There are people who always say yes'

Therefore, indefinite FRs turn out to be equivalent to indefinite DPs. This is a welcome result since it accounts for the intuition about the meaning of indefinite FRs we started with: indefinite FRs can always be paraphrased with indefinite DPs (cf. §2).

6. Conclusions

In this paper I discussed a kind of embedded wh- clause, indefinite FRs, which is syntactically and semantically different from definite FRs and wh- interrogatives.

I showed that, although indefinite FRs are absent in Germanic, they are found in many other languages from different language families.

The morphological shape and the crosslinguistic distribution of wh- words in indefinite FRs, definite FRs and wh- interrogatives show that the wh- words in these three constructions are the same lexical items.

I argued that Jacobson's (1995) analysis of definite FRs and wh- interrogatives which encodes maximality in the lexical meaning of wh- words, can be extended to indefinite FRs as well. All these wh- constructions denote a singleton set containing a maximal plural individual at a certain point of their semantic derivation. A crucial difference between definite FRs and indefinite FRs is in that the existence of the maximal plural individual is presupposed in a sentence with a definite FR, while it is asserted in a sentence with an indefinite FR. This conclusion accounts for native speakers' intuitions that indefinite FRs are best paraphrased with indefinite DPs.

Appendix

Some syntactic differences between indefinite FRs and definite FRs

1. Matching

Unlike definite FRs, indefinite FRs don't show matching effects. (35) is ungrammatical, the reason being a categorial mismatch between the selectional requirements of the matrix predicate (*incontrare* 'to meet' selects only for a DP complement) and the category of the wh- phrase (i.e. PP) in the FR that occurs as the complement of the matrix predicate.

- (35)a. *Ho incontrato [PP con chi] sei appena andato in vacanza.
 have.1SG met.PART with whom are.2SG just gone in vacation
 'I have met with the one(s) who you just went on vacation with.'

Indefinite FRs, instead, can have either a DP or a PP wh- phrase without the whole sentence being ungrammatical (36). The same is true for wh- interrogatives(37).

- (36)a. Non ho [PP con chi] andare in vacanza.
 not have.1SG with whom go.INF in vacation
 'I don't have anybody to go on vacation with.'
- b. Non ho [DP chi] mandare alla conferenza.
 not have.1SG who send.INF to-the conference
 'I don't have anybody to send to the conference.'
- (37)a. Non so [PP con chi] andare in vacanza.
 not know.1SG with whom go.INF in vacation
 'I don't know who to go on vacation with.'
- b. Non so [DP chi] mandare alla conferenza.
 not know.1SG who send.INF to-the conference
 'I don't know who to send to the conference.'

2. Tense

Indefinite FRs can be tenseless, unlike definite FRs and like wh- interrogatives:

- (38)a. Non avevano [indefinite FR dove rifugiarsi in caso di pericolo].
 not had.3PL where shelter.INF in case of danger
 'They didn't have any place they could shelter in case of danger.'

- b. *Non sono andati [_{definite FR} dove rifugiarsi in caso di pericolo].
 not are.3PL gone where shelter.INF in case of danger
 ('They didn't go where they could shelter in case of danger.')
- c. Non sapevano [_{wh- interrogative} dove rifugiarsi in caso di pericolo].
 not knew.3PL where shelter.INF in case of danger
 'They didn't know where they could shelter in case of danger.'

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On impersonal *si* constructions in Italian

Roberta D'Alessandro

Italian impersonal *si* constructions show a number of puzzling properties, which have been largely examined by Cinque (1988), Chierchia (1995) and Dobrovie-Sorin (1996, 1998, 1999) among others. In this paper, I consider the agreement patterns of impersonal *si* constructions. I show how these patterns follow easily from locality and intrinsic properties of *si*, such as, for instance, its clitic nature. There is no need to postulate special properties of *si* which are not shared by other clitics. *Si* can be considered as acting only at the syntactic level, and not, as has been proposed, in the lexicon.

1. Introduction

Impersonal constructions introduce an unspecified, generic subject in an utterance. In Italian, one of the possible strategies for obtaining this is the so-called impersonal *si* construction:

- (1) Al giorno d'oggi si mangia troppo
 at the day of today si eats too much
 'Nowadays people eat too much'

In (1), the subject is not specified. The sentence has a generic meaning, introduced by *si*.

2. The syntax of *si*

In this section, I provide an overview of the theoretical background which I am going to use. In section 3, I introduce the puzzle of agreement patterns with transitive verbs, for which I propose a syntactic analysis based on the intervention effect of *si*. In sections 4 and 5 I examine the case of unaccusative and unergative verbs, which are very different from each other with respect to their agreement patterns.

2.1. Theoretical background

Impersonal *si* constructions display complex agreement patterns, which vary depending on the verb class, as I will show in this section. In the minimalist framework proposed by Chomsky (1995, 1999), the only condition that syntactic expressions need to obey is legibility at the interface between the syntactic system and other systems (for instance, the phonological system or the logical one). In order to fulfil this requirement, all features which are uninterpretable on lexical items must be eliminated before the interface levels are reached. I adopt here the 'Derivation by Phase' framework, according to which features can be valued or unvalued, and the evaluation of unvalued features takes place under Agree if a Match relation of phi-features holds between an element with valued features and one with unvalued ones. Again, all the features need to be valued before the interface levels are reached, or the derivation will crash. Following Chomsky (1999), I assume that the Agree relation doesn't necessarily take place in a specifier-head configuration, but it can be a long-distance relation, though subject to locality conditions. Moreover, I assume that the evaluation of unvalued features takes place at the end of a phase (v, C).

In this paper, I attempt to show that *si* is not a special lexical item which absorbs theta-role or Case. I show that *si* does not have any special property, except the one deriving from its double status as DP and as head, provided by its clitic nature (see Chomsky 1995:249). Sticking to minimalist assumptions, it is not necessary to restrict the merging sites of *si*. In other words, if *si* is a DP, it is possible to merge it in any DP site. No extra restrictions need to be formulated. Furthermore, I assume that *si* is phi-complete, and consequently it can evaluate phi-sets, and it can get Case; more precisely, it can have its Case features evaluated. Among its phi-features, the relevant one for most of the derivations is number, which for *si* is plural, as shown in (2).

- (2) Si_i vuole PRO_i essere ricchi
 si wants-3RD SING PRO_i to be rich-PL MASC
 'People want to be rich'

Given these basic assumptions, all the anomalous agreement patterns in *si* constructions surface as the result of syntactic derivations which involve *si*.

With respect to thematic roles, I assume, with Chomsky (1995) among others, that they are determined configurationally. According to Burzio's Generalization, if a verb does not assign a theta-role to the subject it does not assign accusative Case. There is a one-to-one relationship, thus, between external theta-role and Accusative. However, as pointed out by many linguists (cf. Marantz 1991, Burzio 2000, Reuland 2000), Burzio's Generalization has to be revised and decomposed, as it links very different properties of a predicate, such as structural Case and thematic roles. For my purpose, it is enough to

assume that external theta-role and accusative structural case do not need to be assigned by the same head, in the same projection.

3. Impersonal constructions with transitive verbs

3.1. Agreement in the present tense

In this section, I first introduce some data on agreement in impersonal *si* constructions with transitive verbs. For these sentences, there are two main syntactic constructions: one in which the verb agrees with the Nominative object, and the other in which the verb exhibits the default third person ending and the object is marked with Accusative. For the analysis of these constructions I adopt the model proposed by Anagnostopoulou (2000) for double object constructions. After introducing Anagnostopoulou's model in section 3.2. I discuss similarities between impersonal and double object constructions in section 3.3.; to account for the agreement facts in *si* constructions I propose an analysis similar to Anagnostopoulou's (sections 3.3. and 3.4.). Finally in section 3.5. I show how past participle agreement can be easily derived by adopting the structures I propose.

3.1.1. The data

Si constructions with transitive verbs, in the present tense, show two main agreement patterns, as in (3) and (4):

- (3) Qui *si* raccontano favole
 here *si* tell-3RD PL fairy tales-PL FEM NOM
 'Here people tell stories'
- (4) Qui *si* racconta favole
 here *si* tells-3RD SG fairy tales-PL FEM ACC
 'Here people tell stories'

In (3), the verb shows agreement with the object, which is Nominative, and in (4) it shows the default 3rd singular ending, and the object is Accusative. The Case of the object can be detected by substituting a pronoun for the DP object, which in Italian is marked for Case, as in (5):

- (5) a. Le *si* racconta/ *raccontano
 them-PL FEM ACC *si* tells-3RD SG/ tell-3RD PL
 'People tell them'
- b. Esse *si* raccontano/ *racconta
 they-PL FEM NOM *si* tell-3RD PL tells-3RD SG
 'People tell them'

Furthermore, in Italian agreement with a verb only takes place when a DP is Nominative.

In (3) and (4), the verb is transitive.¹ Despite its nominative Case in (3), the DP object 'favole' is a real object, i.e. an internal argument, in both sentences. This can be shown by using the *ne* test: *ne* is a partitive clitic, which can only replace an internal argument (cf. Burzio 1986):

- (6) Se *ne* raccontano/ racconta spesso
 si of-them tell-3RD PL tells-3RD SG often
 'People tell them often'

Several proposals have been made to explain the difference in agreement pattern between (3) and (4). In particular, Cinque (1988) has postulated the existence of two different *si*'s: an argumental one for (3), and a non argumental one for (4). This assumption is not necessary, as the difference in agreement is syntactic in nature.

3.2. The split-*v*

There is disagreement among researchers concerning the status of *si*. Among the different proposals, I briefly introduce those that are particularly relevant for the discussion of the agreement facts I am trying to explain: McGinnis's, Cinque's and Dobrovie-Sorin's.

McGinnis (1997) suggests that *si* is always argumental. Cinque (1988), on the other hand, shows that argumental *si* is only possible with finite verbs which project an external theta-role, namely transitives and unergatives. This hypothesis is supported by the fact that *si* in Italian is not allowed in untensed clauses, except in Aux-to-Comp and Raising structures with transitive and unergative verbs, where an external theta-role is assigned. However, as shown by Dobrovie-Sorin (1996, 1998, 1999), this problem can be solved in a different way: *si* is not licensed in non-finite clauses because *si* is a nominative clitic and in Italian nominative clitics are not allowed in these contexts. Transitive and unergative Aux-to-Comp and Raising structures allow *si* just because they can passivize. *Si* in this case is not Nominative but Accusative. In other words it's a middle-passive *si*. Thus, there is no need to postulate that *si* is argumental in these structures.

It has been suggested that the external argument is merged in a different projection from that of the main verb. In particular, Marantz (1993) and Kratzer (1994) have argued for the existence of a *v* head, the locus of assignment of the external theta-role and nominative Case. I adopt the model proposed in the Minimalist Program (henceforth MP), which is more in the spirit of Kratzer, and consider *v* as a transitive head.

Coming back to our agreement problems, let's compare the following sentences.

¹ Leaving aside the question about the optional indirect object, I assume that *raccontare* is a 2-place verb.

- (7) In Italia *si* mangia una mela al giorno per stare bene
 in Italy *si* eats an apple-NOM at the day for stay well
 ‘In Italy people eat an apple a day to keep healthy’
- (8) Gianni *si* mangia una mela al giorno per stare bene
 Gianni *si* eats an apple-ACC at the day for stay well
 ‘Gianni eats an apple a day to keep healthy’
- (9) In Italia *si* leggono dei buoni libri
 in Italy *si* read-3RD PL some-PL MASC good-PL MASC books-PL MASC NOM
 ‘In Italy people read good books’
- (10) Gianni *si* legge dei buoni libri
 Gianni *si* reads some good books-PL MASC ACC
 ‘Gianni reads some good books’

(7) and (8), (9) and (10), despite their various syntactic and semantic differences, have the same underlying structure, as I will show below. Observe that in (7) and (9) the verb agrees with the Nominative object, whereas in (8) and (10) there is no such agreement, and the object is Accusative.

Sentences (8) and (10) are a kind of double object construction. *Si* is a benefactive dative clitic, which happens to be coreferent with the subject ‘Gianni’. Anagnostopoulou (2000) proposes two different structures in order to account for this kind of sentences: one with a double *v* and one with a single *v*. The structure with the double *v* includes a *v*CAUS (v_1) head and a *v*APPL (v_2) head. In this structure, the indirect object is introduced by the applicative head (see Marantz 1993, McGinnis 1998, Anagnostopoulou 1999), while the external argument is introduced by the causative head, which is higher. The sentences in (8) and (10) can be analysed within this pattern. In these two sentences, *si* is a benefactive (or goal). Adopting Anagnostopoulou’s proposal, we can say that in (8) and (10), *si* is merged in the specifier of v_2 . According to Anagnostopoulou, in some languages, e.g. Spanish, the applicative head assigns morphological dative. Therefore, there is morphological dative on the benefactive if and only if there is an applicative head that can assign dative. Furthermore, I assume that v_2 in Italian, doesn’t assign accusative Case but only inherent dative case.

In (8) and (10), *si* is clearly dative. This can be shown by substituting *si* with a 3rd person non-reflexive pronoun, which shows morphological case in Italian:

- (11) Gianni *le/* **la* legge dei buoni libri
 Gianni her-DAT her-ACC reads some good books
 ‘Gianni reads her some good books’

Thus, the benefactive in Italian is also marked with dative in this kind of constructions.

Extending Anagnostopoulou’s model, the derivation for the benefactive construction in (10), repeated here as (12), proceeds as follows.

- (12) Gianni *si* legge dei buoni libri
 Gianni *si* reads some good books-PL MASC ACC
 'Gianni reads some good books'

- The DP object 'dei buoni libri' is merged with the root verb.
- v_2 is merged with the VP.
- *Si* is merged in the specifier of v_2 .
- *Si* gets dative case from v_2 . There it gets also the external theta-role.²
- v_1 is merged. *Si* enters a Match+Agree relation with v_1 , which evaluates its structural Case features. However, in this construction *si* is an anaphor, and therefore its phi-features are not evaluated; it needs to be bound by an antecedent in order to get its phi-features evaluated. For this reason, I propose that *si* cannot evaluate the phi-features on v_1 , differently from the impersonal *si*. Thus, v_1 enters another Match+Agree relation with the direct object (henceforth DO), and it evaluates its structural Case features while getting its phi-features evaluated.
- The subject DP is merged in the specifier of v_1 and enters a Match relation with *si*, whose phi-features it evaluates, according to the anaphoric mechanism proposed in Reuland (2001).

Recall that in this construction *si* is anaphoric, and therefore gets inflected according to the DP which binds it.

- (13) Io *mi* mangio una mela
 I I-DAT eat an apple
 'I eat an apple'
- (14) Tu *ti* mangi una mela
 you you-DAT eat an apple
 'You eat an apple'

In impersonal constructions such as (7) and (9), on the other hand, *si* is not anaphoric, it is phi-complete and able to evaluate the features on v . This contrast is crucial, in that it determines the difference in agreement patterns between the benefactive and the impersonal construction, as I will show in the next section.

3.3. *Si* in the specifier of v_2

² I assume that the external theta-role is assigned to *si* by the lower v , and that it is transmitted to its antecedent because of an anaphoric relation. Further elaboration needs to be done on this point.

In the previous section, I have presented the data concerning impersonal constructions with verb-object agreement. I would like to extend Anagnostopoulou's double-*v* structure to the analysis of these constructions too. It was shown in (11) that in these constructions, where *si* is an anaphor, it shows dative morphology. Therefore, the presence of a second *v* assigning dative is requested. I propose the same analysis for the sentences in (7) and (9), despite the difference in their agreement patterns. I argue that the structure for both of these constructions is the double-*v* one, and that the difference in the agreement patterns is due to the presence vs. absence of an intervention effect performed by the impersonal *si*. Regarding the distribution of theta-roles, I assume that the external one is assigned by the whole *v* shell. Specifically, I take the external theta-role to be assigned in v_2 , when present, or in v_1 , when no dative assigning *v* is available.

I repeat sentence (9), which is an impersonal *si* construction with agreement of the verb with the object, in (15). Observe once more that *si* in this case is phi-complete and can evaluate the phi-features on *v*.

(15) In Italia *si* leggono dei buoni libri
 in Italy *si* read-3RD PL some-PL MASC good-PL MASC books-PL
 MASC NOM
 'In Italy people read good books'

The derivation of this sentence runs as follows:

- The DP 'dei buoni libri' is merged in the complement position, where it gets its internal theta-role. Its structural case features need to be evaluated.
- v_2 is merged with the VP.
- *Si* is merged in the specifier of v_2 , and gets inherent dative case. As already mentioned, I assume that although *si* is marked with inherent case, it can still intervene in checking operations (see Zaenen, Maling & Thrainsson 1985). In this position, *si* also gets the external theta-role.
- v_1 is merged; it enters a Match+Agree relation with *si*, which gets its Case features evaluated and is able to evaluate the features on v_1 . Thus, the direct object stays without its Case features evaluated. Basically, *si* performs an intervention effect, preventing the assignment of Accusative by v_1 to the direct object.
- T is merged, and the verb raises to T.
- *si* cliticizes on T. From this moment on, it is silent, both because it has all its features evaluated, and because it has cliticized, thus it doesn't have its DP status any longer.
- A Match+Agree relation takes place between T and the direct object, which gets nominative case and evaluates the phi-features on T, which agrees with it.
- The EPP on T is checked by an expletive *pro*, if present in the numeration.

(16) [TP *pro* [T *si*_j -leggono_i [_{v1P} *ti* [_{v2P} *t*_j [_{VP} *t*_i dei buoni libri]]]]]

- If no *pro* is present in the numeration, the EPP on T is checked by the DP object, which is the only available DP, since *si* has cliticized and cannot check the EPP any longer. An example of object raising is shown in (17):

(17) Dei buoni libri si leggono in Italia
 some good books si read in Italy
 'In Italy, people read good books'

However, the DP object is deeply embedded to be directly attracted by the T head. If we assume a phase-based derivation, then v_1 constitutes a strong phase, and is subject to the Phase Impenetrability Condition (PIC) (Chomsky 1999:9-10):

- (18) The domain of H is not accessible to operations outside HP, but only H and its edge, the edge being the residue outside of H-bar, either Specs or elements adjoined to HP

The PIC states that only the head of a projection with its edge in one previous phase are accessible to the following phase. This means that the DP object is 'not visible' from the T head, because it is not at the edge of the v phase. Chomsky (1999) proposes the existence of features which trigger movement to the edge of strong phases. This movement is called Indirectly Feature-Driven Movement (IFM). For the raising of the object to the specifier of T, there must be an intermediate step through the edge of v_1 , which is a movement of the IFM kind. From the edge of v_1 , the direct object is visible and can raise to check the EPP on T.

(19) $[_{TP} [_{DP} \text{ dei buoni libri}]_k [_T \text{ si}_j \text{-leggono}_i [_{v_1P} \text{ t}_k \text{ t}_i [_{v_2P} \text{ t}_j [_{VP} \text{ t}_i \text{ t}_k]]]]]]$

3.4. *Si* in the specifier of v_1

The example in (4), as already shown, doesn't exhibit the same agreement patterns as the examples we have just examined. Let's consider the following example.

(20) In Italia si legge libri in continuazione
 in Italy si reads-ACC books in continuance
 'In Italy people read books all the time'

As shown in (5) and (6), in this kind of sentence the direct object is also as a real object, just like in (3), (7) and (9), but there is no agreement of the verb with the object, which bears Accusative.

According to my proposal, if Accusative is assigned to the direct object, no intervention effect of *si* has occurred. In fact, for this kind of sentence, I assume

the second structure proposed by Anagnostopoulou (2000), namely the one with one single v . The existence of only v means, in Anagnostopoulou's terms, that the dative assigning head (i.e. the second v) is absent. If, though, in impersonal constructions it is impossible to detect dative morphology, how can I be sure that there is no applicative v ? In order to give an answer to this question, it is necessary to take a closer look at Anagnostopoulou's proposal. Interestingly enough, Anagnostopoulou shows, among other things, that when there is no dative benefactive, and thus when there is only one v , it is the benefactive which checks the only Case available, and the real object is licensed by (abstract) incorporation (see Baker 1996). In order to have incorporation, a bare plural object is required; this means that if we have a DP object incorporation in not available. She observes that, in some languages, whenever the dative assigning head is missing, the object of the construction is a bare noun. This is a bidirectional implication, as the following examples show:

- (21) Che fai oggi? Mangi bistecche/???Ti mangi bistecche
 what do you today you eat steaks you-DAT you eat steaks
 'What are you going to do today? Are you going to eat steaks?'
- (22) Che fai oggi? Ti mangi una bistecca /*bistecche?
 what do you today you-DAT eat a steak /steaks
 'What are you going to do today? Are you going to eat a steak/steaks?'

Sentence (21) shows that the presence of a bare noun excludes the possibility of a dative benefactive. Sentence (22) shows that if a benefactive is present a bare noun is not licensed. Therefore, no v_2 is present when a bare noun object is available.

The pattern proposed by Anagnostopoulou for double object constructions seems to work for impersonal constructions as well. In particular, these data show that in sentences with no agreement between the verb and the object, the object must always be a bare noun:

- (23) In Germania si mangia patate / *le patate
 in Germany si eats potatoes/ the potatoes
 'In Germany people eat potatoes'

I conclude that Anagnostopoulou's equation: bare noun=no dative head is also true for Italian, and thus that there is no dative assigning v when the object is a bare noun. Moreover, following Baker (1988, 1996), the object can be taken to incorporate into the verb. The derivation of (20) is thus as follows:

- The object 'libri' is merged with the verb.
- v_1 is merged, and the object incorporates into the verb.
- *Si* is merged in the specifier of v_1 , and it gets the external theta-role.

- T is merged; *si* immediately cliticizes on it; an expletive *pro* is merged in the specifier of T to check the EPP, which results in the verb showing the default 3rd person singular inflection.

Notice that an accusative object cannot raise unless it is a clitic, as shown in (24).

- (24) *Patate/ le si mangia in Germania
 potatoes them si eats in Germany
 'In Germany, people eat potatoes'

3.5. Past participle agreement with transitive verbs

With transitive verbs, the past participle shows agreement with the object.

- (25) Si è mangiata la cioccolata
 si is-3RD SG eaten-PP SG FEM the-SG FEM chocolate
 'People/we ate the chocolate'
- (26) Si sono viste molte macchine
 si are-3RD PL seen-PP PL FEM many-PL FEM cars-PL FEM
 'People/we have seen many cars'

These constructions also display verb-object agreement. *Si* is thus merged in v_2 and it intervenes in the assignment of accusative Case. In Italian, a past participle is phi-incomplete because it lacks person. Following Chomsky (1999), I will consider past participles as having unvalued Case features. The direct object, which also has unvalued Case features, is phi-complete and can enter a Match relation with the participle. The derivation runs as follows:

- The direct object is merged with the verb.
- The past participle (pp) head is merged, and the verb moves to it. From there, the past participle enters into a match relation with the direct object, which evaluates the unvalued phi-features on the participle, according to the mechanism proposed in Chomsky (1999). This evaluation takes place because the pp projection is a phase; otherwise, the evaluation would take place much later, after the v phase. The fact that the past participle is a phase also implies the eventual raising of the object via the outer specifier of ppP, in conformity with Kayne's (1989) observations. The direct object cannot have its Case features evaluated, because the past participle is phi-incomplete. So, both the pp and the direct object still need to have their Case evaluated.
- v_2 is merged; *si* is merged in spec, v_2 . There, it gets inherent dative case and the external theta-role. Despite this inherent case, *si* can still intervene in checking operations.

- v_1 is merged. It enters an Agree relation with *si*, which gets its Case feature evaluated and evaluates the phi-features on v_1 . The past participle and the direct object are still with their Case features unvalued.
- The auxiliary is merged in T. *Si* cliticizes on T and is no longer visible for any Agree relation. The auxiliary has unvalued phi-features.
- T establishes an Agree relation with the past participle, whose features are still visible. The Case feature on the past participle is evaluated. However, the phi-set of the past participle is incomplete, and thus it cannot evaluate the phi-features on T. T looks deeper down and matches with the direct object, which is phi-complete and can evaluate its phi-features. As a result, the direct object gets nominative Case. The EPP on T is checked by the expletive *pro*, as above.

If the object is not a DP but a clitic, the auxiliary shows the default agreement ending and the participle shows agreement with the direct object:

(27) Le si è raccontate
 them-PL FEM ACC si is-3RD SG told-PL FEM
 ‘People have told them’

This construction is the same as the one in (4), with no verb-object agreement. The clitic exhibits Accusative inflection. In these constructions:

- The direct object is merged with the verb.
- The past participle is merged, and the verb raises to the pp head and establishes an Agree relation with the direct object. The Case features of both past participle and direct object are unvalued.
- v_1 is merged, and it Agrees with the pp. The past participle gets its Case features evaluated, but it cannot evaluate v's phi-features because it is phi-incomplete. Thus, v_1 establishes an Agree relation with the direct object, and it evaluates its Case. The object gets Accusative.
- *Si* is merged in spec, v_1 ; it cliticizes, and so it cannot establish any relation with T. The direct object raises, via the outer specifier of v_1 and cliticizes on the auxiliary.
- The EPP feature on T is checked by *pro*. T Agrees with *pro*, and it gets the 3rd person singular ending as a result of this agreement with *pro*.

4. Impersonal *si* with unaccusative verbs

A puzzle for everybody working on agreement is the peculiar behavior of the auxiliary and the participle in *si* constructions with unaccusative verbs. In the present tense, the verb shows the default 3rd person singular ending, as exemplified in (28).

- (28) Si arriva a casa
 si arrives-3RD SG at home
 'People arrive at home'

Following Kratzer (1994), I assume that an unaccusative verb has no v projection. This means that there is no possibility for *si* to be merged other than in the only argumental position, i.e. the internal argument position.

- *Si* is merged with the verb.
- T is merged, and the verb raises there. *Si* cliticizes on the verb in T, and thus it cannot evaluate the phi-features on T because when the evaluation takes place, at the end of the phase, *si* has already cliticized.
- The phi-features on T and the EPP are evaluated by *pro*.
- The Case features on *si* are evaluated by the incorporation of *si* on the T head.

- (29) $[_{TP} \text{ pro } [_T \text{ si}_i \text{ -arriva}_j \text{ } [_{VP} \text{ t}_j \text{ }]]]]$

In the past tense (passato prossimo), the auxiliary shows the default 3rd person singular ending, while the participle shows the default (for DPs) masculine plural ending (see Corbett 1991). That is, there is a mismatch in number between auxiliary and past participle.

- (30) Si è arrivati a casa
 si is-3RD SG arrived-3RD PL at home
 'People/we arrived at home'

Once again, *si* is merged in the complement position. Then:

- The past participle is merged. *Si* Agrees with the past participle, and it evaluates its phi-features, which get the plural masculine (default) inflection.
- The past participle is phi-incomplete, though, and it cannot evaluate the Case on *si*.
- The auxiliary is merged on T. As I already said, the past participle projection is a phase: *si* must raise via specifier, ppP in order to be visible from T.
- *Si* cliticizes on T, and can no longer enter any Agree relation; the auxiliary then Agrees with the expletive *pro*, which is merged to check the EPP on T.
- The Case feature on *si* is evaluated by incorporation of *si* on T. Note that this kind of incorporation/cliticization doesn't trigger agreement.

- (31) $[_{TP} \text{ pro } [_T \text{ si}_i \text{ - è } [_{ppP} \text{ t}_i \text{ arrivati}_j \text{ } [_{VP} \text{ t}_j \text{ }]]]]]]$

5. *Unergative verbs*

Coming now to unergatives, I assume the analysis proposed by Hale & Keyser (1993), according to which unergatives are actually transitives with the direct object (theme) incorporating into the root by *conflation*. I argue that the object is syntactically projected, but it has no phonological realization.

In the present tense, the agreement patterns resemble those of unaccusatives:

- (32) *Si telefona*
 si calls-3RD SG
 ‘People call’

In this case, *si* is merged in the specifier of the only *v* available. The phi-features on *v* are evaluated by the direct object. *Si* doesn't trigger any Agree relation because it cliticizes immediately on T, as soon as it is merged.

In the past tense (*passato prossimo*), agreement doesn't mirror the unaccusative case. The past participle shows masculine singular ending, and the auxiliary is singular:

- (33) *Si è telefonato*
 si is-3RD SG called-SG MASC
 ‘People/we have called’

The derivation for these verbs is as follows:

- The direct object is merged with the verb. The past participle head is merged, and it Agrees with the direct object, getting its phi-features evaluated (i.e. getting the masculine singular ending).
- *v* is merged, and *si* is merged in its specifier.
- The auxiliary is merged in T, and *si* immediately cliticizes. Its Case features are evaluated by incorporation/cliticization on the auxiliary.
- The EPP on T is checked by *pro*, which also evaluates the phi-features on T.

- (34) $[_{TP} \text{pro} [_T \text{si}_i - \dot{\text{e}} [_{VP} t_i [_{PPP} \text{telefonato}_j [_{VP} t_j (\text{DO})]]]]]$

6. *Conclusions*

Impersonal *si* constructions show a number of puzzling agreement facts. Based on basic locality assumptions I have shown how these patterns can be derived. Thus the postulation of special properties of *si* which are not shared by other clitics is no longer necessary. In particular, *si*, being both a head and a DP, can take part in checking operations for Case assignment, and it can perform an

intervention effect in checking operations in the stage of the derivation in which it behaves as a DP. The various agreement patterns that I have taken into consideration can be accounted for straightforwardly.

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Syntactic amalgams as dynamic constituency in top-down derivations

Maximiliano Guimarães

The aim of this paper is to provide additional evidence for dynamic top-down derivations (Phillips 1996, Drury 1998, Guimarães 1999, Richards 1999). The phenomenon under investigation here is syntactic amalgamation (Lakoff 1974, Tsubomoto & Whitman 2000), which seems to exhibit a constituency paradox if analyzed from the point of view of either a representational approach or a bottom-up derivational approach, requiring extra hidden structure along with *ad hoc* ellipsis and sluicing rules parasitic on one another. Once the directionality of derivation is ‘corrected’, and constituency is taken to be dynamic, the paradox disappears with no need for additional construction-specific machinery.

1. Paradoxical constituency?

This paper is about the construction exemplified in (1), which was first analyzed by Lakoff (1974), who named it *syntactic amalgam*.

(1) John invited you’ll never guess how many people to his party.

Here I present a comparative analysis of a few subcases of amalgamation in Romance (exemplified with Portuguese) and English, as part of a larger cross-linguistic research.

What is puzzling about this construction is that it seems to exhibit a paradoxical constituency, since it is not obvious which clause is the matrix clause and which is the embedded clause. On the one hand, sentence (1) means that John invited a number x of people to his party, where the value of x is unknown to the listener. This suggests either that the chunk **you will never guess** is somehow adjoined to the DP **how many people**, as in (2a), or that **you will never guess how many** is a complex determiner that gets combined with the NP **people**, as in (2b).

- (2) a. John invited [^{DP} [^α you’ll never guess how many] [^{NP} people]] to his party.
b. John invited [^{DP} [^α you’ll never guess] [^{DP} how many [^{NP} people]]] to his party.

On the other hand, the impossibility of sentences like (3) suggests that, at the relevant level of abstractness, the complement of **guess** in (1) is the full clause **John invited how many people to his party**, instead of **how many people** or just **how many**. After all, what is being guessed is not just the number x , but the number x such that John invited x people to his party.

- (3) a. * How many people will you never guess?
 b. * You will never guess 300 people.

Thus, the structure of (1) would be something like (4), where the matrix verb **guess** selects **John invited how many people to his party** as its clausal complement, within which **how many people** undergoes local WH-movement.

- (4) [^{IP} you will never guess [^{CP} [^{DP} how many people]₁ [^{IP} John invited t₁ to his party]]]

The combination of the two conclusions above leads to a content-container paradox. In (2), **John invited (how many) people to his party** is the matrix clause within which **you will never guess (how many)** gets embedded. In (4), the chunk **you will never guess** belongs to the matrix clause, which takes **John invited how many people to his party** as its clausal complement. Is it possible to have both (2) and (4)? How is the subordination established in (1)?

2. The hidden-structure analysis: having the cake and eating it too

According to Tsubomoto & Whitman (2000) – who piggyback on Lakoff's (1974) original insight – the actual representation for (1) has properties of both (2) and (4), without directly facing the content-container paradox. This is achieved by duplicating a chunk of the structure and putting one token of it in the matrix clause and the other one in the embedded clause. The core structure of the matrix clause would be as in (5), where the direct object is an elliptical indefinite DP (which, in one version of Lakoff's analysis, corresponds to a full DP like **a lot of people** that undergoes deletion). This 'kernel sentence', then, gets combined with the structure in (4), which undergoes internal sluicing and adjoins to the elliptical indefinite DP in (5), eventually yielding (6).¹ This kind of amalgam obtains in Romance too, as in (7), from Portuguese.

- (5) John invited [^{DP} *e*] to his party.
 (6) John invited [^{DP} [^{DP} *e*]₁ [^{CP} [^{IP} you'll never guess [^{CP} [^{DP} how many people]₁ ~~John invited t₁ to his party~~]]]]] to his party.

¹ Tsubomoto & Whitman (2000) also postulate a further LF-movement internal to the clause that is adjoined to the elliptical DP, as in (i).

(i) [^{DP} [^{DP} *e*]₁ [^{CP} [^{CP} [^{DP} how many people]₁ ~~John invited t₁ to his party~~]₂ [^{IP} you'll never guess t₂]]

- (7) O João convidou você nunca vai adivinhar quantas pessoas para
 the John invited you never will guess how-many persons to a
 festa dele.
 the party of-his
 ‘John invited you’ll never guess how many people to his party’

A problem with the analysis in (6) is that it requires a construction-specific kind of deletion that is not found in ordinary sluicing outside amalgams.²

- (8) a. * John invited a lot of people to his party. You will never guess how many people.
 b. John invited a lot of people to his party. You will never guess how many.
- (9) a. John invited you’ll never guess how many people to his party.
 b. * John invited you’ll never guess how many to his party.

Moreover, nothing in this Lakoff-style approach explains why both sluicing and DP ellipsis are obligatory, as shown in (10).³ If we aim to eliminate the construction-specific character of amalgamation, and derive its effects from the interaction of other independent grammatical mechanisms, we must avoid having two independent mechanisms being parasitic on one another just by stipulation.⁴

- (10)a. John invited [^{DP} e] you will never guess how many people
~~John invited to his party~~ to his party. [**+ellipsis,+sluicing**]
 b. *John invited [^{DP} a lot of people] you will never guess how many
 people ~~John invited to his party~~ to his party. [**-ellipsis,+sluicing**]
 c. *John invited [^{DP} e] you will never guess how many people
 John invited to his party to his party. [**+ellipsis,-sluicing**]
 d. *John invited [^{DP} a lot of people] you will never guess how many
 people John invited to his party to his party. [**-ellipsis,-sluicing**]

Also, as pointed out by Tsubomoto & Whitman (2000) themselves, it is not clear why and how the elliptical indefinite DP in (6) gets interpreted as co-referential with the WH-phrase [^{DP} **how many people**] in the specifier of the

² We should also consider the alternative analysis in (i), which is a combination of (2a) and (6).

- (i) John invited [^{DP} [^α you will never guess how many ~~people John invited to his party~~]
 [^{NP} people]] to his party.

An obvious advantage is that, as opposed to what happens in (6), **people** is also affected by sluicing within the embedded clause, which corresponds exactly to ordinary sluicing outside amalgams (cf. (8)). Moreover, the facts in (3) follow straightforwardly.

³ The same criticism applies to Romance, as shown below (check example (7) for the glosses):

- i. O João convidou muita gente você nunca vai adivinhar quantas pessoas ~~o João convidou~~
~~pra festa dele~~ pra festa dele.
 ii. * O João convidou muita gente você nunca vai adivinhar quantas pessoas ~~o João convidou~~
~~pra festa dele~~ pra festa dele.
 iii. * O João convidou muita gente você nunca vai adivinhar quantas pessoas o João convidou
 pra festa dele pra festa dele.
 iv. * O João convidou muita gente você nunca vai adivinhar quantas pessoas o João convidou
 pra festa dele pra festa dele.

⁴ Notice that the alternative analysis suggested on footnote 2 does not face this problem.

embedded CP. That is, why is it that the gap in (1) is interpreted as ‘a number *n* of people, such that you will never guess what the cardinality of *n* is’, as indicated by the indices in (6)?⁵

Finally, the analysis in (6) cannot account for Romance cases where the amalgamation affects a DP that is the complement of a preposition, as in (11).

- (11) John invited 300 people to [^{DP} [^{DP} *e*]_i [^{CP} you can imagine
[^{DP} what kind of a party]_j ~~John invited 300 people to t_j~~]]

An exact analog of (11) is impossible in languages like Portuguese, as shown in (12a). Crucially, the preposition must appear after the material that is supposedly adjoined to the DP complement of that very preposition, as in (12b). The opposite pattern obtains in English, as shown in (13).

- (12)a. *O João convidou 300 pessoas pra você pode imaginar que tipo de festa.
the John invited 300 persons to you can imagine what kind of party.
b. O João convidou 300 pessoas você pode imaginar pra que tipo de festa.
the John invited 300 persons you can imagine to what kind of party.
- (13)a. John invited 300 people to you can imagine what kind of a party.
b. *John invited 300 people you can imagine to what kind of a party.

If we maintain the view that the syntactic chunk **you can imagine** (and its Romance equivalent) is a sluiced sentence that adjoins to an elliptical DP, we are forced to assume that, in the matrix clause, the preposition that takes that elliptical DP as its complement somehow undergoes ellipsis in Romance but not in English, as in (14). This also applies to the complex-determiner analysis of (2a), as shown in (15).⁶

- (14) O João convidou 300 pessoas [^{PP} ~~pra~~ [^{DP} [^{DP} *e*] [^{CP} você pode imaginar
the John invited 300 persons ~~to~~ you can imagine
pra que tipo de festa ~~o João convidou 300 pessoas~~]]]
to what kind of party ~~the John invited 300 persons~~

⁵ Tsubomoto & Whitman’s solution is formalized under an indexation-through-predication approach, with feature-percolation mechanisms. Although it makes the right predictions, such analysis is problematic from a minimalist perspective, given its reification of indices.

⁶ Here the alternative analysis of footnote 2 does not work unless an extra mechanism of preposition ellipsis in the matrix clause is stipulated. Moreover, the material within the hypothetical complex determiner does not correspond to ordinary sluiced sentences outside amalgams regarding the morphophonological form of the WH-element or the choice of the preposition.

- i: O João convidou 300 pessoas pra um certo tipo de festa. Você pode imaginar **qual**.
the John invited 300 persons to a certain kind of party. You can imagine **which**.
ii: O João convidou 300 pessoas pra uma festa. Você pode imaginar **de** que tipo.
the John invited 300 persons to a party. You can imagine **of** what kind.

The same problem arises in English. In (13a), the object of the preposition **to** in the matrix clause would be [^{DP} [^α you can imagine what kind of party John invited 300 people to] [^{NP} kind of a party]]. This is problematic to the extent that it requires a special kind of sluiced sentence not found elsewhere (cf. *John invited 300 people to a certain kind of party. You will never guess **what**).

- (15) O João convidou 300 pessoas [^{PP} ~~pra~~ [^{DP} [^α você pode imaginar
the John invited 300 persons ~~to~~ you can imagine
pra que] tipo de festa]]
to what kind of party

Alternatively, we may say that, in Romance, the elliptical argument which the sluiced sentence adjoins to is the entire PP, as in (16), rather than the DP.

- (16) O João convidou 300 pessoas [^{PP} [^{PP} *e*] [^{CP} você pode imaginar
the John invited 300 persons you can imagine
pra que tipo de festa ~~e João convidou 300 pessoas]]
to what kind of party ~~the John invited 300 persons~~~~

Either in (14)/(15) or in (16), we end up stipulating an additional parametric difference between English and Romance for which there is no independence evidence.⁷ The conclusion, then, is that, as opposed to English, there is no slot in the structure of Romance amalgams where the adjunct could possibly fit. I take this to be a major problem for the hidden-structure analysis of amalgams.

3. The remnant-movement alternative

I propose that amalgams are generated through remnant movement, without duplication of any syntactic chunk (therefore no additional ellipsis or sluicing). The derivations for English and Portuguese are as in (17) and (18) respectively.

- (17)a. **building the embedded clause**
[^{IP} John invited 300 people to [^{DP} what kind of a party]]]
b. **local WH-movement (with preposition-stranding)**
[^{CP} [^{DP} what kind of a party]₁ [^{IP} John invited 300 people to t₁]]
c. **building the matrix clause**
[^{CP} [^{IP} you can imagine
[^{CP} [^{DP} what kind of a party]₁ [^{IP} John invited 300 people to t₁]]]]
d. **remnant-movement of the embedded IP to a topic-like position**
[^{CP} [^{IP} John invited 300 people to t₁]₂ [^{IP} you can imagine
[^{CP} [^{DP} what kind of a party]₁ t₂]]]
(18)a. **building the embedded clause**
[^{IP} o João convidou 300 pessoas [^{PP} pra que tipo de festa]]
the John invited 300 people to what kind of party

⁷ The analysis in (16) faces the additional problem that (the equivalents of) **you can imagine** and the elliptical DP inside the elliptical PP do not seem to stand in a syntactic relation that is local enough for the meaning described in §2 to straightforwardly obtain via semantic compositionality.

- b. **local WH-movement (with pied-piping)**
 [^{CP} [^{PP} pra que tipo de festa]₁ [^{IP} o João convidou 300 pessoas t₁]]
 to what kind of party the John invited 300 people
- c. **building the matrix clause**
 [^{CP} [^{IP} você pode imaginar [^{CP} [^{PP} pra que tipo de festa]₁
 you can imagine to what kind of party
 [^{IP} o João convidou 300 pessoas t₁]]]]
 the John invited 300 people
- d. **remnant-movement of the embedded IP to a topic-like position**
 [^{CP} [^{IP} o João convidou 300 pessoas t₁]₂ [^{IP} você pode imaginar
 the John invited 300 people you can imagine
 [^{CP} [^{PP} pra que tipo de festa]₁ t₂]]]
 to what kind of party

Ultimately, the contrast between English and Romance has nothing to do with amalgamation *per se*. It follows from whatever parameter is responsible for WH-movement allowing preposition-stranding in English but not in Romance. We don't need to worry about the nature of those elliptical indefinite DPs, since they actually do not exist. Hence, no rule of PF-deletion or LF-copying is needed, and no condition on such a rule needs to be postulated or derived. With no elliptical DPs to worry about, the co-reference problem mentioned above completely goes away, since in the structure from which the syntactic amalgam originates there is only one occurrence of **invited**, whose object is [^{DP} **how many people**] itself, instead of an elliptical DP whose proper interpretation would require an extra mechanism to obtain. As far as sluicing goes, no questions arise, since there is actually no sluicing. After all, there is no embedded sentence adjoined to [^{DP} **how many people**] or to [^{NP} **people**], where sluicing could possibly apply.

This analysis, however, is not free of problems. Let's consider again the example (1), under the remnant-movement analysis, as in (19).

- (19)a. [^{XP} [^{IP} John₂ [^{VP} t₂ invited₁ [^{VP} [^{DP} how many people] t₁ [^{PP} to his party]]]]]
 b.#[^{CP} [^{XP} [^{PP} to his party]₃ [^{IP} John₂ [^{VP} t₂ invited₁ [^{VP} [^{DP} how many people] t₁ t₃]]]]
 c. [^{CP} [^{DP} how many people]₄ [^{XP} [^{PP} to his party]₃ [^{IP} John₂ [^{VP} t₂ invited₁ [^{VP} t₄ t₁ t₃]]]]
 d. [^{IP} you will never guess [^{CP} [^{DP} how many people]₄ [^{XP} [^{PP} to his party]₃
 [^{IP} John₂ [^{VP} t₂ invited₁ [^{VP} t₄ t₁ t₃]]]]
 e. [^{CP} [^{IP} John₂ [^{VP} t₂ invited₁ [^{VP} t₄ t₁ t₃]]]]₅ [^{IP} you will never guess
 [^{CP} [^{DP} how many people]₄ [^{XP} [^{PP} to his party]₃ t₅]]]

A core property of remnant movement constructions is that all movements involved should be independently motivated (Müller 1998). The movement of the WH-phrase to the specifier of the lower CP in (19c) is independently attested (cf. 20), as well as the movement of the lower TP to the topic position somewhere in the CP-domain of the matrix clause in (19e), as shown in (21).

However, the movement of [^{PP} to his party] in (19b) is not legitimate in any construction other than syntactic amalgams, as exemplified by (22).⁸

- (20)a. How many people did John invite to his party?
 b. I wonder how many people John invited to his party.
 (21) John invited 300 people to his party, she believes.
 (22) * She will never know that [^{PP} to his party]₂ John invited a lot of people t₂.

This means that in order for the remnant movement mechanics to work, we need to stipulate an *ad hoc* movement in English and Romance that is parasitic on TP-topicalization.⁹

Notice that this scrambling-like movement is crucial to get the amalgam in question. Without it, the derivation would be as in (23), yielding the sentence in (24), which is also grammatical but is not what we are trying to account for.

- (23)a. [^{CP} [^{TP} John₂ [^{vP} t₂ invited₁ [^{VP} [^{DP} how many people] t₁ [^{PP} to his party]]]]]
 b. [^{CP} [^{DP} how many people]₄ [^{TP} John₂ [^{vP} t₂ invited₁ [^{VP} t₄ t₁ [^{PP} to his party]]]]]
 c. [^{TP} you will never guess [^{CP} [^{DP} how many people]₄ [^{TP} John₂ [^{vP} t₂ invited₁ [^{VP} t₄ t₁ [^{PP} to his party]]]]]
 e. [^{CP} [^{TP} John₂ [^{vP} t₂ invited₁ [^{VP} t₄ t₁ [^{PP} to his party]]]]]₅ [^{TP} you will never guess [^{CP} [^{DP} how many people]₄ t₅]]

- (24) John invited to his party you will never guess how many people.

4. Dynamic top-down syntax

One of the hottest topics in Minimalism is, perhaps, the derivationalism-*versus*-representationalism debate. The mainstream view is that the syntactic component of UG is a derivational structure-building system that works in a bottom-up fashion, as in (25), incorporating economy principles (cf. Chomsky 1995, 1998; Abraham, Epstein, Thráinsson & Zwart 1996; Collins 1997; Kitahara 1997; Epstein, Groat, Kawashima & Kitahara 1998; Epstein & Hornstein 1999).

- (25) step n: [^Z δ ε] step n+2: [^Y β [^X γ [^Z δ ε]]]
 step n+1: [^X γ [^Z δ ε]] step n+3: [^W α [^Y β [^X γ [^Z δ ε]]]]

⁸ In Portuguese, the same generalizations hold, as shown below [= (20), (21) & (22)].

i: a. Quantas pessoas o João convidou pra festa dele?
 b. Eu me pergunto quantas pessoas o João convidou pra festa dele.
 ii: O João convidou 300 pessoas para a festa dele, ela acredita.
 iii: * Ela nunca vai saber que [^{PP} pra festa dele]₂ o João convidou muita gente t₂.

⁹ Notice, however, that this kind of PP fronting is legitimate in matrix clauses, as in (i). But even in those cases, it is impossible to have a WH-movement crossing the topicalized PP, as in (ii).

i: To his party, John invited a lot of people.
 ii: * How many people to his party did John invite?

Alternatively, syntax may be conceived as a set of declarative statements imposing restrictions on the shape of LF phrase-markers generated in a single step (cf. Brody 1995, 1998, 2000; Frank & Vijay-Shanker 1999).

As Chomsky (1995, 1998) points out, these two perspectives are very hard to tease apart. Arguments go in both directions, and, in most cases, analyses are fully inter-translatable from one framework to the other. Cornell (1999) goes even further, and claims that these two apparently opposite approaches are two sides of the same coin, and must co-exist in any (transformational) theory of grammar. Chomsky (1998) even admits that his choice for a derivational approach is somewhat arbitrary, when he says: ‘I will adopt the derivational approach as an expository device, though I suspect it may be more than that’.

A third alternative was proposed by Phillips (1996) – and explored by Drury (1998), Guimarães (1999), and Richards (1999) among others –, where derivations proceed in a top-down/left-to-right/root-first fashion, as in (26).

$$(26) \quad \begin{array}{ll} \text{step } n: & [^W \alpha \beta] \\ \text{step } n+1: & [^W \alpha [^X \beta \gamma]] \end{array} \quad \begin{array}{ll} \text{step } n+2: & [^W \alpha [^X \beta [^Y \gamma \delta]]] \\ \text{step } n+3: & [^W \alpha [^X \beta [^Y \gamma [^Z \delta \epsilon]]]] \end{array}$$

This system works in such a way that constituency is partially destroyed at every step. What is a constituent (in the spine of tree) at a given step may no longer be a constituent from the next step onwards (e.g. in (26), $[^W \alpha \beta]$ is a constituent at step n , but it gets destroyed when γ is introduced at step $n+1$).

The fully conservative nature of the structure-building system in (25) is intuitively appealing on economy grounds (cf. Uriagereka 2002 on *conservation* from the perspective of Ontological Minimalism). But this is not a necessary property of derivational theories as a matter of logic. Changing structure – as in (26) – is something that only derivational systems can do. Therefore, Phillips’s (1996) research enterprise is justified on methodological grounds, as a potential way of concluding something about the derivationalism-*versus*-representationalism dilemma. By reversing the directionality of the derivation, we can make predictions that, *ceteris paribus*, no representational approach can. A given syntactic chunk α may be a constituent at the specific derivational step when a grammatical operation K applies, and be destroyed later on, no longer counting as a constituent when another grammatical operation L applies. A dynamic system like this makes it possible for a chunk of structure α to both be and not be a constituent, in a sense (cf. Phillips 1996, Guimarães 1999). This partial structure destruction is built into the very definition of the structure-construction device (i.e. merge), as in (27).

$$(27) \quad \text{Merge} \quad (\text{oversimplified definition, see Guimarães 1999 for details})^{10}$$

¹⁰ In order for this definition to work, we need some phrase in the derivational workspace before merging the first terminal. I assume, then, that the system has a starting axiom, which introduces the phrase $[^S \Sigma \emptyset]$ in the derivational workspace. This initial phrase is analogous to the node S of Chomsky (1955) and to the abstract terminal of Kayne (1994: 36-38). I take Σ to be an ‘assertion terminal’, along the lines of Echeperé (1997). From now on, this starting axiom will be

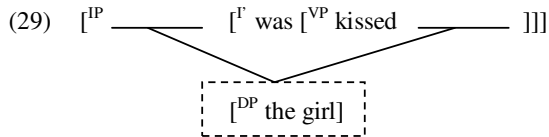
input: [^A *x y*] & *z*, (where [^A *x y*] is a right-branch in the spine of the tree)
 output:[^A *x* [^B *y z*]]

Interestingly, regarding the fundamental syntactic relations of dominance and asymmetric c-command, top-down derivations like (26) are as structure-preserving as mainstream bottom-up derivations like (25), even though the shape of phrase-markers constantly changes along the derivational history. For instance, in (26), at step *n+1*, **α** asymmetrically c-commands **β** and **γ**, while **W** dominates **X**, **α**, **β** & **γ**, and **X** dominates **β** & **γ**. All these relations survive throughout the derivation (*n+2*, *n+3*, and so on). New relations of dominance and asymmetric c-command are monotonically introduced without destroying old ones (an idea that goes back to Weinberg 1985).¹¹

According to Phillips (1996), in a left-to-right/top-down system, movement is always lowering. Under the technical implementation proposed by him, the effect of upward movement is achieved by making a silent copy (i.e. *copy* plus *PF-deletion*) of a given constituent and merging it at a position in the phrase marker lower than the position of the original copy, as shown in (28) for the sentence ‘*the girl was kissed*’. Notice that this is not the traditional concept of lowering, since the moved element gets pronounced in its original/higher position.

- (28)a. [^{IP} [^{DP} the girl] [^I was kissed]]
 b. [^{IP} [^{DP} the girl] [^I was [^{VP} kissed [^{DP} ~~the girl~~]]]]

In what follows, I use the notation in (28) for expository reasons, but my analysis of amalgams depends on a different conception of movement. Here I endorse Drury’s (1998, 1999) proposal that movement is *remerge*. Under that view, there are no copies, and a phrase may have multiple mothers, occupying more than one position in the tree. Merge can assign new mothers to a phrase, while keeping the previous motherhood relation(s) intact, as in (29).¹²



This system incorporates a (reversed) version of Uriagereka’s (1999) multiple spell-out hypothesis. The lowered/remerged element is always pronounced in its higher position as an effect of multiple applications of spell-out, triggered by PF-linearization demands (satisfaction of the LCA (Kayne 1994)). When lowering/remerge happens, the affected element has already

omitted from the notation for expository reasons, but I want the reader to keep in mind that it is always present, or else no derivation could start.

¹¹ Depending on what we take phrasal labels to be, the monotonicity of dominance is not as straightforward as the monotonicity of asymmetric c-command (cf. Guimarães 1999, 2001).

¹² This idea of remerge and multi-motherhood is also present in some versions of bottom-up derivational systems, like the ones proposed by Bobaljik (1995), Gärtner (1997), Epstein, Groat, Kawashima & Kitahara (1998), among others.

been spelled-out. What is getting lowered/remerged is a combination of formal and semantic features whose corresponding morpho-phonological counterpart had already left the derivation for good (cf. Guimarães 1999, for details).

In this dynamic top-down system, remnant movement is formalized as merging an element inside an already remerged/lowered constituent, as in (30).

- (30)a. [^{CP} [^{VP} [^{VP} criticized] [^{PP} by his boss]] [^C C [^{IP} [^{DP} John] has never been]]]
 b. [^{CP} [^{VP} [^{VP} **criticized**] [^{PP} **by his boss**]] [^C C [^{IP} [^{DP} John] has never been
 [^{VP} [^{VP} **criticized**] [^{PP} **by his boss**]]]]]
 c. [^{CP} [^{VP} [^{VP} criticized [^{DP} **John**]] [^{PP} by his boss]] [^C C [^{IP} [^{DP} **John**] has
 never been [^{VP} [^{VP} criticized [^{DP} **John**]] [^{PP} by his boss]]]]]

In (30a), there is an incomplete/unsaturated VP in topic position. In (30b), this topicalized VP is lowered/remerged inside the IP. In (30c), the subject DP [^{DP} **John**] is lowered/remerged inside the already lowered/remerged VP [^{VP} [^{VP} **criticized**] [^{PP} **by his boss**]]. The extra (unpronounceable) copy of [^{DP} **John**] that appears inside the topicalized VP is a mere notational artifact with no independent theoretical status, not counting as an extra (upwards) movement. There is only one VP, which is simultaneously the complement of **been** and the topic (specifier of CP); as well as there is only one DP, which is simultaneously the complement of **criticized** and the subject (specifier of IP).

5. Top-down amalgamation

Having seen the technical tools, let's go back to the data, and run the respective derivations to see how *Dynamic Top-Down Syntax* handles syntactic amalgams.

The generation of (1) – repeated below as (31) – would be as follows.

- (31) John invited you will never guess how many people to his party.

Starting from the top, first the DP [^{DP} **John**] is generated (cf. 32a), and then merged with I, forming an IP (cf. 32b), which takes the verb **invited** as its complement in the next step (cf. 32c).¹³

- (32)a. [^{DP} John]
 b. [^{IP} [^{DP} John] I]
 c. [^{IP} [^{DP} John] [^I I [^{VP} invited]]]

This incomplete/unsaturated IP is then made a topic by being merged with the matrix complementizer (or whichever functional head happens encode topic/comment relations syntactically).

- (32)d. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] C]

¹³ Here I am abstracting away from the *VP-Internal Subject Hypothesis*. See Guimarães (1999, 2001) for details.

The derivation proceeds downwards, step-by-step, by merging the other elements of the matrix clause, one by one.

- (32)e. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{DP} you]]]
- f. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] will]]]
- g. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will never]]]]]
- h. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will [^{VP} never
[^{VP} guess]]]]]]]

After the matrix verb is introduced, it is time to introduce the WH-phrase [^{DP} **how-many people**] as a temporary complement of **guess**, so that it can become the specifier of the embedded CP later on. First, the determiner **how-many** is merged with **guess**, as in (32i). Then, **people** is merged with **how-many**, forming the DP [^{DP} **how-many people**], as in (32j). This WH-phrase becomes the specifier of the embedded CP when the lower C enters the derivation at the step shown in (32k).

- (32)i. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will [^{VP} never
[^{VP} guess how-many]]]]]]]
- j. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will [^{VP} never
[^{VP} guess [^{DP} how-many people]]]]]]]]]
- k. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will [^{VP} never
[^{VP} guess [^{CP} [^{DP} how-many people] C]]]]]]]]]

Then, the whole topicalized IP is lowered/remerged as the complement of the embedded C, as in (32l).

- (32)l. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited]]] [^C C [^{IP} [^{DP} you] [^I will [^{VP} never
[^{VP} guess [^{CP} [^{DP} how-many people] [^C C
[^{IP} [^{DP} John] [^I I [^{VP} invited]]]]]]]]]]]]]

At this stage, remnant movement happens. The WH-phrase in the specifier of the subordinate CP is lowered/remerged into its argumental position within the VP-shell under the lower IP, which has just been lowered/remerged at the previous step (cf. Phillips (1996: 31-32) for a brief discussion about VP-shells).

- (32)m. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited [~~t~~^{DP} how-many people]]]]] [^C C
[^{IP} [^{DP} you] [^I will [^{VP} never [^{VP} guess [^{CP} [^{DP} how-many people] [^C C
[~~t~~^{IP} [~~t~~^{DP} John] [~~t~~^I I [~~t~~^{VP} invited [~~t~~^{DP} how-many people]]]]]]]]]]]]]]]

Then, the preposition **to** is introduced as the sister of **invited**, followed by the merge of **his** and, finally, **party**; yielding the final representation in (32p).

- (32)n. [^{CP} [^{IP} [^{DP} John] [^I I [^{VP} invited [~~t~~^{DP} how-many people] to]]] [^C C
[^{IP} [^{DP} you] [^I will [^{VP} never [^{VP} guess [^{CP} [^{DP} how-many people] [^C C
[~~t~~^{IP} [~~t~~^{DP} John] [~~t~~^I I [~~t~~^{VP} invited [~~t~~^{DP} how-many people] to]]]]]]]]]]]]]]]

- d. [^{CP} [^{IP} o João convidou 300 pessoas] [^{IP} você pode imaginar
the John invited 300 persons you can imagine
[^{CP} [^{PP} **pra que tipo de festa**] [^{IP} ~~o João convidou 300 pessoas~~]]]]
to what kind of party ~~the John invited 300 persons~~
- e. [^{CP} [^{IP} o João convidou 300 pessoas [^{PP} ~~**pra que tipo de festa**~~]
the John invited 300 persons ~~to what kind of party~~
[^{IP} você pode imaginar [^{CP} [^{PP} **pra que tipo de festa**]
you can imagine to what kind of party
[^{IP} ~~o João convidou 300 pessoas~~ [^{PP} ~~**pra que tipo de festa**~~]]]]
~~the John invited 300 persons to what kind of party~~

6. Concluding remarks (and beyond)

The main idea of this paper is that syntactic amalgams have no independent theoretical status. There are no construction-specific grammatical principles of ellipsis or sluicing responsible for amalgamation. The apparent constituency paradox is an effect of a combination of movements, rather than an effect of the presence of hidden structure in complex representations.

The remnant-movement analysis proposed here provides a straightforward account for the cross-linguistic variation of word-order in amalgams where the affected WH-phrase is the complement of a preposition (which is problematic for the hidden-structure analysis). This contrast simply piggybacks on whatever parameter is responsible for the pied-piping/preposition-stranding distinction. Therefore, my analysis makes the strong prediction that, unless there is interference of some other independent factor, every language exhibiting pied-piping should pattern like Portuguese in amalgam constructions, and every language exhibiting preposition stranding should pattern like English in that regard. More research is needed to test this prediction.

Apparent violations of the last resort constraint on movement are epiphenomenal effects of the dynamics of the derivation, which allows for a chunk of structure to be a constituent before a particular application of merge or remerge, and no longer be a constituent after that.

The phenomenon of syntactic amalgams is too complex to be discussed in 15 pages without leaving many crucial issues untouched. In this final section, I would like at least to mention a few of these pending issues, taking the opportunity to ‘advertise my work’.

Besides examples like (1) or (13a) above, both English and Romance exhibit cases of multiple amalgamation, which I haven’t discussed so far. Consider the sentence in (35), first presented by Lakoff (1974).¹⁵

¹⁵ As Lakoff (1974) points out, it seems that, setting aside parsing limitations, the complexity of a syntactic amalgam is unbounded, as shown in (i).

i: John invited you will never guess how many people to you can imagine what kind of party, at it should be obvious where, with God only knows what purpose in mind, despite you can guess what pressures.

- (35) John invited God only knows how many people to you can imagine what kind of party.

As discussed in Guimarães (2001) such constructions are very problematic not only for the hidden-structure analysis in §2 and for the bottom-up remnant movement mechanics in §3, but also for the dynamic top-down system I am advocating for, requiring *ad hoc* instances of merge and move/remerge.

In Guimarães (2001, 2002), I suggest that a precise characterization of the structure of amalgams – either simple ones like (31) or more complex ones like (35) – requires multi-dimensional phrase markers, with multiple parallel trees (each one with its own independent root) that share one (or more) node(s), getting connected ‘somewhere in the middle’. This formalism is, in part, similar to what was proposed by van Riemsdijk (2000) for (transparent) free-relatives, which resemble amalgams in some respects (see also Wilder 1998, and Citko 2000). Putting all technical details aside, the sentence in (35) would be a combination of the three quasi-independent matrix clauses in (36), where the chunks marked with italics are the constituents shared by all three trees.

- (36)a. [^{CP} C_[-WH] [^{IP} *John invited how many people to what kind of party*]]
 b. God only knows [^{CP} [*how many people*]₁ [^C C_[+WH] [^{IP} *John invited t₁ to what kind of party*]].
 c. You can imagine [^{CP} [*what kind of party*]₂ [^C C_[+WH] [^{IP} *John invited how many people to t₂*]].

Interestingly, only (36b) is grammatical when in isolation. (36a) violates whatever principle requires WH-movement to be overt in English; while, in (36c), **what kind of party** moves across **how many people**, violating the M(inimal) L(ink) C(ondition) (Chomsky 1995). But when all these trees are connected, **how many people** satisfies its WH properties in (36b), acting as if it was a non-WH DP like **some people** in (36a) and (36c), therefore not inducing any violation of MLC or feature-checking requirements. The same is true of **what kind of party**, which has its WH properties satisfied in (36c), and behaves as **a party** in (36a) and (36b) (cf. Guimarães 2001 for details).

If this is on the right track, then the fact that amalgams don’t exhibit island effects (cf. Tsubomoto & Whitman 2000) is not surprising. In (37b), the chunk of structure {**he built e when**} is a relative clause with respect to **a house**, but a sentential complement with respect to **I don’t remember**, therefore not counting as an island (cf. Guimarães 2001, for details).

- (37)a. *I don’t remember [when]₁ John lives in [a house]₂ {that he built e₂ t₁}
 b. John lives in [a house]₂ {that he built e₂ I don’t remember when}

Finally, another potential problem for my analysis is that, if there is a one-to-one correspondence between the pied-piping/preposition-stranding distinction and the order of the preposition with respect to the ‘invasive clause’ in amalgams, it is not clear why (13b) is not as acceptable as (13a), since, in English, pied-piping is also attested (under certain restricted circumstances). In

Guimaraes (2001), I address this issue from the perspective of the E-Language/I-Language distinction.

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**The one girl who was kissed by every boy:
Scope, scrambling and discourse function in Russian**

Tania Ionin

This paper discusses frozen scope in Russian, and links it to discourse function. It is argued that covert QR as well as reconstruction are restricted by the availability of discourse-driven overt movement (Topicalization). It is suggested that short obligatory QR, driven by semantic interpretability, exists in Russian. This paper also discusses the nature of Topicalization in Russian, showing an interaction between Topicalization and definiteness / specificity.

1. Introduction

The English sentence in 1 has two meanings – that a single boy kissed every girl in the relevant set of girls, and that for every girl in the set, there is some boy or other who kissed her. The equivalent Russian sentence as in (2a) has the former reading but not the latter. The scrambled (OVS order) Russian sentence in (2b) similarly has only the surface scope reading.¹

- (1) Some boy kissed every girl.
(some>∀), (∀>some)
- (2) a. [Odin mal'čik] poceloval [každyju devočku].
[one boy-NOM] kissed [every girl-ACC]
(one>∀): One (specific) boy kissed every girl.
*(∀>one): For every girl x, x was kissed by some boy.
- b. [Odnu devočku] poceloval [každyj mal'čik].
[one girl-ACC] kissed [every boy-NOM]
(one>∀): For one (specific) girl, every boy kissed that girl.
*(∀>one): For every boy x, x kissed some girl.

¹ Throughout this paper, I will use the term *subject* to mean 'the DP marked by nominative case' and *object* – 'the DP marked by accusative case.' As will be clear from the paper, these labels do not correspond to specific positions in overt syntax.

The major goal of this paper is to explain why inverse scope readings are unavailable in Russian sentences such as 2. I will tie scope to discourse function, and propose that the availability of discourse-driven overt movement constrains availability of covert movement in Russian, overt movement being preferred from the discourse standpoint. I will also suggest that covert movement exists in Russian when it is not related to discourse, as in the case of short obligatory QR.

This paper is organized as follows. Section 2 presents the basic scope data to be discussed in this paper. Section 3 looks at the relationship between scope and discourse function. Section 4 examines overt movement in Russian in more detail. And Section 5 concludes the paper.

2. Scope in Russian – the data

The phenomenon of quantifier scope has been of cross-linguistic interest for some time. According to standard assumptions of generative theory, scope interpretation obeys the universal principle in 3, which applies at LF.

- (3) An operator c-commands its scope.

In the case of English, the position a quantifier occupies at LF is frequently different from its position in overt syntax. Thus, quantifier interactions in English show an availability of inverse scope readings that do not reflect the surface order of constituents (as in 1). Beginning with Chomsky (1977) and May (1977, 1985), there has been much work motivating covert movement of quantifiers as the means for deriving inverse scope. May (1977) argued that covert movement comes in two forms – quantifier raising (QR) and quantifier lowering (QL), which yields what Fox (2000) terms scope reconstruction.

The data in 2 suggest that in Russian, both QR and scope reconstruction are constrained. The lower QP does not raise above the higher QP in (2a) or (2b); nor does the fronted object QP in (2b) reconstruct to its base position at LF. Thus, two questions need to be answered:

- (4) Q1: Does covert QR exist in Russian, and (if so) what is its distribution?
Q2: Does scope reconstruction exist in Russian, and (if so) what is its distribution?

2.1. Basic word order and scope readings in Russian

Russian word order is traditionally analyzed as SVO (see Bailyn 1995, Ch. 1, and the references cited therein).² However, various other word orders can be derived through movement processes traditionally termed ‘scrambling.’

² King (1995) argues that Russian is VSO. See Bailyn (1995, Ch. 3) for counterarguments.

Russian word order strongly interacts with intonation patterns (see Yokoyama 1986, King 1995, Junghanns and Zybatow 1997, a.o.). In this paper, I will primarily discuss sentences with neutral intonation – where sentence stress falls on the right periphery, and there is wide scope on the entire sentence (i.e., the sentence can be used to answer the question ‘what happened?’). Under this neutral intonation, transitive sentences typically exhibit two word orders: the canonical SVO order and the scrambled OVS order. As illustrated in 5, both orders exhibit frozen surface scope.³

- (5) a. [Odná koška] ukusila [KAŽDUJU SOBAKU].
 [one cat-NOM] bit [every dog-ACC]
 ‘One cat bit every dog.’
 (one>∀), *(∀>one)
- b. [Odnú sobaku] ukusila [KAŽDAJA KOŠKA].
 [one dog-ACC] bit [every cat-NOM]
 ‘One dog, every cat bit.’
 (one>∀), *(∀>one)

Note that Russian differs from other scrambling languages, such as German and Japanese (see Frey 1993; Kuroda 1971), in which canonical word order exhibits frozen scope while some types of scrambling create scope ambiguity.

2.2. Scope and referential readings of indefinites

In both (5a) and (5b), the indefinite QP is above the universal QP at Spell-Out. When, on the other hand, the universal QP is above the indefinite QP, inverse scope appears to be possible, in both SVO and OVS orders 0.

- (6) a. [Každaja koška] ukusila [ODNU SOBAKU].
 [every cat-NOM] bit [one dog-ACC]
 (∀>one): For every cat x , x bit one dog.
 (one>∀): For one (specific) dog, every cat bit that dog.
- b. [Každuju sobaku] ukusila [ODNA KOŠKA].
 [every dog-ACC] bit [one cat-NOM]
 (∀>one): For every dog x , one cat bit x .
 (one>∀): For one (specific) cat, that cat bit every dog.

The data in 6 suggest that covert QR is available in Russian after all. However, it has often been argued that wide-scope (specific) readings of indefinites may not be indicative of covert QR. Fodor and Sag (1982) showed that indefinites behave unlike other quantifiers in their ability to scope out of islands, and argued that indefinites are ambiguous between quantificational and

³ Throughout this paper, I will mark the stressed constituent by small capital letters.

referential readings. Later work (Abusch 1994; Reinhart 1997; Winter 1997; Kratzer 1998) has argued that the referential (wide-scope) readings are derived through choice functions, and are independent of QR.

Russian conveniently provides a way of ruling out the referential readings of indefinites and testing for occurrence of covert QR. The quantifier *kakoj-nibud'* 'some' cannot be referential: it must take narrow scope with respect to some other scope-bearing element, in contrast to its referential counterpart *kakoj-to* 'some', which can take either wide or narrow scope. Thus, *kakoj-to* but not *kakoj-nibud'* can be used in the absence of a higher scope-bearing element (7a). On the other hand, when the indefinite is below the universal QP at Spell-Out (7b), both *kakoj-to* and *kakoj-nibud'* are possible, but only the former can (marginally) have a referential (wide-scope) reading.

- (7) a. [Kakaja-to/ *kakaja-nibud' koška] ukusila [každuju sobaku].
 [Some cat-NOM] bit [every dog-ACC]
 'Some cat bit every dog.'
 $(\exists > \forall)$: A single (specific) cat bit every dog (\setminus *kakoj-to*, **kakoj-nibud'*)
 $*(\forall > \exists)$: *For every dog, some cat bit that dog (**kakoj-to*, **kakoj-nibud'*)
- b. [Každaja koška] ukusila [kakuju-to/ kakuju-nibud' sobaku].
 [Every cat-NOM] bit [some dog-ACC]
 'Every cat bit some dog.'
 $(\forall > \exists)$: For every cat x, x bit some dog. (\setminus *kakoj-to*, \setminus *kakoj-nibud'*)
 $??(\exists > \forall)$: For one (specific) dog, every cat bit that dog.
 ($??$ *kakoj-to*, **kakoj-nibud'*)

Thus, *kakoj-nibud'* must take narrow scope with respect to another element. However, it does not need to take the narrowest scope in the sentence. Thus, in both (8a) (SVO order) and (8b) (OVS order), *kakoj-nibud'* scopes under the intensional verb but above the universal QP – i.e., it takes the scope corresponding to its surface position.

- (8) a. Ja xoču, čtoby [kakaja-nibud' koška] ukusila [každuju sobaku].
 I want that [some cat-NOM] bite-subj [every dog-ACC]
 $\text{want} > \exists > \forall$: 'I would like for some (specific) cat to bite every dog.'
 $??/*\text{want} > \forall > \exists$: 'I would like for every dog to be bit by some cat or other.'
- b. Ja xoču, čtoby [kakuju-nibud sobaku] ukusila [každaja koska].
 I want that [some dog-ACC] bite-subj [every cat-NOM]
 $\text{want} > \exists > \forall$: 'I would like for there to be a dog s.t. every cat bites that dog.'
 $*\text{want} > \forall > \exists$: 'I would like for every cat to bite some dog or other.'

On the other hand, when *kakoj-nibud'* is below the universal QP at Spell-Out, in either SVO order (9a) or OVS order (9b), it cannot scope over the universal. Thus, we see that when the referential reading of the indefinite is

ruled out (by using an inherently non-referential quantifier), the indefinite cannot take scope above its surface position – i.e., cannot undergo QR.

- (9) a. Ja xoču, čtoby [každaja koška] ukusila [kakuju-nibud' sobaku]
 I want that [every cat-NOM] bite-subj [some dog-ACC]
 want>∀>∃: 'I would like for every cat to bite some dog or other.'
 *want>∃>∀: 'I would like for there to be a dog s.t. every cat bites that dog.'
- b. Ja xoču, čtoby [každuju sobaku] ukusila [kakaja-nibud' koška].
 I want that [every dog-ACC] bite-subj [some cat-NOM]
 want>∀>∃: 'I would like for every dog to be bit by some cat or other.'
 *want>∃>∀: 'I would like for some (specific) cat to bite every dog.'

Thus, we see that scope between two QPs is frozen in Russian, regardless of whether the word order is SVO or OVS, and of whether the universal or the indefinite is higher at Spell-Out.

2.3. QP-adverb scope interactions in Russian

However, scope is not frozen everywhere in Russian: it appears that a QP can take scope over an adverb higher in the structure, arguably undergoing covert QR to a position above the adverb. The situation is not straightforward. Sentences like (10a), involving 'often' and a universal QP, sound very artificial in Russian; while the inverse scope reading seems to be preferred, the sentence borders on ungrammaticality. If, however, the universal QP is partitive, as in (10b)⁴, the sentence is grammatical and the inverse scope reading is strongly preferred⁵. It is not clear why there should be a difference between (10a) and (10b).

- (10) a. ?? Ja často zaxožu k každomu professoru.
 I often go to every professors-DAT
 ?? (∀>often), *(often>∀)
- b. Ja često zaxožu k každomu iz moix professorov.
 I often go to every-DAT from my professors-GEN
 (∀>often): 'For each of my professors, I often go to see her/him.'
 *(often>∀): 'I often go to see all of my professors (at the same time).'

With other quantifiers, such as 'all' and 'many', the inverse scope reading is quite easy to get, as in (11a) – the surface scope reading is somewhat infelicitous because of the context, so the inverse scope reading is forced. However, it is not clear that this should be considered a case of covert QR at

⁴ Thanks to Ora Matushansky (p.c.) for suggesting this type of example.

⁵ The surface scope reading is unavailable both because of the context and because of the distributive nature of *každyj*, which may be more like the English 'each' than like 'every.' For the other examples in this subsection, with 'all' and 'many', surface scope readings are certainly possible, as long as the context is felicitous.

all. Non-quantified collective DPs also appear to distribute over ‘often’, so that the preferred reading of (11b) is that I go to see each of my professors separately. It is possible that (10a) is another case of such group reading – although this cannot be claimed for (10b), where the QP is clearly distributive.

- (11) a. Ja často zaxožu ko vsem / mnogim profesoram.
 I often go to all / many professors-DAT
 (\forall /many > often): ‘For all/many professors x, I often go to see x.’
 #(often > \forall /many): ‘I often go to see all/many professors (at once).’
- b. Ja často zaxožu k moim profesoram.
 I often go to my professors-DAT
 ‘I often go to see my professors.’

The case is further complicated by indefinites. As 12 shows, the indefinite cannot take scope above the adverb (*kakoj-nibud*’ is used here in order to avoid a referential reading of the indefinite).

- (12) Ja xoču, čtoby Maša často zaxodila [k kakomu-nibud’
 I want that Mary often go-subj [to some
 professoru].
 professor-DAT
 ??/*(want> \exists >often): ‘I want Mary to often go see a specific professor.’
 (want>often> \exists): ‘I want Mary to often go see some professor or other.’

Thus, quantifiers do not behave uniformly in their interaction with adverbs. However, there are at least some cases (10b) in which the quantifier apparently takes scope over an adverb higher in the structure.

To summarize, this section showed that scope between two QPs is frozen in Russian, while inverse scope is at least sometimes possible (and even preferred) for QP-adverb interactions. The next section proposes an analysis of these phenomena.

3. Discourse and scope in Russian

In this section, I will link frozen scope in Russian to the presence of overt DP-movement. Russian has relatively free word order, as evidenced by the possibility of object scrambling. Moreover, if the object is raised to a position above the subject, it scopes over the subject (see ex. (5b), (6b)). Thus, scope configurations between two QPs are changed in Russian via overt movement, rather than covert QR. This fact is captured by the generalization in 13.

- (13) Availability of overt movement restricts covert movement.

The idea that operations that can be done overtly should not be done covertly is not new. Pesetsky (1989) proposed the *Earliness Principle*, according to which filters should be satisfied as early as possible: thus, a filter that can be satisfied at S-Structure *must* be satisfied there, rather than at LF. A

related proposal concerning scope interactions is due to Beck (1996), who looked at intervention effects in German. She states (p. 44): “German is a language that has scrambling and, accordingly, a relatively free word order. It seems that because scope order *can* be made clear at S-Structure, it has to be, so S-Structural c-command mostly reflects semantic scope. Movement at LF thus has to be severely restricted.” While the German data that led Beck to this generalization are not directly comparable to the Russian data in this paper, I believe that Beck’s idea captures the difference between scrambling languages such as Russian and German, on the one hand, and rigid word-order languages such as English on the other. Overt movement is preferred: English is forced to use covert QR because of the relative unavailability of overt movement.

3.1. Overt movement and discourse function

Why should overt movement be preferred to covert movement? I would like to suggest, that at least in the case of Russian, this is a discourse preference. Different positions in Russian clauses have often been linked to distinct discourse function, such as topic and focus (see King 1995, Junghanns and Zybatow 1997, a.o.). It is to be expected that overt movement for discourse function would be preferable to covert movement, from the point of view of the hearer. I will now discuss the nature of discourse-driven movement in Russian in more detail. I will look primarily at Topicalization and new-information focus, ignoring contrastive focus for the purposes of this paper.

Preverbal elements in Russian are often described as topics, while the rightmost constituent has been argued to carry new information focus (Junghanns and Zybatow 1997). Consider 14. The questions “Who did Lora visit?” and “Who visited Dora?” are answered by (14a) and (14b), respectively. Thus, the constituent bearing new information and stress is placed postverbally, while the unstressed old information is placed preverbally⁶.

- (14) a. Lora navestila DORU.
 Lora-NOM visited Dora-ACC
 ‘Lora visited Dora’
 b. Doru navestila LORA.
 Dora-ACC visited Lora-NOM
 ‘Dora was visited by Lora.’

However, the preverbal position is not reserved for explicitly old information. Consider (15a), which may be used to answer ‘What happened?’ In this case, *Dora* is not old information (since the entire sentence is new information); yet the sentence is in some intuitive way *about* *Dora* – i.e., *Dora*

⁶ The situation is actually more complex than this, since constituents bearing stress may be preverbal, as I’ll discuss in Section 0. However, the orders in 0 are the only ones possible under neutral intonation (stress on the right periphery).

is the topic. In contrast, (15b), which may also answer ‘What happened?’, is not about *Dora*, but rather is about ‘the cat’. In Section 4, I will discuss the properties of Russian topics in more detail. For now, I assume, given the examples in 14 and 15, that leftward movement of a (non-stressed, non-focussed) object DP in Russian is an instance of Topicalization. I adopt the terminology of King (1995, p. 64), who describes topics as being “usually loosely defined as what the sentence is about.”

- (15) a. Doru ukusila KOŠKA.
 Dora-ACC bit cat-NOM
 ‘Dora was bitten by a cat.’
 b. Koška ukusila DORU.
 cat-NOM bit Dora-ACC
 ‘The cat bit Dora.’

There is reason to believe that the Topic position occupied by the object in sentences like (15a) is higher than the position of the postverbal subject. The topicalized object can bind a pronoun inside the postverbal subject, as shown in (16b).

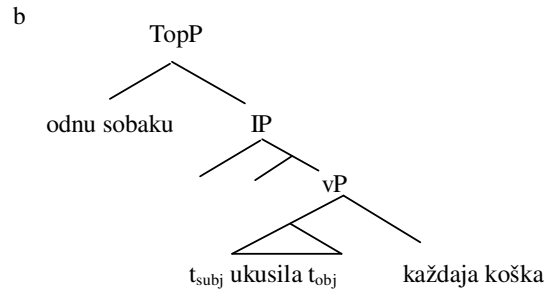
- (16) a. *Ego_i sobaka ljubit [každogo mal’čika]_i.
 his dog-NOM loves every boy-ACC
 b. [Každogo mal’čika]_i ljubit ego_i sobaka.
 every boy-ACC loves his dog-NOM
 ‘Every boy is loved by his dog.’

The topicalized object is thus in some high position, such as [spec, TopP] or [spec, IP]. As for postverbal subjects, I will follow Junghanns and Zybatow (1997) in saying that they are vP-adjoined. An alternative would be to say that the subject is in [spec, vP] and the verb has raised to INFL. However, this is unlikely, since verbs do not raise to INFL in Russian (see also Bailyn 1995). Russian verbs follow frequency/manner adverbs, which are usually assumed to be vP-attached (see Pollock 1989); this is just as true in OVS order as in SVO order.

- (17) a. Loru [_{vP} často naveščæet PODRUGA].
 Lora-ACC often visits friend-NOM
 ‘Lora is often visited by (her) friend.’
 b. ??/*Loru naveščæet často PODRUGA.
 Lora-ACC visits often friend-NOM

Thus, an OVS sentence like (5a), repeated as (18a), has the structure in (18b).

- (18) a. [Odnu sobaku] ukusila [KAŽDAJA KOŠKA].
 [one dog-ACC] bit [every cat-NOM]
 ‘One dog, every cat bit.’ $(\exists > \forall)$, $*(\forall > \exists)$



Thus, in Russian, different discourse configurations are expressed through different word orders (e.g., SVO vs. OVS); scope is ‘read off’ the resulting configuration. It is not necessary to employ covert QR to, for instance, raise the object from its base position. This movement would be superfluous, given the availability of overt Topicalization, which results in the tree in (18).

Just as covert QR is superfluous (given the availability of overt movement), so is reconstruction of the Topic in (18b) unnecessary. The reconstructed object DP would take scope under the subject DP, and would no longer function as a topic. Such vacuous application of Topicalization should not be allowed by Economy. This is captured in 19.

- (19) *Preservation of Discourse Function:*
 Topics cannot undergo reconstruction at LF.

While the above discussion suggests an explanation for why covert movement is restricted in Russian, it also makes an interesting prediction for when covert movement is allowed. Covert movement should be allowed when no overt counterpart is available – when the movement bears no relationship to discourse function. I turn to this prediction next.

3.2. Obligatory short QR in Russian

One case of movement for non-discourse reasons involves semantic interpretability. In the framework of Heim and Kratzer (1998), QPs are of type $\langle et, t \rangle$. This means that the subject of a transitive verb or the object of an unaccusative verb are interpretable in their base-generated position, as sister to a predicate of type $\langle e, t \rangle$, as well as in their derived position (where they have moved by an operation other than QR – e.g., to satisfy the EPP feature on Tense). Objects of transitive verbs, on the other hand, undergo obligatory QR

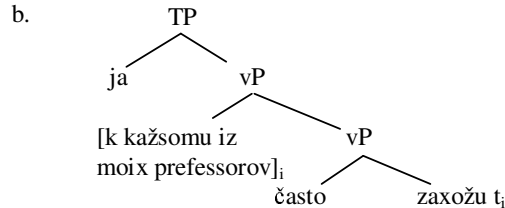
to a clause-denoting expression of type t , with this movement forming a one-place predicate through λ -abstraction over the position of the trace. Fox (2000) distinguishes this obligatory type of QR from optional QR. Thus, in a sentence like (20a) (from Fox 2000), the object QP *must* under QR to [Spec, vP] in order to be interpretable – note that this configuration (20b) does not invert the scope reading. The inverse scope reading is a result of either optional QR to a higher position (20c), or optional reconstruction of the subject QP (20d).

- (20) a. A boy loves every girl.
 b. obligatory QR: $[\text{TP a boy}_1 \dots [\text{VP every girl}_2 [\text{VP } t_1 \text{ loves } t_2]]]$
 c. optional QR: $[\text{TP every girl}_2 [\text{TP a boy}_1 \dots [\text{VP } t_2' [\text{VP } t_1 \text{ loves } t_2]]]]]$
 d. reconstruction: $[\text{TP } ____ \dots [\text{VP every girl}_2 [\text{VP a boy}_1 \text{ loves } t_2]]]$

I have argued that optional QR and reconstruction are both ruled out in Russian by the availability of overt movement. However, nothing in my analysis rules out obligatory QR, which has nothing to do with information structure. In fact, obligatory QR must exist in Russian, if object QPs which have not moved for discourse reasons are to be interpreted.

If obligatory QR moves the object to [spec, vP] (Heim and Kratzer 1998), then it may be possible for the object to take scope over vP-attached adverbs. Recall the sentences in Section 2.3. While the data on QP-adverb interactions are not straightforward, there appear to be at least some cases where a QP object takes scope over a vP-attached adverb – an example of this was (10b), repeated here as (21a). I propose that the LF for this sentence is (21b), in which the (PP) object has moved to a vP-attached position above the adverb.

- (21) a. Ja často zaxožu k každomu iz moix professorov.
 I often go to every-DAT from my professors-GEN
 ‘I often go to see each of my professors.’ ($\forall > \text{often}$). $*(\text{often} > \forall)$



Thus, it may be possible to account for the inverse scope that exists in Russian via short obligatory QR. This account is tentative, however, given the complex pattern of data in Section 2.3.

Given the semantic framework of Heim and Kratzer (1998), short interpretability-driven QR must exist in Russian, as in any other language. Whether this short QR enables the object to scope over an adverb like ‘often’ is not completely certain however. The data in Section 2.3 clearly warrant further investigation.

To summarize, this section examined overt and covert movement in Russian, and argued that the availability of discourse-driven overt DP-movement restricts covert movement in Russian. This section has provided answers to the questions posed in 4. I have argued that only short QR to [spec, vP] is available in Russian, while long QR and reconstruction are unavailable. Both of these processes would result in changes to information structure (i.e., changes in what is interpreted as Topic); however, such changes should be done overtly, an option preferred by the discourse.

4. Information structure and overt DP movement in Russian

In the previous section, I assumed that the leftmost constituent of a Russian sentence is a topic. In this section, I will examine topics in more detail, and I will further link Topicalization to scope. I concentrate on intonation-neutral, wide-scope sentences, which may answer the question ‘what happened?’

While stress typically falls on the right periphery of these sentences, it is also possible to have stress on a preverbal constituent, as long as it is not the leftmost constituent. This is illustrated in 22 for stressed objects, and 23 for stressed subjects. The judgments are given in the context of wide scope (i.e., in answer to “what happened?” or “what’s going on?”).

- (22) a. Galina čitaet KNIGU.
Galina-NOM reads book-ACC
‘Galina is reading a book.’
b. Galina KNIGU čitaet.
Galina-NOM book-ACC reads
c. #KNIGU Galina čitaet.
book-ACC Galina-NOM reads
- (23) a. Loru navestila PODRUGA.
Lora-ACC visited friend-NOM
‘Lora was visited by a friend.’
b. Loru PODRUGA navestila.
Lora-ACC friend-NOM visited
c. #PODRUGA Loru navestila.
friend-NOM Lora-ACC visited

I will not go issues concerning the stress pattern in Russian any further in this paper, although it would make an interesting subject for further investigation. The remainder of this section examines cases with stress on the right periphery, such as (22a) and (23a), but the discussion should generalize to sentences with

preverbal stress like (22b) and (23b)⁷. My main concern will be with the leftmost (unstressed) element in the sentence.

4.1. The nature of topicalization

In this subsection, I will examine the nature of Topics in Russian. I propose the following condition on what may become a Topic in Russian:

- (24) *Condition on Topicalization (for Russian):*
 An XP may be scrambled to Topic position only if there is no other phrase that is more definite / specific than the scrambled XP.

The association of Topics with definiteness/specificity is certainly not new (see, e.g., Szabolcsi 1997, who proposes a Topic position that is occupied only by specific DPs in Hungarian). What I propose for Russian, however, is not a one-to-one mapping between specific DPs and Topic position: rather, the Topic is one of the most specific (or definite) elements in the sentence.

Consider 25. In the canonical SVO order in (25a), ‘cat’ may be either definite or indefinite, and the postverbal ‘mouse’ is indefinite; however, if the object ‘mouse’ is topicalized, in (25b), it must be definite. (25b) is felicitous only if there is a salient mouse in the discourse context.

- (25) a. Koška pojmla MYŠKU.
 cat-NOM caught mouse-ACC
 ‘A/the cat caught a mouse.’
 b. Myšku pojmla KOŠKA.
 mouse-ACC caught cat-NOM
 ‘The mouse was caught by a cat.’

However, it is not the case that a topicalized DP must always be definite. For instance, an indefinite DP modified by ‘one’ or ‘some’ may be topicalized, as long as it receives a specific reading, and as long as there is no definite DP in the sentence. This is illustrated in 26: in (26a), ‘one cat’ must be specific, while ‘some child’ may be either specific or non-specific; the reverse is true for (26b)⁸. Intuitively, (26a) is about a particular cat, while (26b) is about a particular child.

⁷ It should be noted that the position of the stressed constituent does not affect scope: the sentences in 0 will continue to exhibit frozen scope if the stressed universal QP is placed in a preverbal position, as long as it follows the unstressed indefinite DP.

⁸ This raises the question of why ‘mouse’ in (25b) cannot be construed as a specific indefinite, with ‘cat’ being a non-specific indefinite. This may stem from an interaction between properties of bare DPs and the Topic position: when a DP is topicalized, the preference is to interpret it as definite, and in the absence of modifiers such as ‘one’ or ‘some’, this interpretation is adopted. The nature of bare DPs in Russian warrants further investigation.

- (26) a. Odnu košku pogladil KAKOJ-TO REBĚNOK.
 one cat-ACC stroked some child-NOM
 ‘One cat was stroked by a child.’
 b. Odin rebėnok pogladil KAKUJU-TO KOŠKU.
 one child-NOM stroked some cat-ACC
 ‘One child stroked a cat.’

Note that if the postverbal DP is definite, as in (27a), it is usually infelicitous to topicalize the indefinite object. On the other hand, it is fine to topicalize a definite object DP, as in (27b), over a definite subject, as long as the object DP is more salient than the subject (e.g., Lora is more likely to be salient in the discourse than her unnamed friend).

- (27) a. #Odnu košku pogladil RODION.
 one cat-ACC stroked Rodion-NOM
 ‘One cat was stroked by Rodion.’
 b. Loru navestila EĚ PODRUGA.
 Lora-ACC visited her friend-NOM
 ‘Lora was visited by her friend.’

Finally, I address the case where both DPs are clearly non-specific indefinites. An example is given in 28, where the context and the plurality of the DPs make a non-specific reading the only one available.⁹

- (28) V Rossii vsė kak obyčno...
 ‘In Russia everything is as usual...’
 a. ...Milicionery po-prežnemu presledajut GANGSTEROV.
 ...policemen-NOM as old chase gangsters-ACC
 ‘... Policemen are still chasing gangsters.’
 b. (#)...Gangsterov po-prežnemu presledajut MILICIONERY.
 gangsters-ACC as old chase policemen-NOM

In (28a), the non-specific subject can easily precede the non-specific object. It is somewhat infelicitous to put the object before the subject (28b). However, it is possible to force a non-specific object to be a topic, when the subject is even ‘less specific’ – i.e., when the subject is a neg-phrase. This is illustrated in 29¹⁰. Note that *nikto* is preverbal here (perhaps in [spec, NegP]), with stress falling on the sentence-final verb.

- (29) Milicionerov po-prežnemu nikto NE SLUŠAET.
 policemen-ACC as old no one-NOM NEG listens
 ‘As always, no one listens to policemen.’

⁹Thanks to David Pesetsky (p.c.) for suggesting this example.

¹⁰Thanks to Ora Matushansky (p.c.) for suggesting this type of example.

In the previous discussion, I have not addressed the question of whether a sentence *must* have a topic. There is evidence that fronted objects are necessarily topics, but the case is less clear for preverbal subjects. For instance, it is well-known (see, e.g. Rizzi 1997) that bare quantifiers without a lexical restrictor, such as *no one* or *all*, may not be topics. In Russian, it is indeed the case that an object *no one* may not be a topic. This is illustrated in (30a) – compare to (30b), where the topic is a neg-phrase with a lexical restrictor. On the other hand, it is quite possible to have a preverbal subject neg-phrase, as long as the postverbal object is a non-specific indefinite (30c).

- (30) a. #Nikogo ne ukusila SOBAKA.
 No one-ACC NEG bit dog-NOM
 ‘No one was bit by a dog.’
- b. Ni odnogo mal’čika ne ukusila SOBAKA.
 Neg one boy-ACC NEG bit dog-NOM
 ‘No boy was bit by a dog.’
- c. Nikto ne el KAŠI.
 No one-NOM NEG ate porridge-GEN
 ‘No one ate (any) porridge.’

This suggests that while the moved object is necessarily in Topic position, the preverbal subject may be in a canonical subject position such as [spec, TP].

4.2. Topicalization and scope

In this section, I have shown that Topicalization in Russian obeys certain restrictions – that the topic must be more specific / definite than, or at least as specific / definite as, other DPs in the sentence. This ties in with the discussion of Russian scope in Section 3. If an indefinite DP is in Topic position, it must be specific (and hence scope over the universal); a non-specific indefinite would not Topicalize over a universal DP, since this would violate 24. Thus, scope readings in Russian should to some extent reflect the specificity hierarchy, which is exactly what the data in Section 5 show.

5. Conclusion

In this paper, I have looked at scope and discourse properties of intonationally neutral Russian sentences. I have linked frozen scope to the availability of overt discourse-driven movement in Russian, suggesting, following proposals such as Pesetsky (1989) and Beck (1996), that overt movement is preferable to covert movement. Specifically, I have argued that leftward DP-movement in Russian is an instance of Topicalization, and that Topicalization is sensitive to the definiteness and specificity of the constituents. Scope in Russian reflects

this specificity hierarchy. When one QP takes scope over another, it is typically more specific; thus, it is Topicalized – i.e., undergoes overt movement. Covert movement processes like optional QR and reconstruction are not employed by Russian, since overt movement is preferred from the standpoint of discourse. However, I have suggested that obligatory short QR, which is not related to discourse, is available in Russian, resulting in inverse scope between adverbs and object QPs.

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Headedness and scope rigidity

Hironobu Kasai

This paper discusses parametric variation regarding scope rigidity. My proposal is that this parametric variation is reducible to the headedness. Specifically, under Fukui and Takano's (1998) theory of phrase structure, I will propose a mechanism for the locality of Quantifier Raising. Furthermore, I will propose a hypothesis that the visibility of a maximal projection to C_{HL} is determined by the visibility of its head. The theoretical consequence of the present analysis is that head movement takes place at narrow syntax, contrary to Chomsky (2000).

1. Introduction

Parametric syntax has been an important research area under the principles-and-parameters approach, where the theory of UG has invariant principles and parameters that are to be fixed by experience. Various kinds of parametric variation has been discussed under this approach. This paper discusses cross-linguistic variation of scope interpretation. As (1) shows, English allows inverse scope. In (1), the object quantifier, *everyone* can take wide scope over *someone*. May (1977) argues that *everyone* undergoes Quantifier Raising (QR) to the position where it takes wide scope over *someone* at LF.

(1) Someone loves everyone. (everyone > someone)

However, some languages exhibit scope rigidity, which does not allow inverse scope. As Kuroda (1965), Hoji (1985), among others, observe, Japanese is a language of this kind. This is shown in (2).¹

¹ It is important to mention that there are some cases where scope rigidity is not observed in Japanese. Hoji (1985) observes the following contrast.

- (i) a. [John ka Mary]-ga daremo-o sonkeisiteiru (or > every, *every>or)
John or Mary-NOM everyone-ACC admire
b. [John ka Mary Ka]-ga daremo-o sonkeisiteiru (or > every, every>or)
John or Mary-NOM everyone-ACC admire
'John or Mary admires everyone.'

- (2) Dareka-ga daremo-o aisiteru.
 someone-NOM everyone-ACC love
 ‘Someone loves everyone’. (*everyone > someone)

What is the source of this parametric variation? In this paper, I address this question.² Fukui (1986) reduces various kinds of differences between Japanese and English to the difference of functional categories in these languages. Following Fukui, I would like to reduce the difference concerning scope rigidity to the difference of functional categories in these languages.³ In capturing the difference between Chinese and English concerning scope rigidity, Aoun and Li (1993) have already put forward this possibility. Under their analysis, the functional category Infl plays a crucial role. In this paper, departing from them, I will argue that the functional category *v* plays a crucial role for the relevant parameterization.

The organization of this paper is as follows. In section 2, I will review Aoun and Li’s (1993) analysis and point out that Turkish fails to fall under their analysis. In section 3, I will propose an alternative analysis, under Fukui and Takano’s (1998) theory of phrase structure. In section 4, I will propose one hypothesis, which is crucial to a proposal in this paper, that the visibility of a maximal projection to C_{HL} is determined by the visibility of its head. In section 5, I will discuss the locality of QR more. In section 6, I will reconsider Chinese cases, which seem to be a problem for a proposal in this paper. In section 7, I will conclude the paper.

2. Aoun and Li (1993)

In this section, I will review Aoun and Li’s (1993) analysis, which discusses the parametric variation between Chinese and English. As Huang (1982), Aoun and Li (1993), among others, Chinese is a scope rigid language, like Japanese. The relevant example is given in (3).

- (3) youyige xuesheng mai-le meiyiben shu. (*every > a/a > every)
 one student buy-ASP every book
 ‘A student bought every book.’ (Huang 1982: 129)

In (ia), the object quantifier cannot take wide scope over the subject quantifier. In contrast, the inverse scope of the object is possible in (ib), where the disjunction marker is repeated. Watanabe (2000) suggests that the following example also exhibits inverse scope.

- (ii) Darekasiraka-ga daremo-o sonkeisiteiru (some > every, every > some)
 someone-NOM everyone-ACC admire
 ‘Someone admires everyone.’ (Watanabe 2000: 266)

In (ii), the existential quantifier with repeated *ka* allows inverse scope. In this paper, I leave this issue for future research.

² See also Watanabe (2000) for an alternative proposal to the relevant parametric variation.

³ As Naoki Fukui (personal communication) points out, another possibility to be considered is to reduce the relevant parametric variation to some different intrinsic properties between *everyone* and *daremo*. I leave the investigation of this possibility for future research.

In (3), the object quantifier cannot take wide scope over the subject, like Japanese. Aoun and Li (1993:22) argue that the difference in the interpretation of quantifiers in English and Chinese results from a different property of Infl between the two languages.⁴ Their assumptions are as follows.

(4) *The Minimal Binding Requirement*

Variables must be bound by the most local potential A-bar binder.

(Aoun and Li 1993: 11)

(5) *The Scope Principle*

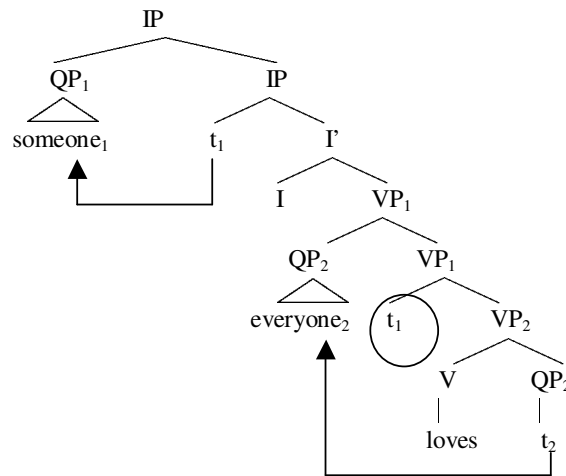
A quantifier A may have scope over a quantifier B iff A c-commands a member of the chain containing B. (ibid.: 11)

(6) Chinese subjects remain in [Spec, VP] due to the degenerate nature of Infl.

(ibid.: 23)

Under Aoun and Li's analysis, example (1) has the derivation given in (7).

(7)



Crucially, they assume that the subject raises to [Spec, IP], leaving the trace in [Spec, VP₁] at S-structure. At LF, the two quantifiers, *someone* and *everyone* undergo QR. They adjoin to IP and VP₁, respectively. Note that *everyone* c-commands a NP-trace of *someone*, which is in [Spec, VP₁]. The crucial assumption is that NP-traces are not relevant to the Minimal Binding Requirement but relevant to the Scope Principle. According to (5), *everyone* can take scope over *someone* because the former c-commands a member of the chain of *someone*, that is, the trace of *someone*. In this way, English has the

⁴ See also Huang (1982) for an alternative analysis.

moved into [Spec, IP] from [Spec, VP], like English.⁵ However, Turkish exhibits scope rigidity, like Chinese.

- (10) [Üç kiři]yi Herkesi dün aramiř. (*every > 3, 3 > every)
 three person-Nom everyone-Acc yesterday call-Past-3sg
 ‘Three people called everyone yesterday.’ (Kural 1997: 504)

As (10) shows, objects cannot take wide scope over subjects in Turkish. Under Aoun and Li’s analysis, it is not clear why Turkish exhibits scope rigidity.

I would like to put forward the idea that head-finality plays a crucial role for scope rigidity.⁶ Turkish and Japanese are a head-final language and exhibit scope rigidity. However, how can I connect headedness with scope rigidity? Chomsky (1995), among others, has argued that linear order does not exist in the narrow syntax. Linear order is one of the PF properties. If this approach is correct, then it seems to be difficult to connect headedness with scope rigidity. In the next section, I will resolve the dilemma.

3. Proposals

Before going to a proposal, I will review some theoretical assumptions made in this paper. I assume Fukui and Takano’s (1998) theory of phrase structure. They assume that the universal word order is SOV, contrary to Kayne (1994). SVO word order is derived from SOV through verb movement. Specifically, they propose (11).

- (11) a. Head movement for checking purposes always takes the form of “substitution into Spec”.
 b. *v* has the property of attracting V in English but not in Japanese.
 (Fukui and Takano 1998: 44-45)

⁵ The assumption that Turkish subjects move to [Spec, IP] from [Spec, vP] is not uncontroversial. Kural (1997) observes that Turkish subjects do not exhibit the Subject Condition effects.

(i) [Op_i [Ahmet’ in t_i k1rmas1]nin beni üzdüğü] bardak.
 Ahmet-GEN break-INF-3SG-GEN I-ACC sadden-PAST-3SG glass
 ‘the glass that Ahmet’s breaking (it) saddened me’ (Kural 1997: 502)

Following Kural (1997), I assume that verbs undergo movement out of VP in Turkish and subjects stay within the c-commanding domain of verbs.

⁶ However, there are important counterexamples to the present approach. As noted before, Chinese is SVO but exhibits scope rigidity. In section 6, I will reconsider Chinese cases. As S.-I. Takahashi (personal communication) points out to me, Serbian/Croatian also exhibits scope rigidity, although it is a SVO language. The relevant example is given in (i).

(i) Ne(t)ko voli svako-ga.
 someone loves everyone-ACC (*every > some)

There is a person X such that X loves everybody.’ (Progovac 1994: 31)
 The present approach cannot give an explanation to this fact in a straightforward way. I need to say something about cases in Serbian/Croatian. I will this issue for future research.

As (11a) shows, they reanalyze head movement as a substitution operation rather than head adjunction. The difference between VO and OV order is due to the property of the light verb, according to (11b). Under their analysis, the derivation of VO order such as English and OV order such as Japanese is schematically given in (12), respectively.

- (12) a. $[_{vP} \text{Subj } [_{v'} V [_{v'} [_{VP} \text{Obj } t_v] v]]] \rightarrow \text{SVO}$
 b. $[_{vP} \text{Subj } [_{v'} [_{VP} \text{Obj } V] v]] \rightarrow \text{SOV}$

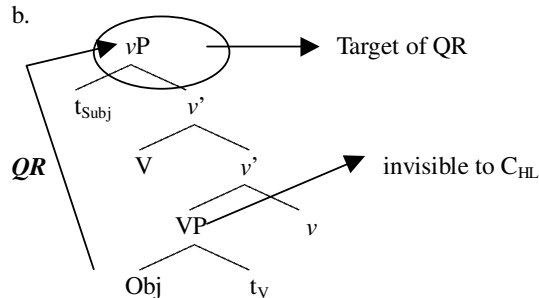
In this paper, I make the following proposal.

- (13) a. A quantifier α must adjoin to the first maximal projection which dominates α .
 b. A maximal projection of α is not visible to C_{HL} if α undergoes head movement.

Condition (13a) says that QR is subject to some economy condition like *Shortest Move*.⁷ I will justify the assumption given in (13b) on independent grounds in the next section.⁸

In what follows, let us see how the present analysis works. In English, the verb is moved to [Spec, vP], which makes VP invisible in the computation and hence VP does not work as an adjunction site of QR. That is why the object quantifier cannot adjoin to VP. According to (13a), the adjunction site should be the next higher maximal projection vP . I assume with Aoun and Li (1993) that the Scope Principle given in (5) plays a crucial role for scope interpretation. The object adjoins to vP and c-commands the trace of the subject. According to the Scope Principle, the inverse scope is possible. This is shown in (14b).

- (14) a. Someone loves everyone. (everyone > someone)

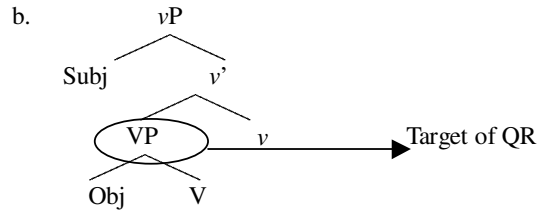


⁷ See also Bruening (2000), Fox (2000), and Sauerland (2000) for the locality of QR.

⁸ The present analysis that head movement is crucially involved in the locality of movement is reminiscent of Law's (1991) proposal that bounding domains should be defined in terms of head movement. Specifically, in his theory, projections with an empty head cannot be a bounding node. See Law (1991) in detail.

Next, take a look at Japanese cases.

- (15) a. Dareka-ga daremo-o aisiteru
 someone-NOM everyone-ACC love
 ‘Someone loves everyone’. (*everyone > someone)



In (15b), in order for *daremo-o* ‘everyone-Acc’ to adjoin to *vP*, the verb must undergo movement to the next higher head, like English. However, as (15b) shows, Japanese does not have verb movement and hence *daremo-o* cannot adjoin to *vP* because (13a) requires that the object quantifier should adjoin to *VP*, which is visible in Japanese. In Japanese, object quantifiers cannot take wide scope over subject quantifiers.⁹

4. Visibility to C_{HL}

So far, I have assumed that a maximal projection whose head undergoes head movement out of it is invisible to C_{HL} . In this section, I will argue that this assumption is justified on independent grounds.

Takano (2000) makes the generalization given in (16).¹⁰

⁹ I would like to mention that the present analysis has to allow the adjunction to *VP*, which is a one-place predicate (type $\langle e, t \rangle$). Heim and Kratzer (1998) assume that quantifiers adjoin to a clause-denoting expression (type t) by QR. They assume that λ -abstraction applies to a clause-denoting expression and a one-place predicate is formed. Then, a quantifier (type $\langle \langle e, t \rangle, t \rangle$) adjoins to the one-place predicate. Under Heim and Kratzer’s approach, if quantifiers were adjoined to *VP*, semantic mismatch would appear. This is because λ -abstraction applies to *VP* and forms $\langle e, \langle e, t \rangle \rangle$, which raises a type mismatch with $\langle \langle e, t \rangle, t \rangle$. In this paper, I employ flexible types for quantifiers. I shift semantic type of quantifiers from $\langle \langle e, t \rangle, t \rangle$ to $\langle \langle e, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$, which resolves type mismatch mentioned above. In fact, Heim and Kratzer (1998:217-220) also suggest that it is necessary to allow *VP* as an adjunction site on independent grounds.

¹⁰ Akira Watanabe (class lecture @ University of Tokyo, 2001) points out a counterexample to the generalization given in (16).

(i) They all said that John was shrewd and [_{VP} _{t_{was}} [_{AP} _{t_{he}} shrewd]] he was _{t_{VP}}.

(ii) *They all said that John was shrewd and [_{AP} _{t_{he}} shrewd] he looks _{t_{AP}}.

The ungrammaticality of (ii) shows that *AP* cannot undergo predicate fronting and hence it must be the case that the fronted category is *VP*, where *was* moves out in (i). He suggests that (i) is a counterexample to the generalization that phrases whose head undergoes movement cannot be moved. I have to give an alternative account to the contrast above but this is an issue for future research. See Kuno (2000) for related discussion.

(16) Remnant movement of α is impossible if the head of α has moved out of α .
(Takano 2000: 146)

In German, remnant movement of a maximal projection whose head undergoes head movement out of it is impossible, as discussed in Haider (1990), Takano (2000), among others. The relevant example is given in (17).

(17) *[Ihr ein Buch t_1] $_2$ gab $_1$ Hans t_2 .
her a book gave Hans
'Hans gave her a book.'
(Haider 1990: 96)

One might say that (17) falls under Müller's generalization. However, (17) does not because head movement and remnant VP movement are not the same type of movement.

(18) a. [Dato t_1 a Gianni] $_2$, non I $_1$ 'ho ancora t_2 .
given to Gianni not it. (I).have yet
'Given it to Gianni, I have not yet.'
(Rizzi 1990: 39)
b. ?dab [t_1 zu lesen] $_2$ es $_1$ keiner t_2 versucht hat.
that to read it no one tried has
'that no one has tried to read it.'
(Müller 1996: 380)

As examples in (18) show, head movement and remnant movement are different movement, under the assumption that a clitic undergoes head movement.¹¹ Through consideration of the grammaticality of (18), it is impossible to say that the ungrammaticality of (17) is due to Müller's generalization. Takano (2000) claims that the ungrammaticality of (17) falls under the generalization given in (16).

Following Chomsky (1995: chapter 4), Takano assumes that every movement is feature-driven and movement of the category α takes place when formal features of the head of α is attracted. Assuming that topicalization/focus movement is also feature-driven, Takano claims that remnant movement of VP in (17) results from the overt application of Attract to the formal features of the head of VP. However, the condition given in (19) prevents Attract/Move F from applying to traces.

(19) Only the head of a chain CH enters into the operation Attract/Move.
(Chomsky 1995: 304)

Since the head of VP is a trace in (17), remnant movement is impossible.

In the previous section, I have argued that V undergoes head movement and VP does not work as an adjunction site of QR in English. In this section, I have reviewed that remnant movement of a maximal projection whose head moves

¹¹ Following Müller (1996), Takano (2000) assumes that the German pronominal clitics undergoes head movement.

out of it is impossible. In this paper, I would like to unify these two things in terms of a maximal projection's loosing its head. In both of the cases, a maximal projection loses its head and is invisible to C_{HL} . In the first case, XP is not qualified as a landing site and in the second case, XP cannot be a target of Move. Why does losing a head make XP invisible to C_{HL} ? I would like to claim that whether XP is visible to C_{HL} or not is determined by the visibility of its head. In this case, the head of XP is a trace. I assume that traces are invisible to C_{HL} . I argue that this assumption is not implausible, if we consider (19). As (19) says, the tail of the chain, that is, traces are not a target of Attract/Move. In this sense, it is possible to say that traces are invisible to C_{HL} . In this paper, I propose the following hypothesis.

- (20) The visibility of a maximal projection is determined by the visibility of its head.

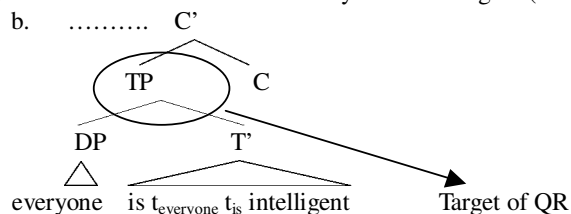
According to (20), under the assumption that a trace is invisible to C_{HL} , it follows that a maximal projection whose head is a trace is invisible to C_{HL} and hence it does not work as an adjunction site and as a target of movement.

5. More on locality of QR

So far, I have assumed that a syntactic head which undergoes head movement makes its maximal projection invisible to C_{HL} . In other words, the visibility of a head determines whether its maximal projection is visible to C_{HL} or not.

The present analysis so far can give a natural explanation to the clause-boundedness effect of QR.¹²

- (21) a. Someone believes that everyone is intelligent. (*everyone > someone)



I assume that the subject *everyone* is base-generated in [Spec, ν P] and moves to

¹² It is important to note that there are some counterexamples. Farkas and Giannakidou (1996) (henceforth F &G) point out that there are counter examples to the clause-boundedness.

(i) A student made sure that every invited speaker had a ride. (F &G 1996: 36)
 According to F &G in (i), *every speaker*, which is the subject of the embedded clause, can take wide scope over *a student*, which is the subject of the matrix clause. They claim that some semantic factor plays a crucial role for the relevant clause-boundedness. Specifically, their claim is that two scopally related expressions are co-participants in some eventuality. See F &G (1996) in detail. I leave examination of their analysis of the clause-boundedness for future research.

[Spec, TP] within the embedded clause. Given (13a), the adjunction site of *everyone* is the embedded TP because the first maximal projection which dominates *everyone* is the embedded TP. *Everyone* cannot take wide scope over *someone* because *everyone* does not c-command any member of the chain of *someone*.

In contrast to finite clauses, however, it has been observed that ECM subjects of infinitival clauses can take wide scope over subjects of the matrix clause. The relevant example is given in (22).

(22) Someone believes everyone to be intelligent. (everyone > someone)

I assume that the subject of the infinitival clause *everyone* is also base-generated in [Spec, ν P] and moves to [Spec, TP] in the embedded clause for the EPP. Under the present analysis so far, TP should be a target of adjunction site of QR like finite clauses and hence the inverse scope given in (22) cannot be predicted. In order to resolve this problem, I would like to suggest that not only traces of head movement but also *to* in the ECM construction is invisible to C_{HL} .

There is a good reason to believe that *to* in (22) is invisible to C_{HL} . Lobeck (1991) argues that only agreeing functional categories license ellipsis of their complement. This is shown in (23).

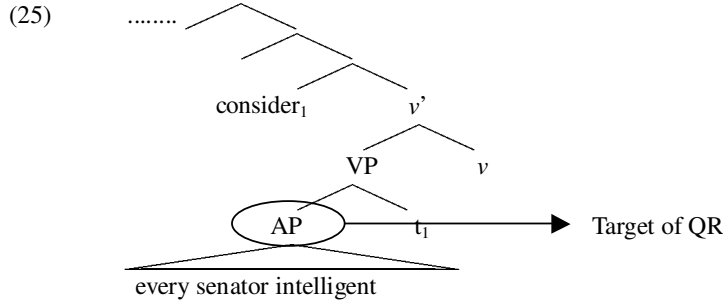
(23) a. John [ν_P likes syntax] and Mary does [ν_P e] too.
 b. *Bill believes John to like syntax and he believes Mary to [ν_P e] as well.

Finite T in (23a), which establishes Case/ Φ agreement, licenses ellipsis site. In contrast, as (23b) shows, *to* cannot license ellipsis of its complement. I assume that the property of heads plays a crucial role at licensing ellipsis of their complement. It is possible to claim that finite T is visible but *to* in the ECM construction is not visible regarding licensing ellipsis of their complement.

Hornstein (1995) observes that small clause subjects cannot take wide scope over matrix subjects. In (24), *every senator* cannot take wide scope over at least one person.

(24) At least one person considers [every senator smart]. (Hornstein 1995: 76)

It has been a mystery why small clause subjects cannot take scope over the matrix clause in (24), unlike (22). The present analysis can capture the contrast given in (22) and (24). I assume that *every senator* stays in AP, without going out of the lexical projection, unlike (22) and hence the target of QR is AP, as shown in (25).

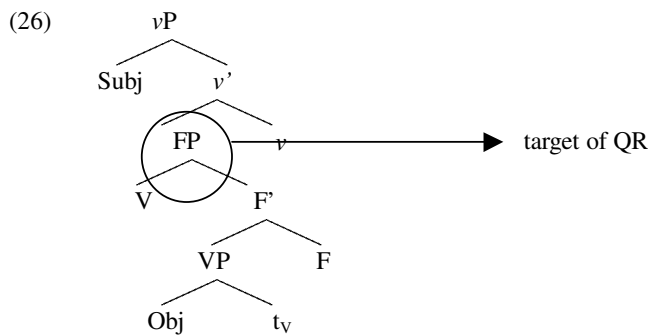


The contrast between (22) and (24) cannot be captured under A-movement approach to quantifier scope, proposed by Kitahara (1996), Hornstein (1995), among others. This is because ECM subjects in infinitival clauses and small clauses behave in the same way in that they undergo A-movement to the higher clause and can have interaction with matrix subjects. In contrast, the present approach can explain the relevant contrast, by assuming that *to* is invisible to C_{HL} and hence TP headed by *to* does not work as an adjunction site.

6. A reconsideration of Chinese

In this section, I will reconsider Chinese cases. Chinese seems to be problematic for the present analysis. Chinese exhibits scope rigidity while it is a verb-initial language. If Chinese had the same phrase structure as English, it is predicted that Chinese would not exhibit scope rigidity.

I suggest that Chinese verb movement is shorter than that in English.¹³ Specifically, I would like to propose that Chinese has a projection between VP and vP, which provides a landing site for raised verbs, as shown in (26).¹⁴

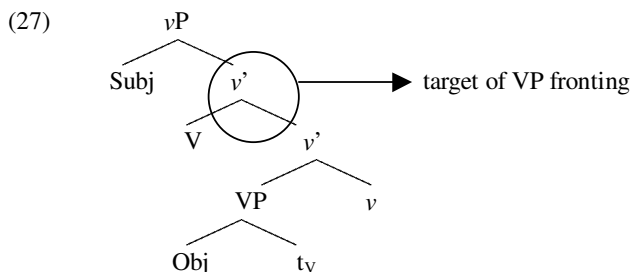


¹³ Fukui and Takano (1998: 52) also make a suggestion that Chinese verb movement is shorter than that in English on independent grounds.

¹⁴ I leave the status of FP an open question.

As (26) shows, according to (13a), FP is a landing site of QRed object quantifiers and hence Chinese exhibits scope rigidity, like Japanese.

I will provide evidence for the existence of the projection between VP and ν P, based on VP fronting. I make the following assumptions. First, following Aoun and Li (1993), Chinese does not have subject raising. Rather, subjects stay in [Spec, ν P]. Second, intermediate projections cannot undergo movement. If there were no projection between VP and ν P, it must be the case that VP fronting applies to ν' . This is inconsistent with the second assumption.



However, Chinese allows VP fronting, as shown in (28). The structure given in (27) cannot generate an example in (28).

- (28) [Piping ziji₁ de pengyou, Zhangsan₁] juedui bu hui.
 criticize self's friend Zhangsan definitely not will
 'Criticize his friend, Zhangsan definitely will not.'

However, given the structure in (26), it is possible to generate (28), by fronting FP in (26). The existence of VP fronting in Chinese is supporting evidence for the projection between VP and ν P.¹⁵

7. Concluding remarks

In this paper, I have claimed that the parametric variation with respect to scope rigidity is reducible to the property of ν . Specifically, English light verbs have the property of attracting V while Japanese light verb does not attract V. Furthermore, I have put forward the idea that the visibility of a maximal projection is determined by the visibility of its head. I have argued that there are at least two

¹⁵ I speculate that FP is active in Chinese on independent grounds. Chinese allows objects to appear in the preverbal position, unlike English.

(i) Ta ba Lisi pian-le.
 he BA Lisi cheat-ASP
 'He cheated Lisi.'

(Huang 1982: 27)

Example (i) has been called "BA construction", where objects of verbs appear in the preverbal position, marked with *ba*. I speculate that the phrase marked with *ba* moves from the complement position to [Spec, FP].

elements which make their maximal projection invisible to C_{HL} . One is a trace which are left behind by head movement. The other is *to* in the ECM construction.

The consequence of this paper is that head movement takes place at narrow syntax, not at PF component. If head movement took place at PF, then the correlation of head movement and scope rigidity would not be captured. However, Chomsky (2000:68n.146) suggests that head movement is part of the phonological component, not at syntax. This suggestion is inconsistent with the claim of this paper. Under the present analysis, head movement plays a crucial role for the locality of QR and hence it must be the case that head movement takes place at narrow syntax, not at PF.

Before concluding the paper, I will review some pieces of evidence for the claim that head movement is involved in semantic interpretation. The first evidence is that head movement plays a crucial role for the licensing of negative polarity items.

- (29) a. *Anybody didn't come.
 b. Didn't anybody come? (Uribe-Etxebarria 1996: 573)

As (29a) shows, negative polarity items in the subject position cannot be licensed. However, when auxiliaries like *didn't* undergo head movement, then it is possible to license negative polarity items in the subject position. This is shown in (29b). I assume that the licensing of negative polarity items takes place at LF. If the relevant movement takes place at PF, it is not possible to explain the grammaticality of (29b).

The second evidence is based on English negative questions. In English, a question like (30) has two possible readings: *Yes-no*-reading given in (31a) and *Alternative*-reading given in (31b).

- (30) Did John drink coffee or tea?
 (31) a. *Yes-no*-reading: "Is it the case that John drank any of these two things, coffee or tea?"
 b. *Alternative*-reading: "Which of these two things did John drink: coffee or tea?"
 (Han and Romero 2001: 101)

Under the *yes-no*-question, the answer can be (32a) and under the *alternative*-question, the answer can be (32b).

- (32) a. Yes, John drank coffee or tea./ No, John didn't drink coffee or tea.
 b. John drank coffee./ John drank tea.

However, in the case of negative questions, examples with non-inverted negation like (33) have both of the readings but examples with inverted negation like (34) does not allow the *alternative*-reading, as discussed in Han

and Romero (2001). The contrast between (33) and (34) also shows that head movement is crucial for semantic interpretation.

(33) Did John not drink coffee or tea?

- a. *Yes-no*-reading answers:
Yes, John did not drink coffee or tea. / No, he did drink coffee or tea.
- b. *Alternative*-reading answers:
John did not drink coffee. / John did not drink tea.

(34) Didn't John drink coffee or tea?

- a. *Yes-no*-reading answers:
No, John did not drink coffee or tea. / Right, he did drink coffee or tea.
- b. *#Alternative*-reading answers:
John did not drink coffee. / John did not drink tea.

(Han and Romero 2001: 101-102)

If head movement were PF phenomena, then it is not possible to capture the difference between (33) and (34), under the assumption that auxiliaries like *did* and *didn't* undergo head movement. Therefore, it is difficult to claim that head movement is PF phenomena.

Acknowledgements

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Much ado about *was*: Why German directly depends on indirect dependency

Melanie Klepp

This paper sets out to challenge the widely held assumption that the Direct Dependency Approach (DDA) is the most suitable analysis for the *was-w*-construction¹ in German (1) (Lutz et al. 2000). It presents a clear case in favour of the Indirect Dependency Approach (IDA) (Dayal 1996, 2000), based on hitherto unrecognised syntactic and semantic evidence about the nature and position of the scope marker *was* as an ordinary *wh*-argument base-generated in direct object position. The syntactic implications of this proposal will be shown to derive in a straightforward manner.

1. Introduction

1.1. The was-w-construction

The *was-w*-construction can be observed in many unrelated languages, such as German, Hindi, Hungarian, Iraqi Arabic, Romany, and Malagasy amongst others. However, for the purpose of this paper it suffices to focus on German and Hindi exclusively since these languages highlight and exemplify the constraints typical of the construction together with its possible diachronic development (cf. section 5).

The *was-w*-construction typically consists of two interrogative clauses. The *wh*-element in CP-1 is an unmarked *wh*-phrase usually used to question over propositions, e.g. *was* in German (1), *kyaa* in Hindi (2) while the *wh*-element in CP-2 may be any ordinary *wh*-phrase. Possible answers to the question always specify values for the embedded *wh*-phrase, e.g. *Miró thought that Picasso had painted 'Il Guernica'* (cf. (4a)).

¹ The *was-w*-construction is also known in the literature as Partial *wh*-movement or Scope Marking Construction. Since both terms presuppose a particular type of analysis, the neutral term *was-w*-construction will be used for the German variant.

- (1) [CP-1 **Was** glaubte Miró *t* [CP-2 **welches Bild** Picasso *t* gemalt
 what believed M. *t* which picture Picasso *t* painted
 hatte]]?
 had
 ‘Which picture did Miró think Picasso had painted?’
- (2) [CP-1 jaun **kyaa** soctaa hai [CP-2 ki merii **kis-se** baat
 John what think-PR that Mary who-INS talk
 karegii]]?
 do-F
 ‘Who does John think Mary will talk to?’

1.2. Constraints on the construction

1.2.1. Licensing verbs

Licensing verbs belong to the class of bridge verbs, i.e. they allow long extraction (3) and take a [-*wh*] clausal complement (4a, b).²

- (3) [CP[+wh] **Welches Bild** glaubte Miró, [CP[-wh] *t* dass Picasso *t*
 which picture believed Miró that Picasso
 gemalt hatte]]?
 painted had
 ‘Which picture did Miró think Picasso had painted?’
- (4)a. Miró glaubte [CP[-wh] dass Picasso ‘Il Guernica’ gemalt
 Miró believed that Picasso ‘Il Guernica’ painted
 hatte.
 had.
 ‘Miró thought Picasso had painted ‘Il Guernica’.’
- b. *Miró glaubte [CP[+wh] **wann** Picasso ‘Il Guernica’ gemalt
 Miró believed when Picasso ‘Il Guernica’ painted
 hatte.
 had.

1.2.2. Multiple embedding

Multiple clauses may be embedded as long as every clause above the real *wh*-phrase contains a scope marker:

² Consider that following the DDA which renders (1) and (3) mere surface-structural variants of each other (cf. section 3), it comes as a surprise that the was-w-construction is not in violation of the *wh*-Criterion (Rizzi 1990).

- (5) **Was** meint Peter, **was** Karl glaubt, . . . , welche Note Matthias bekommen hat].
 what means Peter what Karl believes which grade Matthias got has
 ‘Which grade does Peter think, does Karl believe, . . . , that Matthias got?’

- (6) raam-ne **kyaa** socaa ki ravii-ne **kyaa** kahaa ki
 Ram-ERG kyaa thought that Ravi-ERG kyaa said that
 kon sa aadmii aayaa thaa
 which man came
 Intended as: ‘Which man did Ram think that Ravi say_came?’

This locality requirement is stricter in Hindi since a number of German speakers also allow intervention of a complementiser in the embedded clause (7) (Höhle, 1996, [5c]). A possible analysis suggests that the scope marker is not base-generated in SpecCP (as assumed in the DDA, cf. section 3) but that it is extracted from the direct object position in the embedded clause.

- (7) %Was glaubst du, **dass** Karl *t* meint, wen wir gewählt haben?
 what believe you that Karl thinks whom we elected have
 ‘Whom do you think we have elected?’

1.2.3. Negation

Negation in the matrix clause is ungrammatical:

- (8) *Was glaubt Martin **nicht**, wen Bea geküsst hat?
 what believes Martin not whom Bea kissed has
 (9) ***koi bhii nahii** kyaa soctaa he ki kon aayegaa
 no one kyaa thinks be-PRES that who come-FUT
 Lit. ‘Who does no one think will come?’

1.2.4. Incompatibility with sentential expletives

The scope marker cannot co-occur with a sentential expletive (*es*, *yah*) in the same clause, suggesting that they may be in complementary distribution.

- (10) Was glaubst du (***es**), welchen Film er gesehen hat?
 what believe you (*it) which film he seen has
 ‘Which film do you think he has seen?’

- (11) ***siitaa-ne yah** kyaa socaa ki ravii-ne kis-ko dek-haa
 Sita-ERG it kyaa thought that Ravi-ERGwho saw
 Lit. ‘Who did Sita think it that Ravi saw?’

(Mahajan, 1996:8)

2. The Direct Dependency Approach

In the DDA, the scope marker *was* is an expletive base-generated in matrix SpecCP as a ‘place-holder’ for the true *wh*-phrase in CP-2, thus establishing a direct relationship between the two. The embedded *wh*-phrase has only partly moved to a [-wh] SpecCP position and is licensed in the overt syntax by forming a *wh*-chain with the scope marker, thereby circumventing the violation of the *wh*-Criterion. At LF, the *wh*-phrase moves to matrix SpecCP to replace the scope marker (cf. 13), hence full and partial *wh*-movement constructions (12b, 12a, respectively) are only overt syntactic variants with the same LF interpretation. The DDA is the most widely advocated analysis for German (Stechow & Sternefeld 1988, McDaniel 1989, Sabel 1998, Beck & Berman 2000).

- (12)a. $[_{CP [+wh]} \text{ Was glaubte Miró } [_{CP [-wh]} \text{ welches Bild Picasso } t \text{ gemalt hatte}]]?$
 what believed Miró which picture Picasso
 painted had
 ‘Which picture did Miró think Picasso had painted?’
- b. $[_{CP [+wh]} \text{ Welches Bild glaubte Miró, } [_{CP [-wh]} t \text{ dass Picasso } t \text{ gemalt hatte}]]?$
 which picture believed Miró that Picasso
 painted had
 ‘Which picture did Miró think Picasso had painted?’
- (13) $[_{CP-1} \text{ Wen } \dots [_{CP-2} t \dots t \dots]]$

2.1. Problems with the DDA

2.1.1. *yes/no* questions

Although at first sight the DDA derives the properties of the German *was-w*-construction correctly, it runs into problems on a cross-linguistic basis. The strongest empirical evidence comes from *yes/no* questions which are available in Hindi and Hungarian, amongst other languages, but excluded in German. In Hindi, CP-2 can be a simple *yes/no* question lacking a *wh*-phrase (14a). This implies that there is no element to replace the expletive scope marker at LF. Instead, possible answers show that the entire proposition in CP-2 becomes the focus of the question, i.e. the possibility of Anu coming is expressed (14b) but not the alternative of what Ravi said (14c).

- (14)a. [_{CP-1} Ravi-ne kyaa kahaa [_{CP-2} ki anu aayegii yaa
Ravi-ERG what say-P that Anu come-F or
nahiiN]]?
not
‘What did Ravi say, will Anu come or not?’
- b. [_{CP-1} Ravi-ne kahaa [_{CP-2} ki anu (nahiiN) ayegii]]
Ravi-ERG say-P that Anu (not) come-F
‘Ravi said that Anu will (not) come.’
- c. # [_{CP-1} Ravi-ne (nahiiN) kahaa [_{CP-2} ki anu aayegii ya
Ravi-ERG (not) say-P that Anu come-F or
nahiiN]]
not
‘Ravi said/didn’t say whether Anu will come.’

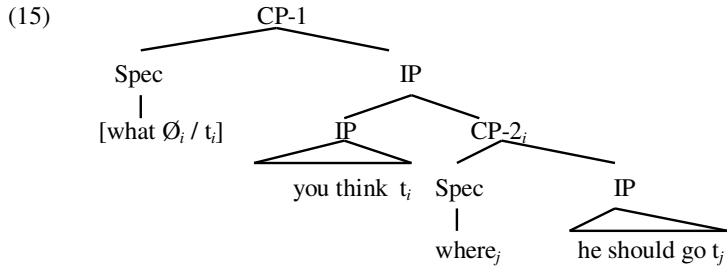
3. Proposal and claims

Beyond the problem of cross-linguistic adequacy, it will be shown that the *was-w*-construction and *wh*-extraction construction exhibit different semantic behaviour, hence they cannot be analysed as syntactic variants with the same LF representation. Based on this evidence, it is claimed that the scope marker *was* is no expletive but a true *wh*-phrase which is base-generated in direct object position of the matrix clause. In addition, it functions as a quantifier over the proposition of the embedded clause. It will be shown that the syntactic structure of indirect subordination (Dayal 2000) can easily be adapted to suit the German *was-w*-construction as in (15).

3.1 The Indirect Dependency Approach

Originally proposed by Dayal (1996, 2000) for the scope marking construction in Hindi, the syntactic analysis of Indirect Subordination translates to the *was-w*-construction without difficulty. As shown in (15), the scope marker *was* is an ordinary *wh*-argument which is base-generated in direct object position. Together with CP-2 it forms a complex argument. Unlike in the DDA, no direct relationship or chain is established, instead the two *wh*-phrases form local dependencies in the overt syntax. The scope marker *was* moves to SpecCP while CP-2 including the second *wh*-phrase is extraposed and adjoined in subordinate position to IP. It is coindexed with the restriction on the scope marker. At LF, CP-2 moves into the position of the restrictor as an instance of replacement or reconstruction, yielding an LF structure like (16). In this way, the scope marker is able to quantify over the proposition in CP2 whose

semantic content in turn restricts the scope marker. An important consequence is that the embedded *wh*-phrase never gets matrix scope.



(16) [CP-1 was [CP-2 wen_j Maria t_j mag]_i [IP meint Peter t_i]]

3.2. Problems with the IDA

3.2.1. *yes/no* questions

Ironically enough, the same empirical evidence which ruled out the DDA as a suitable cross-linguistic analysis also objects against adapting the IDA to German. As already noted above, the German *was-w*-construction lacks the option of *yes/no* questions, a fact which is easily explained in terms of the DDA due to the absence of a true *wh*-phrase:

(17) *Was denkt Peter, ob Maria Klaus liebt?
 what thinks Peter whether Maria Klaus loves

Since in the IDA the entire proposition of the embedded clause restricts to the scope marker, the ungrammaticality in (16) is unexpected and unexplained. A possible solution to solve this problem has been suggested by Reis (2000). She notes that in Hindi, matrix and embedded questions (*wh*- or *yes/no*) have the same syntactic structure since the (purely grammatical) subordinator *ki* is optional (cf. (2), (13a)). In German, however, a shift from V2 to V-final word order in embedded clauses has taken place, together with the additional insertion of the obligatory complementiser *ob* in *yes/no* questions, a conjunction bearing independent lexical meaning. Considering a possible process of grammaticalisation from two independent clauses in juxtaposition (Sequential Scope Marking, cf. section 6), this further insertion of the lexical element *ob* may be an additional operation which is not tolerated and renders the construction ungrammatical.

4. Evidence

This section presents a battery of tests which clearly evidence the semantic differences between the *was-w*-construction and *wh*-extraction construction in German. On the basis of this evidence it is shown that the IDA proves the only suitable analysis for German since the DDA could not derive the semantic alternatives.

4.1. Pragmatic context restrictions

The examples in (18) show that *was* clearly has argument status which is similarly restricted by the pragmatic context scenarios in both (18a) and (18b). While in the former, the restriction is derived by discourse, in the latter the proposition in the embedded clause serves the restricting purpose. The possible answer (18c) to both examples confirms the proposal.

- (18)a. [Lance Armstrong wird die Tour de France gewinnen.] Was meinst du (dazu)?
 [Lance Armstrong will the Tour de France win] what mean you (to that)
- b. Was meinst du, wer die Tour de France gewinnen wird?
 what mean you who the Tour de France win will
 ‘Who do you think will win the Tour de France?’
- c. Ich meine, dass Lance Armstrong die Tour de France
 I mean that Lance Armstrong the Tour de France
 gewinnen wird.
 win will
 ‘I think that Lance Armstrong will win the Tour de France.’

4.2. Complex predicates

Turning to complex predicates, it can be observed that long *wh*-extraction is possible (19a) while the *was-w*-construction is ruled out (19b). This difference in grammaticality clearly confirms the matrix direct object position as base-position for the scope marker. (19b) is ungrammatical since this position is blocked by the presence of the direct object while in (19a), the *wh*-phrase is extracted from the embedded clause, hence the object does not interfere. In a DDA analysis, (19b) should not be problematic.

- (19)a. *Wen* hat Peter so'n Gefühl, *t* dass man *t* fragen könnte.
 whom has Peter such a feeling that one ask could
 ‘Who does Peter feel we could ask?’
- b. **Was* hat Peter *t* so'n Gefühl, *wen* man fragen könnte.
 what has Peter *t* such a feeling whom one ask could

4.3. Passive

A further argument can be drawn from passive constructions. First, the simple embedded passive construction (20a) shows the base-position of *was*, i.e. the direct object position of the embedded clause. Second, (20b) evidence that the *was* in this passive construction can function as a scope marker since it can be further restricted by an additional clausal complement. Finally, the ungrammaticality of (20c) proves the semantic difference of the *wh*-extraction structure, since *wo* cannot have wide scope here. Obviously, this result is unexpected in the DDA.

- (20)a. Es ist mir egal, *was* *t* über mich *t* behauptet wird.
 it is me equal what about me claimed gets
 b. Es ist mir egal, *was* *t* über mich *t* behauptet wird,
 it is me equal what about me claimed gets
 wo ich gestern war.
 where I yesterday was
 ‘I don’t care what people say about me (where I was yesterday).’
 c. *Es ist mir egal, wo über mich behauptet wird, dass
 it is me equal where about me claimed gets that
 ich gestern war.
 I yesterday was

4.4. Asymmetries in embedded contexts

In ordinary embedded contexts, a semantic difference similar to the one in passives is observed. The *was-w*-construction is grammatical (21a) while *wh*-extraction from the lower clausal complement is not (21b). Again, this clearly indicates that *was* and the *wh*-phrase must be base-generated as well as remain in their local clauses, respectively, in order to maintain the appropriate scope relations.

- (21)a. Ich habe gar nicht mitgekriegt, *was* Peter *t* gemeint hat,
 I have PT not with-got what Peter meant has
 wo er gestern war.
 where he yesterday was
 ‘I didn’t get what Peter mumbled where he was yesterday.’
 b. *Ich habe gar nicht mitgekriegt, wo Peter gemeint hat,
 I have PT not with-got where Peter meant has
 dass er gestern *t* war.
 that he yesterday was

4.5. Scope ambiguities

Further scope ambiguities have also been noted by Reis (2000) who presents the following examples.

- (22)a. Was glaubt/sagt/suggeriert sie, wo Fox populärer ist als
 what believes/says/suggests she where Fox popular-eris than
 er ist?
 he is
- b. Wo glaubt/sagt/suggeriert sie, dass Fox populärer ist als
 where believes/says/suggests she that Fox popular-eris than
 er ist?
 he is
 ‘Where does she think Fox is more popular than he is?’

The *was-w*-construction (22a) only has an inconsistent reading, i.e. *For which place x, in her belief world is Fox more popular at x than Fox is popular at x?* The *wh*-phrase in the embedded clause is thus only given narrow scope. On the contrary, the *wh*-extraction structure (22b) allows both an inconsistent as well as a consistent reading, i.e. *For which place x, in her belief world is Fox more popular at x in the real world?* Again, if the *was-w*-construction had an equal LF-interpretation, it should allow both readings as well.

4.6. *De re and de dicto readings*

Another semantic difference between the *was-w*-construction and the *wh*-extraction structure is expressed by the different distribution of *de re* and *de dicto* readings in the two constructions (Herburger 1994).

- (23)a. Was glaubt der Georg, wen die Rosa geküsst hat?
 what believes the Georg whom the Rosa kissed has
- (23)b. Wen glaubt der Georg, dass die Rosa geküsst hat?
 whom believes the Georg that the Rosa kissed has
 ‘Who does Georg think Rosa has kissed?’

In the *was-w*-construction (23a), the proposition in the embedded clause can only be understood *de re*, i.e. the fact that Rosa has kissed somebody is part of the speakers beliefs, not just Georg’s alone. Herburger paraphrases (23a) as something like *Rosa has kissed somebody, who does Georg think it was?* Turning to the *wh*-extraction structure (23b), note that in addition to the *de re* reading, the *de dicto* reading is equally available, i.e. the proposition in the embedded clause is only part of Georg’s mind set. This observation clearly sets the two constructions semantically apart.

As a preliminary conclusion from the examples in 4.3 to 4.6. it can be stated that the constructions in question are semantically similar, however, they are by

no means synonymous. Therefore they cannot simply be analysed as syntactic variants of each other but are independent strategies which demand different syntactic treatment.

4.7. Prepositions with dependent interrogative complements

Examples of prepositions with dependent interrogative complements can be assimilated to the *was-w*-construction as they show similar constraints. In German, prepositions selecting a direct CP complement cannot stand alone but must be constructed with *da* (24), or *wo* in interrogative contexts (25), i.e. they are base-generated together as a complex argument in direct object position. However, as the (b) examples show, these expletive elements can be separately fronted to SpecCP, leaving the preposition as an indication of their trace.

- (24)a. Ich habe damit gerechnet, dass es morgen regnen wird.
 I have there-with reckoned that it tomorrow rain will.
- b. Da habe ich (*t*) mit gerechnet, dass es morgen regnen wird.
 there have I with reckoned that it tomorrow rain will.
 ‘I expected that it would rain tomorrow.’
- (25)a. *Wovon* hast du *t* gesprochen, wen du treffen willst?
 where-of have you spoken whom you meet want
- b. *Wo* hast du (*t*) *von* gesprochen, wen du treffen willst?
 where have you of spoken whom you meet want
 ‘Who did you think you wanted to meet?’
- c. *An wen hast du gedacht, dass du treffen wolltest?
 on whom have you thought that you meet wanted

Assuming that *wo* is the counterpart of *was* in constructions with prepositions, the examples in (25) present strong evidence in favour of base-generating the scope marker in direct object position. The *wh*-extraction structure (25c) is ungrammatical since the preposition is left stranded as the long-extracted *wh*-phrase cannot be linked with it.

4.8. Multiple embedded *wh*-phrases

The *was-w*-construction can also be formed with more than one *wh*-phrase in the embedded clause (26a). As values for both *wh*-phrases are specified (26b), it must be concluded that indeed the entire proposition restricts the scope marker as proposed in the IDA. Obviously, the replacement and chain-formation strategy of the DDA cannot handle more than one embedded *wh*-phrase.

- (26)a. Was meint Anna, wann Katrin in welcher Stadt gewohnt hat?
 what means Anna when Katrin in which city lived has
 ‘What does Anna think when Katrin lived in which city?’
- b. Anna meint dass Katrin 1996 in Stuttgart gewohnt hat.
 Anna means that Katrin 1996 in Stuttgart lived has
 ‘Anna thinks that Katrin lived in Stuttgart in 1996.’

4.9. Resumptive pronouns

Finally, a very interesting contribution concerning the semantic and syntactic difference between the *was-w*-construction and the *wh*-extraction structure comes from examples using resumptive pronouns. These are the *was-w*-construction (27a), the copy construction³ (27b), and two instances of the *wh*-extraction structure (27c, d). In (27a), only the resumptive pronoun which relates to the proposition restricting the scope marker may be used, again indicating that a *wh*-chain formation approach is not correct. Interestingly, (27b) exhibits the reverse in that the resumptive pronoun can only be related to the person denoted by the *wh*-phrase, hence suggesting that the copy construction must be analysed on a par with the *wh*-extraction structure. Finally, the *wh*-extraction structure itself allows both possibilities. However, if *was* in (27a) were a mere placeholder for *wen*, as assumed in the DDA, then this should be reflected in the choice of the resumptive pronoun, as is shown in the copy construction.

- (27)a. Was Hans sagt, wen er verdächtigt, **das/*den** habe ich
 what Hans says whom he suspects that/*him have I
 überprüft.
 evaluated
 ‘I checked what Hans says as to whom he suspects.’
- b. Wen Hans sagt, wen er verdächtigt, ***das/den** habe ich
 Whom Hans says whom he suspects *that/whom have I
 überprüft.
 evaluated
 ‘I checked the person who Hans says he suspects.’

³ The copy construction uses a copy of the true *wh*-phrase instead of the scope marker. Opinions differ as to whether the copy construction is a variant of the *was-w*-construction or the *wh*-extraction structure, as it shares constraints with both. For a detailed discussion, see Höhle (2000).

- c. *Wen* Hans sagt, dass er verdächtigt, **das** habe ich
 whom Hans says that he suspects that have I
 überprüft.
 evaluated
 'I checked what Hans says as to whom he suspects.'
- d. *Wen* Hans sagt, dass er verdächtigt, **den** habe ich
 whom Hans says that he suspects him have I
 überprüft.
 evaluated
 'I checked the person who Hans says he suspects.'

4.10. Conclusion

The above evidence clearly suggests that *was* is a *wh*-argument which needs to be base-generated in direct object position. The distinct semantic behaviour of the *was-w*-construction and *was*-extraction structure calls for separate syntactic analyses. It has been shown that the syntactic structure of Indirect Subordination is particularly suitable, also on a cross-linguistic basis.

5. The diachronic perspective

Recall that the equivalent of the *was-w*-construction is available only in a number of by-and-large unrelated languages where it furthermore displays different constraints, e.g. the availability of *yes/no* questions discussed above. However, in recent research (Dayal 2000, Reis 2000) the interesting suggestion has been made that the construction in question may have developed from the diachronically unified source of sequential scope marking which is universally available and from where it developed into different strategies.

5.1. Sequential Scope Marking

The examples below (Dayal 2000:28,29) testify that a similar kind of scope marking construction is also available in English. Although it consists of a sequence of two independent sentences, it shares many constraints with the *was-w*-construction. In (28a), the proposition in the second clause restricts the scope marker in the first clause. This reading is confirmed by the *yes/no* question in (29) since the possible answers only specify values for the second clause. (28b) shows that multiple embedded *wh*-phrases are allowed. (28c) shows that multiple sequencing is also possible. (28d) is ungrammatical since the sequential scope marking construction is also only licensed by bridge verbs. Finally, (28e) shows that negation is incompatible with the construction.

- (28) a. What do you think? Who is coming tonight?
 b. What do you think? Who will go where?
 c. What do you think? What did he say? Who should go?
 d. *What did she ask? Who is coming?
 e. *What don't you think? Who is coming?
- (29) What did she say? Will Mary come?
 - Yes, she said that Mary will come.
 - No, she said that Mary won't come.

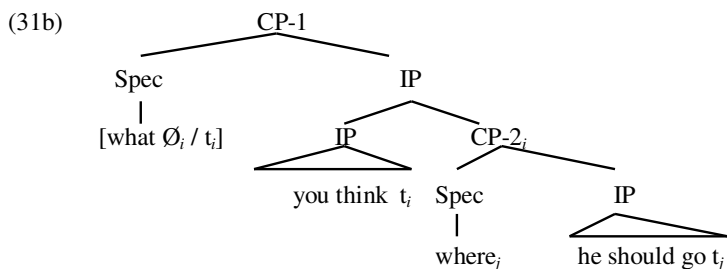
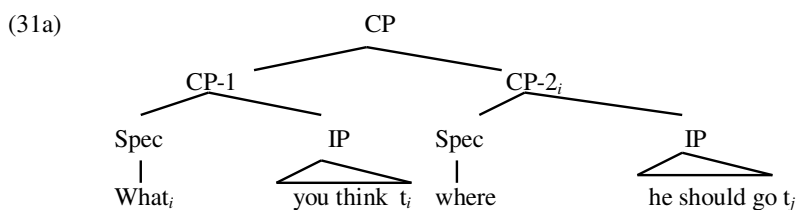
5.2. Diachronic Development

The sequential scope marking construction in German is shown in (30a) (Reis 2000). It is characterised by placing emphasis on the addressee followed by falling intonation and a break. Now Reis makes the interesting suggestion that the *was-w*-construction (30c) may have developed from the sequential scope marking construction via a state of so-called 'integrated *was*-parenthetical constructions' (30b) which have lost the intonation break but retained the verb-second structure in the embedded clause. *Was*-parentheticals share many constraints with both the scope marking constructions and the *wh*-extraction structure, hence they are assumed to reflect an intermediate state of a possible grammaticalisation process. The verb-final structure of the *was-w*-construction is thus seen as a further step which assimilates it to other embedded clauses, however, the semantics has remained the same.

- (30)a. Was glaubst DU(\): Wen wird Peter zum Geburtstag
 what believe you whom will Peter to birthday
 einladen?
 invite
- b. Was glaubst du, wen **wird** Peter zum Geburtstag
 what believe you whom will Peter to birthday
 einladen?
 invite
- c. Was glaubst du, wen Peter zum Geburtstag einladen
 what believe you whom Peter to birthday invite
wird?
 will
 'Who do you think Peter will invite to his birthday?'

The two syntactic models below (Dayal 2000) are used to reflect the different scope marking constructions accordingly. It is important that they yield the same semantic interpretation; this is achieved by co-indexing CP-2 with the scope marker in the matrix clause. (31a), showing simple juxtaposition of two CPs adjoined at CP-level, represents the sequential scope marking structure as well as the *was*-parenthetical construction. It has already been

shown in section 3.1, that besides Hindi, (31b) (= 15 above) is the suitable model for the *was-w*-construction in German. It must be noted that this proposal differs from Dayal's as she suggests a third syntactic structure for the *was-w*-construction in which the scope marker is base-generated in SpecCP (like in the DDA) in order to circumvent the problem of superiority facts in German.⁴ The discussion in this paper has presented numerous examples evidencing the fact that the scope marker can only be base-generated in direct object position. It has been shown that the syntactic structure of indirect subordination is adaptable to German.⁵



6. Conclusion

The evidence presented in this paper has shown that (1) the *was-w*-construction and the *wh*-extraction structure, though semantically similar, exhibit different semantic behaviour in many contexts, and (2) the scope marker *was* must be base-generated as an ordinary *wh*-argument in direct object position of the matrix clause. It was concluded that the *was-w*-construction is an independent strategy which is best analysed by the IDA, using the syntactic structure of indirect dependency. Moreover, the possible diachronic development from the universally available construction of sequential scope marking was sketched out. This attempt to unify scope marking constructions across languages invites further research.

⁴ Due to limited space the relevant superiority facts are not discussed here. The reader is referred to Dayal (2000).

⁵ Note at this point that a similar and very appealing proposal is also advocated by Fanselow & Mahajan (2000). The scope marker is base-generated in matrix direct object position, however, it is not a *wh*-argument but clearly assigned expletive status.

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Aspectual adverbs and stylistic inversion in temporals

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The subject of this paper is French stylistic inversion in temporal subordinates. In line with Cinque (1999), it is shown that, while non-inverted verbs surface in T°, inverted verbs in temporals occupy the head position of a functional projection lower than T°, with the aspectual adverbs *soudain*, *tout à coup*, *brusquement* and *peu à peu* in the specifier position. This is taken as evidence in favor of the claim that Kayne and Pollock's (2001) phrasal movement analysis of stylistic inversion cannot be extended to stylistic inversion in temporal subordinates.

1. Introduction

The subject of this paper is French verb-subject inversion or 'stylistic' inversion (SI) in temporal subordinates, a type of inversion that has not been studied very often (1).

- (1) a. Quand vint le tour d'Arnold, il prit un réel bonheur à (Fr)¹
when came the turn of Arnold, he took a real pleasure in
'When it was Arnold's turn, he really took pleasure in...'
- b. Quand retombera la poussière du bombardement (LM)
when will fall down the dust of the bombardment
'When the dust of the bombardment will fall down...'
- c. Pendant que se préparait la campagne des anges violets (Fr)
while REFL prepared the campaign of the angels purple
'While the campaign of the purple angels was being prepared...'

Stylistic inversion is normally analyzed as involving either phrasal or head movement of the verb to the left of the subject. However, I will show that the inverted verb in temporal subordinates, contrary to the non-inverted verb,

¹ The majority of the examples are (simplifications of) corpus examples. Literary examples from Frantext are indicated by *Fr* and journalistic examples from *Le Monde* (1998) and the internet (mostly yahoo) are marked by *LM* and *ya* respectively.

remains in a position immediately to the right of a class of aspectual adverbs containing *soudain*, *tout à coup*, *brusquement* ‘suddenly’ and *peu à peu* ‘little by little’. In accordance with Cinque (1999), I take this to indicate that the inverted verb in temporal subordinates is in the head position of the functional projection with these adverbs in its specifier. The fact that this position is a *head* position entails that an analysis of stylistic inversion like that of Kayne and Pollock (2001), which involves *phrasal* movement, cannot be applied to stylistic inversion in temporal subordinates.

In this paper, I first survey some current analyses of SI, involving either head or phrasal movement (2.1). Next, I briefly present the theory of Cinque (1999) and his hierarchy of French adverbial classes (2.2). In the third section, I demonstrate that the French aspectual adverbs *soudain*, *tout à coup*, *brusquement* ‘brusquely’ and *peu à peu* ‘little by little’² form an adverbial class and, consequently, can be used as a tool to derive the position of the verb (3). In the fourth section I show that non-inverted verbs are in a position to the left whereas inverted verbs in temporal subordinates are in a head position to the right of the aspectual adverbs STBP (4). Finally, I conclude that my observations constitute an argument against an analysis of stylistic inversion that is based on phrasal movement (5).

2. (Stylistic) inversion and the verbal movement

2.1. Head movement versus phrasal movement

In early analyses of (stylistic) inversion (e.g. Kayne 1972, Kayne and Pollock 1978), the inverted word order was derived by rightward movement of the subject to a position adjoined to VP. However, since Kayne (1994), it is generally accepted that rightward movement, rightward adjunction and rightward specifiers are not allowed. Consequently, the verb-subject word order in stylistic inversion must be analyzed as involving (at least) some kind of verbal movement to the left of the subject.

In recent literature, there are in general two types of analyses for subject inversion. In the first one (e.g. De Wind 1995, Deprez 1988, 1990, Valois and Dupuis 1992), the subject stays in its canonical position in vP (2a) or VP (2b) and the verb moves to one of the functional projections of the Split-Infl layer:

- (2) a. [... V_i + Infl° [... t_i ... [_{vP} DP [t_i (DP)]]]]
 b. [... V_i + Infl° [... t_i ... [_{VP} t_i DP]]]]

The second approach takes the information structure into account and the subject and the verb are both said to surface in the left periphery. A recent example of such an analysis is that of Kayne and Pollock (2001). According to Kayne and Pollock, in French SI, the DP subject starts out as the specifier of a silent subject clitic that heads a larger DP (3a). Then, the DP subject moves out

² In what follows, I use *STBP* to refer to these four adverbs.

of its canonical SpecIP position to the specifier of a higher functional projection FP, leaving a silent subject clitic as in (3b). Finally, the whole IP is moved leftward past the subject (remnant movement) to the specifier position of another functional projection GP (3c):

- (3) a. [_{IP} DP_{subject} SCL [_{I'} verb]]
 → movement of the DP subject to SpecFP
 b. [_{FP} DP_{subject} [_{IP} SCL t_{subj} [_{I'} verb]]]
 → remnant IP movement to SpecGP
 c. [_{GP} [_{IP} SCL t_{subj} [_{I'} verb]]] [_{FP} DP_{subject} [_{IP} t_{IP}]]]

Although the analyses differ, they have one thing in common: they all focus on SI in interrogatives as (4).

- (4) Quand partira ce garçon? (Kayne 1972)
 when will leave this boy
 ‘When will this boy leave?’

and (explicitly or implicitly) assume that the same analysis can be extended to inversion in other types of syntactic environments.

Since the two analyses X and XP movement are incompatible in one and the same syntactic environment, I will try to determine which one accounts best for inversion in temporal subordinates. More precisely, I will try to determine (a) whether verbal movement in stylistic inversion in temporal subordinates is head movement or phrasal movement, and (b) to which position the verb exactly moves. In order to do so, I will, along the lines of Cinque (1999), use the position of the inverted verb with respect to adverbs as a tool for deriving the verbal position.

2.2. Cinque (1999) and adverbs as tools to derive the position of verbs

Since Emonds (1978), and especially since Cinque (1999), adverbs have been used as a tool to derive the target positions of verbal movement. On the basis of the relative position of adverbial classes with respect to each other, Cinque (1999:106) establishes the following universal hierarchy of adverbial classes.³

- (5) ... [*once* T(Past)] [*then* T(Future)] [*perhaps* Mood_{irrealis}] [*necessarily* Mod_{necessity}] [*possibly* Mod_{possibility}] [*usually* Asp_{habitual}] [*again* Asp_{repetitive(I)}] [*often* Asp_{frequentative(I)}] [*intentionally* Mod_{volitional}] [*quickly* Asp_{celerative(I)}] [*already* T(Anterior)] [*no longer* Asp_{terminative}] [*still* Asp_{continuative}] [*always* Asp_{perfect(?)}] [...]

³ Here, as well as in the following sections, I concentrate on ‘lower’ adverbs, since only these adverbs are relevant to my purpose.

Each adverbial class is argued to be in the specifier position of a functional projection through the head of which the verb passes on its way to T°. As such, the precise position of these adverbial classes can be used as a tool for deriving the precise position of the verb.

For French in particular, Cinque establishes the following relative ordering of adverbs:

- (6) *généralement* ‘generally’ > *(ne) pas* ‘not’ > *déjà* ‘already’ > *(ne) plus* ‘no longer’ / *encore* ‘still’ > *jamais* ‘never’ / *toujours* ‘always’ > *complètement* ‘completely’ / *partially* ‘partiellement’ > *tout* ‘everything’ / *rien* ‘nothing’

In the following section, I demonstrate that the French adverbs *soudain*, *tout à coup*, *brusquement* ‘suddenly’ and *peu à peu* ‘little by little’ also form an adverbial class (3.) and have a fixed position in the hierarchy (6).

3. ‘Soudain’, ‘tout à coup’, ‘brusquement’ and ‘peu à peu’: one aspectual class

The four aspectual French adverbs *soudain*, *tout à coup*, *brusquement* ‘suddenly’ and *peu à peu* ‘little by little’ do not occur in the hierarchy established by Cinque (1999), but it can be shown that they form an adverbial class. Three observations confirm this claim: they cannot co-occur (3.1.), they share a semantic feature (3.2.) and they have a fixed position with respect to other adverbs (3.3.).

3.1. These adverbs do not co-occur in the clause

In the literature, it is generally admitted (Cinque 1999, Steinitz 1969, Jackendoff 1972, Quirk et al. 1985) that two adverbs of one class cannot co-occur in a clause. The following examples show that this is true as well for the aspectual adverbs *soudain*, *tout à coup*, *brusquement* and *peu à peu*.⁴

- (7) a. **Tout à coup*, les gens arrivent **peu à peu**_{adv}
suddenly the people arrive little by little
‘Suddenly the people arrive little by little’
- b. * Jean surgit **tout à coup**_{adv} **soudain**_{adv}
John appears suddenly suddenly
‘John appears all of a sudden suddenly’
- c. * Les enfants sont **soudain**_{adv} **peu à peu**_{adv} apparus
the children have suddenly little by little appeared
‘The kids have all of a sudden little by little appeared’

⁴ For reasons of brevity, I will not always mention examples of all the adverbs, but the reader will easily verify that the four adverbs display exactly the same behavior.

Note that these adverbs can also be used as adverbs of manner⁵ and, as such, are compatible with an aspectual adverb.

- (8) Soudain, il l' a brusquement embrassée.
 suddenly he her has brusquely/in a brusque way embraced
 'Suddenly, he embraced her brusquely'

3.2. These adverbs indicate the boundedness of the verb

Since there is a semantic relation between each adverbial class and the head of the functional projection it is attached to (Cinque 1999), all adverbs belonging to the same adverbial class should share (at least) one specific semantic feature. In fact, the question is as follows: if these adverbs form one class, and if, as Cinque (1999) argues, they occupy the specifier position of the same functional projection, what kind of projection is this? First, it is clear that this projection is not a temporal one, given that the adverbs can combine with verbs in future (9a), past (9b) and present tenses (9c).

- (9) a. Les clients arriveront peu à peu / soudain, tout à coup
 the clients will arrive little by little / suddenly
 'The clients will arrive little by little / suddenly'
 b. Les clients arrivaient_{passésimple}/arrivèrent_{imparfait} peu à peu / soudain
 the clients arrived little by little / suddenly
 'The clients arrived little by little / suddenly'
 c. Les clients arrivent peu à peu / soudain, tout à coup
 les clients arrive peu à peu / soudain, tout à coup
 'The clients arrive little by little / suddenly'

Moreover, since the four adverbs co-occur with both perfective and imperfective verbs (9b)⁶, the relevant feature has nothing to do with grammatical aspect, but with lexical aspect⁷. In particular, as the following examples show, *soudain*, *tout à coup*, *brusquement* and *peu à peu* are compatible only with predicates expressing an achievement (10c) or an

⁵ This is made clear by the fact that these adverbs, when used as adverbs of manner, can be modified by an adverb of degree: *si soudain* 'so suddenly', *très brusquement* 'very brusquely'.

⁶ The 'grammatical' aspect (Dahl 1985, Cinque 1999), or 'viewpoint' aspect (Smith 1991) is the aspect that is marked on the verb by specific morphemes. In French, the two past tenses *passé simple* and *imparfait* are realized by different morphemes on the verb and mark the perfective and imperfective grammatical aspect, respectively.

⁷ The 'lexical' aspect is also called 'situation' aspect (Alexiadou 1997) or 'Aktionsart'. Remark that Cinque (1999) only takes into consideration adverbs that denote grammatical aspect, and this is perhaps the reason why he does not take into account *soudain*, *tout à coup*, *peu à peu* and *brusquement*.

accomplishment (10d), but not with predicates expressing a state (10a) or an activity (10b)⁸.

- (10) a. ??? Mon oncle connaît soudain / peu à peu Pierre
 my uncle knows suddenly / little by little Peter
 'My uncle suddenly / little by little knows Peter'
 b. ??? Jean dort soudain / tout à coup / peu à peu⁹
 John sleeps suddenly / suddenly / little by little
 'John suddenly / little by little sleeps'
 c. Les enfants arrivent soudain / peu à peu
 the children arrive suddenly / little by little
 'The children suddenly arrive / little by little'
 d. Jean mange peu à peu les bonbons
 John eats little by little the chocolates
 'John eats the chocolates little by little'

Since achievements and accomplishments are [+bounded] and states and activities are [-bounded], the four aspectual adverbs STBP can be said to be in the specifier position of a functional projection expressing the boundedness of the verb.

- (11) [_{AspboundedP} *soudain, tout à coup, brusquement, peu à peu* [_{Aspbounded} °]]

3.3. The position of these adverbs with respect to other adverbs

The adverbs *soudain*, *tout à coup* and *peu à peu* occupy a position between the negative adverbs *pas* 'not' and *plus* 'no longer': the ungrammaticality of the prime sentences in (12) shows that these three adverbs are positioned after *pas* and cannot occur in front of *pas*.

- (12) a. Je ne me suis **pas tout à coup** senti plus libre (Ya)
 I NEG REFL have not suddenly felt more free
 'I did not suddenly feel more free'
 a'. * je ne me suis **tout à coup pas** senti plus libre
 b. ceux qui irritent le Seigneur ne sont **pas soudain** recherchés (Ya)
 those who irritate the Lord NEG are not suddenly searched-for
 'Those who irritate the Lord are not suddenly sought for'
 b'. * ceux qui irritent le Seigneur ne sont **soudain pas** echerchés
 c. le légal ne devienne **pas peu à peu** le critère...(Ya)
 the legal NEG becomes not little by little the criterion... 'The legal does not **little by little** become the **criterion** of the moral'

⁸ I use the 'traditional' classification of lexical aspect by Vendler (1967).

⁹ Note that this example is correct iff the event denoted by the verb gets the inchoative meaning 'fall asleep'. However, in this case, the verb does no longer denote an activity.

c'. * le légal ne devienne **peu à peu pas** le critère

The contrasts in (13) show that these adverbs are positioned in front of *plus*, and cannot occur behind *plus*.

- (13) a. comme s'il ne comprenait **soudain plus** ce qui se passe
 like if he NEG understood suddenly no longer what happens (ya)
 'like if, suddenly, he did no longer understand what was happening'
 a'. * comme s'il ne comprenait **plus soudain** ce qui se passe
 b. Les hirondelles ne sont **peu à peu plus** venues (ya)
 the swallows NEG have little by little no longer come
 'Little by little, the swallows ceased to come'
 b'. * les hirondelles ne sont **plus peu à peu** venues
 c. je ne pouvais **tout à coup plus** parler avec personne (Ya)
 I NEG could suddenly no longer to-talk with anyone
 'I could suddenly no longer talk with anyone'
 c'. * je ne pouvais **plus tout à coup** parler avec personne

Moreover, these adverbs occur behind *déjà* ('already') as the contrasts (14) indicate.

- (14) a. il a **déjà soudain** abandonné ses études, et...
 he has already suddenly abandoned his studies, and...
 'He has already all of a sudden abandoned his studies, and...'
 a'. ?* il a **soudain déjà** abandonné ses études
 b. il a **déjà tout à coup** abandonné ses études, et...
 he has already suddenly abandoned his studies, and...
 'He has already all of a sudden abandoned his studies, and...'
 b'. ?* il a **tout à coup déjà** abandonné ses études
 c. elle s'était **déjà peu à peu** accoutumée à (ya)
 she REFL had already little by little accustomed to
 'she had already little by little become accustomed to...'
 c'. ?* elle s'était **peu à peu déjà** accoutumée à

So, the examples (12-14) suggest that the precise position of *soudain*, *tout à coup*, *brusquement* and *peu à peu* in the hierarchy of Cinque (6) is the following:

(15) *pas* < *déjà* < *soudain/tout à coup/peu à peu* < *plus*

In accordance with Cinque (1999), the position of this class of aspectual adverbs indicates the existence of an aspectual functional projection between *déjà* and *plus*. In the following section, I use this conclusion to derive the precise position of the inverted verb in temporal subordinates.

4. Soudain, tout à coup, brusquement, peu à peu and verbal positions

In this section, I first determine the position of the non-inverted verbs with respect to the four adverbs that are at stake, and, secondly, I show that the position of the inverted verb is not the same as that of the non-inverted verb.

4.1. The position of *non-inverted* verbs with respect to these adverbs

4.1.1. The non-inverted main verb

The adverbs *soudain*, *tout à coup*, *peu à peu* and *brusquement* do not occur in front of the main verb¹⁰, and have to appear between the main verb and its complements (16):

- (16) a. *? Jean **tout à coup**_{adv} **répond**_v à la question.
 John suddenly answers to the question
 'John suddenly answers the question'
 a'. Jean **répond**_v **tout à coup**_{adv} à la question.
 b. *? L'enfant **soudain**_{adv} **surgit**_v chez nous.
 the child suddenly emerges with us
 'The child suddenly emerges at our place'.
 b'. L'enfant **surgit**_v **soudain**_{adv} chez nous.
 c. *? Les gens **peu à peu**_{adv} **se rendent**_v **compte** des horreurs...
 the people little by little become aware of the atrocities...
 'The people become little by little aware of the atrocities'
 c'. Les gens **se rendent**_v **peu à peu**_{adv} **compte** des horreurs...

This suggests that the main verb has moved leftwards past these adverbs.

4.1.2. The non-inverted auxiliary

Since, in French, auxiliaries are taken to be in the same position as main verbs, they should also appear to the left of the aspectual adverbs STBP. The examples (17) show that this is the case: like the non-inverted main verb, the inverted auxiliary occurs to the left of these adverbs, and the past participle precedes these adverbs.

- (17) a. le CAC 40 **a**_{aux} **peu à peu**_{adv} **réduit**_{part} ses gains (Ya)
 the CAC 40 has little by little reduced its gains
 'The CAC 40 has little by little reduced its gains'
 a'. *? le CAC 40 **peu à peu**_{adv} **a**_{aux} **réduit**_{part} ses gains

¹⁰ Remark, however, that these adverbs can occur in front of the main verb if they are dislocated, i.e. if they have a "parenthetical use".

- b. l'arrière **m'a**_{aux} **soudain**_{adv} **échappé**_{part} (Ya)
 the back me has suddenly escaped
 'I suddenly lost the back'
- b'. *? l'arrière **soudain**_{adv} **m'a**_{aux} **échappé**_{part}
- c. le climat **s'est**_{aux} **tout à coup**_{adv} **assombri**_{part} (Ya)
 the climate REFL has suddenly darkened
 'The climate suddenly became worse'
- c'. ?*le climat **tout à coup**_{adv} **s'est**_{aux} **assombri**_{part}

4.1.3. Conclusion

The examples (16) and (17) show that both the non-inverted auxiliary and the main verb surface in a position to the left of the adverbs *soudain*, *tout à coup*, *brusquement* and *peu à peu* (and, in line with Cinque 1999, pass through the head position immediately to the right of these adverbs) and surface in a higher position (T°, as it is generally assumed that inflected verbs in French move to T°, cf. Pollock 1989).

- (18) [_{TP} DP_{subject} [_{T°} non-inverted V_{finite/aux} [_{AspP} *peu à peu/tout à coup/soudain* [_{Asp°} t_{verb} [V_{participle} [...]]]]]]]

4.2. The position of the inverted verb in temporal subordinates with respect to these adverbs

In the preceding section, it has become clear that non-inverted inflected verbs surface in a position higher than STBP. I will now check whether inverted main verbs (4.2.1.) and inverted auxiliaries (4.2.2.) also occur in the same position.

4.2.1. The inverted main verb

The clearest evidence for the position of the inverted verb probably is the fact that the inverted verb cannot be combined with the negative adverb *ne...pas* ('not') (19), but can be combined with *ne...plus* ('no longer') (20).

- (19) a. * Quand n' arrivaient pas les linguistes...
 when NEG arrive not the linguists
 'When the linguists did not arrive'
- b. * Quand ne s'arrangeront pas les choses...
 when NEG REFL arrangeFUT not the things
 'When the things will not be arranged'

- (20) a. le rassemblement se défait quand n'existent plus
 the connection REFL loosens when NEG exist no longer
 la coalition politique et la conjoncture
 the coalition political and the conjuncture
 'The collective loosens when the political coalition and the conjuncture
 no longer exist'
- b. Quand ne retentirent plus les cliquetis de vaisselle
 when NEG resounded no longer the clashing of the crockery,
 un silence se fit.
 a silence REFL made
 'When the clashing of the crockery no longer resounded, a silence fell'.

This suggests that the inverted verb moves leftward past *plus* 'no longer', but not past *pas* 'not'. This conclusion also correctly predicts that the inverted verb must move leftward past the temporal adverb *encore* 'still', which, following Cinque, occupies a position immediately to the right of the negative adverb *plus* 'no longer'.

- (21) a. Quand lui parvenait encore l'écho de son cri (Fr)
 when to-him reached still the echo of her cry
 'when the echo of her cry still reached him'
- b. Quand (*encore) lui parvenait l'écho de son cri

Moreover, with respect to *déjà* 'already', which immediately precedes the adverbs STBP, (22a) shows that the inverted verb stays behind it, unlike the non-inverted verb (22b).

- (22) a. quand déjà s'apprête l'éclosion de l'art roman (Fr)
 when already REFLprepares the expansion of Romanesque art
 'When the expansion of Romanesque art is already being prepared'
- b. quand la future éclosion (??*déjà*) s'apprête

The intermediate conclusion is that the inverted main verb moves leftward past the temporal adverb *encore* 'still' and the negative adverb *plus* 'no longer' but does not move past the temporal adverb *déjà* 'already' and the negative adverb *pas* 'not'.

- (23) *pas* 'not' > *déjà* 'already' > V_{finite/inverted} > *plus* 'no longer' > *encore* 'still'

Remember from (15) that the adverbs *soudain*, *peu à peu*, *brusquement* and *tout à coup* are in a position between *déjà* 'already' and *plus* 'no longer', just like the inverted finite verb is. If the inverted verb were in the head position of the functional projection marked by these adverbs, it should stay in a position immediately to the right of these adverbs. And indeed, several attested examples prove this.

- (24) a. lorsque tout à coup_{adv} surgit_v l'image
 when suddenly emerges the image...(Fr)
 'When suddenly the image emerges...'
- b. Lorsque soudain_{adv} survient_v le drame, (Fr)
 when suddenly comes the drama
 'When suddenly the drama arrives...'
- c. quand peu à peu_{adv} vinrent_v s'en ajouter d'autres (Fr)
 when little by little come REFL EN to add others
 'When, little by little, others come and join'

The examples in (24), in which the inverted verb stays in a position immediately to the right of the adverbs *tout à coup*, *soudain* and *peu à peu* sharply contrast with the examples (16) and (17) where the non-inverted finite verb and the non-inverted auxiliary are to the left of these adverbs.

On the basis of these data, I conclude that the inverted verb is in a position lower than that of the non-inverted verb (T°), and, more precisely, in the head position of the functional projection with the adverbs *soudain*, *tout à coup*, *peu à peu* and *brusquement* in the specifier position.

- (25) [T° non-inverted V_{finite}] > *pas* 'not' > *déjà* 'already' > [SpecAspP *soudain/tout à coup/peu à peu/ brusquement* [Asp° inverted V_{main}]] > *plus* 'no longer' > *encore* 'still'

4.2.2. The auxiliary in inversion

Given that auxiliaries and main verbs occur in the same position in French, and given that the inverted main verb in temporal subordinates stays in a position to the right of the adverbs I am considering (25), the inverted auxiliary should also be in the same position.

This turns out to be true, since in the following paradigm, the (a)-examples, with the inverted auxiliary to the right of the adverb, are perceived by natives to be much better than their ungrammatical counterparts (b) with the inverted auxiliary to the left of the adverb:

- (26) a. Quand soudain_{adv} a_{aux} éclaté la bombe
 when suddenly has exploded the bomb
 b.* Quand a_{aux} soudain_{adv} éclaté la bombe
 when has suddenly exploded the bomb
 c. Quand la bombe a_{aux} soudain_{adv} éclaté
 when the bomb has suddenly exploded
 'When the bomb has suddenly exploded'
- (27) a. Quand tout à coup_{adv} a_{aux} éclaté la bombe
 when suddenly has exploded the bomb

- b. * Quand a_{aux} tout à coup_{adv} éclaté la bombe
 when has suddenly exploded the bomb
- c. Quand la bombe a_{aux} tout à coup_{adv} éclaté
 when the bomb has suddenly exploded
 ‘When the bomb has suddenly exploded’
- (28) a. Quand peu à peu_{adv} sont_{aux} arrivés les clients
 when little by little have arrived the clients
- b. * Quand sont_{aux} peu à peu_{adv} arrivés les clients
 when have little by little arrived the clients
- c. Quand les clients sont_{aux} peu à peu_{adv} arrivés
 when the clients have little by little arrived
 ‘When the clients have little by little arrived’

The sharp contrast between the (a) examples and the (b) examples proves that the inverted auxiliary does not move to a position to the left of the adverbs *soudain*, *tout à coup*, *brusquement* and *peu à peu*, while the non-inverted auxiliary does, as the grammatical (c) examples show. In other words, while the non-inverted auxiliary moves to T°, the non-inverted auxiliary stays in a lower functional projection.

4.3. Conclusion

The evidence provided in this section leads to the conclusion that the position of inverted verbs in temporal subordinates is not the same as the position of non-inverted verbs. More precisely, the data concerning the relative position of the verbs and the aspectual adverbs *soudain*, *tout à coup* and *peu à peu* show that in inversion in temporal subordinates neither the auxiliary nor the finite verb raises to T°. On the contrary, both the auxiliary and the finite verb have been shown to stay in the head position of a functional projection with the aspectual adverbs *soudain*, *tout à coup*, *brusquement* and *peu à peu* in its specifier position.

- (29) [_{T°} non-inverted V_{finite}] > *pas* ‘not’ > *déjà* ‘already’ > [_{SpecAspP} *soudain/tout à coup/peu à peu/brusquement* [_{Asp°} inverted V_{finite}]] > *plus* ‘no longer’ > *encore* ‘still’

The fact that the position of the inverted verb is a *head* position also implies that the verb has undergone *head* movement to the left of the subject, rather than phrasal movement. As a consequence, an analysis of stylistic inversion like that of Kayne and Pollock (2001) cannot be applied to inversion in temporal subordinates.

5. General conclusion

In this article, I have shown that the French aspectual adverbs *soudain*, *tout à coup*, *brusquement* ‘suddenly’ and *peu à peu* ‘little by little’ form one adverbial class, given that they do not co-occur in the clause, they indicate the boundedness of the verb and have the same relative position with respect to other adverbial classes. Since, in accordance with Cinque (1999), adverbial classes can be used as a tool to derive the movement of the verb, I have used this class of bounded adverbs as a tool to derive the position of the inverted verb in temporal subordinates. I have demonstrated that, while non-inverted verbs occur to the left of these adverbs, inverted verbs in temporal subordinates occur to their right. More precisely, the inverted verb in temporal subordinates has been shown to immediately follow this adverbial class and, moreover, to immediately precede the adverbial classes that follow *soudain*, *tout à coup*, *brusquement* and *peu à peu*. This has led me to the conclusion that the inverted verb in temporals stays in the head position immediately to the right of the specifier position in which these adverbs surface. This observation entails that, of the two analyses for SI in French, only one can be applied to inversion in temporal subordinates, namely the account in which the inverted word order is explained in terms of head movement.

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On Triggered Inversion in Hebrew

Erez Levon

Triggered Inversion (TI) in Hebrew has been previously analyzed as canonical A'-movement to the specifier position of a functional projection in the CP-layer (Doron & Shlonsky 1990, Shlonsky 1997). This article examines the semantic properties of TI constructions in Hebrew, specifically the cross-linguistic similarities between TI in Hebrew and pseudoclefts (PC) in English, as discussed in Heycock & Kroch (1999). A structure is proposed for Hebrew TI that parallels the structure given for equatives in Hebrew by Rothstein (1995), in which the trigger is base-generated in the operator layer and the inverted surface word order is an artifact of subject movement to a position below that of the verb. Finally, TI is considered in the cross-linguistic typology of focus constructions outlined in Kiss (1998).

1. Introduction

Modern Hebrew normally manifests an SVO word order in declarative clauses, as in (1) below. Additionally, there exists a construction in Modern Hebrew in which this canonical word order can be “inverted”, yielding the XP VS(O) order illustrated in the matrix environment in (2) and the embedded environment in (3), below:

- (1) ha-mištara ʔacra arbe peʔilim ba-pšita ha-leilit
the-police detained many activists in-the-raid the-nightly
'The police detained many activists in the nightly raid.'
- (2) arbe peʔilim ʔacra ha-mištara ba-pšita ha-leili
many activists detained the-police in-the-raid the-nightly
'Many activists was who the police detained in the nightly raid.'
- (3) Dani amar-li še arbe peʔilim ʔacra ha-mištara ba-pšita
Dani said-to-me that many activists detained the-police in-the-raid
(Doron & Shlonsky 1990)

Doron & Shlonsky (1990) discuss this “inverted” word order, and label it Triggered Inversion (TI). Their analysis conceives of TI as overt movement of some XP constituent from low in the clause to some specifier position in

COMP. This XP movement triggers verb movement from its position within the IP-layer up to C^0 , yielding the observed surface word order. The term “triggered inversion” is descriptively accurate insofar as the subject/verb inversion is only possible when some XP trigger has moved from lower in the clause to a position preceding the subject. The required presence of this trigger thus differentiates TI in Hebrew from other known inversion structures, such as Stylistic Inversion in French, as described in Kayne & Pollock (1978, 2001). TI can also be distinguished from other types of inversion in Hebrew, such as Wh-Inversion, Negative Inversion, and Free Inversion. These types of inversion in Hebrew will be returned to below.

This article preserves the insights into the nature of TI developed in Doron & Shlonsky (1990) and Shlonsky (1997). These descriptive generalizations are presented in Section 2. In Section 3, I combine these descriptive generalizations with a more rigorous examination of certain semantic properties of TI, specifically comparing the semantic and syntactic behavior of TI in Hebrew and pseudoclefts (PC) in English. Based on their similar behaviors, I argue that TI in Hebrew and PC in English deserve identical analysis, and I adopt the analysis for PC in English given in Heycock & Kroch (1999), in which PC in English are argued to be equative copular constructions. In section 4, I pursue this analysis of TI as an equative construction by adapting the structure given in Rothstein (1995) for equatives in Hebrew. Section 5 argues for the existence of a third subject position in the Hebrew clause, adapting the argument for a third subject position in the Spanish clause given in Ordóñez (2000). Section 6 then combines the structure given for the top of the clause in Section 4 and the structure given for the rest of the clause in Section 5, resulting in a structure in which TI is analyzed as a null-pronominal copular construction interpreted with equative semantics, in which the first argument of equation is base-generated in specifier position of a functional projection in the CP-layer, and the second argument of equation is a null-headed complex DP residing in the complement position of this functional projection. The inverted surface word order is shown to be an artifact of overt movement of the subject to a position in the clause below that of the moved verb. Section 7 will briefly discuss the ramifications of this analysis of TI in Hebrew for the taxonomy of focus constructions given in Kiss (1998).

2. Descriptive generalizations

2.1. TI and the V2 phenomenon

TI can be distinguished from the V2 phenomenon familiar from Germanic languages. Shlonsky (1997) enumerates two factors that serve to distinguish TI from most Germanic V2 phenomena: a) TI can appear embedded under an overt complementizer, b) TI is not sensitive to the type of constituent under which it is embedded. These properties are exemplified in (4), below, where the constituent under which TI is embedded is not a matrix bridge verb and the overt complementizer is present:

- (4) mipney še ba-pšita ha-leilit Źacra ha-mištara peŹilim
 because that in-the-raid the-nightly detained the-police activists
 rabim hexlatnu le-Źargen hafgana
 many decided-1PL to-organize demonstration
 ‘Because in the nightly raid was when the police detained many activists,
 we decided to organize a demonstration.’

These two factors are not sufficient, however, to distinguish TI in Hebrew from Germanic V2. As Doron & Shlonsky (1990) note, V2 in Icelandic and Yiddish can be embedded under overt complementizers. However, TI manifests certain extraction restrictions (which are returned to below) that are not evidenced in either Icelandic (Rognvaldsson & Thráinsson 1990) or Yiddish (Vikner 1990). These three distinguishing characteristics between TI and different varieties of Germanic V2 are sufficient to warrant a unique analysis for TI in Hebrew.

2.2. Other inversion constructions in Hebrew

As was noted in §1, TI is one of four possible inversion constructions in Hebrew. The other types of inversion, however, can be crucially distinguished on both syntactic and stylistic grounds. Wh-Inversion, the phenomenon by which the surface word order of the subject and verb is inverted when a Wh-operator appears clause-initially, is very common cross-linguistically, and is theoretically enforced by the Wh-Criterion (Rizzi 1997, 2000). This phenomenon in Hebrew is, in fact, not straightforward, as Hebrew seems to optionally allow inversion or lack thereof when a Wh-Operator is fronted, without any discernible semantic effect. This is distinct from TI, which is a stylistically stilted construction in Hebrew, and is furthermore required when the trigger appears clause-initially. Negative Inversion is also common cross-linguistically, and is mandatory in Hebrew, like TI, though it also bears none of the stylistic marginality of TI constructions. Finally, Free Inversion, or inversion with passive and ergatives verbs is also mandatory in Hebrew and common cross-linguistically, yet also carries no stylistic marginality, and requires no constituent to appear clause initially to be licensed. Because of these somewhat fundamental differences, this article analyzes TI as distinct from these other types of inversion in Hebrew, a position which differs from the one taken in Shlonsky (1997).

2.3. Constituents which can act as triggers

A wide variety of constituents can act as triggers, though triggers must be co-extensive with a full XP. Consider the illustrative (though not exhaustive) examples below, taken from Shlonsky (1997):

- (5) a. **Direct Object**
 peŹilim rabim Źacra ha-mištara ba-pštia ha-leilit

- activists many detained the police in-the-raid the-nightly
- b. **Indirect Object**
 la-taxana šalxa ha-mištara et-ha-ʕacurim
 to-the-station sent the-police ACC-the-detainees
- c. **Prepositional Phrase**
 ba-pšita ha-leilit ʕacra ha-mištara arbe peʕilim
 in-the-raid the-nightly detained the-police many activists
- d. **Clausal Adverb**
 mi-bli lə-kabelišur mi-gavoʔa ʕacra ha-mištara
 without to-get permission from-above detained the-police
 peʕilim rabim
 activists many
- e. **Clausal Complement**
 lə-ševet be-šeket bəmesex ha-nesia tavʔa ha-mištara min
 to-sit in-silence during the-drive demanded the-police from
 ha-jeladim
 the-children
- f. **Temporal Adverb**
 ʔetmol ʕacra ha-mištara arbe peʕilim
 yesterday detained the-police many activists

The examples in (5) illustrate that a wide variety of constituents can serve as triggers for TI constructions. Shlonsky (1997) states that any constituent which can appear clause-initially via some other mechanism (e.g., Topicalization) can serve as a trigger of TI. We should further note that while sentence level adverbs, such as the one in (5f), can serve as triggers, VP-adverbs cannot, as is shown in (6) below. This makes sense under our current assumption that triggers must be co-extensive with an XP, given the notion that sentence level adverbs are, in fact, XPs, while VP-adverbs are not (Travis 1988, referred to in Doron & Shonsky 1990, fn. 4).

- (6) *bə-adinut patax Dani et-ha-delet
 gently opened Dani ACC-the-door

Moreover, though I will not provide examples here for reasons of space, constituents from higher up in the clause (e.g., functional projections in the IP-layer) cannot serve as triggers either. It therefore seems that triggers must be full XPs that originate low in the clause (i.e., below the VP).

2.4 Trigger and Topics

Triggers for TI and topics in Hebrew can be distinguished by two distinctive properties: long-distance topicalization in Hebrew is fine, and topics must be definite DPs. Triggers in Hebrew are totally clause-bounded, while topics, on the other hand, can extract long-distance, as in (7) below.

- (7) *la-peʕilim* *ha-mištara* *hodiʔa* *še* *ha-memšala* *tagiš* *tviʔa*
 to-activists the-police announced that the-government press charges
 a. [To the activists] the police announced t that the government would
 press charges.
 b. [Against the activists] the police announced that the government would
 press charges t.

The topic *la-peʕilim* ‘to/against the activists’ in (7) is ambiguous, and can be interpreted as either having originated in the matrix clause as the complement of the verb *hodiʔa* ‘announced’, or in the embedded clause as the complement to the verb *tagiš tviʔa* ‘press charges.’

Topics in Hebrew must also be definite DPs, a condition on topics in various other languages, which Kayne & Pollock (2001) label the ‘counter-indefiniteness effect’. Consider (8) and (9) below.

- (8) a. * *harbe* *peʕilim* *ha-mištara* *ʔacra* *ba-pšita* *ha-leilit*
 many activists the-police detained in-the-raid the-nightly
 b. *harbe* *peʕilim* *ʔacra* *ha-mištara* *ba-pšita* *ha-leilit*
 many activists detained the-police in-the-raid the-nightly
- (9) a. *et-ha-peʕilim* *ha-politijim* *ha-mištara* *ʔacra* *ba-pšita*
 ACC-the-activists the-political the-police detained in-the-raid
 ha-leilit
 the-nightly
 b. *et-ha-peʕilim* *ha-politijim* *ʔacra* *ha-mištara* *ba-pšita*
 ACC-the-activists the-political detained the-police in-the-raid
 ha-leilit
 the-nightly

The indefinite DP *arbe peʕilim* ‘many activists’ cannot serve as a topic in (8a), and the sentence is ungrammatical, whereas the definite DP *et-ha-peʕilim ha-politijim* ‘the political activists’ is a grammatical topic in (ex. 9a). Note that both the indefinite and definite DPs are grammatical triggers for the TI sentences in (8b) and (9b).

Finally, triggers and topics cannot co-occur. The issue of determining whether a fronted DP is a topic or a trigger is not a trivial one. We know that topics cannot be indefinite, and so any fronted indefinite DP must be a trigger. However, both topics and triggers can be definite. Therefore, the only way to determine whether a fronted definite DP is a topic or a trigger is to rely on the second unique property of topicalization in Hebrew, namely that it can extract from an embedded clause. Consider the examples in (10) below:

- (10)a. * la-peʕilim ha-politijim bə-jom rišon hodiʔa ha-mištara
 to-the-activists the-political on-day first announced the-police
 še ha-memšala tagiš tviʔa
 that the-government press charges
- b. *? bə-jom rišon la-peʕilim ha-politijim hodiʔa
 on-day first to-the-activists the-political announced
 ha-mištara še ha-memšala tagiš tviʔa
 the-police that the-government press charges
- ‘The police announced on Sunday that the government will press charges against the political activists.’

The PP *la-peʕilim ha-politijim* ‘against the political activists’ is topicalized from the object position of the embedded verb, indicated both by the translation given and the lack of inversion in the embedded clause. Because of the inversion in the matrix clause, and our assumptions about the clause-boundedness of triggers, we must assume that the PP *bə-jom rišon* ‘on Sunday’ is a trigger. (10a,b), therefore, illustrate that topics and triggers cannot co-occur in either order of linear precedence.

3. Hebrew TI and English Pseudoclefts

Consider the first example of a TI construction, given in (2) repeated as (11).

- (11) arbe peʕilim ʕacra ha-mištara ba-pšita ha-leilit
 many activists detained the-police in-the-raid the-nightly
 ‘Many activists was who the police detained in the nightly raid.’

Notice that the translation given for the Hebrew TI sentence in (15) is a pseudocleft (PC) construction in English, based on the observation that a PC is the most accurate translation of the TI construction in (11). TI is some sort of focus construction in Hebrew. Kiss (1998) differentiates between focus constructions that manifest an exhaustive operator and focus constructions that do not. Both Hebrew TI and English PC do not manifest an exhaustive operator, as exemplified in the examples below.

- (12)a. Dani natan šaršeret saʔav le-Rina.
 Dani gave necklace gold to-Rina
 ‘Dani gave a golden necklace to Rina.’
- b. Gam praxim natan Dani le-Rina.
 Also flowers gave Dani to-Rina
 ‘Flowers was what Dani also gave to Rina.’
- (13)a. Et-praxim ve chocolad natan Dani le-Rina.
 ACC-flowers and chocolate gave Dani to-Rina
 ‘Flowers and chocolate was what Dani gave to Rina.’
- b. Et-praxim natan Dani le-Rina.
 ACC-flowers gave Dani to-Rina

- ‘Flowers was what Dani gave to Rina.’
 (14)a. lo le-hasot raʔaš bikša ha-mištara min ha-ʔacurim
 NEG to-make noise asked the-police from-the-detainees
 ‘Not to make noise was what the police asked of the detainees.’
 b. ? lo, gam lo liftoax ha-einajim bikša ha-mištara
 no also NEG to-open the-eyes asked the-police
 ‘?No, also not to open their eyes was what the police asked.’

The sentences in (12)-(14) present tests for exhaustive identification for both the Hebrew TI sentences and their English PC translations. The sentences in (12) are a test for exhaustive identification described in Kiss (1998), where the grammaticality of the sentence in (12b) indicates that the trigger is not exhaustively identifying the direct object of the verb *natan* ‘gave’. (13) illustrates a test for exhaustive identification outlined in Szabolcsi (1981), where if the sentence in (13b) is a logical consequence of the sentence in (13a), then the sentence in (13a) does not express exhaustive identification. This is the case in the sentence in (13) above, thus lending support to the claim that Hebrew TI and English PC do not contain an exhaustive operator. Finally, the sentences in (14) together constitute a test for exhaustive identification conceived of by Donka Farcas (cited in Kiss 1988). In this test, if the first sentence in the pair contains an exhaustive operator, the negation of the second sentence should result in a grammatical sentence in which the assertion of the original sentence is not negated, but the exhaustivity of the original sentence is. If the second sentence receives a downgraded grammaticality rating, this indicates that there is no exhaustive operator to be negated. Again, (14) supports the notion that Hebrew TI and English PC do not express exhaustive identification.

Because of their similar semantic behavior, this analysis argues that English PC and Hebrew TI are language specific manifestations of the same construction. Heycock & Kroch (1999) analyze PCs in English as a sub-type of equative construction, which they label specificational copular constructions. This goes against the popular analysis of PCs in English as inverse predicative copular constructions (Moro 1990, 1997). I accept Heycock & Kroch’s (1999) analysis of English PCs as equative specificational copular constructions and, consequently, analyze Hebrew TI sentences as equatives as well. This argument is supported by the similar behavior of TI and PC with respect to two distinct syntactic/semantic phenomena: Wh-extraction and scope capabilities.

We have already seen that TI constructions in Hebrew do not allow Wh-extraction. Consider the examples below, where the ungrammaticality of the Hebrew TI sentence and its English PC translation serve as evidence that neither construction allows Wh-extraction:

- (15)a. arbe sfarim natan Dani le Rina ʔetmol.
 many books gave Dani to Rina yesterday
 ‘Many books was what Dani gave to Rina yesterday.’

- b. le-mi arbe sfarim natan Dani t ?etmol?
 to-who many books gave Dani t yesterday
 ‘*To who many books was what Dani gave yesterday?’
- c. * mi arbe sfarim natan t le-Rina ?etmol?
 who many books gave t to-Rina yesterday
 ‘Who many books was what t gave to Rina yesterday?’

Additionally, both specificational copular construction (i.e., PCs) and TI manifest similar scoping capabilities. Consider the English examples below:

- (16)a. Every article bothered a friend of mine.
 b. A friend of mine was who every article bothered.

The canonical predicative sentence in (16a) is ambiguous with reference to scope. The specificational PC sentence in (16b) has only one reading, namely, the reading in which the universal quantifier scopes over the indefinite. Heycock and Kroch (1999) explain this property of equative sentences by claiming that the constraints on equative semantics require that the two arguments of equation be of the same semantic type. Thus, the post-copular DP in (16b) above cannot be analyzed as a purely quantificational DP, but must rather denote a plural individual to match the semantic type of the pre-copular argument. Because of this, only the quantifier embedded within the pre-copular argument can take scope. There are apparent counter-examples to this analysis. Consider (17), below (example (74) in Heycock & Kroch 1999).

- (17) A friend of his was who every boy saw.

The PC sentence in (17) seems to allow for an ambiguous reading in which each boy is seeing a different friend. Heycock & Kroch (1999) argue that this ambiguity arises from within the free relative, where multiple scope relations are possible between the universal quantifier and the Wh-operator *who*. They, therefore, conclude that examples of the type in (17) are not true counter-examples to their explanation of the restricted scope capabilities of PCs in English. Let us now consider the Hebrew examples in (18, Tal Siloni pc).

- (18)a. Rut lo zaxra et-kol-ha-xomer. (NEG>..., ...>NEG)
 Rut NEG remembered ACC-all-the-materials
 ‘Ruth did not remember all of the materials.’
- b. Et-kol-ha-xomer lo zaxra Rut. (...>NEG only)
 ACC-all-the-materials NEG remembered Rut
 ‘All the materials was what Ruth did not remember.’

We see that the same pattern of scoping capabilities emerges in the Hebrew paradigm as well: the canonical sentence in (18a) is ambiguous with reference to scope, while the TI sentence in (18b) is not. Only the quantifier embedded in the first argument can take scope. Because of their similar behavior with

respect to this scope phenomenon and their similar restrictions on Wh-extraction, TI in Hebrew and PCs in English deserve to be analyzed similarly, namely as specificational copular constructions interpreted with equative semantics.

4. Equatives in Hebrew

Hebrew is said to have a defective present tense copula. Consider the three sentences in (19).

- (19) a. ani hajiti šamen b. ani ʔihje šamen c. ani šamen
 I be-PAST fat I be-FUT fat I fat
 ‘I was fat.’ ‘I will be fat.’ ‘I am fat.’

As these sentences illustrate, there is an overt copula in both the past and future tenses, yet present tense copular constructions in Hebrew take the form of matrix small clauses. There is a certain construction which manifests a copula-like element in the present tense. Consider the example below.

- (20) Dani hu Mar Josef.
 Dani 3MS Mr. Josef.
 ‘Dani is Mr. Josef.’

This pronominal copula, which Doron (1983) labeled *Pron*, is the phonetic realization of agreement features in INFL, and is present in equative constructions. Rothstein (1995) argues that *Pron* is required in these constructions to create a syntactic relationship between the two arguments of equation. Rothstein (1995) contrasts the equative sentence with *Pron* in (20) with the predicative sentence without *Pron* in (21).

- (21) Dani nexmad.
 Dani nice
 ‘Dani is nice.’

According to Rothstein (1995), predicative sentences, like the one in (21) do not manifest *Pron* because they are licensed internally via saturation. The adjective *nexmad* ‘nice’ has a subject θ -role that needs filling. The DP subject *Dani* ‘Dani’ fills this θ -role and the matrix small clause is licensed internally. This process is schematized in (22). Equative constructions, on the other hand, bear no saturation relation, and therefore require the presence of *Pron* to project a syntactic host for the two arguments of equation. This process is schematized in (23b).

- (22) [[Dani]_{DP}[nexmad]_{AP}]_{SC}
 (23) a. * [Dani]_{DP}[Mar Josef]_{DP}
 b. [Dani][hu[Mar Josef]_{DP}]_{IP}

4.1 TI and Pron

Pron, therefore, allows for the syntactic licensing of these types of equative constructions in Hebrew. TI constructions are a different type of equative, however, where the arguments of equation are not DPs that agree in INFL features (e.g., number, gender). Rather TI constructions are specificational copular constructions that require syntactic hosting in the CP-layer. Consider the schematic structure given by Déchaine (2001) for focus constructions in Yorùbá:

$$(24)[\text{FOC}_i][ni]_{[\text{DP } pro_i[\text{CP Op}_i[\text{IP} \dots t_i]]]}$$

In her analysis, the focalized element sits in some left-periphery position, presumably in the specifier of *ni*, which is a focus particle in Yorùbá. The complement of *ni* is a null-headed complex DP, where the *pro* head and the null operator in the complex DP are co-indexed with the moved focalized constituent. I will adopt this structure and modify it slightly to fit with Rothstein's (1995) theory of equatives in Hebrew. I propose an additional pronominal copular element in Hebrew, which is a null manifestation of some CP-layer features, which I call *Pron_{arb}*.¹ *Pron_{arb}* is similar to the *Pron* proposed by Doron (1983) in that it is also a realization of functional features, though this syntactic realization has no phonetic counterpart.² A partial schematic structure for TI in Hebrew is given in (25), where G^0 is some arbitrary head in the CP-layer:

$$(25)[\text{XP}_{\text{trigger}, i}[_i \text{Pron}_{\text{arb}}[\text{DP } pro_i[\text{CP Op}_i[\text{IP} \dots t_i]]]]]_{G^0}[\text{GP}]$$

In the structure given in (25), the trigger is base-generated in the specifier position of the G^0 projection, which hosts the *Pron_{arb}* realization of the CP-layer feature. The second argument of equation is a null headed complex DP that is co-indexed with the XP trigger, creating a chain linking the trigger to its interpretation site.

5. Post-verbal subjects in Hebrew

Let us now turn to the position of subjects in the Hebrew clause. Shlonsky (1997) argues that subjects in Hebrew cannot remain VP-internal because nominative case-assignment into VP is blocked in Hebrew. According to Shlonsky's (1997) theory, AspectP is the universal assigner of VP-internal nominative case, and its position is configured universally by UG. Agr(ement)

¹ For the moment I choose not to make claims about the exact nature of the CP-layer features realized by *Pron_{arb}*. I propose that it may be a realization of [finite], thus making the syntactic host for TI constructions FiniteP in Rizzi's (1997) articulated structure of the left-periphery. For our current purposes, however, I remain intentionally non-committal.

² I conjecture that the lack of phonetic realization of *Pron_{arb}* is somehow due to the lack of overt morphemes in Hebrew that correspond to CP-layer features, though I will not explore this here.

P(hrases), however, are configured locally by language. In Hebrew, the position of AgrOP directly dominating the VP blocks the possibility of nominative case assignment to a VP-internal subject, creating the difference between Italian (26) and Hebrew (27) below:

- (26) Ha telefonato Gianni.
has telephoned Gianni.
'Gianni telephoned.'
- (26)* Cilcel Dani.
telephoned Dani
'Dani telephoned.'

In Italian, AspP directly dominates VP, therefore nominative case assignment is possible, whereas in Hebrew, according to the assumptions in Shlonsky (1997), the AgrOP projection intervenes between the VP and AspP, thus preventing nominative case assignment. Subjects in Hebrew must therefore move out of the VP to receive case, and Shlonsky (2000) identifies two positions to which the subject can move. Both of these positions are, however, crucially above the position of the moved verb; one of them corresponding to the canonical position of nominative case-assignment, the second the landing site for subjects of ergatives and passives who receive partitive case assignment from the verb. There is evidence from the position of certain VP manner adverbs, however, that a third subject position exists in Hebrew. Consider the sentences below:

- (28) ha-boker patax be-šeket Dan et-ha-delet
this-morning opened quietly Dan ACC-the-door
'Dan quietly opened the door this morning.'
- (29) ha-boker hecig bə-ʔofen recini Dan et-ha-pitaron šelo
this-morning proposed in-manner serious Dan ACC-the-idea of-3MS
'Dan proposed his idea seriously this morning.'

Under current assumption the VP manner adverbs, *be-šeket* 'quietly' and *be-ʔofen recini* 'seriously', in (28) and (29), respectively, mark the upper edge of the lexical layer. In the sentences in (28) and (29), the subjects reside directly below these adverbs, and directly above the accusative case-marked objects, presumably sitting in the AgrOP position. This seems to indicate the existence of an additional subject position in Hebrew within the lexical layer.

Ordóñez (2000) argues for three subject positions in Spanish, while he claims that French, Italian, and Catalan only contain two subject positions. His first piece of evidence is the ungrammaticality of the word order evidenced in (28) and (29) above, namely the VSO order. Consider the ungrammatical VSO sentences and the grammatical VOS counterparts below.

- (30)a. * Scrisse Gianni la lettera. (Italian)
wrote Gianni the letter
b. Scrisse la lettera Gianni.
wrote the letter Gianni

- ‘Gianni wrote the letter.’
- (31)a. * Quand a écrit Jean la lettre? (French)
 when has written Jean the letter
- b. Quand a écrit la lettre Jean?
 when has written the letter Jean
 ‘When did Jean write the letter?’
- (32)a. * Quan va discutir el professor lingüística? (Catalan)
 when will discuss the professor linguistics
- b. Quan va discutir lingüística el professor?
 when will discuss linguistics the professor
 ‘When will the professor discuss linguistics?’

Spanish and Hebrew, however, both accept this VSO word order:

- (33) ¿Cuándo compró usted manzanas? (Spanish)
 when bought you apples
 ‘When did you buy apples?’
- (34) abaita šalxa ha-mištara et-ha-ʕacurim (Hebrew)
 to-homesent the-police ACC-the-detainees
 ‘Home was where the police sent the detainees.’

In addition to the fact that Spanish and Hebrew both allow subjects to reside between the verb and the object, both Spanish and Hebrew share the characteristic that subjects in this position receive neutral interpretation, in opposition to post-verbal subjects in French, Italian, and Catalan, which all receive some form of topicalized interpretation. In fact, Shlonsky (2000) states that both of the preverbal subject position he enumerates are positions in which the subject receives a topic-like interpretation. I propose that in TI constructions in Hebrew, an additional subject position becomes available where the subject receives neutral interpretation.³ Ordóñez (2000) reaches the same conclusion for Spanish, and identifies what he calls a Neut(ral)P. I adopt Ordóñez’s (2000) terminology and claim that a NeutP resides directly above AgrOP and below AspP in the structure of TI sentences. Subjects residing in the specifier position of NeutP can therefore receive nominative case assignment in the canonical fashion. The structure for the TI clause is outlined in (35) below:

- (35) [AgrSP[TP[AspP[NeutP[AgrOP[VP ...]]]]]]

6. Putting it together

Combining the structure for the top of the clause given in §4, and the structure for the lexical layer of the clause given in §5, we have a schematic structure for a TI clause in (36):

³ Thank you to J. van Craenenbroeck for pointing out the necessity for this motivation.

- identificational focus can be iterated, information focus can project

Hebrew TI does not express exhaustive identification, based on the diagnostics for exhaustive identification given by Kiss (1998), Szabolcsi (1981), and Farkas (cited in Kiss 1998). TI resembles what Kiss (1998) would call information focus. Hebrew TI is very non-restrictive in terms of what constituents it allows to act as triggers, as was shown in §2.3. Hebrew TI seems to behave like information focus. TI constructions do not take scope, as was shown in §3, and thus behaves like what Kiss (1998) labels information focus. Kiss (1998) claims that identificational focus involves movement, while information focus does not. Hebrew TI structures pass the standard diagnostics of A'-movement (i.e., they license parasitic gaps and exhibit crossover effects), though I am assuming a base-generation analysis. This is line with reformulation of the notion *MOVE* α , as given in Brody (1995). Therefore, with respect to this criterion, TI seems to behave as identificational focus. As was shown in §2.3, triggers for TI constructions must be co-extensive with an XP, thus behaving like identificational focus. Finally, triggers of TI constructions cannot iterate, but can, to some extent, project their domain of focus. With respect to this final criterion, Hebrew TI behaves like information focus.

Hebrew TI, therefore, defies straightforward classification in Kiss' (1998) typology of focus constructions. While it behaves like information focus on the more semantically driven criteria, Hebrew TI does manifest the syntactic characteristics of information focus. The main conceptual difference for Kiss (1998) in distinguishing between informational and identificational focus is the presence of a semantic operator. Her six criteria, listed above, are based on the semantic and syntactic ramifications of an additional semantic operator in a focus construction. Hebrew TI, and English PC, seems to provide preliminary evidence for the need to expand the taxonomy of focus constructions to include syntactically driven focus, as opposed to phonological focus, that may contain a zero-operator and, more crucially, are interpreted with equative semantics.

8. Conclusion

TI structures in Hebrew have been shown to be instances of specificational equative constructions, of the type described in Heycock and Kroch (1999). Because of this, Hebrew TI structures manifest a syntactic structure mediated by the presence of a functional projection (GP), which I conjecture may be a realization of the finiteness feature. The triggers in TI structures were shown to be unclassifiable according to the diagnostic typology established in Kiss (1998), and may in fact indicate the need to expand the established taxonomy of focus constructions. This analysis of triggers, in fact, fits nicely into the concept of the focus/ground opposition presented in Prince (1978), whereby the trigger in a TI structure serves as the value for the variable in the free relative (Heycock and Kroch 1999).

Though this analysis has accepted most of the descriptive insights regarding Hebrew TI structure from the earlier work by Doron and Shlonsky (1990) and Shlonsky (1997), it has rejected their analyses of TI as canonical I-to-C

movement. The semantic examination of TI structure in this analysis has instead lead us to represent TI in Hebrew as in the structure given in (36).

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Function words, prosodic structure and morphological dependency

Ana R. Luís

This paper addresses the grammatical status of pronominal clitics in European Portuguese (henceforth EP). Based on properties displayed by the clitic-clitic sequence and the verb-enclitic combination, it is argued that object pronouns in this language must be derived in the morphological component. Among other affix-like properties, it is shown that they undergo allomorphic variation and induce stem allomorphy on the verb. These non-productive phonological alternations support the view that enclitics are in morphological construction with the verb.

1. Introduction

Within the theory of prosodic phonology, Romance pronominals are generally treated as prosodically deficient function words. It is assumed that they combine with the verb in the syntax and attach through purely phonological processes (cf. Peperkamp 1997, for Spanish and Italian). Vigário (1999b) supports this view for EP pronominal clitics, but argues that the morphophonological effects taking place between verbs and enclitics cannot be simply derived through rules of phrasal phonology. To account for the data, she develops a detailed analysis within the theory of Precompiled Phonology (Hayes 1990) and treats object pronouns as phrasal allomorphs.

The goal of this paper is to challenge the view that cliticisation in EP takes place across syntactic word units. It is shown that the morphosyntactic factors determining allomorphic alternation pose serious problems to a 'precompiled' approach. Giving special emphasis to the verb-enclitic combination, it is claimed that object pronouns are inflectional affixes and that cliticisation is therefore a morphological operation (Spencer 1992, Crismann 1997, Luís 2002a).

The paper is organised as follows. Section 2, motivates the morphological analysis and reviews some basic facts regarding the clitic-clitic sequence and the verb-enclitic combination. Section 3 examines the 'precompiled' treatment of allomorph selection presented in Vigário (1999b), and section 4 briefly sketches an alternative analysis and shows how an inflectional approach provides an elegant and insightful account of the facts.

2. The facts

Recent work on clitic pronouns in French and Italian (Miller&Sag 1997, Monachesi 1999) has convincingly shown that the regularities underlying the formation and placement of clitic clusters display many properties that are typical of affixes. In this section, I provide an overview of the affixational status of object pronouns in European Portuguese by outlining the internal properties of the clitic cluster and the idiosyncrasies of the verb-enclitic construction¹ (Spencer 1992, Crysmann 1997, Luís 2002a).

2.1. The clitic-clitic sequence

The pronominal system in EP comprises reflexive, accusative and dative pronouns, as given in (1):

(1)

	Refl	Dat	Acc
1.S	me		
2.S	te		
3.S.M	se	lhe	o
3.S.F			a
1.Pl	nos		
2.Pl	vos		
3.Pl.M	se	lhes	os
3.Pl.F			as

Similar to other Romance languages, the order in which pronominals can combine is quite limited. In EP, only two types of clusters can be found: the reflexive-dative cluster (with reflexives preceding datives), and the dative-accusative cluster (with datives preceding accusatives).

Idiosyncratic co-occurrence restrictions apply within both types of clitic sequences. As shown in (2), within the reflexive-dative cluster, only 3rd reflexives can combine with datives. Similarly, only 3rd accusatives combine with dative pronouns, within the dative-accusative cluster, as in (3):

(2)

	1S.Dat	2S.Dat	3S.Dat	1Pl.Dat	2Pl.Dat	3Pl.Dat
3.S.Refl	se-me	se-te	se-lhe	se-nos	se-vos	se-lhes
3.Pl.Refl	se-me	se-te	se-lhe	se-nos	se-vos	se-lhes

¹ This paper will not address the nature of the proclitic-verb combination. Unlike in the other Romance languages, proclitics in EP display distributional/scopal idiosyncrasies which suggest that preverbal and postverbal attachment are different in status. The proclitic cluster however is in all respects like the enclitic cluster. For further details about proclitic placement, see Crysmann 2001 and Luís&Sadler (to appear).

(3)

	1 Sg	2 Sg	3.Sg. M.Acc	3.SG. F.Acc	1 Pl	2 Pl	3.M. Pl. Acc	3.Pl. F.Acc
1.S.Dat			me+o	me+a			me+os	me+as
2.S.Dat			te+o	te+a			te+os	te+as
3.S.Dat			lhe+o	Lhe+a			lhe+os	lhe+as
1.P.Dat			nos+o	nos+a			nos+os	nos+as
2.P.Dat			vos+o	vos+a			vos+os	vos+as
3.P.Dat			lhes+o	lhes+a			lhes+os	lhes+as

Cluster internally, object pronouns generally exhibit phonological alternations. For example, the 3rd accusative pronouns *o, a, os, as* ('him, her, them.masc, them.fem') alternate with *lo, la, los, las* when they are preceded by a 1st/2nd plural dative pronoun. In this context, the dative loses its final consonant.

- (4) a. A Maria *compra-nos-o.
 b. A Maria compra-no-lo.
 the Maria buy-3SG.MASC.DAT-3SG.MASC.ACC
 'Maria buys it for us'

The complete inventory of clusters combining 1st/2nd plural datives with 3rd accusatives is given in (5):

(5)

	3.Sg.M. Acc	3.Sg.F.Acc	3.Pl.M.Acc	3.Pl.F.Acc
1.Pl.Dat	(nos+o) → no-lo	(nos+a) → no-la	(nos+os) → no-los	(nos+as) → no-las
2.Pl.Dat	(vos+o) → vo-lo	(vos+a) → vo-la	(vos+os) → vo-los	(vos+as) → vo-las

Idiosyncratic phonological effects are also found when 1st/2nd singular & 3rd plural dative pronouns combine with 3rd accusatives. In this case, an opaque portmanteau unit is formed, as the complete list below shows:

(6)

	3.Sg.M.Acc	3.Sg.FAcc	3.M.Pl.Acc	3.Pl.F.Acc
1.Sg.Dat	(me+o) mo	(me+a) ma	(me+os) mos	(me+as) mas
2.Sg.Dat	(te+o) to	(te+a) ta	(te+os) tos	(te+as) tas
3.Sg.Dat	(lhe+o) lho	(lhe+a) lha	(lhe+os) lhos	(lhe+as) lhas
3.Pl.Dat	(lhes+o) lho	(lhes+a) lha	(lhes+os) lhos	(lhes+as) lhas

Interestingly, when 3rd datives co-occur with 3rd accusatives, the dative plural features are neutralised giving rise to syncretism. Each of the forms therefore corresponds to two different feature combinations: e.g. *lho* can mean either 'dat.1.SG-ACC.3.SG.MASC' OR dat.1.PL-ACC.3.SG.MASC'.

2.2. *The verb-enclitic combination*

At the distributional level, clusters cannot constitute an utterance on their own, they cannot be topicalised, coordinated or modified. Instead, enclitic pronouns are in strict adjacency with the verb and nothing can intervene between them:

- (7) a. O João deu-lhe livros.
 the John gave-3.SG.DAT books
 ‘John gave him/her books’
 b. *O João deu livros-lhe.
 the John gave books-3.SG.DAT
 ‘John gave him/her books today.’

As mentioned earlier, 3rd accusative pronouns change their phonological form in combination with datives. Similar effects are found when 3rd accusatives follow the verb. In particular, if the verb ends in -r, -s or -z, then the *l*-form must be selected (i.e. *-lo, -la, -los, -las*) (8a):

- (8) a. O João [*diz-o]. → O João di-lo.
 the João says-3.SG.MASC.ACC
 ‘João says it’
 b. Os meninos [*levam-os] → Os meninos levam-nos.
 the boys take-3.PL.ACC
 ‘the boys take them’

Alternatively, 3rd accusatives surface as *-no, -na, -nos, -nas* if they follow a 3rd plural verb form. These verbs generally end in a nasal diphthong (8b). However the choice of the *n*-accusative is not phonologically conditioned, since 3sg verbs ending in a nasal do not generally induce allomorphy.

Having addressed the phonological changes suffered by pronouns, I will now show that verbs also exhibit interesting variations. Unlike in most of the Romance languages, object pronouns in EP induce phonological changes on the verb. For example, 3rd accusatives trigger final consonant deletion on verbs ending in -s, -z or -r (i.e. the set of verbs which selects the *-lo, -la, -los, -las* forms). In this case, we get reciprocal allomorphy, namely a simultaneous phonological change on the pronoun and on the verb (8a). This phenomenon is restricted to the clitic cluster and the verb-enclitic unit.

Another idiosyncratic case of stem allomorphy appears when 1st/2nd plural pronouns *-nos* and *-vos* trigger consonant deletion on 1pl verb forms, regardless of tense/mood/aspect properties (9):

- (9) Nós [*vêmos-nos] hoje. → Nós vêmo-nos hoje.
 we see-1.PL.REFL today
 ‘We see each other today’

This deletion only takes place if the verb final -s represents a 1pl ending. It fails to apply in contexts where it realises a different set of features, such as

2sg, as given in (10). This indicates that the alternation is morphologically conditioned and not determined on phonotactic grounds:

- (10) Tu recibes-nos.
 you.SG receive-2.SG.ACC
 ‘You receive us’

Finally, object pronouns also seem to interact with internal layers of affixation:

- (11) As crianças dá-los-ão aos pais. (not: *dar-os-ão)
 the children give-3.PL.MASC.ACC-FUT to the parents
 ‘The children will give them to their parents’

As (11) illustrates, the cluster intervenes between the verb stem and the future/conditional agreement marker, in what seems to be a typical case of morpheme reordering. In word-internal position, the accusative induces similar phonological changes on the verb.

2.3. Conclusion

The above outline of the data shows that the regularities underlying EP pronominals are quite typical of affixes. Fixed clitic order and co-occurrence restrictions contrast sharply with the combinatorial possibilities available for nominal phrases and do not follow from general syntactic principles. Similarly, the morphophonological changes taking place inside the cluster cannot be derived through productive rules of phonology. Crucially, verbs undergo stem allomorphy and cannot be separated from enclitics. To sum up, the properties presented in this section clearly suggest that a morphological analysis of EP pronominals should be preferred (Spencer 1992, Crismann 1997, Luís 2002a).

3. The idiosyncrasies of the verb-enclitic combination

In a different vein, Vigário (1999a,b) argues against the morphological status of object pronouns in EP. On the basis of several phonological rules, it is claimed that object pronouns and function words belong to the same syntactic category and combine post-syntactically with the host².

Surprisingly, despite going to great lengths to challenge the morphological attachment of enclitics, Vigário (1999b) supports the view that the phonological effects presented above cannot be derived through standard phrasal phonology. To maintain both claims, i.e. that object pronouns are syntactic units and that they undergo rules of lexical phonology, Vigário provides an analysis of the verb-enclitic combination within the theory of Precompiled Phonology (Hayes 1990). The leading idea of this account is that

² Cf. Luís (2002b) for a critical discussion of the phonological evidence provided by Vigário (1999a,b).

words can have allomorphic variants in the lexicon. Under this view, the *l*-forms and *n*-forms of accusative pronouns are derived as phrasal allomorphs and inserted in the syntax postlexically.

This might at first seem a plausible approach to pronominal alternants, but upon closer inspection, the data in EP involves more than just the selection of pronominal forms. To account for the overall morphophonological effects, Vigário introduces significant extensions to the framework which seriously challenge the spirit of the theory of precompilation. This is a clear indication that object pronouns should not be derived as phrasal allomorphs, but as inflectional affixes in the morphology.

3.1. Precompiled phonology

To provide a background against which to compare Vigário's proposal for EP, I will first provide a brief summary of the phenomena that motivated Hayes (1990) theory of Precompiled Phonology. These are untypical cases of phonological alternations which are dependent on syntactic information but, crucially, do not generalise over prosodic domains and, so, fall out of the scope of phrasal phonology. Two of the phonological rules which seem to have direct access to syntax are a) the alternation in the feminine article *la* in Spanish which becomes *el* before nouns beginning in stressed /á/, and b) the rule of vowel shortening in Hausa which applies to the final long vowel of verbs when they are preceded by a full NP direct object.

Assuming that phonology cannot have direct access to the syntax, Hayes (1990) develops a framework in which word classes may have allomorphic variants. Crucial for this proposal is the fact that each one of the phrasal allomorphs is accompanied by a frame indicating where it may be inserted in the syntax³. For Spanish, for example, it is assumed that the lexical entry for the feminine article contains two allomorphs, i.e. *la* and *el*, and two environments for syntactic insertion, as in (12). Under the Elsewhere Condition, the insertion context of *el* is the more specific and takes precedence over the more general context of *la*.

$$(12) \left(\begin{array}{l} /el/ \quad _ \quad [N \acute{a}] \\ /la/ \quad / \quad (\text{elsewhere}) \end{array} \right)$$

For Hausa, Hayes derives phrasal allomorphy by lexical rule on the grounds that the phonological change of vowel shortening affects whole classes of words. The lexical phonological rule in (13a) derives the verb forms and the phonological instantiation frame in (13b) inserts these forms into their relevant syntactic context:

³ It is important to point out that precompiled phonology assumes a late insertion model of syntax. Words are represented through abstract markers and phonological instantiation takes place post-syntactically (Hayes 1990).

- (13) a. V: \rightarrow V / [... ___]_[Frame1]
 b. Frame 1: / [_{VP} ___ NP ...], NP non pronominal

The above summary showed that the data analysed by Hayes (1990) is significantly different from the morphophonological effects displayed by EP: a) in EP, phonological changes are reciprocal in that they affect both the selected pronominal allomorph *and* its context of insertion, b) the context within which allomorphy takes place must make reference to the specific inflectional features of the elements involved, and c) EP pronouns only combine with verbs from which they are inseparable, therefore lacking the syntactic freedom of the Spanish and Hausa categories.

3.2. A precompiled approach to EP object pronouns

This section presents the precompiled account by Vigário (1999b) and discusses the problems that emerge from a postlexical view of the verb-enclitic combination.

As mentioned before, object pronouns combine into clusters, and any account of the data must be able to explain how these sequences are formed. In Vigário (1999b), single object pronouns are lexically listed words. As to combinations of pronouns, they are represented as phonologically opaque units listed together with individual pronouns. Although this may be the right approach for portmanteau clusters, object pronouns are also well known for forming transparent sequences of concatenated units. Viewing all clusters simply as phonological units inevitably blurs the distinction between transparent sequences of pronouns and portmanteau clusters, and also fails to capture cluster internal regularities. Of course, deriving clusters as the combination of two individual pronouns in the syntax poses serious difficulties (Anderson 1992), however, in the morphology, as I will try to show later, assigning individual exponence to pronouns follows from the nature of inflectional affixation. Failure to take into account the internal composition of clusters seriously weakens any analysis.

Let us now look at the lexical rules and insertion contexts set up by Vigário. It was previously shown that the phonological form of 3rd accusative pronouns in EP is dependent on whether a) the final consonant of the verb ends in -s, -z, -r or on whether b) the verb is inflected for 3pl. To account for pronominal allomorphy, Vigário produces a lexical entry for 3rd accusatives where each allomorph is individually specified for its context of insertion (14).

- (14) $\left(\begin{array}{l} \text{a. no / [...] Vb}_{[3pl]} \text{ ___} \\ \text{b. lo / [... }_{[+cons]} \text{] Vb ___} \\ \text{c. o / elsewhere} \end{array} \right) \begin{array}{ll} \text{e.g. davam} & \text{'they gave'} \\ \text{e.g. davas} & \text{'you.sg gave'} \\ \text{e.g. dava} & \text{'I/he/she gave'} \end{array}$

Then, consonant deletion on verbs is captured by deriving verbal allomorphs through the lexical rule in (15) and by inserting them into the contexts specified in (16).

(15) C → Ø / [... _ ...] [Frame 1] [Frame 2]

- (16) a. Frame 1: ... [..._] Vb [...] cl [acc]
 b. Frame 2: ... [..._] Vb [1pl] [...] CL (nos/vos)

Frame 1 inserts the consonant-less verb form before an *l*-accusative, and Frame 2 specifies that the deleted consonant is part of a 1pl verb form and that it occurs either before a 1pl or 2pl pronoun. Let us now discuss Vigário's proposal.

1. Starting with the lexical entry in (14a), *n*-forms correspond roughly to the Spanish determiner, since all that seems to be necessary is to select an allomorph and find the right syntactic context for it. The problem is that the context of insertion is not just based on phonological or syntactic properties, but crucially on inflectional features of the verb form. As Vigário correctly indicates, the *-no,-na,-nos,-nas* allomorphs must follow verb forms with 3pl features⁴, however specific combination of inflectional features should only play a role in the morphological derivation of words. Phonological effects that are motivated by morphosyntactic features are generally regarded as clear evidence for morphological status. This point is also made by Hayes (1990), in his discussion about true morphological alternations:

'rules of [inflectional] allomorphy have diverse structural conditions: they may refer to phonological environment, to *inflectional features*, and to the identity of individual morphemes (...).' (Hayes 1990:90) (my underlining)

Similarly, Vigário also defines the context of insertion in (16b) on the basis of very specific inflectional properties. Although the rules in (16) seem to draw an analogy between the placement of Hausa verbs and EP verbs, there is one important difference between both. Whereas the context of insertion for Hausa verbs is purely syntactic and phonological, for EP it must be defined in terms of a restricted set of pronominal person and number features. As already mentioned, if inflectional features must play a significant role in analysing the data, then pronouns should be derived as inflections attached on a verbal stem.

Even though not sufficient work has been carried out within precompiled phonology to ascertain the exact nature of the insertion frames, in Hayes (1990) they are clearly based on phonological and syntactic information. The fact that EP pronouns cannot be derived by merely addressing purely phonological or syntactic contexts suggests that they do not constitute the set of phenomena precompilation was designed to account for.

2. The rule deriving consonant-less verb forms in (15) also raises two questions. The rule is formulated very much like the rule of Vowel Shortening for Hausa verbs, but here again are important differences. First, whereas in the

⁴ In some varieties of EP, the selection of *n*-accusatives seems to be more general, being determined by any verb-final nasal (Cunha&Cintra 1987). In these cases, the context of insertion is simply phonological and syntactic. However, in the variety analysed in Vigário (1999b) the triggering factors are inflectional.

case of Hausa the rule applies to a whole class of words (13a), in EP it only applies to a reduced set of forms (i.e. of the type '2pl' and 'consonant final'). Second, the verbal allomorphs of Hausa constitute fully inflected forms, whereas the EP verbs forms generated through the lexical rule in (15) are not well-formed words and are not perceived by speakers of EP as grammatical.

- (17) a. lavamo a'. lavamo-lo (not: *lavamos-o)
 '(we) wash-3.SG.MASC.ACC'
 b. fi b'. fi-lo (not: *fiz-o)
 '(I) did-3.SG.MASC.ACC'

As such, the verb forms produced by (15) do not have independent word status. This clearly suggests that these verbs forms are not part of the verbal paradigm, but simply form the base/stem for pronominal suffixation. As suggested by Hayes (1990), bases and stems cannot have an independent representation in the syntax. If inflection is derived through precompilation, each inflected form is precompiled in the lexicon and inserted under one terminal node. For EP, this means that the verb-enclitic unit is inserted in the syntax as one morphological word.

3. Let us now move on to the interaction between verbs and *l*-accusatives which is perhaps the most difficult aspect of the data. First, because it involves both the selection of a listed and a derived allomorph; and second, because two insertion contexts must be provided – one for the accusative form and one for the verb form – although only one can surface in the syntax. The reciprocal effect taking place between verbs and *-l* accusative pronouns is quite distinct from the data which originally motivated the need for precompiled allomorphs and poses a serious challenge to the framework. Unfortunately, Vigário (1999b) does not provide exact details about the verb-pronoun interaction, apart from providing mechanisms for the selection of the pronoun and the verb.

The problem with the analysis is that it constitutes yet another attempt at deriving genuine morphological allomorphy outside the morphology. Although the mechanisms driving the verb-enclitic unit are, in this particular case, defined in terms of phonological and syntactic features, the elements involved do not easily undergo a precompiled analysis. For example, *l*-accusatives are never inserted into their triggering context, although this is evidently in violation with the rule of allomorph selection provided in (14b). Looking closer at the three rules in (14), it seems that (14b) predicts, just like (14a) and (14b), that the pronoun will be inserted into its triggering context. That of course is not attested for *l*-accusatives, given that the consonant-final verb never precedes the *l*-accusative pronoun. If it did, a rule of phrasal phonology would have to delete the consonant post-syntactically. That however would be a direct-syntax rule. This rule then generates an unusual type of phrasal allomorph, i.e. one that cannot appear within its triggering phrasal environment. The fact that *l*-accusatives do not easily undergo an analysis based on precompiled lexical entries strongly supports the view that they are not precompiled.

It also remains unclear how the verb forms triggering the *l*-accusative can refer back to the pronoun and use it both as trigger (for the lexical rule in (15)) and as context of insertion (in (15a)). However regardless of how it is done, it makes the prediction that two phrasal allomorphs can be placed side by side, and have a mutual effect on each other. Once again, reciprocal allomorphy is far more typical within morphology than syntax.

To conclude: As this section has shown, a precompiled account of EP poses several conceptual problems: a) allowing precompiled rules to refer to inflectional properties seriously damages the differences between precompiled allomorphy and true inflectional allomorphy; b) treating verbal stems as fully inflected words makes wrong predictions about what constitutes a well-formed word in the verbal paradigm of EP, and c) placing phrasal allomorphs side by side and/or inserting them outside their phrasal context is rather counter-intuitive. On the contrary, within an inflectional approach, the data can be derived as a typical case of suffix selection and stem allomorphy. This then supports the view that the morphophonological idiosyncrasies displayed by the verb-enclitic combination do not fall within the scope of precompiled phonology.

The proposal I make in the following section is also based on the assumption that the morphophonological properties of the verb-enclitic combination are best derived in the lexicon (cf. Spencer 1992 and Crysmann (1997) for similar view). But unlike Vigário (1999b), I assume that object pronouns are inflectional suffixes and that clitic sequences are morphological units with an internal structure.

5. An alternative proposal

My claim is that through the ordered application of inflectional rules, pronominal clusters can be derived as morphological sequences of affixes. Standard inflectional mechanisms capture quite naturally co-occurrence restrictions inside the cluster, feature neutralisation and portmanteau formation.

I adopt the realisational theory of Paradigm Function morphology (henceforth PFM) developed by Stump (2001) which derives inflections as morphophonological realisations of morphosyntactic features. In line with previous work on Slavic clitics (Spencer 2001) and French pronominals (Miller&Sag 1997), it is shown that PFM can successfully account for the realisation and placement of pronominal clitics in EP. In what follows, I illustrates briefly how the proposal derives single and multiple occurrences of object pronouns, and how it deals with cluster placement.

5.1 The internal structure of the cluster

As shown in section 2, there are several facts about object clitics that must be accounted for. For example, pronominals combine in a rigid order (i.e., reflexives before datives and datives before accusatives) and are restricted to specific co-occurrence patterns (i.e., only 3 reflexives combine with datives,

and datives only combine with 3 accusatives). Some clitic sequences have an opaque structure and others can have more than one interpretation. Any account of cliticization should be able to derive these regularities.

We will begin with the realisation rules (RRs) that are necessary to generate EP pronouns. These can be stated, in a simplified way, as in (18):

- (18) Block I: RR_I {REFL:+} (X) ⇒ [se]
 Block II: i. RR_{II} {1, SG} (X) ⇒ [me]
 ii. RR_{II} {2, SG} (X) ⇒ [te]
 iii. RR_{II} {1, PL} (X) ⇒ [nos]
 iv. RR_{II} {2, PL} (X) ⇒ [vos]
 v. RR_{II} {DAT, 3, SG} (X) ⇒ [lhe]
 vi. RR_{II} {DAT, 3, PL} (X) ⇒ [lhes]
 Block III: i. RR_{III} {ACC, 3, SG, MASC} (X) ⇒ [no/lo/o]
 ii. RR_{III} {ACC, 3, SG, FEM} (X) ⇒ [na/la/a]
 iii. RR_{III} {ACC, 3, PL, MASC} (X) ⇒ [nos/los/os]
 iv. RR_{III} {ACC, 3, PL, FEM} (X) ⇒ [nas/las/as]

Within a realisation view of morphology, inflections exist only after the application of inflectional rules, and it is the rules themselves which associate a given feature content to a phonological form. For EP, rule block I supplies the 3rd singular and plural reflexive pronouns, block II supplies rules for the 1st/2nd pronouns (regardless of case) and for 3rd singular and plural datives; Rule Block III realises the 3rd accusative pronouns.

Rule blocks capture cluster-internal linearisation very naturally. The order in which rule blocks are organised reflects the order in which object pronouns combine. As such, rule block I applies before rule block II, thus capturing that 3 reflexives must precede datives. Similarly, rule block III applies after rule block II deriving datives before 3rd accusatives. When two pronouns co-occur, the rigid order falls out naturally without any additional restrictions, as shown in (19):

- (19) For $\sigma = \{(\text{REFL: +, ACC, 3, SG}); (\text{DAT, 3, SG})\} \Rightarrow$
 (RI ° RII_i) (X) ⇒ < [se-lhe], X >

(19) shows, in a very simplified way, that the combined morphosyntactic features of 3rd reflexive and 3rd dative determine the application of block I and block II in the expected order.

As to co-occurrence restrictions inside the cluster, these are also derived from the ordering of rule blocks. Based on the principle that each rule block can only apply once, pronouns can be prevented from co-occurring if they are assigned to the same block. Rule block II in (18) therefore captures that 1st and 2nd pronouns may never combine with each other. This processual approach then accounts for all restrictions on clitic combinations, except for one, namely the restriction on reflexive-accusative clusters. For this case, a constraint such as (20) must be introduced stating that the realisation of reflexives rules out the occurrence of accusatives (Miller&Sag 1997):

(20) ‘If REFL, then *ACC’

The incidence of portmanteau affixes is also a very common in inflectional morphology and can be found in pronominal clusters. For e.g., in EP, as mentioned earlier (cf. section 2.1), the combination of dative pronouns (except 1/2pl) with 3rd accusatives takes the form of an unanalysable affix. In our proposal, the status of affixes realising two (or more) exponents is captured by the rules given in (21) which associate one affix simultaneously with the morphosyntactic features pertaining to two affixes.

(21) Block IV: $R_{II/III}$ i. {(DAT, 1, SG); (ACC, 3, SG, MASC)} (X) \Rightarrow [mo]
 ii. {(DAT, 1, SG); (ACC, 3, PL, MASC)} (X) \Rightarrow [mos]
 iii. ...

Crucially, portmanteau rules are in paradigmatic opposition with the rules realising each pronoun individually and therefore pre-empt their ordered application, in accordance with the Maximal Subset Override (Stump 2001).

Syncretism is another typical inflectional phenomenon and develops when one affix (i.e., its phonological form) has more than one morphosyntactic value. As mentioned before, in EP the plural interpretation of the 3rd dative pronoun is neutralised when 3rd plural datives combine with 3rd accusatives. To derive ‘3 dative syncretism’ (cf. section 2.1), we assume that, for e.g., the rule for *lho* realises the feature specification {DAT, 3} rather than the specification {DAT, 3, SG}, as shown in (22). This solution then derives the observed homophony, by generating one phonological form for both the plural and singular interpretation:

(22) Block IV: $R_{II/III}$ i. {(DAT, 3); (ACC, 3, PL, MASC)} (X) \Rightarrow [lhos]
 ii. {(DAT, 3); (ACC, 3, SG, FEM)} (X) \Rightarrow [lha]
 iii. ...

One further affix-like property of EP pronouns is the incidence of allomorphy in the verb-enclitic combination. Starting with pronominal allomorphy, it was mentioned earlier that the form of the 3rd accusative is dependent on a complex combination of phonological and morphosyntactic properties of the preceding verb: a) the *n*-form is selected if the verb is 3pl, b) the *l*-form follows verbs ending in -s, -z, -r, and, finally, c) the vowel initial accusative is selected by default. In our proposal, we capture the various alternants by enriching the inflectional rules in Block III (cf. (18)) with information about the grammatical and phonological contexts that influence the realisation of 3rd accusative pronouns, as shown in (23):

(23) Block III: i. RR_{III} {ACC, 3, SG, MASC} (X) \Rightarrow [o]
 a. [n-], before 1pl verb
 b. [l-], before -s/-z/-r

Which allomorph gets realised is also determined by the linearisation rules which place the pronoun in preverbal or postverbal position (cf. 5.2).

Finally, as to the phonological alternations on the verb, two types of stem allomorphy have been identified: a) consonant-final verbs lose their final consonant when followed by an *l*-accusative, and b) the 2pl marker gets deleted if the following pronoun is either 1st pl or 2nd pl. It is worth noting again, that the factors determining the allomorphy refer to a restricted class of word categories (i.e., verbs and pronominal clitics) and to specific grammatical features of the verb and the pronoun.

To capture the data, two rules are introduced which express the association between the inflectional rules realising/linearising pronominal affixes and the morphophonological regularities induced by them. Simplifying somewhat, these morphophonological metageneralisations can be formulated as follows (Stump 2001):

- (24) Where $V=X$,
- i) 'If X ends in -s, -z or -r and if X is followed by an accusative suffix, then the final consonant is absent'
 - ii) 'If X is 1pl and if X is followed by a 1st/2nd pl pronominal suffix, then the final -s consonant must be deleted'⁵

5.4 The cluster as a morphological unit

Having shown how the structural properties of the cluster can be derived within realisational morphology, this section briefly addresses the behaviour of the clitic cluster as a morphological unit. It is well-known that clusters can never be broken up, and that the order of clitic inside the cluster remains the same regardless of whether the cluster is placed before or after the host (Anderson 1992). Both of these properties are an indication that clitic sequences must be analysed as an autonomous unit. In this paper, the idea that sequences of affixes behave as one whole is formalised by deriving the cluster as a composed unit through function composition, adopting PFM (Stump 1992, Spencer 2001)⁶.

Standardly, a sequence of realisation rules applies in a cyclic fashion such that each rule applies to the output of the previous rule. For cluster formation, the cyclic application has two shortcomings. If clitics were attached one-by-one to an anchor point, then preverbal clitics would be realised as prefixes whereas postverbal clitics would be linearised as suffixes. This would make it difficult to explain why the order of clitics inside the cluster is always the same, regardless of placement. Furthermore, attaching each clitic individually to the verb would also fail to explain why the cluster cannot be broken up.

The crucial aspect about deriving the clitic cluster as a composed unit is that clitics can be linearised without reference to a base or stem, as shown in (25).

- (25) For $\sigma = \{ \text{Refl+}, \text{Acc}, \text{3sg}; \text{Dat}, \text{3sg} \}$,

⁵ The metageneralisations proposed here bear a certain resemblance to the insertion contexts in Vigário (1999b). That is simply because the same factors are being addressed, however the rules here apply to morphological units and are part of the morphological derivation of the suffixed verb form.

⁶ For reasons of space, only an outline of the proposal made in Luis (2001) is provided.

$$\begin{aligned} \text{PF}(X, \sigma) &=_{\text{def}} (\text{R}_I \circ \text{R}_{II}) (X) \Rightarrow \\ (\text{R}_I \circ \text{R}_{II}) (X) &\Rightarrow \langle [\text{se-lhe}] \rangle (X) \end{aligned}$$

From the derivation in (25) it follows that cluster formation and cluster placement are independent processes. This idea is formalised by providing two sets of rules: cluster formation is carried out by the realisation rules in (18) and (25) which define the sequence of affixes, whereas cluster placement is determined by an independent set of linearisation rules, given in (26), which determines the linear ordering of the cluster with respect to the verb.

- (26) a. LR-preverbal: [se-lhe] is linearised as $\langle X [\text{se-lhe}] \rangle$, if certain conditions hold⁷
 b. LR-postverbal: [se-lhe] is linearised as $\langle [\text{se-lhe}] X \rangle$, elsewhere

This analysis, then, captures elegantly the fact that the same clitic sequence, as a morphological unit with an invariant order, can attach before or after the host.

Finally, the two-step derivation of clusters makes no claims as to the exact status of X , i.e. the host, in (26). In this sense, the linearisation rules may either attach the cluster to a syntactic head (e.g. the verb) or they may position it with respect to a phrasal domain. Within the morphology, the former would be analysed as a case of head attachment, whereas the latter would be a typical case of phrasal affixation. This then predicts that cross-linguistically clusters may attach to different types of hosts. More importantly, it also predicts that the same cluster could in principle attach to both a syntactic head and a phrasal domain. Clitic placement in EP illustrates exactly this type of non-uniform attachment, as proposed in Luís & Sadler (to appear).

6. Conclusion

The first of goal of this paper was to show that object pronouns in EP display many of the properties of affixes (Spencer 1992, Crysmann 1997, Luís 2001). The decisive criteria for our characterisation were a) rigid ordering, b) idiosyncratic co-occurrence restrictions, c) fusion, d) syncretism, e) allomorphic variation, and f) allomorphic alternations within the verb-enclitic unit. It was then argued that a precompiled analysis of the morphophonological effects of the data, as is assumed by Vigário (1999b), necessarily faces conceptual shortcomings because of the morphosyntactic nature of the data. As an alternative proposal, a brief outline of a morphological analysis was provided which derives i) the internal structure of pronominal sequences and ii) the idiosyncratic behaviour of postverbal pronouns. It was shown that clitic order and co-occurrence restrictions are derived through the linear ordering of inflectional rules, and that pronominal/verbal allomorphy follow from rules of affix selection and stem formation, respectively.

⁷ Cf. Luís&Sadler (to appear).

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The importance of being Onset

Clàudia Pons

In Balearic Catalan, verbal forms that correspond to the first person of present indicative do not show an explicit inflectional morph, unlike most dialects of Catalan. Among these forms we can find final consonantal clusters that involve a violation of the restrictions imposed by the sonority scale, according to which the degree of sonority between the segments of a syllable must be decreasing in relation to the nucleus. Furthermore, these final consonantal groups also exhibit a peculiar behavior with respect to the nominal forms. In previous approaches, these verbal clusters have been analyzed as the onsets of an empty nucleus. In this paper we are going to investigate the problems derived from this kind of approach and prove they are better analyzed by considering paradigmatic effects, such as uniformity and contrast between the members of a paradigm.

1. Introduction

Balearic is the Catalan dialect spoken in the Balearic Islands and is composed by three subdialects, Majorcan, Minorcan and Eivissan Catalan. Balearic is probably the most differentiated dialect of Catalan due to the isolation that their inhabitants have been subjected to. In this paper we are going to analyze one of the features that confers more singularity to this dialect: the behavior of the verbal forms corresponding to the first person singular of present indicative.

Final consonantal clusters of the verbal forms that correspond to the first person of present indicative, which in Balearic do not show any explicit inflectional morph, often involve a violation of the syllabic restrictions imposed by the sonority scale. This can be seen in the examples of (1a). An epenthetic final vowel ([ə]) is inserted in the nominal forms that are not properly constructed from a syllabic point of view (1b); however, first person singular verbal forms with a similar structure are maintained although they violate the sonority hierarchy (1a).

(1) Balearic Catalan

a. verbal forms

alegr /əlegr/ [ə.'lekr] '(I) amuse'
compr /kompr/ ['kompr] '(I) buy'

b. nominal forms

magre /magr/ ['ma.ɣrə] 'skin'
timbre /timbr/ ['tim.brə] 'bell'

<i>entr</i>	/entr/	[¹ ɛ̃n̩tr̩]	‘(I) enter’	<i>centre</i>	/sentr/	[¹ sen̩.trə]	‘center’
<i>mescl</i>	/mɛskl/	[¹ mɛskl]	‘(I) mix’	<i>mascle</i>	/maskl/	[¹ mas.klə]	‘male’
<i>mostr</i>	/mɔstr/	[¹ mɔstr̩]	‘(I) show’	<i>mestre</i>	/mɛstr/	[¹ mɛs.trə]	‘teacher’

Except for Alguer Catalan, in the rest of Catalan dialects the verbal forms that correspond to the first person of present indicative exhibit an inflectional morph ([u], [o] or [e] depending on the dialect), which is the nucleus of these consonantal clusters; therefore, in these dialects there are no problems of syllabification.

Furthermore, there are first person present indicative forms that violate the syllabic restrictions of sonority because they show final consonantal clusters with the same degree of sonority (2a). The same final sequences in nominal forms require the insertion of an epenthetic vowel (2b).

(2) Majorcan and Minorcan Catalan

a. verbal forms			b. nominal forms		
<i>adopt</i>	[ə.ˈðott]	‘(I) adopt’	<i>concepte</i>	[kun.ˈset.tə]	‘concept’
<i>design</i>	[dɛ.ˈzinn]	‘(I) design’	<i>signe</i>	[ˈsin.nə]	‘sign’
<i>condemn</i>	[kun.ˈdenn]	‘(I) condemn’	<i>solemne</i>	[su.ˈlen.nə]	‘solemn’

Catalan also avoids codas with a glide plus a sonorant. The list is limited to a few borrowed words such as *gasoil* (‘gas oil’) and *rail* (‘rail’), learned words such as *linòleum* (‘linoleum’), or archaisms such as *saure* (‘dark yellow’). The avoidance of this type of segmental combinations in Catalan explains the insertion of a final epenthetic vowel in most cases, as we can see in (3b). However, in Balearic Catalan it is possible to find first person present indicative verbal forms that end in one of these combinations of glide plus sonorant (3a).

(3) Balearic Catalan

a. verbal forms			b. nominal forms		
<i>entaul</i>	[ən̩.ˈtaw̩]	‘(I) strike up’	<i>retaula</i>	[rə.ˈtaw̩.lə]	‘altarpiece’
<i>restaur</i>	[rəs.ˈtaw̩r]	‘(I) restore’	<i>centaure</i>	[sən̩.ˈtaw̩.rə]	‘centaur’
<i>lliur</i>	[ˈliw̩r]	‘(I) deliver’	<i>lliure</i>	[ˈliw̩.rə]	‘free’

Apart from these cases, which are cases of underapplication of a general process of the language, i.e. epenthesis, there are first person present indicative forms that exhibit an unexpectedly behavior within the patterns of Minorcan dialect. These are typical cases of overapplication of a process. In Minorcan Catalan regressive place assimilation only applies if the second consonant of a cluster is placed in onset position, either due to syllabification —as in *accent* ‘accent’ (4a)— or due to resyllabification —as in *lloc segur* ‘safe place’ or in *pocs amics* ‘few friends’ (4a). On the contrary, regressive place assimilation does not take place on final position, precisely because the second consonant of the group is not in onset position, but in coda position, as we can see in (4b). Note that this behavior shows up clearly in the contrast between a sequence such as *pocs* ‘few’ (4b), without assimilation, with a sequence such as *pocs*

amics ‘few friends’ (4a), in which regressive place assimilation applies precisely because the *s* in *pocs* is syllabified in onset position, due to resyllabification. Against this generalization, though, in this dialect there is regressive place assimilation in the consonantal endings that correspond to the first person singular of present indicative (4c).

(4) Minorcan Catalan

a. nominal forms (C2=onset position)

<i>accent</i>	/əksent/	[ət.tsent]	‘accent’
<i>lloc segur</i>	/lək##səgur/	[,lət.tse.ˈɣu]	‘safe place’
<i>pocs amics</i>	/pək+z##əmig+z/	[,pəd.dzə.ˈmiks]	‘few friends’

b. nominal forms (C2=coda position)

<i>pocs</i>	/pək+z/	[ˈpəks]	‘few’
<i>fax</i>	/faks/	[ˈfaks]	‘fax’
<i>llums</i>	/lum+z/	[ˈlum]	‘lights’

c. first person singular of present indicative verbal forms (C2=coda position)

<i>fix</i>	/fiks/	[ˈfɪts]	‘I fix’
<i>relax</i>	/rəlaks/	[rə.ˈlats]	‘I relax’
<i>prems</i>	/prems/	[ˈprens]	‘I press’

2. Previous approaches

The special behavior of first person singular present indicative verbal forms, specially the one shown in (1a) and (2a), has been analyzed in different ways. The first formal analysis of these final consonantal groups can be found in the work of Dols (1993a, 1993b), which deals with different aspects of Majorcan consonantism within the framework of autosegmental phonology. The author bases his analysis on Gussmann (1992), a paper devoted to Polish consonantism. Polish, like Balearic Catalan, presents heavy consonantal final clusters (cf. *naste*[mpstf] ‘consequence gen. plur.’). Polish also shows a restriction that bans the presence of non-sonorant consonants in coda position. In order to explain this violation and the presence of heavy clusters, Gussmann proposes to reduce all word-final consonantal clusters to a sonorant in coda position plus a complex onset, which has been desyllabified as a result of vowel deletion. Dols puts forward this approach and analyses these final consonantal clusters of Balearic Catalan as onsets of an empty nucleus. A verbal morpheme (M), corresponding to the first person singular of present indicative, would license this syllabic position without segmental content. Similar structures without this morpheme (M) are subjected to epenthesis.

In an article published in 1995, Dols and Wheeler analyze these final consonantal clusters from a different point of view. They try to simplify the Majorcan syllabic structure to the highest degree by assuming that the syllable is composed exclusively of a nucleus, an onset and a monoconsonantal coda. Any other consonant in final position is considered an onset. Therefore, a group of consonants in word final position is always interpreted as a unique coda-consonant plus an onset composed of one or two consonants. Although a

syllabic nucleus is what universally tends to license an onset, the authors propose that it may also be licensed by the right edge of a prosodic domain. Note that an important difference with regard to Dols (1993a, 1993b) proposal is that the morpheme (M) no longer licenses these onsets but the right edge of a prosodic domain.

This proposal, although very attractive at first sight, has some problems derived from the overgeneralization of certain structures. In fact, their analysis is led by the facts of these special (and exceptional) cases, while regular forms become exceptional. That is the case of forms such as *timbre* ‘ring’ or *magre* ‘skin’ (cf. 1b), which have an underlying structure identical to that of first person singular present indicative verbal forms but require the insertion of an epenthetic vowel (/timbr/ [t̪im.brə], /magr/ [ma.ɣrə]). The authors, in order to explain the fact that first person endings do not require epenthesis, argue that these final vowels in nominal forms are either cases of insertion morphophonologically conditioned to nominal inflection, or that they are not inserted but are different allomorphs of the masculine morpheme. Considering these forms exceptional and subjected to a morphophonological rule entails the unnecessarily overloading of the lexicon. For that reason, it seems more convincing, as Dols states in earlier works, to propose that it is the morpheme M (of first person singular of present indicative) what licenses these final consonantal groups.

In fact, an analysis along these lines within Optimality Theory is what Serra (1996) proposes. This author provides an interpretation of these final consonantal groups by assuming the existence of an *extrasegmental* morpheme (that is, a morpheme without segmental content) in the forms which correspond to the first person of the present indicative. This morpheme would license those structures which are not well-formed from a syllabic point of view (1a, 2a and 3a). Under this proposal, the absence of this extrasegmental morpheme in the nominal forms (1b, 2b and 3b) explains the insertion of the epenthetic vowel.

An inherent problem of the analyses of Dols (1993a, 1993b) and Serra (1996) is that the presence of the extrasegmental morpheme is justified by the special behavior of these consonantal clusters and this special behavior is justified by appealing to the presence of an extrasegmental morpheme. Therefore we inexorably fall into cyclic argumentation. Moreover, the authors have not explored the consequences of such analysis for nominal inflection, where other extrasegmental ‘zero’ morphemes could be posited although this would not interfere with syllabic structure (Pons 2000).

Apart from that, these verbal forms undergo a series of phonological processes that are generally associated with the coda position and not with the onset position. For instance, this is the case of the devoicing process that affects final obstruents; this process applies systematically in final clusters integrated by one, two or three consonants, as can be seen in the following examples.

(5) Balearic Catalan (general)

a.	<i>pos</i>	/pɔz/	[p̪ɔs]	‘(I) put’ (cf. [p̪ɔ.zə] ‘(he/she) puts’)
	<i>acab</i>	/əkab/	[ə.ˈkəp]	‘(I) finish’ (cf. [ə.ˈka.bə] ‘(he/she) finishes’)
	<i>ajud</i>	/əʒud/	[ə.ˈʒut]	‘(I) help’ (cf. [ə.ˈʒu.ðə] ‘(he/she) helps’)

- b. *reserv* /rəzerv/ [rə.'zɛrf] '(I) book' (cf. [rə.'zɛr.və] '(he/she) books')
enfang /ənfang/ [ənŋ.'fɑŋk] '(I) muddy' (cf. [ənŋ.'fɑŋ.gə] '(he/she) muddies')
allarg /əʎarɔ/ [ə.'ʎark] '(I) extend' (cf. [ə.'ʎar.ɣə] '(he/she) extends')
obr /ɔbr/ [ɔ'ɔpr] '(I) open' (cf. [ɔ.'βrɔ] '(he/she) opens')
arregl /ərregl/ [ə.'rɛkl] '(I) repair' (cf. [ə.'rɛg.glə] '(he/she) repairs')
c. *sebr* /sebr/ [sɛmpr] '(I) sow' (cf. [sɛm.brə] '(he/she) sows')
sembl /sebr/ [sɛmpl] '(I) look like' (cf. [sɛm.blə] '(he/she) looks like')

There is another process that affects verbs that end in *-var* in certain Majorcan varieties that also casts doubt on the convenience of treating these forms as onsets of an empty nucleus (Pons 2000). In Catalan, the intervocalic [v] (or [β] in case of dialects which do not have the voiced labiodental fricative phoneme) generally alternates with a labiovelar glide in final position. In the Majorcan dialect, verbal forms with an intervocalic [v] can show, as demonstrated in (6), two types of behavior when this consonant is placed in final position: either this [v] is realized unvoiced, as shown in the examples of (6a), or this [v] is realized as a labiovelar glide, as shown in the examples of (6b). In fact, the latter is the general behavior that these segments show in nominal forms, as the examples in (6c) illustrate.

(6)

a. Majorcan and Minorcan Catalan

- prov* [pɾɔf] '(I) try' (cf. [pɾu.'va]~[pɾo.'va] 'to try')
aprov [ə'pɾɔf] '(I) approve' (cf. [ə.pɾu.'va]~[ə.pɾo.'va] 'to approve')
cav [kaf] '(I) dig' (cf. [kə.'va] 'to dig')

b. Majorcan Catalan (some varieties)

- prov* [pɾɔw] '(I) try' (cf. [pɾu.'va]~[pɾo.'va] 'to try')
aprov [ə'pɾɔw] '(I) approve' (cf. [ə.pɾu.'va]~[ə.pɾo.'va] 'to approve')
cav [kaw] '(I) dig' (cf. [kə.'va] 'to dig')

c. Catalan (nominal forms)

- meva~meu* [mɛ.va], [mɛ.βə]~[mɛw] 'mine fem.~masc.'
neva~neu [nɛ.və], [nɛ.βə]~[nɛw] 'it snows~snow'

None of the aforementioned studies refers to this kind of alternation in final position, which is clearly associated to final position. If these final consonants are considered onsets of an empty nucleus they should not alternate, because this behavior is only related to the coda position.¹ To sum up, the convenience of treating these final forms as onsets is not clear at all, because, as the last

¹ In the analysis proposed by Dols & Wheeler (1995), in which the presence of the structures that are not well-formed from a syllabic point of view is not justified by the presence of an empty nucleus, but simply by the right edge of a prosodic domain, the lack of voice in these cases is justified because these consonants are in the coda position before the eventual transference to the onset position. And it is in this position where the voice features disappear. This approach exhibits contradictory derivations in the context of the language that for expository reasons we will not refer to and it is insufficient to explain the lack of voice in cases like *reserv* [rə.'zɛrf] '(I) book', *allarg* [ə.'ʎark] '(I) extend' or *sebr* [sɛmpr] '(I) sow', where the final obstruents are never associated to the coda position.

examples have proved, the lack of voicing segments and the presence of [w] also affect consonantal segments associated to the onset position according to these proposals.

3. Paradigmatic effects

The analysis we propose is to consider that first person singular present indicative verbal forms exhibit a different syllabification with respect to the nominal forms because of the pressure that other forms exert in the context of the same paradigm. The pressure can either work by contrast—in which case homophony is avoided—or by analogy—in which case the shared stem tends to homogenization. The lack of these paradigmatic pressures in nominal inflection explains the application of the regular phonological processes of the language.

Recently, these kinds of paradigmatic pressures have been discussed in the framework of Optimality Theory by different authors with the same purpose in mind: to give an account for the surface similarities and differences among morphologically related words, that is, between the members of a paradigm.

Up to now, constraints with uniformity effects have been largely explored from different perspectives.

In order to explain this kind of behavior, Kenstowicz (1996) proposes two different constraints, *BASE-IDENTITY* and *UNIFORM EXPONENCE*. The former explains those cases where an immediate constituent, the base, exerts pressure over its derived form, motivating either the underapplication or the overapplication of a process. The latter, on the contrary, explains those cases where there is no base that exerts pressure or those cases where it is the base form the one which is modified due to the pressure of a derived form. As pointed out in McCarthy (2001), this later approach to surface resemblances is inherently symmetric because none of the forms morphologically related has priority among the others, so that any form can be modified.

According to Benua's (1997) *Transderivational Correspondence Theory*, which deals basically with derivational morphology, the relation between the words subjected to uniformity is expected to be asymmetric, since there is a base, the simple word, to which the derived forms are faithful.

In McCarthy (2001), it is argued that within inflectional morphology only symmetric relations between the members of a paradigm are possible, which means that any form of the paradigm can be the one which exerts the pressure. In order to formalize pressures between the members of an inflectional paradigm, the author proposes the *Optimal Paradigms model*. According to this model, candidates consist of entire inflectional paradigms, which are all subjected to markedness and I-O faithfulness constraints. The members of the paradigm also stand in a surface correspondence, which is materialized by a set of O-O faithfulness constraints.

Paradigmatic homophony avoidance, on the other hand, has been formalized by Crosswhite (1997), who appeals to an *ANTI-IDENT* constraint

responsible for the blocking of vowel reduction in a dialect of Bulgarian and in Standard Russian when it would create homophone words within a paradigm. Similarly, Kenstowicz (to appear) proposes a PARADIGMATIC CONTRAST constraint which ensures that ‘two morphologically distinct members of the paradigm remain phonetically distinct’.

We should point out that what uniformity and contrast constraints have in common is that they apply within a paradigm, that is, among a set of forms that share a stem. However, whereas uniformity constraints are only sensitive to the shared morpheme of a paradigm, constraints which express contrast are sensitive to the whole inflected form.

In this paper, we are going to prove how the special phonological behavior of the verbal forms exposed in § 1 can be explained appealing to such paradigmatic relations. We are going to show, first, how the lack of epenthesis in the verbal forms exposed in (1a), (2a) and (3a) can be analyzed as the result of the effect of a constraint that bans the presence of identical forms in the same paradigm.

First of all, we must give an account for the nominal forms listed in (1b), (2b) and (3b), which exhibit a regular behavior, that is, with the insertion of an epenthetic vowel (cf. *timbre* /timbr/ [t̪im.br̪] ‘bell’). To explain the syllabification of these nominal forms, we need those markedness constraints which ensure a proper syllabification in Catalan, that is *P/C, according to which only a vowel can be the nucleus of a syllable, and the SONORITY SEQUENCING PRINCIPLE, according to which the sonority between the segments of a syllable must be decreasing with respect to the nucleus.

(7) *P/C: C may not associate to Peak (Nuc) nodes (Prince & Smolensky 1993)

(8) SONORITY SEQUENCING PRINCIPLE: Between any member of a syllable and the syllable peak, only sounds of higher sonority rank are permitted (Clements 1990)

A constraint banning intrasyllabic clusters integrated by a glide plus a sonorant is also active in Catalan dialects. For simplicity, we collapse these specific constraints under the constraint σ STRUCT. In Catalan, this constraint is undominated with respect to the correspondence constraint that prohibits epenthesis (DEP-IO) but not with respect to the correspondence constraint that bans deletion (MAX-IO), so that deletion is not the strategy selected to satisfy syllabic restrictions exposed above.² Since epenthesis is always peripheral in Catalan, the CONTIGUITY constraint, which prevents from morpheme internal insertion or deletion, must be high-ranked, so that the candidate with external epenthesis is selected as the optimal, as it can be seen in the tableau of (12).³

² Jiménez (1997, 1999), which deals with other phenomena of Catalan, argues that the constraint which prevents from deletion due to syllabic restrictions is Max-F.

³ If we take into account the whole data of these dialects, other interacting constraints such as *CCC]σ should be included. For the sake of simplicity, we exclude them.

- (9) DEP-IO: Every segment in S_2 has a correspondent in S_1 (Epenthesis is prohibited). (See McCarthy & Prince 1995)
- (10) MAX-IO: Every segment of S_1 has a correspondent in S_2 (Deletion is prohibited). (See McCarthy & Prince 1995)
- (11) CONTIGUITY-IO: The portion of S_1 standing in correspondence forms a contiguous string, as does the correspondent portion of S_1 . (Morpheme epenthesis and deletion of segments are prohibited) (See McCarthy & Prince 1995)

(12) *timbre* /timbr/ [ˈtim.brə] ‘bell’

/timbr/	CONTIGUITY	MAX-IO	σ STRUCT	DEP-IO
☞ a. ˈtim.brə				*
b. ˈtimpr.			*!	
c. ˈtimp.		*!		
d. ˈtim.bər	*!			*

The same ranking for a verbal form like /ɛmpr/ ‘(I) use’, with a similar underlying structure as /timbr/ ‘bell’, would predict the selection of the wrong candidate as the optimal, as we can see in the following tableau.

(13) /ɛmpr/ [ˈɛmpr] ‘(I) use’

/ɛmpr/	CONTIGUITY	MAX-IO	σ STRUCT	DEP-IO
☞ a. ˈɛm.prə				*
b. ˈɛmpr.			*!	
c. ˈɛmp.		*!		
d. ˈɛm.pər	*!			*

We need an explanation for the lack of vowel insertion in the case of the first person singular present indicative verbal forms. In fact, there is. Epenthesis does not take place in these cases because this would produce a form identical to another form of the same paradigm: the third person singular of present indicative (/ɛmpr+ə/ [ˈɛmprə]), where the final schwa is the tense morph of the verbs of the first conjugation of verbs in Catalan. In order to understand this behavior, we list the whole paradigm of this verb below.

(14) Present indicative paradigm of *emprar* ‘to use’

<i>empr</i>	[ˈɛmpr]	/ɛmpr/	‘(I) use’
<i>empres</i>	[ˈɛm.prəs]	/ɛmpr+ə+z/	‘(you) use’
<i>empra</i>	[ˈɛm.prə]	/ɛmpr+ə/	‘(he/she) uses’
<i>empram</i>	[əm.ˈpram]	/ɛmpr+a+m/	‘(we) use’
<i>emprou</i>	[əm.ˈpraw]	/ɛmpr+a+w/	‘(you) use’
<i>empren</i>	[ˈɛmprən]	/ɛmpr+ə+n/	‘(they) use’

As indicated before, Crosswhite (1997) proposes an ANTI-IDENT constraint which bans the presence in a paradigm of two identical forms, and it is stated as follows.

- (15) **ANTI-IDENT**: For two forms, S_1 and S_2 , where $S_1 \neq S_2$, $\exists \alpha$, $\alpha \in S_1$, such that $\alpha \neq \mathcal{R}(\alpha)$ (Crosswhite 1997)

According to this constraint, given two forms, S_1 and S_2 , there must be some segment α belonging to S_1 such that α is not identical to its correspondent in S_2 . As stated in (15), the forms subject to ANTI-IDENT (S_1 and S_2) must be different. We should point out that it is not always the case that two members of a paradigm have an element which stands in a correspondence relation, as it is the case we are dealing with in this paper. Note, on the other hand, that it is not necessary to make reference to the fact that the forms subject to this constraint must be morphologically or semantically different because the members of an inflectional paradigm inherently have a different morphological structure and, therefore, a different meaning. That is why we propose a more general constraint with similar effects, which could be stated as follows.

- (16) **PARADIGM CONTRAST (PC)**: “For n members of a paradigm $X \exists n$ surface realizations that are different for at least one property” (Identical forms in a paradigm are prohibited)

In a form such as /empr/ ‘(I) use’, the insertion of the epenthetic vowel is blocked in order to avoid that the resultant form was identical to another form that already exists in the same paradigm. The constraint responsible for the blocking of epenthesis is PC, which bans the presence of identical forms in a paradigm. As we can see in the following tableau, the candidate with epenthesis is discarded because it is identical to another form of the paradigm, and, because of this, it ends up violating PC. Deletion of the final consonant (17c) or the medial epenthesis (17d) are not possible strategies to satisfy PC because MAX-IO and CONTIGUITY are high-ranked constraints in Catalan (See, for example, Colina 1995, Bonet & Lloret 1996, 2001, Serra 1996, Jiménez 1997, 1999). That is why the blocking of epenthesis is the strategy selected to satisfy PC in spite of σ STRUCT constraints.

(17) *empr* /empr/ [ˈempr] ‘(I) use’

/empr/	CONTIGUITY	MAX-IO	PC	σ STRUCT	DEP-IO
a. ˈem.prə			*!		*
☞ b. ˈempr.				*	
c. ˈemp.		*!			
d. ˈem.pər	*!				*

This kind of approach would give a satisfactory explanation for forms such as the one seen in (2), *adopt* [ə.ˈðott] ‘(I) adopt’, and (3), *lliur* [ˈliwr] ‘(I) deliver’,

as we can see in the following tableaux. We list the whole paradigm of these verbs before each tableau.

(18) Present indicative paradigm of *adoptar* ‘to adopt’

<i>adopt</i>	/ədɔpt/	[ə.ˈdɔt]	‘(I) adopt’
<i>adoptes</i>	/ədɔpt+ə+z/	[ə.ˈdɔt.təs]	‘(you) adopt’
<i>adopta</i>	/ədɔpt+ə/	[ə.ˈdɔt.tə]	‘(he/she) adopts’
<i>adoptam</i>	/ədɔpt+a+m/	[ə.ðut.ˈtam]	‘(we) adopt’
<i>adoptau</i>	/ədɔpt+a+w/	[ə.ðut.ˈtaw]	‘(you) adopt’
<i>adopten</i>	/ədɔpt+ə+n/	[ə.ðot.ˈtən]	‘(they) adopt’

(19) *adopt* /ədɔpt/ [əˈdɔt] ‘(I) adopt’

/ədɔpt/	CONTIGUITY	MAX-IO	PC	σ STRUCT	DEP-IO
a. ə.ˈdɔtə			*!		*
☞ b. ə.ˈdɔt				*	
c. ə.ˈdɔt		*!			
d. ə.ˈdɔ.pət	*!				*

(20) Present indicative paradigm of *lliurar* ‘to deliver’

<i>lliur</i>	/liwɾ/	[ˈliwɾ]	‘(I) deliver’
<i>lliures</i>	/liwɾ+ə+z/	[ˈliw.rəs]	‘(you) deliver’
<i>lliura</i>	/liwɾ+ə/	[ˈliw.rə]	‘(he/she) delivers’
<i>lliuram</i>	/liwɾ+a+m/	[liw.ˈram]	‘(we) deliver’
<i>lliurau</i>	/liwɾ+a+w/	[liw.ˈraw]	‘(you) deliver’
<i>lliuren</i>	/liwɾ+ə+n/	[ˈliw.rən]	‘(they) deliver’

(21) *lliur* /liwɾ/ [ˈliwɾ] ‘(I) deliver’

/liwɾ/	CONTIGUITY	MAX-IO	PC	σ STRUCT	DEP-IO
a. ˈliwɾə			*!		*
☞ b. ˈliwɾ				*	
c. ˈliw		*!			
d. ˈliwəɾ	*!				*

The consonants in these final clusters are associated with coda position, and thus they are expected to undergo the typical processes associated with this position, that is, syllable-final devoicing. As we can see in the following tableau, the ranking of IDENTONSET(voice), which ensures the preservation of the laryngeal features of the segment associated with the onset position, above the markedness constraint *VOICEDOBSTRUENT, which penalizes voiced obstruents, explains the voicing alternations seen in the examples of (5).

(22) *VOICEDOBSTRUENT: Voiced obstruents are prohibited. (See Beckman 1998)

(23) IDENTONSET(voice): Onset segments and their input correspondents must agree in voicing. (See Beckman 1998, Lombardi 2001)

(24) IDENT(voice): The specification for voice of an input must be preserved in its output correspondent. (See McCarthy & Prince, Beckman 1998)

(25) *obr* /ɔbr/ [ˈɔpr] ‘(I) open’

/ɔbr/	IDENTONSET(voice)	*VOICEDOBSTRUENT	IDENT(voice)
a. ˈɔbr		*!	
☞ b. ˈɔpr			*

(26) *reserv* /rəzerv/ [rəˈzɛrf] ‘(I) book’

/rəzerv/	IDENTONSET(voice)	*VOICEDOBSTRUENT	IDENT(voice)
a. rəzɛrv		*!	
☞ b. rəzɛrf			*

We will give an account now for the unexpectedly assimilation in final position that we find in first person present indicative verbal forms in Minorcan Catalan, where regressive place assimilation never applies in final position. The constraint responsible for place assimilation is AGREE(place), which is stated below:

(27) AGREE(place): Adjacent consonants have the same specification for place articulation

In Majorcan and Minorcan Catalan, where regressive place assimilation is really common, this constraint is very high-ranked with respect to the one which prevents from changes of place articulation between the input and the output segments, that is IDENT(place). This can be seen in the tableau of (29), where the markedness constraint AGREE(place) is ranked above IDENT(place), and thus the candidate with regressive place assimilation is selected.

(28) IDENT-IO(place): The specification for place articulation of an input must be preserved in its output correspondent (See McCarthy & Prince 1995).

(29) *poc segur* /pɔk##səɣur/ [pɔt.t͡sə.ˈɣu]

/pɔk##səɣur/	AGREE(place)	IDENT(place)
☞ a. [pɔt.sə.ˈɣu] ⁴		*
b. [pɔk.sə.ˈɣu]	*!	

As the tableau in (30) express, this ranking should be completed with another constraint which refers to the direction of assimilation, that is

⁴ We don't consider actual candidates with a lengthened affricate because it is not relevant to the purpose of this paper. This lengthening is related to Syllable Contact Law.

IDENTONSET(place). This constraint stands for the maintenance of the place features in the segments that are placed in a strong position, i.e. in onset position. This constraint ensures that the assimilation is regressive and not progressive, so that candidate (30a) is selected as the optimal.⁵

(30) *poc segur* /pɔk##səɡur/ [pɔt.tsə.'ɣu]

/pɔk##səɡur/	IDENTONSET(pl.)	AGREE(pl.)	IDENT-IO(pl.)
☞ a. pɔt.sə.'ɣu			*
b. pɔk.xə.'ɣu	*!		*

We should point out, however, that the constraints given so far are not sufficient enough to explain the facts of Minorcan Catalan, where there is regressive place assimilation only when the second consonant is placed in the onset position. With the constraint ranking proposed above we do not have any means to discriminate forms with or without regressive place assimilation in final position. This can be seen in the next tableau, where the wrong candidates, (31b) and (31c), are selected as the optimal:

(31) *pocs* /pɔk+z/ ['pɔks] 'few'

/pɔk+z/	IDENTONSET(place)	AGREE(place)	IDENT(place)
a. 'pɔks		*!	
☞ b. 'pɔts			*
☞ c. 'pɔkx			*

The introduction of a constraint banning that two final consonants share the same specification for place, ranked at the same level as AGREE(place), would give the actual output.⁶

(32) *poc segur* /pɔk##səɡur/ [pɔt.tsə.'ɣu]

/pɔk##səɡur/	IDENTONS (pl.)	AGREE (pl.)	NO-LINK CC]σ	IDENT(pl.)
a. pɔt.sə.'ɣu				*
☞ b. pɔk.sə.'ɣu		*!		
c. pɔk.xə.'ɣu	*!		*	*

⁵ In recent studies devoted to voicing and place assimilation, it has been argued that the reference to syllabic positions is not complete enough to give an account for the assimilation processes (see, for example, Steriade 1999 or Padgett 1995). In fact, the consonants that universally tend to preserve the voice and place features are the one defined as release, that is, the positions where the acoustic cues of voicing and place are more perceptible. For simplicity, we will refer to syllabic positions.

⁶ Another interpretation to these data with similar effects would be to ascribe the lack of regressive place assimilation in final position to the extrasyllabic character of the final <s>, so that AGREE(place) would be vacuously satisfied (cf. 'pɔk<s> vs. 'pɔd.zə.mik<s>).

(33) *pocs* /pɔk+z/ [ˈpɔks] ‘few’

/pɔk+z/	IDENTONS(pl.)	AGREE(pl.)	NO-LINK CC]σ	IDENT(pl.)
↷ a. pɔks		*		
b. pɔts			*	*!
c. pɔkx			*	*!

With the set of constraints given so far, we could hardly explain, however, regressive place assimilation in a case such as *fix* [ˈfɪts] ‘(I) fix’ (5c), where the two final consonants are placed in coda position and, therefore, regressive place assimilation is not expected. The presence of assimilation in these verbal forms could be explained by appealing to a constraint responsible for the uniformity of the paradigm. As we show in the next examples, all the other forms of the paradigm exhibit assimilation precisely because in all these cases the second consonant of the cluster is syllabified in onset position.

(34) Present indicative paradigm of *fixar* ‘to fix’ in Minorcan Catalan

<i>fixes</i>	[ˈfit.ʦəs]	‘(you) fix’	<i>relaxes</i>	[rə.ˈlat.ʦəs]	‘(you) relax’
<i>fixa</i>	[ˈfit.ʦə]	‘(he/she) fixes’	<i>relaxa</i>	[rə.ˈlat.ʦə]	‘(he/she) relaxes’
<i>fixam</i>	[fit.ʦam]	‘(we) fix’	<i>relaxam</i>	[rə.lət.ʦam]	‘(we) relax’
<i>fixau</i>	[fit.ʦaw]	‘(you) fix’	<i>relaxau</i>	[rə.lət.ʦaw]	‘(you) relax’
<i>fixen</i>	[ˈfit.ʦən]	‘(they) fix’	<i>relaxen</i>	[rə.ˈlət.ʦən]	‘(they) relax’

The pressure that all these forms exert over the first person singular form (/fiks/) explains regressive place assimilation in this context, where, according to the regular behavior, is not expected. This would be a case of overapplication of a process due to the pressure of the rest of the forms of the paradigm. The constraint responsible for this special behavior would be a paradigm uniformity constraint which ensures that the correspondent segments belonging to the shared stem have the same value for a concrete property, in this case, place of articulation.

Following the Optimal Paradigms model proposed by McCarthy (2001), the constraint responsible for the overapplication of regressive place assimilation in a case like *fix* [ˈfɪts] ‘(I) fix’ would be OP-IDENT(place), according to which the output correspondents must agree in place of articulation. In the rest of the members of the paradigm, regressive place assimilation is explained through the markedness constraint AGREE(place); it is due to the OP-IDENT(place) constraint, however, that a form such as *fix* [ˈfɪts] ‘(I) fix’ exhibits regressive place assimilation, in spite of the syllabic position of the consonants of the cluster. This can be seen in the next tableau, where all the members of the paradigm are subjected to I-O faithfulness, markedness and OP constraints:

(35)

/fiks/	IDENTONS (pl.)	AGREE(pl.)	NO-LINK CC]σ	OP- IDENT(pl.)	IDENT(pl.)
a. <fiks, 'fitsəs, 'fitsə...>		*		*!	*****
b. <fɪts, 'fɪtsəs, 'fɪtsə...>			*		*****
c. <fiks, 'fiksəs, 'fiksə...>		*****!			

The paradigm candidate with the form without regressive place assimilation acting as the attractor, (35c), cannot be the winner because it involves multiple fatal violations of the markedness constraint AGREE(place). The paradigm candidate with alternations for the place feature, (35a), is also excluded because OP-IDENT(place)⁷ is crucially ranked above IDENT(place). The winner candidate is the one that satisfies both AGREE(place) and OP-IDENT(place) constraints, (35b), in spite of the syllabic position of the cluster.

We should explore now the consequences that such paradigmatic constraints have in the voice alternations shown in forms like *obr~obra* [ˈɔpr]~[ˈɔbrə] ‘(I) open~ (he/she) opens’ (cf. 6); the lack of devoicing due to the pressure of the members of the paradigm is not possible because it would imply a violation of the high-ranked constraint *VOICEDOBSTRUENT.⁸ The overapplication of the process in the forms of the paradigm where the obstruent is placed in the onset position is neither possible because, as stated before, the IDENTONSET(voice) constraint is ranked above the *VOICEDOBSTRUENT constraint and, therefore, above the OP-IDENT(voice) constraint. Unlike the case of place assimilation, we have voicing alternations within the paradigm, as the high-ranked *VOICEDOBSTRUENT and IDENTONSET(voice) constraints cannot be violated to satisfy paradigmatic constraints.

4. Concluding remarks

In this paper we have investigated the special behavior that final consonantal clusters of first person present indicative verbal forms exhibit with respect to the nominal forms in Balearic Catalan. We have shown that this special behavior can be explained through the pressure that other forms exert in the context of the same paradigm. This pressure can either work by contrast—in which case homophony is avoided—or by analogy—in which case the shared stem tends to homogenization. A constraint which prevents from having phonetically identical forms within a paradigm explains the underapplication of epenthesis. A constraint that ensures the uniformity of the stem shared by the

⁷ If we consider the whole present indicative paradigm, the candidate (35a), with 5 forms with assimilation ([ts]) and 1 without ([ks]), exhibits 10 violations (5*1*2) of the OP-IDENT(pl.) constraint. Candidate paradigms with other place alternations, such as <fiks, 'fiksəs, 'fiksə, 'fit'sam, 'fit'saw, 'fitsən>, are ruled out due to the activity of the AGREE(place) constraint.

⁸ As justified in McCarthy (2001), only overapplication of a process is possible due to the pressure of the members of an inflectional paradigm.

members of the paradigm, on the other hand, explains the overapplication of regressive place assimilation.

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Ablaut and Umlaut

What they have in common, what distinguishes them.

Elisabeth Rieder & Anita Schenner

The aim of this paper is to discuss the main properties of New High German Ablaut and Umlaut in the light of concepts that were recently developed within the framework of Government Phonology. It will be shown that Ablaut and Umlaut, although both are instances of process morphology, can not be viewed as the same phenomenon.

1. Introduction

New High German (henceforth NHG) Ablaut and Umlaut are both morphophonological processes. Both are realized on the surface as vowel alternations. Both have a grammatical function. Nevertheless, it is assumed that Ablaut and Umlaut are different grammatical tools. In this paper we will take a closer look at various synchronic properties of the two processes and investigate which characteristics they share and which not.

The theoretical framework for the following analysis is Government Phonology (Harris & Lindsay 1995, Kaye, Lowenstamm & Vergnaud 1985, 1990) under the strict CV-skeleton hypothesis (Lowenstamm 1996).

The paper is organized as follows: in section 2 we are going to give an overview of recent theoretical developments concerning Ablaut phenomena from a universal perspective and the implications for the theory of NHG Ablaut. In section 3 a synchronic analysis of NHG Umlaut is presented. For a thorough understanding of the mechanism at work also a short diachronic background is provided. Section 4 concludes the paper. It recapitulates the main characteristics of Ablaut and Umlaut and gives an account of their relevant differences and similarities.

2. Ablaut

Ablaut is viewed here, put briefly, as a context-free non-arbitrary vowel alternation with grammatically distinctive character.

As was already noted by Kuryłowicz (1956, 1968), Ablaut is a derivational process: the apophonically derived form is a non-arbitrary output. But whereas Kuryłowicz acknowledges the derivational link between two forms related by apophony, he does not postulate any restriction on the possible set of vowel pairs that can be in an apophonic relation. Such a restriction to the possible vocalic participants in apophony exists in recent approaches to apophony (Bendjaballah 1995, 1999, Guerssel & Lowenstamm 1993, 1996, Ségéral & Scheer 1998). Furthermore a universally valid regularity is postulated. This non-arbitrariness or regularity of the morphophonological alternation in question is captured in the so-called Apophonic Path.

2.1. The Apophonic Path

Originally, the Apophonic Path was formulated by Guerssel & Lowenstamm (1993, 1996) to account for vowel alternations that occur in Classical Arabic (henceforth CA) verbal morphology.

(1) CA Measure I¹

<i>Root</i>	<i>Active Perfective</i>	<i>Active Imperfective</i>	<i>Gloss</i>	<i>Alternation</i>
Drb	Dar <u>a</u> b-a	ya-Dri <u>b</u> -u	'beat'	a ~ i
lbs	lab <u>i</u> s-a	ya-lba <u>s</u> -u	'clothe'	i ~ a
ktb	kata <u>b</u> -a	ya-kt <u>u</u> b-u	'write'	a ~ u
kbr	kabu <u>r</u> -a	ya-kbu <u>r</u> -u	'grow'	u ~ u

As can be seen in (1), CA apophony seems to be a rather opaque system. Input *a* yields output *i* and input *i* output *a* (called 'polarity' by Guerssel & Lowenstamm) irrespective of whether one takes the perfective or the imperfective forms as the base form. Furthermore one and the same input can have two different outputs, that is input *a* can have output *i* and *u*, assuming that the direction of derivation is perfective to imperfective, or input *u* can have output *a* and *u*, assuming the opposite direction of derivation, imperfective to perfective ('opacity').

Guerssel & Lowenstamm stipulate the existence of another underlying vocalic element in CA apart from the three surface vowels [a, i, u]. This fourth vocalic element is the null set *∅*. Two assumptions make the apophonic system of CA transparent. The form *Daraba* carries this underlying *∅*, which on the surface is filled by propagation of the vowel to its left. The

¹ Examples are quoted in their 3rd person masculine singular forms.

imperfective, the morphologically more complex form, is derived from the perfective.

(2)

<i>Root</i>	<i>Active Perfective</i>	<i>Active Imperfective</i>	<i>Gloss</i>	<i>Alternation</i>
Drb	Dar ḡ b-a	ya-Dr ī b-u	'beat'	0 ~ i
lbs	lab ī s-a	ya-lb ā s-u	'clothe'	i ~ a
ktb	kat ā b-a	ya-kt ū b-u	'write'	a ~ u
kbr	kab ū r-a	ya-kb ur -u	'grow'	u ~ u

Input *0* yields output *i*, input *i* output *a*, input *a* output *u* and input *u* output *u*. This series of alternations can be represented as an apophonic path:

(3) Apophonic Path: 0 → I → A → U → U

With the formal instrument of the Apophonic Path, the derived vowel is predictable without any ambiguity from the source vowel, i.e. only the source vowel is a lexical entry. It is concerned with alternations of quality only, traditionally termed 'qualitative Ablaut' in Indo-European studies. Alternations in quantity, traditionally termed 'quantitative Ablaut', are not considered to be of an apophonic origin in this framework.

The apophonic path is crosslinguistically unique. It proved to be a valuable instrument for analyzing morphologically conditioned vowel alternations in such diverse languages as e.g. Kabyle Berber (Bendjaballah 1995, 2001), Beja (Bendjaballah 1999), Nepali (Boyé 1996), French and Spanish (Boyé 2000).

2.2. Ablaut in New High German

Ségéral & Scheer (1998) applied the Apophonic Path to one of the most well-known apophonic systems, that of German strong verbs.

The stem vowel of NHG strong verbs alternates in different morphological categories. This morphophonological alternation is supposed to date back to proto-Indoeuropean times. Ablaut is not a productive process in NHG. NHG strong verbs constitute a closed class with about 170 members. Ségéral & Scheer's analysis of NHG Ablaut is carried out on a purely synchronic level.

(4) Examples of NHG strong verbs²

<i>Present</i>	<i>Preterite</i>	<i>Past Participle</i>	<i>Gloss</i>	<i>Surface Alternation</i>
				<i>s</i>

² Here only examples of Ablaut classes are quoted which can be analyzed rather straightforwardly. For the analysis of the more obstinate cases, cf. Ségéral & Scheer (1998).

s <u>in</u> gen	s <u>a</u> ng	ges <u>u</u> ngen	'sing'	i ~ a ~ u
schw <u>im</u> men	schw <u>a</u> mm	geschw <u>o</u> mmen	'swim'	i ~ a ~ o
bi <u>e</u> gen	bo <u>g</u>	geb <u>o</u> gen	'bend'	i ~ o ~ o
he <u>l</u> fen	ha <u>l</u> f	geh <u>o</u> lfen	'help'	e ~ a ~ o
me <u>l</u> ken	mo <u>l</u> k	gem <u>o</u> lken	'milk'	e ~ o ~ o

As can be seen in table (4), the complex vowel system of NHG calls for a theoretical extension to the apophonic theory presented in the previous section. A complex segment like [e] or [o] consists of two fused elements, *A.I* and *A.U* respectively. It has to be clear which part of a complex vowel participates in an apophonic operation. Ségéral & Scheer (1998) propose a distinction between possible entering elements and parasitic elements. An entering element is the input to the first step of an apophonic derivation, i.e. the lexically recorded source vowel, whereas a parasitic element is an element that 'contaminates' the participant of the apophonic operation on the surface. This parasitic element is of a non-apophonic origin, e.g. an Umlaut process etc.. An entering element cannot be a parasitic element and vice versa, that is entering and parasitic elements are in complementary distribution.

A and *U* are parasitic elements in NHG which leaves only *o* and *I* as possible entering elements. In the present both *A* and *U* occur as parasitic elements. In the preterite only *U* occurs, due to an *U*-containing consonantal environment. In the past participle only *A* occurs, due to a historical vowel harmony process, namely *A*-Brechung.

In the light of the considerations above the alternations in (4) can be analyzed as being instances of only one underlying alternation, $I \rightarrow A \rightarrow U$.

(5)

<i>Present</i>	<i>Preterite</i>	<i>Past Participle</i>	<i>Gloss</i>	<i>Underlying Alternation</i>
s <u>in</u> gen	s <u>a</u> ng	ges <u>u</u> ngen	'sing'	^s I ~ A ~ U
schw <u>im</u> men	schw <u>a</u> mm	geschw <u>o</u> mmen	'swim'	I ~ A ~ U
bi <u>e</u> gen	bo <u>g</u>	geb <u>o</u> gen	'bend'	I ~ A ~ U
he <u>l</u> fen	ha <u>l</u> f	geh <u>o</u> lfen	'help'	I ~ A ~ U
me <u>l</u> ken	mo <u>l</u> k	gem <u>o</u> lken	'milk'	I ~ A ~ U

The application of the Apophonic Path to the system of NHG strong verbs shows that even in this non-productive system only the present form is lexically recorded. The other forms are derived according to the Apophonic Path.

3. Umlaut

Another phenomenon of vowel alternations in NHG is Umlaut. NHG Umlaut occurs in different environments, only in some of them regularly. Derivational as well as inflectional processes are potential environments for umlaut to

surface. (6) lists derivational processes involving umlaut in NHG, (7) inflectional ones:

(6)³

<i>Affix</i>	<i>Process</i>	<i>Base</i>	<i>Derivation</i>	<i>Gloss</i>
-chen	N > N(diminutive)	Haus	Häuschen	'house' > 'little house'
-lein	N > N(diminutive)	Mann	Männlein	'man' > 'little man'
-ling	N/A > N(m)	dumm	Dümmling	'stupid' > 'stupid chap'
-erich	N(f) > N(m)	Gans	Gänserich	'goose' > 'gander'
-e	A > N(abstract)	gut	Güte	'good' > 'goodness'
Ge-	N/V > N(mass)	Strauch	Gesträuch	'bush' > 'bushes'
-in	N(m) > N(f)	Hund	Hündin	'dog' > 'bitch'
-er	V > N(agent)	backen	Bäcker	'bake' > 'baker'
-lich	N/V/A > A	Mann	männlich	'man' > 'manly'
-ig	N/V/A > A	Wasser	wässrig	'water' > 'watery'
-isch	N/V/A > A	Hohn	höhnisch	'scorn' > 'scornful'
-eln	N/V > V	Zunge	züngeln	'tongue' > 'to let its tongue out'
-ern	V/A > V	rauchen	räuchern	'smoke' > 'smoke, fumigate'

(7)

<i>Affix</i>	<i>Process</i>	<i>Base</i>	<i>Inflection</i>	<i>Gloss</i>
-er	N(sg) > N(pl)	Haus	Häuser	'man' > 'men'
-e	N(sg) > N(pl)	Sau	Säue	'pig' > 'pigs'
comparative and superlative forms of A		groß	größer grössten	'big' > 'bigger' > 'biggest'
subjunctive II of strong V		schwamm	schwämme	'swam' > 'swam'

Historically umlaut was a phonological process. In Old High German suffixes containing palatal segments caused assimilation of the base-vowels they attached to. The vowels [a], [o] and [u] turned into their umlauted versions [e], [oe] and [ue] - back vowels became front ones. This was a regular and productive process as long as suffixes still bore secondary stress. But in the course of time, the stress patterns of German changed. Suffixes lost their ability to bear stress which resulted in the lenition of the suffix vowels. This so-called "Schwaisierung" went hand in hand with the morphologisation

³ N (noun), V (verb), A (adjective), m (masculine), f (feminine), sg (singular), pl (plural).

of the umlaut process. Umlaut was no longer triggered by once palatal suffixes directly, but occurred in specific morphological environments (at first still depending on the simultaneous occurrence of once umlaut triggering suffixes) or took place by analogy. Still, only one vowel of the base was affected, the main stressed one. In NHG only some suffixes have productive status with respect to umlaut formation. Diminutive formation of nouns via the attachment of *-chen* or *-lein* is nearly always accompanied by Umlaut of the stem vowel. But in general, the once phonological operation has lost its productive status with the continued morphologisation.

In NHG, umlaut is caused by morphological or syntactic environments. The alternation of the base vowel can still be analyzed phonologically: in autosegmental terms, a floating element *I* is the phonological trigger at Deep Structure which, added to the vocalic segments [a, u, o] of the base, derives their umlauted versions [ae, y, oe].

(8) <ä>	[ae]	A . I
<ü>	[y]	U . I
<ö>	[oe]	[o] ⁴ . I

Umlaut can be analyzed as part of a universal process called mutation (cf. Lieber 1987). Mutations, by definition, are local processes. No spreading rules⁵ apply. Only one element is affected by the mutation process. Floating elements (or features) on an autonomous tier are triggers of the mutation process. For NHG umlaut, the phonological element *I* serves as trigger, the affected element is the main stressed element of the base.

Though locality is universally claimed for mutation processes and NHG umlaut perfectly fits into this frame, we would rather claim that locality or non-locality is defined as a language specific parameter. There are various languages where umlaut is not strictly local⁶ but still behaves well with respect to other main characteristics of universal mutation processes.

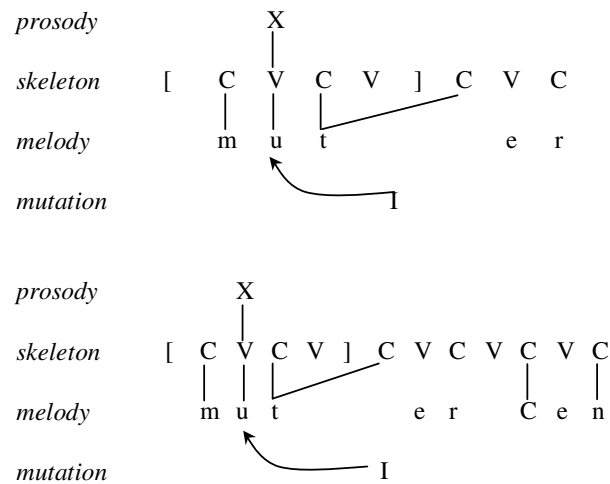
(9) Representation of Sg. *Mutter* 'mother' - Pl. *Mütter* 'mothers', Dim. *Mütterchen* 'little mother':

<i>prosody</i>		X					
<i>skeleton</i>	[C	V	C	V]	C V C
<i>melody</i>		m	u	t			e r

⁴ For complex segments cf. section 2.2

⁵ For a definition of spreading (and other autosegmental) rules cf. McCarthy 1979 and also Lieber 1987.

⁶ As was pointed out to us by Jan G.Kooij (personal communication), in Roermond (a Dutch variant in the area of Limburg), umlaut can affect more than one vowel in the stem. The ending *-ke* in the following examples is the diminutive suffixes which productively triggers umlaut of stem vowels: e.g. *piano* > *piaeneuke*, *kano* > *kaeneuke*.



Several autonomous tiers interact simultaneously in the above representations. The phonological segments of bases and suffixes reside on the melody-tier. They are associated with C and V positions of the skeleton tier. Prosodically prominent segments associate with markers (X in the representation above) at the prosody-tier. A fully specified (associated) skeletal string is input for the phonetic output (or spell-out) and results in a pronounceable sequence of a language L. Umlaut in NHG is a morphological process. The floating *I* resides on a separate morphological tier, the mutation-tier. In specific derivational and inflectional environments it is activated and associates to the prosodically most prominent vocalic segment at the skeletal level. *A*, *U* and the complex segment [o] are potential candidates for Umlaut in NHG. The addition of an *I* element leads to their respective umlauted versions, as explained above. Non-associated material of the melody-tier is realized as schwa or oppressed completely at the phonetic level.⁷

4. Ablaut and Umlaut

As was shown in the sections above, Ablaut is a derivational process that lacks any contextual conditioning, i.e. there is no phonological trigger for the

⁷ For a detailed account of the representation of NHG Umlaut, cf. Rieder (2000).

apophonic derivation. There is one, and only one, universally valid regularity, the Apophonic path, according to which apophonic alternations can take place.

Umlaut in derivational and inflectional word formation is represented as an autonomous morpheme, the floating element *I*. This phonological trigger fuses with the main-stressed vocalic segment of the base which results in the various umlauted versions of the base vowels.

The major difference between Ablaut and Umlaut is that Umlaut involves a floating element, whereas Ablaut does not. This floating element, *I*, is in itself the phonological trigger as well as part of the surface form of the derivational output. Put differently, input *I* is present in the output as *I*. In Ablaut on the other hand, the input element is replaced by the respective output element. If Ablaut were achieved by a floating element, a parallel behaviour of the triggering elements in both processes would be expected, but such a parallel behaviour is clearly not the case in NHG.

The formation of the subjunctive of NHG strong verbs illustrates this case:

(10)

<i>Present</i>	<i>Preterite</i>	<i>Subjunctive</i>	<i>Gloss</i>	<i>Surface Alternation</i>
s <u>i</u> ngen	s <u>a</u> ng	s <u>ä</u> nge	'sing'	<i>s</i> i ~ a ~ ä
schw <u>i</u> mmen	schw <u>a</u> mm	schw <u>ä</u> mmen	'swim'	i ~ a ~ ä
m <u>e</u> lken	m <u>o</u> lk	m <u>ö</u> lke	'milk'	e ~ o ~ ö

In the derivation of the preterite forms from the present, the apophonic source vowel, *i* and *e* in (10), transforms into its apophonic output *a* respective *o*. By contrast the relation between the preterite forms and the subjunctive clearly shows that the base vowel mutates. The alternations *a ~ ä* and *o ~ ö* are results of fusion operations with the floating element *I*. As can be seen, in Umlaut the source vowel is part of the derived vowel, whereas in Ablaut the source vowel is not.

To sum up, NHG Ablaut and Umlaut are both instances of process morphology, but there are different mechanisms at work.

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The Agent/Affectee ambiguity and beyond

Tomokazu Takehisa

This paper investigates sentences whose subject can be interpreted either as an Agent or an Affectee in Japanese and English. It argues that a purely semantic approach (Amano 1995) and a causation-based approach (Kageyama 1996) cannot be maintained as they stand, and shows that a syntactic factor must be involved in determining the distribution of Affectees. Specifically, it proposes a Case-theoretic approach in conjunction with minimal assumptions about the argument structure of verbs. Evidence in favor of this approach comes from languages in which an Agent and an Affectee can co-occur.

1. Introduction

1.1. The Agent/Affectee ambiguity

This paper is primarily concerned with ambiguous sentences as in (1):¹

- (1) a. Taroo-ga ude-o ot-ta (<or-Ø-ta)
Taro-NOM arm-ACC √break-CAUS-PST
'Taro broke his arm.'
- b. Taroo-ga kaze-de boosi-o tob-asi-ta (<tob-as-ta)
Taro-NOM wind-in cap-ACC √fly-CAUS-PST
'Taro had his cap fly away in the wind.'
(Lit. 'Taro flew his cap.'; * in English)

When the arm is understood as Taro's in (1a), and when Taro is understood as wearing his cap in (1b), the sentences are ambiguous between two readings, each involving a distinct interpretation of the subject. In one reading, Taro is the person who instigated the breaking of the arm in (1a), and is the person who

¹ I apologize to the reader in advance for this paper being full of brutal examples. The following abbreviations are used in the glosses: NOM = nominative; ACC = accusative; DAT = dative; TOP = topic; 1 = first person; 3 = third person; SG = singular; PL = plural; CAUS = causative; INCH = inchoative; PST = past; NEG = negative; COP = copula; GER = gerundive. Moreover, √ indicates a morphological root, and it should not be confused with a category-neutral root proposed by Marantz (1997), which is adopted in this paper.

acted upon the cap in order for it to fly in (1b). On the other reading, Taro does not instigate, but rather, merely undergoes the event in which he is involved, by means of possessing the object. The same holds in English to a varying degree. The former interpretation of the subject is customarily called Agent. For want of a suitable technical term, I will call the latter Affectee.

It can be shown that sentences like (1) are truly ambiguous: since no contradiction arises in conjoining a VP with its negated counterpart in (2), it must be that the two subjects receive different interpretations. The presence of an emphatic reflexive in one of the conjuncts facilitates the judgment, as it forces the subject to be interpreted as an Agent.

- (2) a. Taroo-ga ude-o ot-ta (<or-Ø-ta) kedo
 Taro-NOM arm-ACC √break-CAUS-PST but
 (zibun-de-wa) or-Ø-anak-at-ta (<-ar-ta)
 self-by-TOP √break-CAUS-NEG-COP-PST
 ‘Taro broke his arm, but he didn’t break it (himself).’
- b. Taroo-ga kaze-de boosi-o tob-asi-ta (<tob-as-ta) kedo
 Taro-NOM wind-in cap-ACC √fly-CAUS-PST but
 (zibun-de-wa) tob-as-anak-at-ta (<-ar-ta)
 self-by-TOP √fly-CAUS-NEG-COP-PST
 ‘Taro had his cap fly away in the wind, but he didn’t do it (himself).’
 (Lit. ‘Taro flew his cap, but he didn’t do it (himself).’; * in English)

However, the Agent/Affectee ambiguity is not always available, and the distribution of Affectees is more restricted than that of Agents. Inoue (1976) has shown that there are two descriptive generalizations concerning the distribution of Affectees, as follows:

- (3) a. Verb class:
 Affectees appear with verbs that show the causative/inchoative alternation.
- b. The possession requirement
 There must be a “close” relation, typically that of possession, between the subject and the object.

Thus, (4) and (5) are unacceptable with their subjects interpreted as an Affectee. This is because (4) contains a transitive verb that does not enter into the causative/inchoative alternation, and because (5) does not involve a relation of possession between the subject and the object.

- (4) *Taroo-ga ude-o nagut-ta (<nagur-ta) kedo
 Taro-NOM arm-ACC punch-PST but
 (zibun-de-wa) nagur-anak-at-ta (<-ar-ta)
 self-by-TOP punch-NEG-COP-PST
 ‘Taro punched his arm, but he didn’t do it (himself).’

- (5) *Taroo-ga Ziroo-no boo-o ot-ta (<or-Ø-ta) kedo
 Taro-NOM Ziro-GEN stick-ACC √break-CAUS-PST but
 (zibun-de-wa) or-Ø-anak-at-ta (<-ar-ta)
 self-by-TOP √break-CAUS-NEG-COP-PST
 ‘Taro broke Ziro’s stick, but he didn’t break it (himself).’

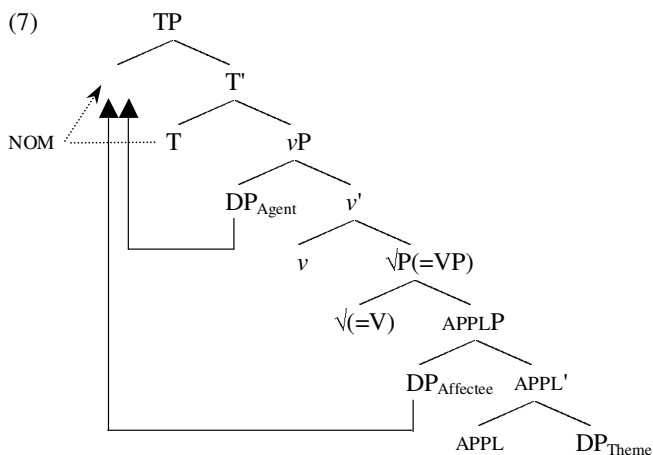
Attempts have been given to explain the distribution of Affectees, and existing analyses are either purely semantic (Amano 1995) or assume a tight connection with lexical causatives (Kageyama 1996). The aim of this paper is to argue that a syntactic factor, specifically Case, plays an important role in deriving the distribution of Affectees and that it explains the Agent/Affectee ambiguity in concert with the argument structure of the verbs involved.

1.2. Proposals

I will first refine the generalization concerning verbs that allow an Affectee subject in Japanese and English and then provide an analysis that explains why this generalization holds in Japanese and English.

The generalization and the structure proposed in this paper are given in (6) and (7):²

- (6) If the subject is interpreted as an Affectee, then the root of the verb involved does not necessarily require the presence of an external argument, where an external argument is a Proto-Agent (in the sense of Dowty 1991)—e.g. an Agent, an Experiencer, and the like.

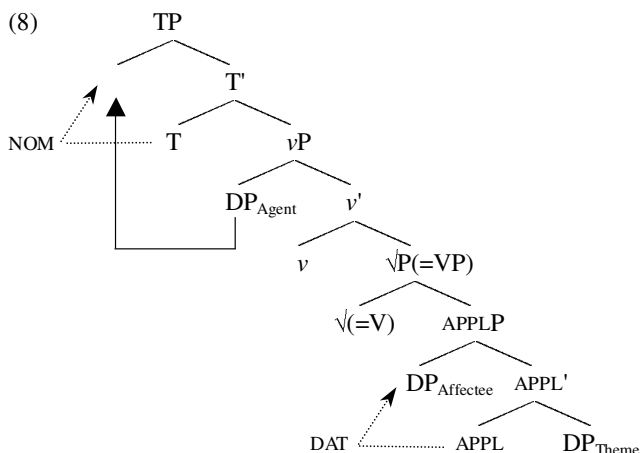


² (6) is stated in terms of the category-neutral theory of lexical categories (Marantz 1997). In this theory, lexical categories are derived from a combination of a functional category and a category-neutral root (√). Thus, a verb and a noun are realized as a result of syntactic composition: specifically, [*v* √P] and [D √P], respectively.

On the basis of (6), I will propose, rhetorically put, that the Agent/Affectee ambiguity results from an Agent and an Affectee competing for nominative Case in Japanese and English, as depicted in (7), under the assumption that the Affectee theta-role is assigned by the functional head APPL(icative) (Marantz 1993, Low APPL in Pyllkanen 2000a, 2000b).

An immediate consequence of this Case competition approach is that verbs that do not fall under (6), i.e. verbs that require the obligatory presence of an Agent, do not allow an Affectee to appear due to their requirement, while verbs that do fall under (6), however, allow either an Agent or an Affectee (but not both) to appear, thereby yielding the Agent/Affectee ambiguity.

Evidence in favor of the Case competition approach to the Agent/Affectee ambiguity comes from languages with possessor datives such as Modern Hebrew and Spanish. Assuming that the dative-marked possessor argument is an Affectee in such constructions and, contrasting with Japanese and English, that inherent dative Case is available to Affectees in these languages, I thus argue that possessor dative constructions have the following structure when an Agent and an Affectee co-occur.



Moreover, I argue that the presence of such an extra Case feature (here, of dative) versus the lack thereof accounts for the differences in the distribution of Affectees between languages with the Agent/Affectee ambiguity, like Japanese and English, and those that allow the co-occurrence of an Agent and an Affectee, like Modern Hebrew and Spanish.

The paper is organized as follows. In section 2, I refine the generalization concerning verbs that allow an Affectee subject in Japanese and English, and briefly summarize previous approaches to the distribution of Affectees. Section 3 discusses languages in which, unlike Japanese and English, an Agent and an Affectee can co-occur. I show here that the previous approaches to the Agent/Affectee ambiguity do not go beyond the Japanese and English data, and cannot account for this additional possibility of the co-occurrence of an Agent

and an Affectee. In section 4, an analysis is provided that explains the two types of languages in a unified way. Section 5 concludes the paper.

Due to space limitations, I will not discuss here the possession requirement posed on the subject and the object, mentioned in (3b). I will note, however, on this matter, that inalienable possession counts as what is characterized as a “close” relation in every language, but that languages vary as to whether alienable possession counts as such a relation.

2. Agent or Affectee: Japanese and English

2.1. Verbs

Let us consider verbs that allow the Affectee subject in Japanese and English. I propose the generalization in (6) that says that verbs with an Affectee subject are characterized in terms of the non-obligatory presence of an Agent.

There are two ways to show that a root does not require the presence of an Agent: the causative/inchoative alternation and process nominalizations. First, if a verb, or more precisely a verbalized root, enters into the causative/inchoative alternation, then an Agent is not necessarily required by the verb. Second, if an Agent cannot appear in the process nominal of a root, then the root does not require an Agent (Marantz 1997).

Inoue (1976) observes that the distribution of Affectees is tightly correlated with verbs that display the causative/inchoative alternation, as in (3a) above. This is illustrated in the following examples.

- (9) a. Taroo-ga ude-o ot-ta (<or-Ø-ta)
 Taro-NOM arm-ACC √break-CAUS-PST
 ‘Taro broke his arm.’
 a'. Taroo-no ude-ga or-e-ta
 Taro-GEN arm-NOM √break-INCH-PST
 ‘Taro’s arm broke.’
 b. Taroo-ga kaze-de boosi-o tob-asi-ta (<tob-as-ta)
 Taro-NOM wind-in cap-ACC √fly-CAUS-PST
 ‘Taro had his cap fly away in the wind.’
 (‘Lit. Taro flew his cap in the wind.’; * in English)
 b'. Taroo-no boosi-ga kaze-de ton-da (<tob-Ø-ta)
 Taro-GEN cap-NOM wind-in √fly-INCH-PAST
 ‘Taro’s cap flew away in the wind.’

On the other hand, verbs that do not allow an Affectee subject do not enter into the causative/inchoative alternation.

- (10) a. Taroo-ga ude-o nagut-ta (<nagur-ta) (*Affectee)
 Taro-NOM arm-ACC punch-PST
 ‘Taro punched his arm.’

- a'. *Taroo-no ude-ga nagut-ta (<nagur-ta)
 Taro-GEN arm-NOM punch-PST
 'Taro's arm punched.' (* in English)
- b. Ziroo-ga migi-asi-o ket-ta (<ker-ta) (*Affectee)
 Ziro-NOM right-leg/foot-ACC kick-PST
 'Ziro kicked his right leg/foot.'
- b'. *Ziroo-no migi-asi-ga ket-ta (<ker-ta)
 Ziro-GEN right-leg/foot-NOM kick-PST
 'Ziro's right leg/foot kicked.' (* in English)

However, there are cases in which non-alternating verbs do allow an Affectee subject in English, as in (11).³ This indicates that the generalization in (3a)—the correlation between Affectees and verbs showing the causative/inchoative alternation—holds in one way only: if a verb enters into the causative/inchoative alternation, then an Affectee subject can appear, but not vice versa.

- (11) a. John lost his son in the war, but he didn't lose him himself.
 a'. *John's son lost in the war. (^{OK} in the sense of being defeated)
 b. Mary injured her arm, but she didn't injure it herself.
 b'. *Her arm injured.

Although the examples in (11) do not pose problems under the one-way interpretation, (3a) nonetheless makes no predictions about examples like (10) and (11), since the verbs involved there do not show the causative/inchoative alternation. This amounts to claiming that there is no regularity to be captured concerning the distribution of Affectees with non-alternating verbs.

In fact, however, there is a regularity to be captured here, and this emerges when process nominalizations are considered. As mentioned above, an Agent cannot appear in the process nominalization of a root when that root does not require an Agent (Marantz 1997). In (12), then, we see from the process nominal readings involving *loss* and *injury* that the roots of the verbs in (11) do not require an Agent.

- (12) a. i. John's frequent loss of \$50 or more (is shocking.)
 ii. *The frequent loss of \$50 or more by John (is shocking.)
 b. i. John's frequent injury of/to his arm (is shocking.)
 ii. *The frequent injury of/to an arm by John (is shocking.)

Therefore, since positing the non-obligatory presence of an Agent captures both the causative/inchoative alternation and process nominalizations, the refined generalization in (6) subsumes cases covered by (3a), while additionally capturing the facts involving non-alternating verbs in (11) and correctly ruling out cases like (10).

³ There seem to be no corresponding cases in Japanese. See Takehisa (2001) for discussion.

2.2. Previous approaches

Let us briefly review the previous approaches that attempted to explain the generalization concerning verbs with an Affectee subject in (3a).⁴ In the following, I assume for the sake of discussion that the basic tenets of the approaches to be considered are not undermined in the face of cases involving non-alternating verbs with the Affectee subject in (11).

The distribution of Affectees has received attention in the Japanese literature, and previous approaches that sought an explanation for the generalization in (3a) either fall under one of two categories, or are a hybrid of the two. One approach can be called purely semantic. Its basic tenet can be formulated as in (13), and (14) has been proposed by Amano (1995) under this approach.

- (13) A semantic notion determines the distribution of Affectees.
- (14) An Affectee appears with a verb that denotes an activity of the subject and a change of state of the object in the Agent interpretation.

(14) can only be taken to hold in such a way that if the subject is interpreted as an Affectee, then the verb denotes an activity of the subject and a change of state of the object, as there are verbs that denote both an activity and a change of state but do not allow an Affectee, as illustrated in (15). As (15a) shows, the verb *koros-* 'kill' does not allow the Affectee interpretation of the subject, although it does denote a change of state, as shown in (15a), and an activity of the subject, which can be further specified as in (15c).

- (15) a. *Taroo-ga titioya-o korosi-ta kedo
 Taro-NOM father-ACC kill-PST but
 (zibun-de-wa) koros-anak-at-ta (<-ar-ta)
 self-by-TOP kill-NEG-COP-PAST
 'Taro killed his father, but he himself didn't kill him.' (* in English)
- b. *Taroo-ga titioya-o korosi-ta kedo sin-anak-at-ta (<-ar-ta)
 Taro-NOM father-ACC kill-PST but die-NEG-COP-PST
 'Taro killed his father, but he didn't die.' (* in English)
- c. Taroo-ga titioya-o boo-de tatai-te korosi-ta (<koros-ta)
 Taro-NOM father-ACC stick-with hit-GER kill-PST
 'Taro killed his father by hitting him with a stick.'

Note that the verb does not have an intransitive alternant, as in (16), thus showing that reference to the causative/inchoative alternation or to the non-obligatory presence of an Agent is still necessary to characterize verbs that allow an Affectee subject, independently of (14).

⁴ In the previous literature, what is called an Affectee has been called an Experiencer.

- (16) *Taroo-no titioya-ga korosi-ta (<koros-ta)
 Taro-GEN father-NOM kill-PST
 ‘Taro’s father died.’ (Lit. ‘Taro’s father killed.’; * in English)

Amano’s proposal is very similar to the rejected interpretation of (3a), given that the notion of change of state plays an important role in the causative/inchoative alternation (Levin & Rappaport Hovav 1995), but it might also account for non-alternating verbs in (11) by assuming that verbs like *lose* and *injure* both denote a change of state. Thus, it is hard to choose (6) or (14), as far as Japanese and English are concerned.

More importantly, Amano further proposes that the notion of change of state derives the Affectee interpretation in conjunction with the notion of possession, which is independently necessary to obtain the Affectee interpretation: if a part of X undergoes a change of state, then X undergoes a change of state. As she argues, this explains why verbs must be such that they imply a change of state, i.e. lexical causatives. In this sense, if an Affectee appears, then it undergoes a change of state in addition to being a possessor. I will show in section 3 that this claim is untenable.

The other approach that I discuss can be called a causation-based approach, and analyses within this approach assume the following:

- (17) The distribution of Affectees is tightly correlated with the distribution of lexical causatives.

In other words, this approach claims that the presence of a lexical causative morpheme plays a crucial role in allowing an Affectee to appear.⁵ Moreover, given that it is impossible to have more than one occurrence of a lexical causative morpheme in a single sentence and in such a case, one of them is construed as a syntactic causative, this approach requires that either an Agent or an Affectee can appear in a single clause, but that the co-occurrence of the two is impossible. For instance, Kageyama (1996) implements this idea by proposing the lexical rule in (18) and the lexical semantic templates in (19). To account for sentences like (19a), Kageyama assumes that a lexical causative morpheme can function either as CAUSE or as EXPERIENCE, as represented in (19b) and (19c), respectively. The former function is a result of the lexical rule in (18), which is only applicable to verbs that show the causative/inchoative alternation.⁶

- (18) If a verb has the lexical semantic templates in (19b) and (19d), then it can have (19c).

⁵ Affectees cannot appear with syntactic causatives, with the matrix subject being an Affectee. An Affectee, being a possessor, must be a co-argument of its possessum (Takehisa 2001).

⁶ (19c) has an independent problem. It is implausible to encode the second occurrence of the variable *x* in the verb’s lexical representation, as it is possible to have the Affectee interpretation in sentences like *John broke Bill’s arm* under sufficiently rich contexts, e.g. if Bill’s arm was transplanted onto John.

- (19) a. Taroo-ga ude-o ot-ta (<or-Ø-ta)
 Taro-NOM arm-ACC √break-CAUS-PST
 ‘Taro broke his arm.’
- b. [x CAUSE [y BECOME *BROKEN*]] (x = Agent)
- c. [x EXPERIENCE [[x’s y] BECOME *BROKEN*]] (x = Affectee)
- d. [x BECOME *BROKEN*]]
- (Kageyama 1996: 286, with minor changes)

The lexical rule in (18) makes crucial reference to the causative/inchoative alternation in the antecedent clause, but it does not explain why the distribution of Affectees is tightly correlated with verbs showing this alternation. In this sense, Kageyama’s analysis, in particular (18), is a restatement of the generalization in (3a) and at most does not go beyond the level of description.

As briefly presented in section 1.2, I propose instead that the Agent/Affectee ambiguity arises from an Agent and an Affectee competing for Case when the verb involved does not necessarily require the presence of an Agent. This allows a straightforward explanation for the observed restrictions in the distribution of Affectees in Japanese and English. We turn next to look at languages in which an Agent and an Affectee can co-occur, and show that the Case competition approach to the Agent/Affectee ambiguity also provides an account for the co-occurrence of an Agent and an Affectee, which is again superior to the purely semantic and causation-based approaches just reviewed.

3. Agent and Affectee: Languages with possessor datives

Previous approaches to the Agent/Affectee ambiguity have only considered languages in which either an Agent or an Affectee, but not both, can appear in a given sentence. Given that the defining characteristic of an Affectee is being a possessor, there are in fact languages in which both can appear.⁷ Specifically, the possessor datives found in many languages can be taken to be Affectees. In this section, I will show that the distribution of Affectees in these languages is not as restricted as in Japanese and English. I then argue for the Case competition approach by showing that the previous approaches reviewed do not go beyond the Japanese and English data, and that they fail to account for the differences between the two types of languages.

One crucial difference between Japanese and English, on the one hand, and languages with possessor datives, on the other, is that dative Case is available only in 3-place predicates in Japanese and English, while it is available rather freely, in 1- and 2-place predicates as well as 3-place predicates, in the languages with possessor datives. This is illustrated in the following

⁷ This is the reason why there must be a relation of possession between the subject and the object in Japanese and English. The present treatment stipulates rather than explains the possession requirement.

examples from Modern Hebrew and English.⁸ (20) and (21) involve 2-place predicates and 1-place predicates, respectively.

- (20) a. ha-yeladim zarku le-Gil 'et ha-kadur le-tox ha-gina
 the-boys threw DAT-Gil ACC the-ball into the-garden
 'The boys threw Gil's ball into the garden.'
 'The boys threw the ball into Gil's garden.'
 (A. Shaked, S. Ofir p.c.)
- b. *The boys threw the ball to Gil into the garden.
 'The boys threw Gil's ball into the garden.'
- c. *The boys threw the ball into the garden to Gil.
 'The boys threw the ball into Gil's garden.'
- (21) a. Gil caxak le-Rina ba-mitbax
 Gil laughed DAT-Rina in-the-kitchen
 'Gil laughed in Rina's kitchen.' (Landau 1999)
- b. ha-mitriya nafla le-Nina
 the-umbrella fell DAT-Nina
 'Nina's umbrella fell down.' (Arad 1998)
- c. *Gil laughed in the kitchen to Rina.
 'Gil laughed in Rina's kitchen.'
- d. *The umbrella fell to Nina.
 'Nina's umbrella fell.'

With this difference in mind, let us look at the distribution of Affectees. First, as already mentioned above, it is possible to have an Agent and an Affectee in a single clause, as illustrated in (20a) and (21a) above, and (22) below, where agentive transitives and unergatives are involved.⁹ It is clear that

⁸ The claim about the difference in Case properties between the two types of languages does not apply to benefactive constructions in Japanese and English, which are left for future research.

⁹ Other languages that are claimed to have possessor datives are French, German, and so on. However, as reported by Guéron (1999), native speakers of French prefer a dative clitic to a full DP. If a dative argument is realized as a full DP, as in (i-a), a sentence degrades in acceptability.

- (i) a. ?J'ai cassé le bras à Jean.
 I-have broken the arm DAT Jean
 'I broke Jean's arm'
- b. Je lui ai cassé le bras
 I 3SG.DAT have broken the arm
 'I broke his/her arm.'

Since it can be assumed that (i-b) might involve an ethical dative, I will remain neutral here regarding whether the dative clitic in (i-b) is possessive or ethical, and leave it for further research.

As for German, there is some microvariation among the dialects. Specifically, some dialects, but not all, allow a possessor dative associated with a DP inside a spatial PP (S. Mohr, p.c.):

- (ii) (*)Hans hat dem Peter gestern im Haus geraucht.
 Hans has the.DAT Peter yesterday in.the house smoked
 'Hans smoked in Peter's house yesterday.' (T. Grüter, S. Wurmbrand p.c.)

Since I do not have a satisfactory answer at present, I also leave this for further investigation.

the verbs which can be involved in these languages are not restricted to lexical causatives, contrasting with Japanese and English. Kageyama's (1996) approach makes a wrong prediction that the co-occurrence of an Agent and an Affectee should be impossible here, contrary to fact.¹⁰ The purely semantic approach makes no predictions in this respect.

(22) Spanish¹¹

- a. Les revise los informes a los estudiantes.
 3PL.DAT 1SG.revised the reports DAT the students
 'I revised the students' reports.' (Kempchinsky 1992)
- b. Juan le nadó en la piscine a Ricardo.
 Juan 3SG.DAT swam in the pool DAT Ricardo
 'Juan swam in Ricardo's pool.' (P. Ruiz, E. Valenzuela p.c.)

Secondly, an Affectee can appear in cases where an Agent cannot appear, as in (23) and (24), where non-alternating unaccusatives or weather verbs are involved. This contrasts sharply with Japanese and English, where the distribution of Affectees is a subset of that of Agents. This fact also argues against the causation-based approach, since it claims that the distribution of Affectees is restricted to lexical causatives, and that, unlike the distribution of Agents, it is further restricted by the possession requirement, thereby being a subset of the distribution of Agents. As was true regarding the co-occurrence of an Agent and an Affectee, the purely semantic approach predicts nothing about the relation between the distribution of Affectees and that of Agents.

(23) Modern Hebrew

- a. ha-kelev ne'elam le-Rina
 the-dog disappeared DAT-Rina
 'Rina's dog disappeared.' (Landau 1999)
- b. ha-mitriya nafla le-Nina
 the-umbrella fell DAT-Nina
 'Nina's umbrella fell down.' (Arad 1998)

(24) Spanish

- a. El niño se le murió a Lola.
 The child SE 3SG.DAT died DAT Lola
 'Lola's child died.' (P. Ruiz, E. Valenzuela p.c.)
- b. Nos llovió en la casa.
 1PL.DAT rained in the house
 'It rained in our house.' (P. Ruiz, E. Valenzuela p.c.)

Note, however, that the arguments in this paper hold nonetheless.

¹⁰ One might assume a lexical semantic template that accounts for the co-occurrence of an Agent and an Affectee. Once it is assumed, it should be explained why it does not exist in Japanese and English and why the two types of languages differ the way they do.

¹¹ Note that Spanish is a clitic-doubling language and the dative clitics in the Spanish examples are not ethical.

Thirdly, an Affectee cannot occur in cases where it cannot be Case-licensed (Landau 1999). Specifically, it is impossible to have an Affectee in addition to the dative-marked Goal argument in the languages under consideration, where only one dative argument is allowed per clause unless one of the two dative phrases is an ethical dative clitic, as shown in (25) and (26). These facts are straightforwardly explained if we assume that the Affectee and the Goal compete for dative Case. Neither the purely semantic approach nor the causation-based approach predict anything in this respect.

(25) Modern Hebrew

- a. ?*Gil hirbic le-Rina la-yeled
 Gil beat-up DAT-Rina DAT-the-child
 ‘Gil beat up Rina’s child.’
- b. ?*Gil natan le-Rina la-misrad konanit sfarim gdola
 Gil gave DAT-Rina DAT-the-office case books big
 ‘Gil gave Rina’s office a big bookcase’

(Landau 1999)

(26) Spanish

- a. *Maria le dio un proyecto grande a la oficina
 Maria 3SG.DAT gave a case big DAT the office
 a Juan.
 DAT Juan
 ‘Maria gave a big case to Juan’s office.’
- b. *Hablo a la mujer a Ricardo.
 1SG.talk DAT the wife DAT Ricardo
 ‘I talk to Ricardo’s wife.’

(P. Ruiz, E. Valenzuela p.c.)

The examples presented so far show that Affectees can appear with all verb classes, and that they resist receiving a coherent semantic characterization such as change of state. Thus, Amano (1995) cannot account for the distribution of Affectees in the languages under consideration. The same criticism applies to Kageyama (1996), given that the causative/inchoative alternation can be semantically characterized (Levin & Rappaport Hovav 1995).¹²

To sum up, neither the purely semantic approach nor the causation-based approach go beyond the Japanese and English data, and thus fail to account for the distribution of Affectees in Modern Hebrew and Spanish. As mentioned at the outset of this section, the two types of languages differ with respect to Case properties, and this difference is directly correlated with differences in the distribution of Affectees. Taking the former to be the primary difference, I

¹² Note that the lexical semantic treatment of the causative/inchoative alternation itself does appear tenable. My claim, though, is that, though the change-of-state semantics does account for the causative/inchoative alternation, it does not play a role in the distribution of Affectees per se: the Agent/Affectee ambiguity in Japanese and English results from an interplay between the argument structure of the verb, which hinges on the lexical semantics of that verb and on the unavailability of an extra Case in these languages.

give next a unified analysis of the distribution of Affectees in the two types of languages in terms of Case theory, and provide as well an explanation for the generalization in (6) that holds in Japanese and English.

4. Analysis

We have seen that there are two types of languages concerning the distribution of Affectees, and the differences between them can be reducible to the ability to license the Affectee argument—the availability of an extra Case feature.

Under the current Principles-and-Parameters framework (Chomsky 1995), it is assumed that the computational system of human language is invariant among languages, and that language variation is derived in terms of what enters into the computation. To derive the difference between the two types of languages under consideration, I take the different Case properties of the two types of languages at face value, and entertain the possibility that a formal feature, in particular, a Case feature, is what differentiates them. Specifically, I assume that inherent dative Case is available freely in 1- and 2-place predicates, as well as in 3-place predicates, in Modern Hebrew and Spanish, while it is not in Japanese and English (cf. Borer & Grodzinsky 1986, Kempchinsky 1992). The assumption that dative Case in these languages is inherent is supported by the fact that the dative-marked argument in an active sentence cannot be the subject in its passive counterpart, as shown by the following passive sentences corresponding to the active (20a). Cases involving unaccusative verbs as in (23) and (24a) also lend further empirical support to this assumption, in that the Theme argument, which is lower than the Affectee argument, moves to SpecTP to receive nominative Case.

- (27) a. ha-kadur nizrak le-Gil le-tox ha-gina
 the ball was-thrown DAT-Gil into the-garden
 ‘Gil’s ball was thrown into the garden.’
 ‘The ball was thrown into Gil’s garden.’
 b. *Gil nizrak et ha-kadur le-tox ha-gina
 Gil was-thrown ACC the-ball into the-garden
 ‘Gil had his ball thrown into the garden.’
 ‘Gil had the ball thrown into his garden.’

Moreover, as depicted in (7) and (8) above, I assume that Affectee is assigned by the independent head APPL(icative) (Marantz 1993, Pylkkanen 2000a, 2000b), and that the APPL heads in the two types of languages differ in their ability to license the Affectee argument. Thus, APPL in Japanese and English cannot license an Affectee in terms of Case, while APPL in Modern Hebrew and Spanish can.¹³ This single difference in the ability of APPL derives the

¹³ Landau (1999) accounts for possessor datives in terms of movement (possessor raising). At the present stage of investigation, however, his arguments for a movement analysis do not

differences between the two types of languages.

Let us first consider Modern Hebrew and Spanish. Given that the APPL head in these languages has the ability to license an Affectee with inherent dative Case, it follows that an Agent and an Affectee can co-occur, being Case-licensed by T and APPL, respectively, and that an Affectee can appear where an Agent cannot appear. This is because the distribution of Affectees is solely determined by APPL in these languages. In contrast, the APPL head in Japanese and English does not have the ability to license the Affectee argument in terms of Case. Due to the lack of an “extra” Case feature, an Affectee cannot co-occur with an Agent: only one of them can appear in a single clause, being marked nominative. In this sense, the Agent and the Affectee compete for Case in these languages. Moreover, an Affectee cannot appear with verbs which obligatorily require an Agent are involved, since, in such cases, an Agent must appear and be marked nominative and, for that reason, an Affectee will be unable to be Case-licensed. Furthermore, non-alternating unaccusative verbs like *arrive* are excluded as well, since their internal argument will be marked nominative, due to their inability to check accusative Case. Hence, environments where an Affectee can appear are ultimately restricted to those involving transitive verbs which do not necessarily require the presence of an Agent. Therefore, the difference in Case-licensing between the two types of languages explains why they differ in terms of the distribution of Affectees and, in particular, why the generalization in (6) holds in Japanese and English.

5. Conclusion

We have seen that the differences in the distribution of Affectees between languages with the Agent/Affectee ambiguity such as Japanese and English, and languages with possessor datives such as Modern Hebrew and Spanish can be explained by a single factor: the availability of an extra Case feature. Given that Case is a syntactic property, the distribution of Affectees is a case in which syntactic factors determine the possible thematic interpretations for a given language, and this thus constitutes an argument against a purely lexical treatment of valency alternations.

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convincingly exclude a base-generation analysis. I implement an analysis in terms of base generation as the null hypothesis, in consideration of the existence of base-generated dative arguments such as Benefactives. See Takehisa (2001) for discussion.

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The asymmetrical behaviour of syllabic sonorants in Southern British English

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This article presents original acoustic data on syllabic /l/ and syllabic /n/ in Southern British English and proposes a new phonological account of their behaviour. Previous analyses have proposed that syllabic /l/ and syllabic /n/ should be represented identically. This paper, however, shows that syllabic /l/ and syllabic /n/ behave in very different ways, and in light of this, a unitary analysis is not justified. Instead, a proposal is made that syllabic /l/ and syllabic /n/ have different phonological structures, and that these different phonological structures explain their different phonetic behaviours.

1. Introduction

This paper provides a rare empirical study of syllabic consonants in British English and in doing so raises questions regarding the role of phonetics in phonology. First we must establish what is meant by 'syllabic', or indeed, 'syllable'. In trying to establish what indeed a syllable is, many phonologists have attempted to describe and explain the possible forms a syllable may take. Typically a syllable is described as consisting of a vocalic centre, optionally accompanied by a consonantal onset or coda, either of which may be complex (cf. Selkirk 1982/1999, Blevins 1995). In most languages, every syllable has a vowel at its centre. However, some languages allow segments which are not traditionally classed as vocalic to form the nucleus of a syllable, for example the /n/ in /bʌnm/ 'button' or the /l/ in /mʌdl/ 'muddle', and it is these segments which are known as syllabic consonants.

One survey (Bell 1978) cites 85 languages with syllabic consonants yet relatively little work has focused on their phonological or phonetic nature. Are syllabic consonants phonetically different from their non-syllabic counterparts? Can syllabic consonants be flanked by (complex) onsets or codas in the same way vocalic nuclei can be? Answers to such questions will help refine our understanding of what it means to be a syllable.

When different authors transcribe syllabic consonants we must ask ourselves what do the different authors mean to represent with the syllabicity mark. It quickly becomes apparent that its interpretation varies from author to

author, and we are left asking a number of questions: Are syllabic consonants underlyingly (phonologically) vowel-consonant sequences? Do syllabic consonants actually have vowels of some sort associated with them on the surface (phonetically)? If so, are these vowels always present? Could it instead be the case that (some) syllabic consonants attach directly and uniquely to the syllable nucleus? These questions relate directly to discussions concerning what can and cannot occur in a nucleus, onset or coda, and thereby to the typology of the syllable. The answers to these questions are also of crucial importance to phonological theories where there are very strict conditions on syllable structure and the presence of epenthetic vowels. Such a phonological theory will be discussed in §5.

2. Syllabic consonants in British English

In British English it is widely recognised that different styles produce different phenomena with respect to syllabic consonants (Roach, Sergeant and Miller 1992). In semi-formal registers /n/, /l/ and /r/ may be syllabic, the latter only in some rhotic dialects. Such syllabics are found in post tonic stress positions and almost always before a morpheme boundary. Syllabic consonants in semi-formal registers are often described as obligatory, in as much as it is deemed to be a mispronunciation to say, for example, [pi:pəl] rather than [pi:p] for 'people' (Jones 1976:56). In fast and/or casual registers, /m/, /ŋ/ and even obstruents have been argued to be syllabic, arising through processes of assimilation and elision. Such syllabics can be found in pre-stress positions and domain initially, and their syllabicity is entirely optional. Examples include [ʃpəʊz] (Roach, Sergeant and Miller 1992: 476), [prɒbbli] (Sivertsen 1960, quoted in Bell 1978:185), and [n̩? 'maʔtʃ] (not much) (Beaken 1971, quoted in Wells 1982:321). In neither semi-formal, nor fast/casual registers may syllabic consonants themselves be stressed.¹

In this paper I examine only syllabic /n/ and /l/ in semi-formal registers of non-rhotic speakers of British English. In the following section I describe a series of experiments designed to investigate whether segments which are transcribed as syllabic consonants ever have vowels (schwas) associated with them, and how syllabic consonants differ from their onset and coda counterparts in terms of durational characteristics.

3. Experiment Design

First a list of disyllabic words potentially containing syllabic /l/ or /n/ was drawn up from Wells' (2000) *Longman Pronunciation Dictionary*, Rockety's

¹ Whilst this generalisation holds true for most dialects and registers, we may note that some analyses of General American /r/, argue that /r/ can be both syllabic and stressed, in words such as 'bird' [br̩d], curt [krt̩] (Bloomfieldian transcription).

(1973) *Phonetic Lexicon* and an online pronunciation dictionary, *Beep*.² In order to control for contextual effects, potential syllabic consonants were preceded only by /p/, /t/, or /k/, either as singletons, or as part of a (homorganic) nasal + stop cluster. A second list, of monosyllabic words containing /l/ and /n/ in domain initial (onset) and domain-final (coda) positions was also drawn up from the same sources. Each target word was placed in a carrier sentence ('How does _ translate?') to ensure that all target words occurred in the same prosodic context (i.e. within the word carrying main sentential stress). The two lists were combined and the sentence order then quasi-randomised.

Eight subjects naïve to the purpose of the experiment read the list of sentences three times at normal conversational tempo. All subjects were female, native English speakers with a university education reporting normal speech and hearing. All subjects, bar one, spoke with a modified Southern British English accent showing close systemic similarities to RP English. A single subject spoke with a distinct North Eastern accent.³ One important restriction was placed on selection of speakers: they were chosen such that they did not vocalize their /l/s as is typical of some English dialects.

Subjects were recorded onto minidisk in a sound-proofed room using a Brüel and Kjær condenser microphone (Type 4165) and measuring amplifier (Type 2609). These recordings were digitised at 22, 500 Hz using Goldwave and then imported in PRAAT where spectrograms for each sentence were produced and labelled. Labelling was done by visual inspection of the waveform and spectrogram, and by listening to the speech signal.

In total 1705 sentences were recorded and labelled (some tokens were discarded due to noise interference on the recording e.g. speaker coughing or page turning). Duration measurements were extracted by script⁴ using PRAAT, and all results were analysed using SPSS, where the threshold of significance was set at 95%.

4. Experimental Results

4.1 Results concerning distributional data

With regard to the distribution of syllabic /l/ and syllabic /n/ post singletons, statistical tests showed that /l/ was found to be syllabic irrespective of context, whilst the distribution of syllabic /n/ was context dependent, being found primarily only after /t/, and not after /p/ or /k/.

² <ftp://svr-ftp.eng.cam.ac.uk/pub/comp.speech/dictionaries/beep.tar.gz>

³ The results of this speaker at no time differed significantly from the results of other speakers. Thus, although her dialect was not that under main consideration, her results were nevertheless included in the final analysis.

⁴ A random sample of these results were checked by hand and found to be accurate.

(1) Distribution of syllabic /l/ after /p/, /t/ and /k/

	Preceding context		
	/p/_ e.g. 'people'	/t/_ e.g. 'beetle'	/k/_ e.g. 'vocal'
Post-schwa	n ⁵ = 1, 0.93%	n = 2, 1.85%	n = 7, 6.42%
Syllabic	n = 106, 99.07%	n = 106, 98.15%	n = 102, 93.58%

A binomial statistic shows that all distributions of syllabic /l/ deviate significantly from chance ($p < 0.001$). Statistically there appear to be just significant differences between the three contexts, /p/, /t/ and /k/ ($\chi^2 (2) = 6.261$, $p = 0.044$). However, this chi-squared was obtained from a table where 50% of the cells have an expected count less than 5. As a consequence the value obtained for p may be inaccurately low.

(2) Distribution of syllabic /n/ after /p/, /t/ and /k/

	Preceding context		
	/p/_ e.g. 'deepen'	/t/_ e.g. 'beaten'	/k/_ e.g. 'beacon'
Post-schwa	n = 80, 73.39%	n = 16, 14.81%	n = 75, 70.09%
Syllabic	n = 29, 26.61%	n = 92, 85.19%	n = 32, 29.91%

Again, a binomial statistic shows that all distributions of syllabic /n/ deviate significantly from chance ($p < 0.001$). Statistically there are highly significant differences between the three contexts ($\chi^2 (2) = 93.914$, $p < 0.001$). Visual inspection confirms that /n/ tends to be syllabic following /t/ and non-syllabic following /p/ and /k/.⁶

A pilot study (642 sentences) based on one speaker with an expanded set of contexts (/p, t, k, b, d, g, s, z, f, v/) supports this conclusion:

(3) Place: Distribution of syllabic /l/ after expanded set of contexts (1 speaker)

	Preceding context		
	labial_ e.g. 'bauble'	coronal_ e.g. 'sozzle'	velar_ e.g. 'beagle'
Post-schwa	n = 0, 0%	n = 4, 5.56%	n = 2, 5.41%
Syllabic	n = 70, 100%	n = 68, 94.44%	n = 35, 94.59%

With this expanded set of contexts we see that there is *no* statistically significant effect of place on the occurrence of syllabic /l/ ($\chi^2 (2) = 3.99$ $p = 0.14$).⁷

⁵n = number of tokens

⁶ It may be the case that where /n/ was syllabic following a /p/ or a /k/ assimilation had taken place to /m/ or /ŋ/ respectively. This is an area for further research.

⁷ Again, this chi-squared was obtained from a table where 50% of the cells had an expected count less than 5, and thus it is likely that the value of p is inaccurately low.

(4) Place: Distribution of syllabic /n/ after expanded set of contexts (one speaker)

	Preceding context		
	labial_ e.g. 'carbon'	coronal_ e.g. 'loosen'	velar_ e.g. 'pagan'
Post-schwa	n = 69, 95.83%	n = 7, 9.86%	n = 38, 97.44%
Syllabic	n = 3, 4.17%	n = 64, 90.14%	n = 1, 2.56%

As with the restricted set of contexts, so now with the expanded set of contexts we see that there is a highly statistically significant effect of place on the occurrence of syllabic /n/ ($\chi^2(2) = 138.59, p < 0.001$).

These results give us the first difference in behaviour between syllabic /l/ and syllabic /n/: place of context influences distribution of syllabic /n/ but not of syllabic /l/. /l/ appears to be always syllabic when it is preceded by any consonant and followed by a word boundary, whilst /n/ must be preceded by a coronal consonant to be syllabic.⁸

A second area where syllabic /l/ and syllabic /n/ behave differently from one another concerns their distribution following nasal + stop clusters. Results of statistical tests confirm that /l/ is found to be syllabic irrespective of context, whilst /n/ is found never to be syllabic, not even when preceded by a /nt/, i.e. homorganic, cluster. These results, in conjunction with the singleton results, suggest that the distribution of syllabic /l/ is not affected by preceding structural complexity. The distribution of syllabic /n/, on the other hand is affected: syllabic /n/ is not found following a cluster.

(5) Distribution of syllabic /l/ after nasal + stop clusters

	Preceding context		
	labial_ e.g. 'trample'	coronal_ e.g. 'dental'	velar_ e.g. 'wrinkle'
Post-schwa	n = 5, 4.20%	n = 9, 7.44%	n = 9, 7.63%
Syllabic	n = 114, 95.80%	n = 112, 92.56%	n = 109, 92.37%

A binomial statistic shows that all distributions deviate significantly from chance ($p < 0.001$). For a target consonant /l/ there are no significant differences between the three contexts ($\chi^2(2) = 1.469, p = 0.480$).

⁸ It must be acknowledged that my results are statistical rather than categorical. Thus, for example, not all potential syllabic /n/s preceded by (homorganic) /t/ were actually realised as syllabic. One factor that may play a role in the realisation of target consonants as syllabic is their relative frequency: Fidelholtz (1975) showed that relative frequency can significantly influence vowel reduction (the more frequent a word, the more likely it is to show vowel reduction). Thus, it may be demonstrable that frequency also plays a role in total vowel absence, i.e. in the distribution of syllabic consonants. In drawing up the target word lists used for experiments described in this paper, I did not control for word frequency for to do so would have resulted in a very restricted set of usable words.

(6) Distribution of syllabic /n/ after nasal + stop clusters

	Preceding context		
	labial_ e.g. 'dampen'	coronal_ e.g. 'Clinton'	velar_ e.g. 'drunken'
Post-schwa	n = 58, 96.67%	n = 114, 95.00%	n = 57, 96.61%
Syllabic	n = 2, 3.33%	n = 6, 5.00%	n = 2, 3.39%

Again, for a target consonant /n/, a binomial statistic shows that all distributions deviate significantly from chance ($p < 0.001$) and that there are no significant differences between the three contexts ($\chi^2(2) = 0.400$, $p = 0.819$).⁹

To conclude this section, if we compare the the distribution of syllabic /l/ and syllabic /n/ following both singletons and clusters we note two different patterns of behaviour. When a potential syllabic consonant is preceded by a singleton, context in the form of place, does affect the distribution of syllabic /n/: /n/ will be syllabic if the context is coronal. The distribution of syllabic /l/, however, is not influenced by place context. When a potential syllabic consonant is preceded by a (nasal + stop) cluster we see a different pattern of behaviour: /n/ is never syllabic, not even when preceded by a coronal cluster, whilst /l/ continues to be syllabic irrespective of context.

4.2 Continuous data results: durations

In this section I first present data regarding the mean duration of four different /l/ allophones: onset (word initial), coda (word-final), syllabic and post schwa. We see that with regard to duration, *coda* /l/ is distinct from all other allophones, being significantly longer. In the second set of data we see how /n/ allophones pattern with respect to duration. /n/ allophones do not pattern like /l/ allophones with respect to duration: *onset* /n/ is significantly shorter than all other allophones.

(7) Summary of continuous data for /l/: Means (standard deviations)

	Syllabic (N=314)	Post Schwa (N=10)	Onset (N=114)	Coda (N=116)
Duration (ms)	86 (18)	70 (17)	81 (17)	116 (27)

If we look in detail at the mean duration of the different /l/ allophones, an ANOVA test for *target C allophone* shows significant differences between allophones ($F(3, 550) = 79.70$, $p < 0.001$). A Tukey post hoc test shows that the duration of *coda* /l/ is significantly longer than syllabic /l/, post schwa /l/ and onset /l/ ($p < 0.001$ in each case). A Tukey post hoc test also shows that the duration of syllabic /l/ is significantly longer than post schwa /l/ ($p = 0.045$).

⁹ In fact this p may in fact be inaccurately low given that 2 cells had expected counts of less than 5.

However, none of the other durational differences are significant. Thus, with regard to duration, we can argue that syllabic /l/ patterns like onset /l/, not like coda /l/, nor as a distinct category (on the grounds that the duration of syllabic /l/ is not significantly different from the duration of onset /l/).

(8) Summary of durational data for /n/: Means (standard deviations)

	Syllabic (n=153)	Post Schwa (n=171)	Onset (n=116)	Coda (n=114)
Duration (ms)	106 (20)	98 (18)	86 (24)	102 (22)

An ANOVA test for *target C duration* shows significant differences between the four /n/ allophones (F (3, 550) 21.92, $p < 0.001$) and a Tukey post hoc test shows that the duration of onset /n/ is significantly shorter than that of syllabic /n/, post schwa /n/ and coda /n/ ($p < 0.001$ in all cases). A Tukey post hoc test also shows that the duration of syllabic /n/ is significantly longer than the duration of post schwa /n/ ($p = 0.006$), though none of the other differences in duration are significant. Thus we could say that syllabic /n/ patterns like coda /n/, and not like onset /n/, nor as a distinct category (in that the durations of syllabic /n/ and coda /n/ are not significantly different).

The results of this section show that syllabic /l/ and syllabic /n/ pattern quite differently with respect to duration: syllabic /l/ patterns with onset /l/ and not with coda /l/, whilst syllabic /n/ patterns with coda /n/ and not with onset /n/. To summarise and conclude §4, what we have seen above is three ways in which syllabic /n/ behaves differently from syllabic /l/: (i) distribution of syllabic /n/, but not syllabic /l/ is sensitive to the context's place of articulation; (ii) distribution of syllabic /n/, but not syllabic /l/ is sensitive to the context's structural complexity (i.e. whether or not it is preceded by a singleton or a cluster); (iii) the duration of syllabic /n/ is akin to the duration of coda /n/, whilst duration of syllabic /l/ is akin to the duration of onset /l/.

Having gone some way towards empirically establishing the behaviour of syllabic /l/ and syllabic /n/ we must now look for an explanation of the behaviour observed. To this end, in the following section I outline a phonological framework where there are severe restrictions on the syllable template and strict conditions govern the occurrence of epenthetic schwas.

5. A Phonological Framework

Government Phonology¹⁰ (GP) aims to provide a non-arbitrary account of phonological events by replacing the rule component of a phonology with a finite set of universal principles and parameters (contra Bromberger and Halle 1989).

¹⁰ With regard to constituency I shall primarily be following work by Kaye, Lowenstamm and Vergnaud (1990), Charette (1991) and Harris (1994) whilst with regard to melody my work shall be based on Harris and Lindsey (1995).

The only constituents available in Government Phonology are the Onset, the Nucleus and the Rhyme, each of which may be maximally binary branching¹¹ (Kaye, Lowenstamm and Vergnaud, henceforth KLV, 1990:198-199). No 'syllable' constituent is recognised (KLV 1990:200-201, Harris 1994: 45-46), but rather, domains are constructed of iterated Onset-Nucleus pairs: neither a Nucleus, nor an Onset may form a domain on its own, nor may two Onsets (or two Nuclei) follow one another, without an intervening Nucleus (or Onset) (Harris 1994:160). No 'Coda' constituent is recognised either (Kaye 1990a): Any word-final consonant is instead attached to an Onset, which is necessarily followed by a (licensed, empty) nucleus (see below).

Whilst it is no longer controversial to suggest that linguistic units of sounds are decomposable into smaller units, the nature of these subparts remains a topic of discussion. In those approaches which adopt traditional features, such as [+/- front], [+/- anterior] as the smallest phonological units, articulation is elevated to unwarranted levels of importance given the wealth of evidence showing that speech production is parasitic on speech perception.¹² The primacy of articulation is undermined not least by the fact (all too often dismissed) that the same acoustic signature can be achieved by very different articulatory means.

In contrast to feature based approaches, Government Phonology takes seriously the relationship between phonological information and information in the speech signal. Sounds are composed of one or more monovalent elements, which although not in themselves acoustic events, are directly mappable onto gestalt patterns in the acoustic signal.¹³ I propose the following representations for the consonantal inventory of English.

(9) Internal representation of the consonantal inventory of Southern British English¹⁴ (broadly based on Harris 1994)

/p/ (@.U.?h.H) /θ/ (@.R.h.H) /t/ (@.R.?.h.H) /ʃ/ @.I.R.h.H) /h/(@.h)
 /b/ (@.U.?h) /ð/ (@.R.h) /l/ (@.R.?) /ʒ/ (@.I.R.h)
 /m/ (@.U.?.N) /s/ (@.R.h.H) /ɹ/ (@.R) /k/ (@.?.h.H)
 /f/ (@.U.h.H) /z/ (@.R.h) /dʒ/ (@.I.R.?) /g/ (@.?.h)
 /v/ (@.U.h) /d/ (@.R.?.h) /j/ (@.I) /ŋ/ (@.?.N)
 /w/ (@.U) /n/ (@.R.?.N) /tʃ/ (@.I.R.?.H) /k/ (@.?.h.H)

A PE that contains only @, as an operator, is known as an empty expression, and the nucleus to which such an expression is attached is known as an empty nucleus. Special principles govern the manifestation of such empty nuclei and these are discussed below.

¹¹Some GP researchers adopt a strict CV approach (Lowenstamm 1996) where only the Onset and Nucleus are recognised constituents, neither of which may branch.

¹²Consider, for examples, studies showing how acquired deafness and distorted auditory feedback can impair speech production e.g. Perkell et al 2000.

¹³ See Harris and Lindsey (1995) for details.

¹⁴ By convention the head of a phonological expression is underlined

Many languages exhibit vowel-zero alternations. The vowels involved in such alternations are typically peripheral or reduced, for example the alternation $i \sim \emptyset$ in Moroccan Arabic (Kaye 1990b), and $\text{ə} \sim \emptyset$ in French (Charette 1991). In Government Phonology, vowels which have this special property of alternating with zero are argued to be underlyingly empty (or in terms of the theory of elements outline above, to contain only operator @) and their interpretation is subject to the Empty Category Principle (ECP) and concomitant parameters.

- (10) The Phonological Empty Category Principle
(Charette 1990:235, precise wording here taken from Kaye 1995:295)
A p-licensed (empty) category receives no phonetic interpretation

There are four potential circumstances under which an empty category, or specifically here, an empty nucleus, can be p-licensed.

- (11) (Parametric) Conditions on p-licensing
(Kaye 1995:295, precise wording here my own)
A p-licensed (empty) category may receive no phonetic interpretation
iff: i. it is domain-final
 ii. it is properly governed
 iii. it is magically licensed
 iv. it is within an Inter-Onset governing domain

Magic licensing (Kaye 1991) is concerned with nuclei preceding S+C clusters. As such it is not relevant to the discussion at hand and will not be considered further. Inter-Onset Government (Lee 1999) is a governing relationship which may, in languages where this particular parameter is ON, be contracted between two onsets separated by a nucleus if certain substantive constraints are met. The domain-final parameter, referred to in (i) above, is ON in those languages which allow apparent word-final consonants (e.g. English) and OFF in those languages where words may only end in vowels (e.g. Cayuvava, Hawaiian). Given that GP holds that phonological strings consist of Onset-Nucleus pairs, those words, which appear to end in consonants, actually end in a nucleus. This nucleus is empty (it has no melodic content) and because it is silent it must (by stipulation) be p-licensed. By convention, a p-licensed category is indicated by underlining.

An empty category may also remain without interpretation if the conditions for Proper Government are met (cf. (11.ii)).

- (12) Proper Government
(Kaye 1995:295, precise wording here taken from Charette 1998:170)
A nucleus α properly governs and empty nucleus β iff:
i. α and β are adjacent on the nuclear projection
ii. α is not itself p-licensed
iii. α is not a government licenser (for its onset)

- (13) Government Licensing (Charette 1990:242)
 For a governing relation to hold between a non-nuclear head A and its complement B, A must be licensed to govern by its nucleus

The key issue to note here is that there are strict principles governing the (non) interpretation of empty nuclei. Unless certain conditions are met empty nuclei are phonetically interpreted as reduced vowels, typically as schwa.

6. Towards a Phonological Analysis

As we saw above, 'syllables' in GP are made up of Onset-Nucleus pairs. Thus the syllabification of a word like 'button' necessarily includes a nuclear constituent between the /t/ and the /n/. Furthermore, we have seen that GP has strict principles governing the non-interpretation of nuclei; only p-licensed empty nuclei can remain without phonetic interpretation. Given this let us consider the predictions we can make concerning the realisation of a word like 'button'.

- (14) Phonological structure for 'button'

O	N ¹	O	N ²	O	N ³
x	x	x	x	x	<u>x</u>
b	ʌ	t	?	ɪ	

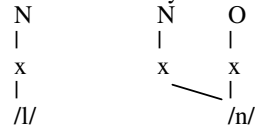
First, let us consider N³: this nucleus is p-licensed by the domain-final parameter, and because it is itself p-licensed, it cannot act as a Proper Governor for N². Thus the conditions for Proper Government are not met. Are any of the other conditions for p-licensing met? Magic Licensing is not relevant here (we are not dealing with S+C clusters), and Inter-Onset Government could not be active here for /t/ could not enter into a governing relation with /n/.¹⁵

In fact we see that none of the conditions are met for the p-licensing of N² in (14): it is not domain-final, it is not properly governed, it is not magically licensed, nor is it subject to Inter-onset Government. From this we can conclude that N² must be phonetically realised, and our next question arises: how is this N² phonetically realised? The results given in §4 showed that words containing a potential syllabic /l/ never contained a schwa, whilst words containing a potential syllabic /n/ either contained no schwa, when the /n/ was preceded by a coronal, or such words contained a schwa-/n/ sequence, when the preceding syllable ended in a non coronal.

To explain this behaviour I propose the following structures for syllabic /l/ and syllabic /n/.

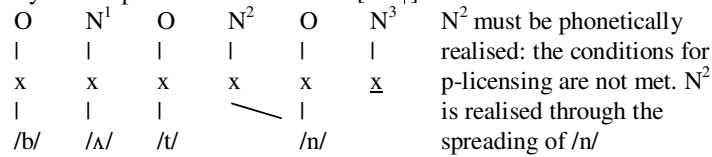
¹⁵ For details see Lee (1999).

(15) Structures for syllabic /l/ and syllabic /n/



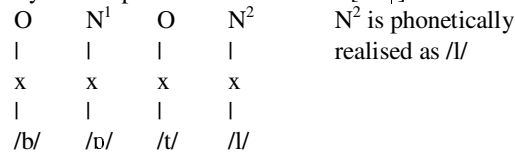
Syllabic /l/, unlike non syllabic /l/ is attached directly to a nuclear constituent, whilst syllabic /n/ is attached to both a onset constituent, and the preceding nuclear constituent, as a result of spreading (see below). This gives syllabic structures for words like 'button' and 'bottle' as in (16, 17).

(16) Syllabic representation of 'button' [bʌtʌn]



/n/ is licensed to spread because it is preceded by a phonological expression with the same element (R) as head cf. Hawarth (1994), Harris (1994), Rennison (1993) (see below).

(17) Syllabic representation of 'bottle' [bɒtl̩]



It is clear from minimal pairs such as 'finally' [fʌnli] vs. 'finely' [famli], 'evening' (<vb. meaning 'to smooth') [i:vniŋ] vs. 'evening' (time of day) [i:vniŋ], that syllabic /l/ and syllabic /n/ are not the same as their non-syllabic counterparts. This rules out representations whereby syllabic /l/ and syllabic /n/ are directly and uniquely attached to an onset constituent, as is the representation of non-syllabic /l/ and /n/.

The experimental results in §4 showed that for potential syllabic /n/ there is some free variation between [ŋ] and [ən], irrespective of context. For example, following /t/, [ŋ] occurred 85% of the time, whilst [ən] occurred 15% of the time. The possibility for this variation to exist must somehow be captured in whatever representation is proposed for syllabic /n/.

This variation can indeed be captured by proposing the structure for syllabic /n/ as given in (15), and *in addition*, a condition on the spreading of /n/: /n/ may only spread into the preceding nucleus when head licensed to do so by an onset adjacent at the relevant projection *with the same element as head*. Similar head based licensing proposals have been made by Hawarth (1994) for French, and

Rennison (1993) for Koromfe. When the onset preceding /n/ is not capable of Head Licensing the /n/, no spreading takes place. In such circumstances, the intervening nucleus must still be realised, but in these cases it is realised as a default vowel, or in other words, as a schwa (e.g. as in 'bacon' [beɪkən] where [k] and [n] do have the same element as head and thus /n/ is not licensed to spread).

Returning now to the representation of syllabic /l/, I proposed that this segment be directly attached to a nuclear constituent. Theory internally to Government Phonology there are no restriction on the set of elements which may attach to either a nuclear or non-nuclear constituent (cf. the one mouth principle, Anderson and Ewen 1987, Clements 1991). Theory externally, however, we must, as an upshot of my proposal, ask ourselves whether it is legitimate to treat syllabic /l/ as a vowel.

Let us consider definitions which have been made concerning what is and what is not a vowel or a consonant. A vowel can be defined articulatorily as involving no major stricture in the vocal tract (Ladefoged and Maddieson 1996:281), or acoustically as having relatively a long interval of periodic energy with three clear formants (Johnson 1997). Phonologically speaking, a structural definition is usually given for vowels: that which is found at the centre of a syllable, or acts as a syllable on its own. On each of these grounds it could be argued that syllabic /l/ is indeed very vowel-like. Phonetically speaking, /l/ is the most sonorous of oral consonants, having vowel-like formant characteristics, and can indeed be produced without any occlusion (Ladefoged and Maddieson 1996). Syllabic /l/ is also vowel-like phonologically speaking: it may occur after any onset (recall that syllabic /n/ does not show this behaviour), and can indeed form a syllable on its own, as in 'bottle'. Thus there seem to be no strong grounds for ruling out my proposal that syllabic /l/ is indeed attached directly to a nuclear constituent. Such an analysis would explain why no variation is seen in the realisation of potential syllabic /l/ (there is no 'space' in the syllabic structure, contrary to the case of syllabic /n/).

7. Conclusions

In this paper I have presented the results of an acoustic investigation into the nature of syllabic /l/ and syllabic /n/ in Southern British English. These showed that syllabic /l/ and syllabic /n/ behave quite differently from each other, in at least three ways. The distribution of syllabic /n/, but not syllabic /l/, is sensitive to the place of articulation of the immediately preceding singleton consonant. A potentially syllabic /n/ is only actually realised as syllabic when preceded by a homorganic, i.e. coronal consonant. When /n/ is preceded by a non-coronal consonant, the potential syllabic consonant is actually realised as /ən/. Syllabic /l/, on the other hand as no such restrictions on its distribution, for a potential syllabic /l/ is realised as a syllabic /l/ (distinct from a schwa-/l/ sequence) irrespective of the place of the preceding consonant.

Secondly, the distribution of syllabic /n/ is also affected by the structural complexity of its context: if a potential syllabic /n/ is preceded by a nasal-stop cluster, the potential syllabic /n/ is always realised as /ən/, even when preceded by a homorganic cluster. Once again, syllabic /l/ behaves in a different way: a potentially syllabic /l/ is always realised as an actual syllabic /l/ irrespective of the place of the preceding nasal-stop cluster. Thirdly, with respect to duration syllabic /n/ is akin to coda /n/, both being significantly longer than onset /n/. Syllabic /l/, however, is not akin to coda /l/ in duration, but is rather significantly shorter than coda /l/, and approximately the same duration as onset /l/.

In the second half of this paper I proposed that these differences in behaviour can best be explained by proposing differences in their syllabic structure. This is a new proposal, quite unlike those made by previous researchers (Chomsky and Halle 1968:354, Gimson 1989, Gussmann 1991, Wells 1995). If syllabic /n/ and syllabic /l/ are represented differently it is not surprising that they also behave differently.

By proposing that syllabic /l/ is attached directly to a nuclear constituent I capture that fact that potential syllabic /l/ is always realised as syllabic /l/ regardless of the nature of the preceding onset. As discussed in §6 above, there are no theoretical or definitional grounds for ruling out the interpretation of syllabic /l/ as a vowel. By proposing that syllabic /n/ is attached to an onset, and that this /n/ may spread when the conditions for head licensing are met, I capture and explain the variability of potential syllabic /n/, which is sometimes realised as [ŋ] and sometimes as [ən], when preceded by a singleton. As for why syllabic /n/ is never found following a nasal-stop cluster, even when that nasal-stop cluster is coronal, I believe this is due to an interaction between Head Licensing and Government Licensing¹⁶, which can only be given by a nucleus with content not shared with other constituents.

Government Licensing is concerned with the ability of an onset head to license its complement. In order for that head to license its onset, it must receive licence to do so. Languages vary as to what may provide the licence to govern to an onset head (Charette 1990, 1991). In some languages a p-licensed nucleus may act as a Government licensor, whilst in others only a realised nucleus, i.e. one with phonetic content, may act as a Government licensor. Thus occasions can arise when Proper Government and Government Licensing come into conflict and the solution depends on the language specific ranking of these two principles. I wish to extend these ideas in two ways (1) to propose that Head Licensing and Government Licensing can also come into conflict in those languages where both principles are active, and (2) to propose that a licence to govern can parametrically be given additionally by a nucleus which shares its content with an adjacent onset, or by a nucleus which does not share any content with an adjacent onset. A similar proposal has been made by Haworth (1994) for the treatment of French glides.

¹⁶ It might instead be argued that some sort of OCP effect is active but I do not believe this is the case: when a nasal is preceded by a nasal + stop cluster the two nasals are not adjacent at any level.

In conclusion I have shown that syllabic /l/ and syllabic /n/ behave in ways which do not justify a uniform analysis. Instead I have proposed distinct syllabic structures and new interactions of well-established principles in Government Phonology, providing an analysis which I believe can capture well different behaviours of syllabic /l/ and syllabic /n/ in Southern British English. I also hope that this paper has shown how phonological insight can be informed by phonetic research.

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