Two types of prepositions in Serbian and the nature of Spell-out

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This paper explores the syntactic behaviour of two classes of apparently synonymous prepositions in Serbian. It is shown that the two classes differ in the degree to which they allow measure phrases and null DP-complements. The analysis proposed captures the observed differences in terms of a detailed syntactic decomposition of PPs, as well as relates the syntactic behaviour of each class to their morphological make-up. The analysis is then extended to account for a similar pattern in English. The goal is to show how the properties of various types of Ps in both English and Serbian can be made to follow from the lexical specification of the particular vocabulary items found in each language.

1. Two types of Ps in Serbian

Serbian has two classes of apparently synonymous prepositional elements. The members of each class, which I label as *Simple* and *Complex* prepositions, are listed in the table below.

(1)

SimplePs	ComplexPs	
nad	*iznad*	over, above
pod	*ispod*	under
pred	*ispred*	in front of
za	*iza*	behind

The chosen labels refer to the morphological complexity of the two classes of prepositions. SimplePs are monomorphemic, while ComplexPs are formed by attaching the morpheme *iz* to one of the SimplePs.[1]

(2)   *iz + nad → iznad*
        iz + pod → ispod

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[1]The labels have been chosen in order to avoid any theoretical implications. My intention is however not to suggest that there are no other morphologically simple or complex prepositions in the language.

$$iz + pred \rightarrow ispred$$
$$iz + za \rightarrow iza^2$$

The morpheme *iz* which occurs in ComplexPs is homophonous with the source preposition, meaning 'from, out of':[3]

(3) David je   istrčao iz   kuće.
     David AUX run   out.of house
     'David ran out of the house.'

However, when *iz* is combined with one of the SimplePs, the resulting complex preposition does not have a source interpretation. In fact, both Simple and ComplexPs can be used in the same context, with no significant difference in meaning.[4]

(4) a. David je   stajao pred   kućom/ispred kuće.
         David AUX stood in.front house/in.front house
         'David was standing in front of the house.'
     b. Helikopter je   leteo nad gradom/iznad grada.
         helicopter AUX flown over town/over   town
         'The helicopter was flying over the town.'

Interestingly, this is not the case in other Slavic languages, such as Russian or Czech, where the corresponding complex prepositions do have source meanings. Thus while *iz-pod* in Serbian means simply 'under,' the Russian *iz-pod* and the Czech *z-pod* mean 'from under.' Consider the following example from Russian:

(5) Myšj   vybežala iz-pod   krovati.
     mouse out-ran   from-under bed
     'The mouse ran from under the bed.' (from Arylova et al. 2005)

That ComplexPs in Serbian are truly locative expressions can be shown by applying several diagnostics (based on Svenonius to appear). First of all, as other locative PPs, ComplexPs can appear in the complement position of stative verbs:

(6) Banka se   nalazila ispred   hotela.
     bank   REFL located in.front hotel
     'The bank was located in front of the hotel.'

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[2]Note that phonological changes can slightly alter the shape of the morpheme *iz* in ComplexPs. Thus, when *iz* attaches to *pod* and *pred*, assimilation in voicing gives rise to the forms *ispred* and *ispod*. On the other hand, when *iz* attaches to *za*, elision reduces a double consonant to a single one.

[3]Abbreviations are as follows: ACC - accusative case, AUX - auxiliary, DIST - distal morpheme, EZ - ezafe linker, INSTR - instrumental case, ^{I} - imperfective, ^{P} - perfective, REFL - reflexive

[4]In the examples throughout the article, DP complements of Simple and ComplexPs surface bearing instrumental and genitive case respectively. SimplePs belong to case-alternating prepositions, occurring with instrumental case in locative uses and accusative in directional uses. On the other hand, there is no case-alternation with ComplexPs — the DP complement always surfaces in genitive case. I will set aside the issue of case assignment since I will mostly focus on locative uses of these prepositions.

Furthermore, PPs headed by a ComplexP can be used as locative adjuncts to verb phrases which imply no motion:

(7) David je   pretučen iza   škole.
     David AUX beaten   behind school
     'David was beaten up behind the school.'

Replacing the ComplexPs above with the source preposition *iz* (or any other directional PP) gives rise to ungrammaticality, showing that *iz*, when it occurs on its own, behaves as a directional preposition.

(8)   a. *Banka se   nalazila iz   hotela.
              bank   REFL located from hotel
       b. *David je   pretučen iz   škole.
              David AUX beaten   from school

It can be thus concluded that there are two sets of locative prepositions in Serbian which share basically the same meaning. This article will focus on syntactic properties of these two classes. It will be shown that Simple and ComplexPs differ in the degree to which they allow measure phrases and null DP-complements. I will then propose how the observed differences could be captured in terms of a detailed syntactic decomposition of PPs, as well as relate them to the morphological make-up of each class.

The article is organized as follows. In §2, I identify and illustrate the differences between Simple and ComplexPs, building on Svenonius (to appear). In §3, I turn to a similar pattern in English and an attempt to account for it presented in Svenonius (to appear). I spell out my background assumptions in §4 before moving on to the proposed analysis of the observed patterns in §5. Section 6 concludes the paper.

2.   *Contrasting Simple and ComplexPs*

We have seen that both Simple and ComplexPs in Serbian are locative prepositions. As such they express static location and provide information regarding the relationship between the Figure (an object which is being located) and the Ground (the landmark with respect to which the Figure is located). Focusing on their syntactic properties, Simple and ComplexPs can be shown to differ in at least two properties, compatibility with measure phrases and licensing of phonetically null Grounds (drawing on Svenonius (to appear)).

First of all, there is a distinction between Simple and Complex prepositions in the degree to which they allow measure expressions. Measure phrases can be used to modify ComplexPs, as illustrated by the following examples:

(9)   a. Ona je   stajala tri   metra ispred ulaza.
              she AUX stood   three meters in.front entrance
              'She was standing three meters in front of the entrance.'
       b. Par   centimetara ispod kolena, imao je   ogromnu modricu.
              a.few centimeters under knee   had AUX huge   bruise
              'A few centimeters under the knee, he had a huge bruise.'

    c.   Kuća se   nalazila desetak metara iznad puta.
            house REFL found   ten   meters above road
            'The house was about ten meters above the road.'

The same examples with SimplePs are however degraded:[5]

(10)   a. ??Ona je   stajala tri   metra pred   ulazom.
              she AUX stood three meters in.front entrance
              'She was standing three meters in front of the entrance.'
        b. ??Par   centimetara pod kolenom, imao je   ogromnu modricu.
              a.few centimeters under knee   had AUX huge   bruise
              'A few centimeters under the knee, he had a huge bruise.'
        c. ??Kuća se   nalazila desetak metara nad   putem.
              house REFL found   ten   meters above road
              'The house was about ten meters above the road.'

Secondly, ComplexPs allow their complement, i.e., the Ground, to be omitted in certain contexts. The examples below show that identifying the Ground anaphorically is generally sufficient.

(11)   a.   Na kraju ulice je   naša kuća, a   ispred (kuće) je   parkiran naš auto.
              at end   street AUX our house and in.front house AUX parked   our car
              'Our house is at the end of the street, and our car is parked in front.'
        b.   Sedeli smo i   posmatrali plažu, dok je   iznad (plaže) kružilo jato
              sat   AUX and watched   beach while AUX above beach circled flock
              galebova.
              seagulls
              'We were sitting and watching the beach, while a flock of seagulls was circling above the beach.'
        c.   Na vrhu brda je   stajalo orahovo drvo, a   ispod (njega) je   bilo zakopano
              on top hill AUX stood chestnut tree and under it   AUX been buried
              blago.
              treasure
              'On top of the hill, there was a chestnut tree, and under it the treasure was buried.'

With SimplePs, on the other hand, the Ground must be overt.

(12)   a.   Na kraju ulice je   naša kuća, a   pred   *(kućom) je   parkiran naš auto.
              at end   street AUX our house and in.front   house   AUX parked   our car
              'Our house is at the end of the street, and our car is parked in front.'
        b.   Sedeli smo i   posmatrali plažu dok je   nad   *(plažom) kružilo jato
              sat   AUX and observed   beach while AUX above   beach   circled flock

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[5]Some speakers I've consulted do not find the contrast to be as strong though they all acknowledge that there is a contrast. A Google search reveals that there might also be differences between Croatian and Serbian speakers, suggesting that Croatian speakers are more likely to accept measure phrases with SimplePs than Serbian speakers. I return to this briefly in §5.

galebova.
seagulls
'We were sitting and watching the beach, while a flock of seagulls was circling above the beach.'

c.   Na vrhu brda je   stajalo orahovo drvo a   pod   *(njim) je   bilo zakopano
on top hill AUX stood chestnut tree, and under   it   AUX been buried
blago'
treasure
'On top of the hill, there was a chestnut tree, and under it the treasure was buried.'

The distribution of measure phrases and null Grounds with Simple and ComplexPs is summarized in the table below.

(13)

	SimplePs	ComplexPs
measure expressions	*	✓
null Ground	*	✓

I will return to this pattern in §5, where I suggest that the differences in the syntactic behaviour of Simple and ComplexPs can be captured by assuming a rather detailed decomposition of PPs, together with a particular view of the interface spell-out procedure. Before doing so, I turn to the proposal put forth in Svenonius (to appear), intended to capture similar facts in English.

3.   Two types of locative Ps in English
3.1.   Projective vs Bounded Ps

A similar pattern to the one discussed in the previous section has been observed in English by Svenonius (to appear). Svenonius (to appear) distinguishes two types of locative Ps in English on the basis of their compatibility with measure phrases and the possibility of omitting the Ground. The class of prepositions which he refers to as Bounded Ps disallows both measure phrases and null Grounds, while the class of Projective Ps allows both.

(14)   Projective Ps (in front of, inside, above etc.)

a.   We remained sixty feet in front of the palace.
b.   I saw a line of soldiers. The one in front (of it) was talking on the phone.

(15)   Bounded Ps (next to, beside, against etc.)

a.   *They opened the door one meter next to the stage.
b.   There was a beach. Next *(to it), the cliffs swarmed with birds.

The distribution is summarized below, and is clearly similar to the Serbian facts. Serbian ComplexPs behave like Projective Ps in English, while SimplePs pattern together with what Svenonius (to appear) labels Bounded Ps in English.
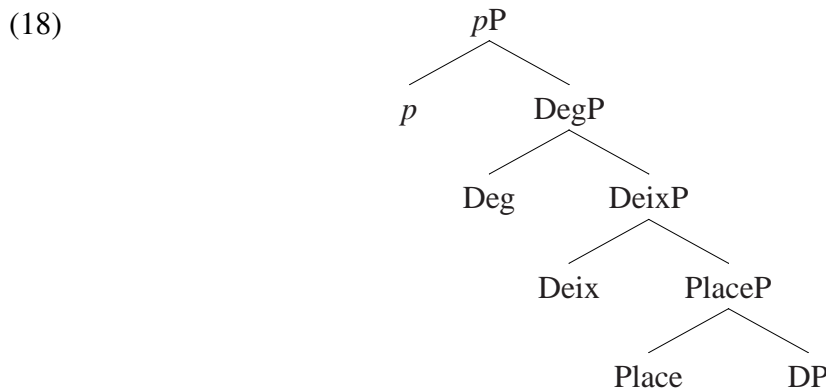
(16)

	Bounded Ps	Projective Ps
measure expressions	*	✓
null Ground	*	✓

3.2.   Deictic expressions and null Grounds

Svenonius (to appear) establishes another correlation between the possibility of having a null Ground and the possibility of overt *there*. The spatial words *here* and *there* can appear to the right of Projective Ps, but not Bounded Ps.

(17)   a.   Get inside there. (Projective P)
         b.   *Get next to there. (Bounded P)

Svenonius (to appear) (following Kayne 2004) notes that *there* is not interpreted as the Ground in (17a) — *inside there* means 'there, inside something,' rather than 'inside that place.' Svenonius therefore concludes that the Ground is null in this case, while the deictic element is introduced higher up, in a layer called Deix[is]. The prepositions themselves head a projection labelled PlaceP, which is dominated by DeixP. The relevant part of the syntactic decomposition of locative PPs argued for in Svenonius (to appear) is given in (18):[6]

(18)

```
                        pP
                   ╱         ╲
                  p          DegP
                          ╱        ╲
                        Deg        DeixP
                                ╱        ╲
                              Deix      PlaceP
                                      ╱       ╲
                                   Place       DP
```

Svenonius (to appear) argues that (17a) is derived by phrasal movement of PlaceP to a position left of the deictic element. This movement is obligatory when the Ground is null, as evidenced by the impossibility of having deictic expressions precede the preposition, illustrated in (19b). When the deictic element occurs to the left of the preposition, the Ground must be overt, as shown in (19a).[7] Svenonius (to appear) thus concludes that the movement of PlaceP licenses the null Ground.

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[6]The structure of locative PPs assumed by Svenonius (to appear) is in fact even more elaborate than shown in (18), with two additional categories below Place, namely K for case and Ax[ial]PartP, hosting for instance *top* in a complex expression like *on top of*. For the sake of simplicity, I will ignore these projections as they are not relevant for my current concerns.

[7]Examples such as *Get inside the house here* are grammatical but Svenonius (to appear) shows that in such cases *here* must be inside the DP.

(19)   a.   Come here inside the closet.
        b. ??Come here inside.

In this way, the two seemingly independent facts, appearing with a null Ground and preceding a deictic element, are captured by a single movement of PlaceP (which hosts the preposition and the null DP) to the left of the deictic expression. This movement must be unavailable for Bounded Ps, such as the one in (17b), since these are ungrammatical when they occur to the left of *there*. To explain this, Svenonius (to appear) assumes that Bounded Ps have an additional p feature, which must be checked by head-movement from Place to p. If PlaceP would move to a specifier position below p, then the p feature of a Bounded P would remain unchecked, assuming that a head cannot move out of a specifier. As a result, Bounded Ps don't allow null Grounds and cannot precede deictic expressions, since both of these properties are dependent on the movement of PlaceP.

Note that by assumption p is higher than at least DeixP. If p was taken to be lower than Deix, then Bounded Ps could first check their p feature and then move leftward across the deictic element, deriving the ungrammatical (17b). Thus the categorial hierarchy given in (18) coupled with the assumption that Bounded Ps have an additional p feature and that the movement of PlaceP to a position above Deix licenses null Grounds derives the distribution of null Grounds and captures the placement of deictic elements.

What is not stressed in Svenonius (to appear) though and poses a potential problem for the analysis is the fact that deictic expressions are compatible with both types of locative Ps when the Ground is overt.

(20)   a.   Come here inside the closet. (Projective P)
        b.   Lie there next to the closet. (Bounded P)

It is not entirely clear whether the deictic element occupies the specifier or the head of Deix on Svenonius's (to appear) analysis, but either option seems problematic. If *there* was in the head of DeixP, it would block head movement of a Bounded P to check its p feature. On this scenario, we would incorrectly predict that Bounded Ps should always be incompatible with deictic elements. If *there* was assumed to occupy the specifier of DeixP, the Bounded P could move and check its features in pP, but we would end up with the wrong word order. Since pP is higher than Deix, we would predict that the Bounded P should precede the deictic element after moving to pP, clearly the wrong result:

(21)   *Lie next to there the closet.

Thus, as (20) shows, both types of locative Ps are compatible with deictic expressions when the Ground is overt. What makes (17b) ungrammatical is the presence of null Ground, regardless of the position of the deictic expression. However, the fact remains that when the preposition allows its Ground to be null, it must precede the deictic element, suggesting possibly a necessity for some kind of licensing movement targeting the position above DeixP.

Serbian replicates the English pattern in cases involving overt Grounds. As illustrated below, both Simple and ComplexPs are compatible with deictic expressions:

(22)   SimplePs
    a.   Nezadovoljni radnici su   se   okupili tamo pred   skupštinom.
        dissatisfied   workers AUX REFL gathered there in.front parliament
        'Dissatisfied workers gathered there in front of the parliament.'
    b.   Mačka leži ovde pod   stolom.
        cat   lies here under table
        'The cat is lying there under the table.'

(23)   ComplexPs
    a.   Nezadovoljni radnici su   se   okupili tamo ispred skupštine.
        dissatisfied   workers AUX REFL gathered there in.front parliament
        'Dissatisfied workers gathered there in front of the parliament.'
    b.   Mačka leži ovde ispod stola.
        cat   lies here under table
        'The cat is lying there under the table.'

As expected , when the Ground is null, only ComplexPs are licit. Recall that SimplePs disallow null Grounds (illustrated in (12)).

(24)   a.   On je   stajao tamo ispred.
        he AUX stood there in.front
    b.   *On je   stajao tamo pred.
        he AUX stood there in.front

However, in contrast to English, the deictic expression always precedes the preposition in Serbian.

(25)   a.   Come inside here.
    b. ??Come here inside.

(26)   a.   On je   stajao tamo ispred.
        he AUX stood there in.front
    b.   *On je   stajao ispred tamo.
        he AUX stood in.front there

3.3.   Measure phrases

Adopting a vector space semantics for locative PPs (see Zwarts 1997; Zwarts & Winter 2000), Svenonius (to appear) argues that the Place head can be treated as a function from regions to vector spaces. Measure expressions restrict these vector spaces by picking out a subset of vectors of certain length. Svenonius (to appear) assumes that a special Degree head, μ introduces measure phrases in its specifier position. The reason why Bounded Ps, according to Svenonius (to appear) do not combine with measure phrases is that they do not denote vector spaces at the Place level and thus cannot combine with μ. Bounded Ps presuppose either a complex Ground (*among*, *between*), or a very short or zero distance (*beside*, *next to*, *against*).
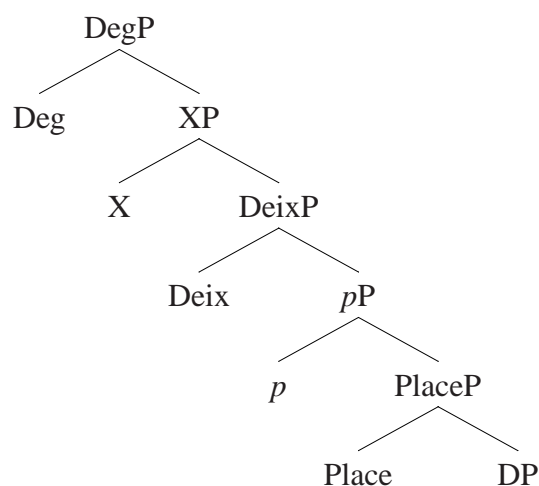
This type of explanation seems to me difficult to extend to cases of Serbian Simple and ComplexPs, since these are, as already noted, nearly synonymous. In §5, I will therefore pursue an alternative approach to the incompatibility of measure phrases with certain types of Ps in both English and Serbian. I start off however by laying out my assumptions regarding the internal structure of prepositional phrases.

4.   Background assumptions
4.1.   The structure of locative PPs

Many studies focusing on adpositional phrases in recent years have argued for more or less finegrained decomposition of PPs (Koopman 2000; den Dikken (to appear); Svenonius (to appear)). Following this line of research, and building in particular on the proposal put forth in Svenonius (to appear), I will assume that the syntactic structure of locative Ps is as illustrated below.

(27)

```
              DegP
             /    \
          Deg      XP
                  /  \
                 X    DeixP
                     /    \
                  Deix     pP
                          /  \
                         p    PlaceP
                             /    \
                         Place     DP
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Svenonius (2003) proposes that the split-V hypothesis be extended to P. In analogy to the verbal domain where the external argument is introduced by a distinct head usually known as little *v* (Kratzer 1996). Svenonius (2003) assumes that there is a functional head *p* which introduces the Figure and takes PP as its complement. In his more recent work, Svenonius proposes a finer-grained decomposition of PPs and introduces a number of projections between *p*P and PP (see the tree in (18)). Thus, *p*P is argued to dominate both Deix and DegP. Recall that in Svenonius (to appear), the placement of *p* higher than Deg and Deix plays a crucial role in accounting for the distribution of null Grounds — Bounded Ps cannot license a null Ground by moving over Deix since they have to check their *p* feature by head-movement and *p*P is above Deix.[8] Since the analysis to be proposed will not rely on the position of *p*P in the functional sequence, I will follow more closely the analogy with the verbal domain and assume that *p*P takes PlaceP as its complement, with Deg and Deix appearing higher up.

DeixP is the projection hosting deictic expressions, such as the spatial words *here* and *there* discussed in the previous section. (Svenonius (to appear); cf. den Dikken (to appear)). Sveno-

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[8]It is less clear why *p*P should be above Deg.

nius (to appear) shows that at least in some languages which have distal and proximal morphemes, these are preceded by measure phrases, suggesting that Deix is below Deg:

(28)   Persian

      a.   dær 10 metri-ye un   birun-e   xane.
          at   10 meters-EZ DIST outside-EZ house
          'there, 10 meters outside the house'
      b. *dær un   10 metri-ye birun-e xane
          at   DIST 10 meters   outside house

In Serbian, as well, the measure phrase precedes the deictic expression:[9]

(29)   10 metara tamo ispred kuće
       10 meters there in.front house

Following Svenonius (to appear), I assume that null Grounds are licensed by movement to a position above Deix, which I label here simply as XP.[10] Finally, on top of XP there is a DegP, hosting measure expressions (cf. Koopman 2000; den Dikken (to appear), Svenonius (to appear)).

4.2.   The Spell-out procedure

A particular view of the relationship between abstract functional structure and the actual lexical items which instantiate it will play a crucial role in accounting for the patterns discussed in the previous sections. Following Halle & Marantz (1993), I assume that word-formation is syntactic in nature and that the phonological information is inserted into the structure after all syntactic operations have applied. I do not assume, however, that lexical items are inserted under a single terminal node. Rather, I will adopt the view that a single morpheme can lexicalize (or be associated with) a number of syntactic heads (see McCawley 1968; Starke 2005; Ramchand 2008; Caha 2007 and references cited therein). A particular morpheme can spell out a sequence of syntactic heads if these are adjacent to each other, i.e. a single morpheme can lexicalize one or more heads that select each other's maximal projections (see Abels & Muriungi 2008). The Spell-out procedure is regulated by the Superset principle, which allows a lexical item to spell out a certain chunk of syntactic structure if the lexical entry of that item contains all or a *superset* of features present in the syntax (Starke 2005; Caha 2007).[11] This means that the spell-out procedure can ignore lexical features, but cannot ignore syntactic features, i.e., all syntactic

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    [9]The deictic expression can also precede the measure phrase, but in that case it is followed by a long pause.

    [10]Svenonius (to appear) is not explicit about the landing site of the Groundless PlaceP, other than noting that it occupies a specifer below Deg but above Deix. If deictic expressions occupy the specifier of DeixP, then the Groundless PlaceP can either move to a higher Spec of DeixP (assuming multiple specifiers), or alternatively there must be another functional projection below Deg, i.e. the one I label here as XP, on Svenonius's approach as well. Note also that on Svenonius's analysis it is the entire PlaceP, hosting the Ground, which moves to the licensing position, while on the approach developed here, it is only the null Ground which undergoes movement.

    [11]For discussion of empirical and theoretical advantages of the Superset Principle over the Subset Principle employed in Distributed Morphology see Caha (2007).

features must be lexicalized.

With these assumptions in hand, I now turn to the analysis intended to capture the syntactic properties of different types of Ps in Serbian and English.

5.   Analysis
5.1.   Simple vs ComplexPs in Serbian

We have seen in §2 that ComplexPs in Serbian occur freely with measure expressions and are able to license null Grounds. On the other hand, it was shown that SimplePs disallow both null Grounds and measure modification.

(30)

	SimplePs	ComplexPs
measure expressions	*	✓
null Ground	*	✓

In order to account for the observed pattern, let us assume that the lexical entry of SimplePs, such as *pod* 'under,' contains the features [Deix, *p*, Place]. According to the Superset Principle, this means that SimplePs can lexicalize maximally Deix, *p*, and Place, or a subset of these, but cannot lexicalize X and Deg. This is illustrated below.

(31)
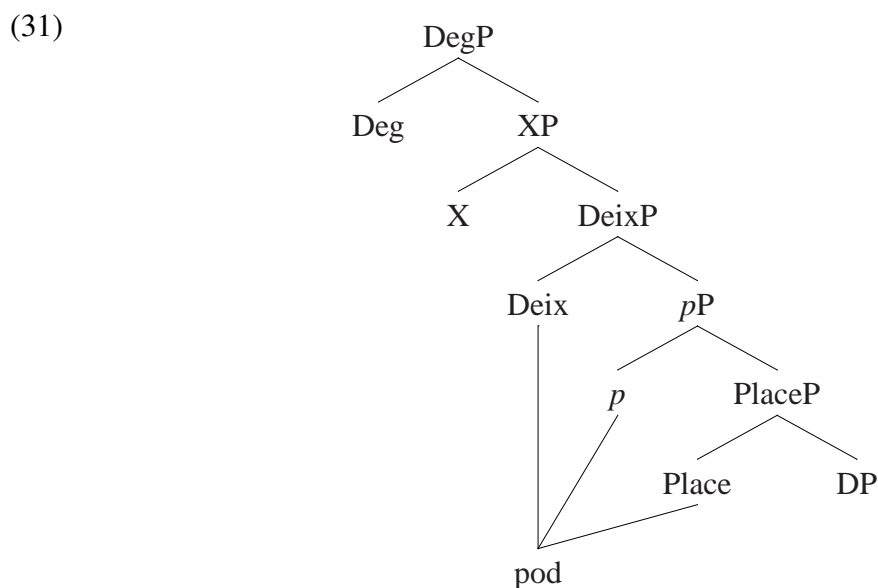
With this assumption regarding the lexical specification of SimplePs in place, we can now account for the incompatibility of SimplePs with both null Grounds and measure expressions. The reason why SimplePs do not combine with measure phrases is that they cannot lexicalize the Deg head, which is responsible for introducing measures. If Deg is present in the structure, it must be 'spelled-out,' i.e., it must be identified by a lexical item. Adopting the Superset Principle, a SimpleP is not a possible candidate for spelling out Deg since the lexical specification

of SimplePs does not contain Deg.[12]

The same logic can be used to capture the distribution of null Grounds. Following Svenonius (to appear), I assume that null Grounds are licensed in the specifier position above DeixP, which I have labelled XP. SimplePs then do not occur with null Grounds because they cannot lexicalize X, the head in whose specifier null Grounds are licensed.[13] What is more, we also know that XP must be higher in the functional sequence than at least DeixP. We've seen that SimplePs are compatible with deictic expressions, therefore they must be able to spell out Deix. If X was below Deix, a SimpleP would not be able to spell out the structure containing Deix since the lexical specification of a SimpleP would now be a subset of syntactic features present — a scenario prohibited by the Superset Principle. That the licensing position for null Grounds is above Deix is the conclusion reached by Svenonius (to appear) as well, on somewhat different grounds.

Turning now to ComplexPs, recall that these are morphologically related to SimplePs, being formed by attaching a morpheme *iz* to one of the SimplePs. Since we've already reached the conclusion that SimplePs spell out [Deix, p, Place], the morpheme *iz* must then be able to spell out (at least) [Deg, X].

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[12]The question that arises is what happens to Deg and X when they are not spelled out by a SimpleP. For the sake of explicitness, I assume that they can be missing. The issue is however too complex to be given a proper treatment here (see Starke 2004 for relevant discussion). Alternatively, we could assume that Deg and X are always present, but can have [+/-] values. Only marked values of Deg and X can license modifiers and null Grounds. This would mean that SimplePs can lexicalize Deg and X on the condition that they have unmarked values.

[13]A reviewer points out that the reason why SimplePs cannot take null complements could be because they are proclitics. Evidence that prepositions in Serbian are proclitics comes solely from the location of accent, i.e. the observation that a tone can spread onto a preceding preposition. Note however that tone spread happens both with Simple and ComplexPs. Nevertheless, let us for a moment entertain the idea that the examples with SimplePs taking a null complement are ungrammatical not because the movement licensing null complements is unavailable, but because SimplePs lack an appropriate host to which they could attach. In this respect, consider first (32), an example of Right Node Raising, which does not give rise to ungrammaticality:
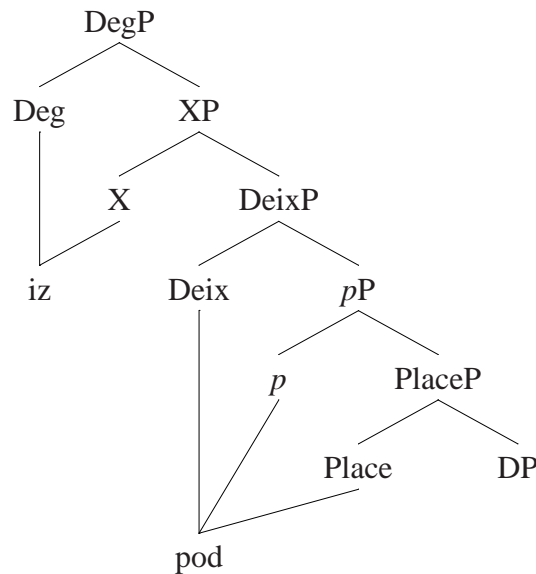
(32)   nad   i   pod   zemljom
           above and below ground

If the prosodic requirements of the preposition *nad* 'above' are somehow satisfied in (32), the question arises of how to account for the following contrast in prosodic terms, i.e. why the participle in (33b) is not an appropriate host for the preposition:

(33)   a.   ispod (stola) ostavljene cipele
             under table   left   shoes
    b.   pod   *(stolom) ostavljene cipele
             under table   left   shoes
             'the shoes left under the table'

I therefore conclude that the possibility of SimplePs to license null Grounds cannot be reduced to their status as proclitics. The reason why (33b) is ungrammatical under the approach developed here is due to the unavailability of the movement licensing null complements. I also assume that Right Node Raising does not involve movement (see Abels 2003 and references cited there).

(34)

```
                    DegP
                   /    \
                 Deg     XP
                 /      /  \
                iz     X    DeixP
                      /    /      \
                     iz  Deix      pP
                        /         /  \
                      pod        p    PlaceP
                                /    /      \
                              pod  Place     DP
                                   /
                                  pod
```

This assumption about the lexical entry of the morpheme *iz* allows us to capture the observation that by adding *iz* to one of the SimplePs, the use of measure phrases and null Grounds becomes possible. While a SimpleP such as *pod* cannot spell out Deg, Deg can be spelled out by *iz*, thus making the site for insertion of measure phrases available. Anaphoric identification of Grounds becomes possible as well, since *iz* can spell out X, which is by assumption the position where null Grounds are licensed. Deictic expressions are expected to be compatible with ComplexPs as well, since Deix is always spelled-out by *pod*. [14] In the following subsection, I will adopt the same kind of approach to account for the parallel facts in English.

5.2. *Bounded vs Projective Ps in English*

In §4, we have seen that two types of locative prepositions in English discussed in Svenonius (to appear) exhibit the same pattern as the one found in Serbian. One class of prepositions, which Svenonius (to appear) labels as Bounded Ps, disallows measure phrases and null Grounds, while so called Projective heads are compatible with both.
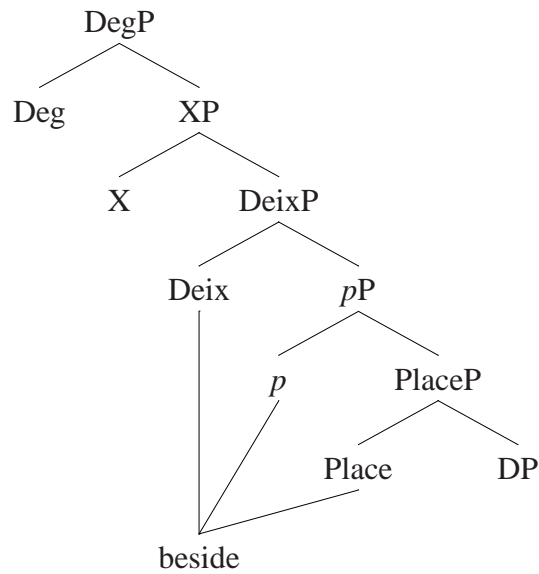
(35)

	Bounded Ps	**Projective Ps**
measure expressions	*	✓
null Ground	*	✓

The explanation provided for Serbian facts can be easily extended to English data. I assume that Bounded Ps (such as *next to*, *beside* etc.) are like Serbian SimplePs in that their lexical entry is specified for the features [Deix, *p*, Place].

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[14]An alternative, suggested by the reviewer, would be to list each ComplexP separately in the lexicon, together with the feature specification [Deg, X, Deix, p, Place], rather than parsing them into two separate morphemes. This type of approach, however, would fail to capture the observation that Simple and ComplexPs are morphologically related and that it is always the addition of the morpheme *iz* which is responsible for availability of null Grounds and measure phrases.
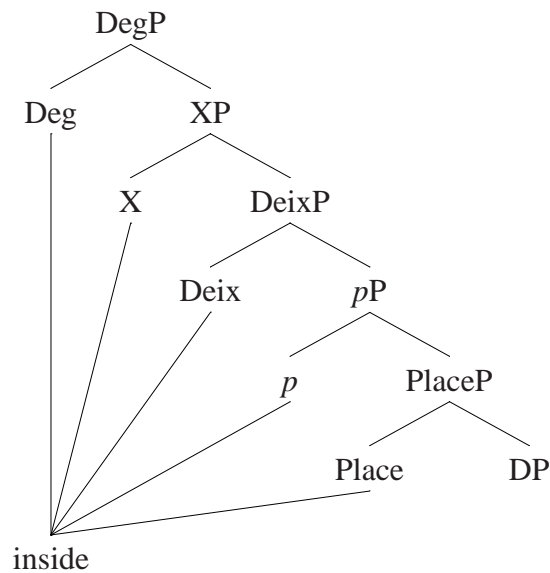
(36)

```
                        DegP
                       /    \
                    Deg      XP
                            /  \
                           X    DeixP
                               /    \
                            Deix     pP
                                    /  \
                                   p    PlaceP
                                        /    \
                                    Place     DP
                              beside
```

Since Bounded Ps are not able to spell out Deg, measure phrases are illicit. Null Grounds cannot be licensed either since there is nothing to lexicalize X. Anaphoric identification of the Ground is therefore impossible with Bounded Ps.

Place heads (such as *inside*, *above* etc.), on the other hand, can lexicalize the entire functional sequence, as shown below:

(37)

```
                        DegP
                       /    \
                    Deg      XP
                            /  \
                           X    DeixP
                               /    \
                            Deix     pP
                                    /  \
                                   p    PlaceP
                                        /    \
                                    Place     DP
                        inside
```

Since Place heads can lexicalize Deg and X, they are correctly predicted to be able to occur with both measure expressions and null Grounds.

Note that according to the approach pursued here, it is the lexical entries of Projective Ps such as *inside* that contain more features than lexical entries of Bounded Ps. This is exactly the opposite of what is assumed by Svenonius (to appear), where Bounded Ps were specified for an additional *p* feature.

The proposed analysis thus enables us to give a unified account of Serbian and English facts by deriving the differences in the syntactic behaviour of various types of prepositions from their lexical specifications. Different types of locative Ps thus vary with respect to how much functional structure they are able to spell out, which in turn has consequences for their syntactic behaviour.

5.3.   *Some speculations regarding the XP projection*

So far I have been assuming that null Grounds are licensed in a projection above DeixP, labelled XP. The question that emerges is what the nature of this functional layer is. In particular, is it possible to do away with this projection, the sole purpose of which is to provide a licensing position for null Grounds?

It is immediately obvious that DeixP and XP cannot be reduced to a single projection. If we were to do so, we would be unable to rule out null Grounds with either SimplePs in Serbian or Bounded Ps in English. As we have seen, both SimplePs and Bounded Ps can occur with deictic expressions and thus are clearly able to spell out Deix. If DeixP were at the same time the position where null Grounds could be licensed, we would predict that these should be licit with SimplePs and Bounded Ps. This is clearly the wrong result.

The other possibility would be to collapse DegP and XP into a single projection. If we thus eliminated XP, the specifier of DegP could be targeted by movement of the null Ground, while measure phrases could be adjoined to DegP.[15] This would have the welcome consequence of correlating the possibility of having null Grounds with the possibility of measure modification. We have seen that in both English and Serbian whenever measure modification is impossible, null Grounds are also illicit. The question is why these two properties pattern together. By linking both properties to a single projection, let's say DegP, we predict that a preposition which is not able to lexicalize Deg would be incompatible with both measure phrases and null Grounds. The Serbian and English facts discussed so far suggest that this kind of approach could be on the right track. However, if the connection between measure expressions and anaphoric identification of Ground proves not to be as tight when facts from other languages are taken into account, this would suggest that we might nevertheless want to keep these two projections apart. Pending further research, I leave this issue unresolved for now.[16]

---

[15]See den Dikken (to appear) for similar suggestions regarding his Dx[space]P, which corresponds to Koopman's (2000) DegP. In den Dikken's analysis, Dx[space]P is the counterpart of the Dx[tense]P (a.k.a. TP) in the clausal domain. The specifier of Dx[space]P can be filled by movement of the complement of P, just like SpecTP is filled by movement of an argument of the verb. There is furthermore no special relationship between this projection and the insertion site of measure phrases. Nevertheless, measure phrases can adjoin to Dx[space]P, in the way that adverbials are commonly assumed to adjoin to TP. A significant difference between den Dikken's Dx[space]P and my DegP however is that Dx[space]P is assumed to host deictic expressions as well.

[16]As already noted, Croatian seems to be freer in the use of measure phrases than Serbian. A quick Google search reveals that combinations of measure expressions with SimplePs can be occasionally found predominantly on Croatian sites (though the number of hits is still significantly smaller than for ComplexPs). This might suggest that SimplePs are able to lexicalize Deg, but not X, at least for some Croatian speakers (and possibly even some Serbian speakers for whom the contrast is less strong). Note also that the cases discussed so far offered us no clue as to what the relative ordering between Deg and X might be. The behaviour of SimplePs in Croatian then might be taken as an indication that X in fact dominates Deg.

5.4.   Directional uses of ComplexPs

In §1, it has already been noted that the morpheme *iz* which occurs in ComplexPs is ho-
mophonous with the source preposition *iz*, meaning 'from, out of'. Nevertheless, we have seen
that PPs headed by ComplexPs not only lack the source directional interpretation, but generally
behave like locative expressions. That ComplexPs are locative PPs is further supported by the
fact that they receive only locative interpretation when combined with imperfective verbs.

(38) a. David je   trčao iza   kuće.
          David AUX run^I behind house
          'David was running behind the house.'
      b. Beba je   puzala   ispod stola.
          baby AUX crawled^I under table
          'The baby was crawling under the table.'

ComplexPs can however get a directional interpretation when they are used with perfective
verbs. Interestingly, even then the most natural interpretation is a goal rather than source direc-
tional one.

(39) a. David je   otrčao iza   kuće.
          David AUX run^P behind house
          'David ran to behind the house.'
      b. Beba je   otpuzala ispod stola.
          baby AUX crawled^P under table
          'The baby crawled to under the table.'

How can we account for directional uses of ComplexPs? In particular, can the lexical entry of
the morpheme *iz* be refined in such a way as to capture not only the possibility of directional
interpretation in cases like (39), but also the fact that *iz* can function as a source preposition
when occuring on its own?

   One way to address this issue under the current approach would be to assume that the lexical
entry of the morpheme *iz* carries additional features which give rise to a directional interpreta-
tion. It is often argued that directional PPs contain a category labelled *Path*.[17] In the functional
sequence, Path dominates the projection(s) of Place.

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[17]*Path* and *Place* is the terminology used by Jackendoff (1983), Koopman (2000), Svenonius (to appear) etc.
Some others use *dir[ectional]* and *loc[ative]* instead (see van Riemsdijk and Huybregts 2002, den Dikken (to
appear)).

(40)

```
                    PathP
                   /     \
                Path      DegP
                         /    \
                       Deg     XP
                              /   \
                             X     pP
                                  /   \
                                 p    PlaceP
                                     /     \
                                  Place     DP
```
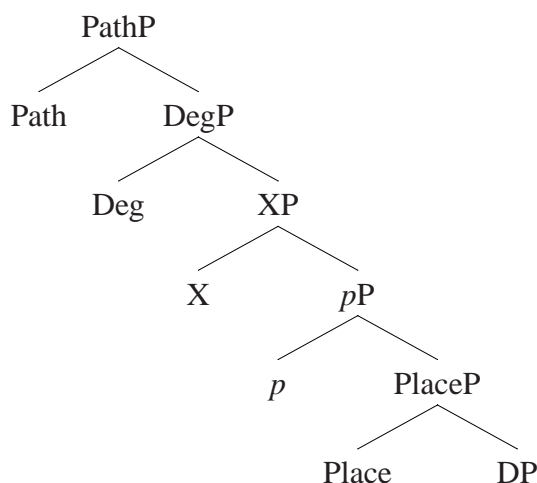
If there is a single lexical entry for *iz*, then the lexical specification of *iz* should include the category *Path*. As a result, *iz* would be able to lexicalize the Path head and thus give rise to a directional interpretation. We would then predict that a directional reading should always be possible, not only with the source preposition *iz*, but also with ComplexPs.[18] That this is however not the case is clear from examples in (38), i.e. a directional interpretation of PPs headed by ComplexPs is not available with imperfective verbs. Consider also the following contrast:

(41) a. Lopta se   kotrljala iz   kuhinje u   kupatilo.
          ball   REFL rolled^I from kitchen into bathroom
          'The ball rolled from the kitchen into the bathroom.'
      b. *Lopta se   kotrljala ispod stola u   kupatilo.
          ball   REFL rolled^I under table into bathroom
          Intended: The ball rolled from under the table into the bathroom

Although having a single lexical entry for the morpheme *iz* covering all of its uses would certainly be desirable, the unavailability of a directional reading in cases like (38) and (41b) forces us to conclude that the source preposition *iz* and the morpheme *iz* in ComplexPs cannot share the same lexical entry.

A welcome consequence of assuming separate entries is that it allows us to account for the contrast between (38) and (39), i.e the fact that aspectual properties of the verb have an effect on the availability of directional interpretation. If ComplexPs cannot lexicalize the Path head, examples in (38) are correctly predicted to allow only locative interpretation. In order for a directional interpretation to arise, the Path head has to be lexicalized. Note that perfective verbs in Serbian (and Slavic more generally) are formed by attaching a prefix to an imperfective base.[19]

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[18]Note that a directional interpretation would not be necessary since the Superset principle allows the lexical features to be ignored.

[19]A reviewer asks whether it is a general property of locative prepositions in Serbian to receive directional interpretation only when used with perfective verbs. Most prepositions in Serbian that can be used both in locative

(43)   a.   Beba je   puzala   ispod stola.
            baby AUX crawled^I under table
            'The baby was crawling under the table.'
      b.   Beba je   OD-puzala   ispod stola.
            baby AUX away-crawled^P under table
            'The baby crawled to under the table.'

What I would like to argue is that the Path head can be lexicalized by prefixes. As a result, a directional reading of ComplexPs becomes possible with perfective verbs.[20] Assuming thus that the morpheme *iz*, unlike the source preposition *iz*, cannot lexicalize the Path head opens up a way of capturing the effect that the choice of a particular aspectual pair has on the availability of directional reading with ComplexPs.

6. *Conclusions*

This article has focused on two types of nearly synonymous locative Ps in Serbian. The two types differ morphologically in that ComplexPs are bimorphemic, consisting of a morpheme *iz* attached to one of the SimplePs. It was shown that the two types differ syntactically as well. ComplexPs such as *ispod* allow measure modification and null Grounds while SimplePs, such as *pod*, do not. I have argued that these properties might be accounted for by assuming a fine-grained syntactic decomposition of Place expressions in combination with a particular view regarding the spell-out of syntactic structure. The differences between these two classes were argued to stem from the amount of functional structure each type of preposition is able to spell out. SimplePs are thus assumed to be able to lexicalize only a subset of categories lexicalized by ComplexPs, and as a result display more restrictions in their syntactic behaviour.

    It was further argued that the same logic can be pursued to account for the differences between what Svenonius (to appear) has labelled Projective and Bounded Ps in English. Though these two types in English are not morphologically related, they pattern like Serbian Ps with respect to measure modification and anaphoric identification of Grounds. I have argued that the differences between these two classes can be captured by assuming that Projective Ps such

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and directional contexts are case-alternating prepositions. Thus, with SimplePs, for instance, it is not sufficient to change the aspectual value of the verb in order to obtain a directional interpretation (see (42a)), rather the case of the DP-complement to P has to change from instrumental to accusative (see (42b)).

(42)   a.   *Beba je   otpuzala   pod stola.
            baby AUX away-crawled^P under table.INSTR
      b.   Beba je   otpuzala   pod stol.
            baby AUX away-crawled^P under table.ACC
            'The baby crawled to under the table.'

In this paper, I won't discuss the interaction between case assignment and the interpretation of a PP. Note that the complement of ComplexPs always surfaces in genitive case. What is interesting about ComplexPs is that unlike with other prepositions in the language and despite the fact that they seem to incorporate a source preposition, the availability of directional interpretation in this case depends solely on the aspectual properties of the verb.

   [20]That lexical prefixes merge as Path heads has been argued on independent grounds by Romanova (2007).

as *inside* can spell out a superset of categories lexicalized by Bounded Ps. Thus, the proposed analysis shows how the properties of various types of prepositions in both English and Serbian can be made to fall out from the lexical specification of the particular vocabulary items found in the lexical inventory of each language. This has a welcome consequence of reducing the intra- and interlanguage variation to properties of lexical items, i.e., to that component of grammar for which there is independently strong evidence of learning (Borer 1984).

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Acquisition of unaccusativity: re-examining the 'unergative misanalysis hypothesis'

Eugenia Birger

This paper re-examines the empirical data taken to support the unergative misanalysis of unaccusative verbs in L1 acquisition. Two types of data are discussed: acquisition of the Genitive of negation in Russian (Babyonyshev et al. 2001) and Nominative case drop in the acquisition of Japanese (Machida et al. 2004). I show that the authors' interpretation of the data cannot be maintained. Furthermore, I show that upon a careful examination, the very findings taken to support the unergative misanalysis of unaccusatives actually point in the opposite direction, namely that unaccusatives are assigned the correct syntactic representation from the onset of acquisition.

1. Introduction

Unaccusative verbs (e.g. *fall, break*) are intransitive predicates whose subject is base-generated in the direct object position, as shown in the representation in (1). In contrast, unergative verbs (e.g. *jump, laugh*) are intransitive predicates whose subject is base-generated in Spec VP (or adjoined to VP, following Koopman & Sportiche 1991), as shown in (2).[1] The difference in the base-generated position of the subject is supported by various cross-linguistic environments, which show that subjects of unaccusative verbs behave on a par with direct objects, and in contrast with subjects of unergative verbs (Burzio 1986; Levin & Rappaport-Hovav 1995).

(1)   [$_{TP}$ [$_{NP}$ The bottle]$_i$ [$_{VP}$ fell t$_i$]]

(2)   [$_{TP}$ [$_{NP}$ The clown]$_i$ [$_{VP}$ t$_i$ laughed]]

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[1] Since the seminal work of Kratzer (1996), it became almost standard to assume that the subject of transitive and unergative predicates (i.e. external argument) receives its thematic role from the abstract functional head called little-*v*, and consequently, that it is merged in Spec *v*P; see Horvath & Siloni (2003) for arguments against severing the external theta-role assignment from the lexical verb. In this work, I am using 'VP' as a convenient abbreviation of 'Verb Phrase', without committing myself to its precise analysis as a VP or a *v*P. Nothing in my presentation or argumentation hinges on this distinction. Likewise, the distinction between NP and DP is immaterial for my purposes here; I am using 'NP' as a convenient abbreviation of 'Noun Phrase'.

Throughout this work, I will be assuming that subjects of unaccusative verbs are derived by A-movement and contain an A-chain, in contrast with subjects of unergative and transitive verbs. To understand the reasoning behind this assumption, a small digression to the development of these terms is in order.

In the standard GB analysis, subjects of transitive and unergative verbs were assumed to be generated directly in Spec TP (Chomsky 1981), while subjects of unaccusative verbs were assumed to be generated in the direct object position, reaching the pre-verbal position (e.g. in English) by movement to Spec TP (Burzio 1986; Perlmutter 1978; Perlmutter & Postal 1984). Since Spec TP was considered a thematic position, and since A-movement was defined as movement to a thematic position, movement to Spec TP was considered A-movement. Therefore, the derivation of unaccusative verbs was assumed to contain an A-chain, in contrast with that of transitive or unergative verbs. The same applied to the derivation of raising constructions, where the subject of the matrix clause originated in Spec TP of the embedded clause, as illustrated in (3).

(3)   [$_{TP}$ John$_i$ seemed [$_{TP}$ t$_i$ to be mad]]

With the introduction of the VP-Internal Subject Hypothesis (Koopman & Sportiche 1991), movement to Spec TP could no longer be considered A-movement, as Spec TP was no longer seen as a thematic position. This is because transitive and unergative subjects were now assumed to originate inside the VP, reaching Spec TP by movement on a par with unaccusative subjects. Thus, the syntactic difference between unaccusative and unergative verbs could be reduced to the original position of their subjects, raising the question of whether the A-movement analysis of unaccusative (and raising) subjects should still be pursued. A positive answer, along with an updated syntactic analysis of unaccusatives, was given in Borer and Wexler (1992). Specifically, the authors suggested that unaccusative subjects moved to the matrix Spec TP in two steps: (i) from the direct object position to Spec VP, and (ii) from Spec VP to Spec TP. Step (i) was considered as A-movement, as it involved movement to a thematic position (i.e. Spec VP). The unergative derivation, in contrast, was assumed to contain only step (ii). Under this analysis, the derivation of sentences with unaccusative and unergative predicates would be as in (4)-(5), respectively.

(4)   [$_{TP}$ [$_{NP}$ The bottle]$_i$ [$_{VP}$ t$_i$ fell t$_i$]]

(5)   [$_{TP}$ [$_{NP}$ The clown]$_i$ [$_{VP}$ t$_i$ laughed]]

For the purposes of this paper, a precise analysis of unaccusative verbs (e.g. with an intermediate trace in Spec VP, as in (4), or without it, as in (1)), as well as a precise definition of A-movement, are largely irrelevant. What is relevant, however, is that both acquisition studies discussed here, namely Babyonyshev et al. (2001) and Machida et al. (2004), presuppose that unaccusative subjects are derived by A-movement and contain an A-chain in their representation. (Additionally, Babyonyshev et al. assume that raising subjects, as in (3), are derived by A-movement as well.) Since this underlying assumption is not the focus of my work, I follow the authors' decision, leaving open the specific representation of unaccusatives and the definition of A-movement.

Returning to sentences like *The bottle fell* and *The clown laughed*, their superficial similarity on the one hand, and the syntactic difference on the other, raise the following question: when and how is this difference acquired? While there exists rich cross-linguistic

evidence showing that children start using unaccusatives already before they are 2 years old (Friedmann 2007; Lorusso, Caprin & Guasti 2005; Pierce 1989; Tomasello 1992), it is insufficient by itself to determine that unaccusatives are correctly represented at this young age. In fact, the rather dominant approach nowadays assumes that children initially assign an unergative analysis to unaccusative verbs, misrepresenting sentences like *The bottle fell* as in (6) (Borer & Wexler 1987, 1992; Wexler 2004); this proposal is known as the Unergative Misanalysis Hypothesis (UMH henceforth).

(6) $[_{TP} [_{NP}$ The bottle$]_i [_{VP} t_i$ fell$]]$

The UMH originated with the A-Chain Maturation Hypothesis (Borer & Wexler 1987), according to which A-chains are unavailable at the onset of acquisition, becoming available only around the age of 5. Therefore, this hypothesis predicts that the acquisition of any construction derived by A-movement in the adult grammar will be delayed, unless the child can assign it an alternative representation without the movement. At first glance, then, the acquisition of unaccusative verbs is predicted to be delayed. This prediction is clearly at odds with the spontaneous production data mentioned above, which show that unaccusative verbs are among the first verbs produced by children cross-linguistically, and crucially, that SV sentences with unaccusatives are quite frequent in children's early speech. The most plausible way to account for this seemingly early acquisition, without abandoning or altering the A-Chain Maturation Hypothesis, would be to suggest that children find a way to avoid the A-chain in their representation of unaccusative verbs. Thus, the most plausible way to render the A-Chain Maturation Hypothesis compatible with the empirical data would be to adopt the UMH, according to which children initially misanalyze unaccusatives as unergatives; paradoxically, this incorrect syntactic analysis accounts for the apparently early usage of both unaccusative and unergative verbs.[2]

A question arises, then, whether there exists any independent evidence supporting the UMH. This work examines two (sole) types of such evidence; both strive to show that despite the early production, children err with unaccusative verbs due to their incorrect analysis. Before turning to the examination of empirical data, it should be added that determining how children analyze unaccusatives has wide theoretical implications. Specifically, the results of this examination can be used in the evaluation of proposals like the A-Chain Maturation Hypothesis. This is because the UMH, in essence, 'saves' the predicted delay in the acquisition of unaccusatives from the conflicting empirical findings. Therefore, if the UMH can be shown to be untenable, by showing that the two verb types are distinguished from an early age, the A-Chain Maturation Hypothesis (and similar proposals, like the Universal

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[2] Alternatively, one could dismiss the A-movement analysis of unaccusative verbs. Even though this might seem reasonable, given previous discussion, proponents of the A-Chain Maturation Hypothesis would be reluctant to adopt such a step. This is because the hypothesis was originally proposed in order to account for the difficulty in the acquisition of verbal passives (e.g. *The tiger was chased by the lion*), which, under standard assumptions, share with unaccusative verbs the base-generated position of their subjects. In other words, both passive and unaccusative subjects are believed to originate in the direct object position (e.g. Jaeggli 1986). Therefore, either both will be analyzed as containing an A-chain, or both will be analyzed as lacking an A-chain. Under the A-Chain Maturation hypothesis, this means that either both will be predicted to be delayed (in the former case), or both will be predicted to be acquired early (in the latter case). However, while unaccusatives seem to be acquired early, (at least some) verbal passive constructions seem to be acquired late (see, inter alia, Fox & Grodzinsky 1998; Maratsos et al. 1985; Wexler 2004). Therefore, adopting such a step would force the A-Chain Maturation Hypothesis to find a new account for the problematic acquisition of the verbal passive, or, alternatively, to explain why verbal passives, but not unaccusatives, have an A-chain in their representation. The former is tantamount to renouncing the hypothesis itself, while the latter is a difficult, if not an impossible, task.

Phase Requirement of Wexler 2004), will be shown to be untenable as well.[3] Let us now examine the existing evidence supporting the hypothesis that unaccusative verbs are initially misrepresented as unergative verbs, starting with the Russian data.

2. Russian evidence for UMH
2.1. Theoretical background

A NP in Russian can be marked with the Genitive of Negation if it is located in a negated clause and it is an internal argument (Pesetsky 1982). Thus, direct objects of transitive verbs can bear Genitive (7b), provided they are located in a negated clause (7c), while their subjects cannot (8).[4]

(7)   a.   Ja ne   poluchil pis'ma.
          I   not received   letters-ACC
          'I did not receive the letters.'
      b.   Ja ne   poluchil   pisem.
          I   not received   letters-GEN
          'I did not receive (any) letters.'
      c.   Ja poluchil pis'ma   /*pisem.
          I   received   letters-ACC / letters-GEN
          'I received (the) letters.'

                                                                    (Babyonyshev et al. 2001: (8a-c))

(8)   a.   Mal'chiki   ne   poluchali pis'ma   iz   doma.
          boys-NOM   not received   letters-ACC from home
          'The boys did not receive letters from home.'
      b. *Mal'chikov   ne   poluchalo   pis'ma   iz   doma.
          boys-GEN   not received-NEU.SG letters-ACC from home

                                                                    (Babyonyshev et al. 2001: (9a-b))

Importantly, Genitive direct objects are interpreted as indefinite and non-specific (i.e. unfamiliar in the discourse), while Accusative direct objects are interpreted as definite and specific. The semantic effect of case marking is evident from the interpretive difference between (7a) and (7b): the Accusative direct object in (7a) is interpreted as specific ('the'), while the Genitive direct object in (7b) is interpreted as non-specific ('any').

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[3] The gist of the Universal Phase Requirement is that in child grammar, in contrast with the adult, any verbal head projects a phase. As a result, subjects of unaccusatives (together with raising and passive verbs) are 'locked' inside the phase, being invisible for any movement/AGREE operations. Since no grammatical representation can be assigned to such constructions, all of them are predicted to be acquired late. Merging the unaccusative subject at the edge of the VP, however, allows it to be accessible for further computation, saving the derivation from crash. Therefore, the UMH allows the Universal Phase Requirement to account for the early production of unaccusative verbs. While in this paper I focus on the A-Chain Maturation Hypothesis, this is merely due to its relative familiarity and ease of presentation; my arguments apply equally well to any proposal of this type.

[4] The following transliteration is used in the presentation of the Russian data: а=a б=b в=v г=g д=d e=e ё=jo ж=zh з=z и=i й=j к=k л=l м=m н=n о=o п=p р=r с=s т=t у=u ф=f х=x ц=c ч=ch ш=sh щ=shh ъ='' ы=y ь=' э=eh ю=ju я=ja.

Turning to unaccusatives, their subjects can be marked either with Nominative or with Genitive, provided they are located in a negated clause (9). When Genitive case is used, the verb does not agree with the subject, surfacing in the 3rd person neuter form instead. In contrast, subjects of unergatives cannot appear with Genitive and obligatorily appear with Nominative (10). Thus, Genitive of Negation serves as a diagnostic of unaccusativity, that is an environment where subjects of unaccusatives behave like direct objects, and unlike subjects of unergatives.

(9) a. Griby   zdes' ne rastut.
         mushrooms-NOM here not grow-PL
         'Mushrooms do not grow here.'
     b. Gribov   zdes' ne rastjot.
         mushrooms-GEN here not grow-NEU.SG
         'Mushrooms do not grow here.'

(10) a. Kulturnye   deti   ne   krichat.
         civilized-NOM kids-NOM   not   yell-PL.
         'Civilized children do not yell.'
     b. *Kulturnyx   detey   ne   krichit.
          civilized-GEN kids-GEN   not yell-NEU.SG

It is assumed in Babyonyshev et al. that the effect of case marking on the interpretation of most unaccusative subjects mirrors the effect of case marking on the interpretation of direct objects. In other words, it is assumed that Genitive marking of most unaccusative subjects indicates non-specificity and non-Genitive (i.e. Nominative) marking indicates specificity. While an important part of my claim is that the last part of this assumption is incorrect, let us assume it to be accurate for the moment and proceed with the presentation of Babyonyshev et al. (I return to this in §2.4.) Still, the question arises why the above was assumed to hold for most, and not all, unaccusative subjects. This is due to the existence of a small class of unaccusatives, labeled 'bleached verbs', which require their subjects to be marked with Genitive (provided they are located in a negated clause). This is illustrated in (11) with the verb *byt'* 'be': (11a) with a Genitive subject is ambiguous between a non-specific and a specific reading, while (11b) with a Nominative subject is ungrammatical.

(11) a. V gorode ne   bylo   vracha.
         in town   not   was-NEU.SG   doctor-GEN
         'There was no doctor in town/The doctor was not in town.'
     b. *V gorode ne   byl   vrach.
          in town   not   was-MASC.SG doctor-NOM⁵

                                              (Babyonyshev et al. 2001: (13b,a))

Given the data above, a question arises as to the syntactic analysis of post-verbal Genitive subjects of unaccusative verbs. While they do not pass the familiar subject-hood diagnostics (e.g. they can neither control PRO in adjunct clauses nor can they bind a reflexive), it is argued in Babyonyshev et al. that they move covertly to the matrix Spec TP. The supporting

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⁵ While the order between the verb and the subject in (11) differs from all the previous examples, this cannot account for the ungrammaticality of (11b), as Nominative subjects of unergative (and unaccusative) verbs can occur post-verbally.

evidence for this analysis comes from the interaction of sentential negation with negated phrases. Before turning to the specific evidence supporting the movement analysis, a few words about negation in Russian are in order: Russian is a negative concord language, which means that negated phrases like *nikto* 'no one' or *nikakoy* 'no' must be licensed by sentential negation. In a complex sentence, negated subjects of transitive verbs can be licensed only by the matrix clause negation, while negated direct objects can be licensed both by the matrix clause and the embedded clause negation. This difference is illustrated in (12)-(13) (I gloss sentential negation as 'not' and phrasal negation as 'NEG').

(12) a. Nikto   ne   xochet [PRO chitat' Vojnu   i   Mir].
        NEG-one not   wants   read-INF War   and Peace
        'No one wants to read War and Peace.'
    b. *Nikto   xochet [PRO ne   chitat' Vojnu   i   Mir].
         NEG-one   wants   not   read-INF War   and Peace
                                                          (Babyonyshev 2001: (18a-b))

(13) a. Ja$_1$ ne   dolzhna [$_{TP}$ t$_1$ chitat' nikakix   statej].
        I   not   must-FM. [read.INF NEG-kinds-GEN   articles-GEN]
        'I don't have to read any kind of articles.'
    b. Ja$_1$ dolzhna [$_{TP}$ t$_1$ ne   chitat' nikakix   statej].
        I   must-FM. [not   read.INF NEG-kinds-GEN   articles-GEN]
        'I must not read any articles.'
                                                          (Babyonyshev et al. 2001: (17a-b))

Thus, (12) shows that the matrix subject can be a negated phrase *nikto* 'noone' when negation is located in the matrix clause (12a), but not when it is located in the embedded clause (12b). This contrasts with (13), where the negated phrase *nikakix statey* 'any articles' (i.e. direct object of the embedded predicate) is grammatical both when the negation is in the matrix clause as in (13a) and when it is in the embedded clause as in (13b). Assuming sentential negation to be a clitic located in T, Babyonyshev et al. suggest that negated NPs are licensed only if they are m-commanded by the negation. Given this condition, it is quite unexpected that subjects which raise out of an infinitival clause are licensed only by the matrix clause negation, as shown in (14).

(14) a. Nikto$_1$ ne   dolzhen [$_{TP}$ t$_1$ chitat' ehti   stat'ji].
        NEG-one   not   must   [read.INF these-ACC   articles-ACC]
        'Nobody must read these articles'
    b. *Nikto$_1$ dolzhen [$_{TP}$ t$_1$ ne   chitat' ehti   stat'ji].
         NEG-one   must   [not   read.INF these-ACC   articles-ACC]
                                                          (Babyonyshev 2001: (19a-b))

The negated element *nikto* 'noone', which raises out of the infinitival clause complement of *dolzhen* 'must', is grammatical only if the sentential negation is located in the matrix clause (14a). Given the m-command condition, however, we would expect (14b) to be grammatical as well, since the embedded clause negation m-commands the subject's trace in the embedded Spec TP. In order to account for these data, Babyonyshev et al. suggest that if the negated NP moves by A-movement, the negation must m-command the head of the A-chain. Assuming that raising subjects are derived by A-movement (recall the discussion in §1), (14b) is indeed

expected to be ungrammatical, because the head of the A-chain in the matrix clause is not m-commanded by the embedded clause negation (being m-commanded only by the matrix clause negation, as in (14a)).

Turning to post-verbal Genitive subjects of unaccusatives, we would expect them to pattern with direct objects, being licensed both by the matrix and the embedded clause negation. Surprisingly, they pattern with raised subjects, being licensed only by the matrix clause negation (15a).

(15) a. Ne   dolzhno   [TP pojavitsja nikakix   malchikov v klasse].
        not must-NEU.SG [appear.INF NEG-kinds-GEN boys-GEN in class]
        'There don't have to appear any boys in (the) class.'
     b. *Dolzhno   [TP ne   pojavitsja nikakix   malchikov v klasse].
         must-NEU.SG [not appear.INF NEG-kinds-GEN boys-GEN in class]
                                                    (Babyonyshev 2001: (20a-b))

The data in (15) lead the authors to conclude that Genitive of negation requires the subject to move covertly to the matrix Spec TP, creating an A-chain. This accounts for the ungrammaticality of (15b), as the head of the covert A-chain would be located in the matrix Spec TP, being m-commanded only by the matrix clause negation (i.e. in (15a)).

Turning to acquisition, the authors reason that if children have difficulty forming A-chains (assuming the A-Chain Maturation Hypothesis), they will refrain from marking the subjects of unaccusatives with Genitive, even when this is obligatory (i.e. with bleached unaccusatives). Consequently, it is proposed that they will mark the subjects of unaccusatives with Nominative instead, assigning them an unergative analysis (i.e. without an A-chain).

2.2. Experimental findings

The above predictions were tested in a sentence completion experiment, in which 30 children aged 3;0-6;6 took part. Each child heard a story, followed by a beginning of the test sentence, and had to complete it with one of the following types of NPs: a. specific direct object (Accusative in the adult grammar), b. non-specific direct object (Genitive in the adult grammar), c. subject of an unergative (Nominative in the adult grammar), d. non-specific subject of a regular unaccusative (Genitive in the adult grammar)[6], e. non-specific subject of a bleached unaccusative (Genitive in the adult grammar). The task included 3 verbs for each of the 5 types of post-verbal NPs, resulting in 15 sentences overall for each child.

The results reveal that children had little difficulty with using Genitive of negation with transitive verbs: across all ages, and all trials, children produced Genitive NP when the NP was a non-specific direct object in 73% of the cases and only in 4.8% when the NP was a specific direct object.[7] Furthermore, children produced Genitive in 0% of the cases where the NP was the subject of an unergative verb. Crucially, children marked with Genitive only 46.9% of non-specific subjects of regular unaccusatives and 48% of non-specific subjects of bleached unaccusatives (producing 53.1% and 52%, respectively, with Nominative).

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[6] As it was mentioned in §2.1, I contest this assumption, showing in §2.4 that non-specific subjects of unaccusatives can be marked both with Genitive and with Nominative in the adult grammar.

[7] While we might expect that all non-specific direct objects will be marked with Genitive, it is independently known that children sometimes misinterpret new information as old information (e.g. Karmiloff-Smith 1979).

The finding that children marked about 50% of unaccusative subjects with Nominative is taken to support the UMH. However, given the movement analysis of Genitive subjects, it is evident that the percentage of Genitive subjects of unaccusatives is unexpectedly high: if children never assigned them an unaccusative analysis, they are expected to never use the Genitive case marking. Consequently, individual responses are examined in order to determine inter-subject variation. As it turns out, 11 children marked unaccusative subjects sometimes with Nominative and sometimes with Genitive, which leads the authors to weaken their original claim; specifically, Babyonyshev et al. suggest that children *sometimes* misanalyze unaccusatives as unergatives, concluding as follows: 'We thus have experimental evidence that children have trouble with unaccusatives…*This [A-Chain Maturation Hypothesis] causes the children to produce a nominative argument when the adult language would favor or even require the genitive.* We propose (following Borer and Wexler 1992) that children represent unaccusative verbs in this construction as unergatives…' (Babyonyshev et al. 2001:24, emphasis mine).

2.3. Nominative subjects of unaccusatives do not lack an A-chain

At this point I would like to re-examine the authors' interpretation of the findings. Recall that they take Genitive marking on unaccusative subjects to be an overt indication of the covert A-movement to the matrix Spec TP, and Nominative marking as an overt indication of the absence of such movement. However, this association between the morphological marking and the syntactic derivation is untenable, as a Nominative response does not necessarily indicate the absence of an A-chain. Let me show this by assuming the opposite: if Nominative post-verbal subjects of unaccusatives lacked an A-chain, as assumed in Babyonyshev et al., we would expect them to contrast with Genitive subjects of unaccusatives with respect to their licensing by sentential negation. Recall that the movement analysis of Genitive subjects was based on the interaction between negated Genitive subjects of unaccusatives and the sentential negation. The relevant sentences are repeated in (16).

(16) a. Ne dolzhno   [TP pojavitsja nikakix   malchikov v klasse].
         not must-NEU.SG [appear.INF NEG-kinds-GEN boys-GEN in class]
         'There don't have to appear any boys in (the) class.'
     b. *Dolzhno   [TP ne pojavitsja nikakix   malchikov v klasse].
          must-NEU.SG [not appear.INF NEG-kinds-GEN boys-GEN   in class]

Contrary to the reasoning above, Nominative subjects of unaccusatives behave *precisely* like Genitive subjects, in being licensed only by the matrix clause negation. This is shown in (17).

(17) a. Ne   dolzhny [TP pojavitsja nikakije   deti   na vecherinke].
         Not must-PL. [appear.INF NEG-kinds-NOM boys-NOM on party]
         'No kids should appear at the party.'
     b. *Dolzhny [TP ne pojavitsja nikakije   deti   na vecherinke].
          must-PL [not appear.INF NEG-kinds-NOM kids-NOM on party]

Thus, it is plausible that some children marked non-specific direct objects with Accusative case, mistakenly interpreting them as specific.

Following the authors' reasoning, the contrast in (17) could be accounted for if post-verbal Nominative subjects of unaccusatives raised to Spec TP, heading an A-chain; (17a) would be grammatical, in contrast to (17b), because the head of the chain in the matrix Spec TP would be m-commanded by *ne* 'not' only there. This means, however, that it is impossible to conclude from a Nominative response provided by the child that the analysis s/he assigned to the sentence lacks an A-chain. Therefore, I believe that the findings cannot be interpreted as providing support for the UMH, as both the Nominative and the Genitive response in the adult grammar include an A-chain in their representation (or at least they behave alike with respect to licensing by sentential negation, used as a diagnostic for A-movement). In my view, this renders the contrast between Genitive marking of direct objects and Genitive marking of unaccusative subjects interesting for its own sake, but not directly relevant to the research question at hand. Does this mean that the findings are uninformative to the research question? In my view, the answer is clearly negative: recall that children marked with Genitive 0% of unergative subjects, compared to (roughly) 47% of unaccusative subjects. I believe that this not only shows that they distinguish the two verb types, but that they analyze unaccusatives correctly at this stage (allowing Genitive marking on a par with direct objects). Still, the difference in the amount of Genitive direct objects and Genitive subjects of unaccusatives calls for an explanation. The following subsection shows that the findings can be accounted for without assuming that unaccusative verbs are initially misrepresented as unergatives.

2.4. Alternative explanation

The experimental findings of Babyonyshev et al. raise two questions: (i) First, why did children treat direct objects (73% Genitive) differently from subjects of unaccusatives (roughly 47% Genitive)? Looking at the findings from another perspective, the question is why children produced more Nominative (i.e. non-Genitive) non-specific unaccusative subjects than Accusative (i.e. non-Genitive) non-specific direct objects? (ii) Second, why didn't they differentiate bleached unaccusatives (requiring Genitive) and normal unaccusatives?

Starting with (i), I believe that children's performance is in fact consistent with the adult use of Genitive of negation with unaccusatives. While I do not contest the assumption that Genitive direct objects and Genitive subjects of unaccusatives are interpreted as non-specific, I do contest the assumption that both Accusative direct objects and Nominative unaccusative subjects are necessarily interpreted as specific. Let us look at (18) and (19): (18) includes a transitive verb *poluchila* 'received' with an Accusative direct object. As mentioned in §2.1, its sole reading is the one in (i), namely a specific, definite interpretation of the direct object. In contrast, a non-Genitive (Nominative) subject of an unaccusative predicate in (19) is judged ambiguous precisely between a specific reading in (i) and a non-specific reading in (ii).

(18) Ja ne   poluchila   zhurnaly
      I not   received   magazines-ACC
      (i)   'I did not receive the magazines.'
      (ii)   #'I received no magazines.'

(19) V   klasse   ne   poyavilis'   studenty
     in   class   not   appeared   students-NOM
    (i)   'The students did not appear in class.'
    (ii)   'No students appeared in class.'

(Babyonyshev 1996: (77a,b))

Returning to the experimental findings of Babyonyshev et al., recall that the child had to complete a test sentence with a NP, the specificity of which was determined by the background scenario. In my view, the finding that children produced more Nominative subjects of unaccusatives than Accusative non-specific direct objects is hardly surprising, given the data in (18)-(19): while the non-specific interpretation is incompatible with Accusative, it *is* compatible with Nominative in the adult grammar. Therefore, Nominative responses with unaccusative subjects simply cannot be considered erroneous.[8]

Returning to (ii), it seems plausible that the children who allowed Nominative with bleached unaccusatives still do not know the distinguishing property of bleached verbs, taking Genitive marking to be optional with all unaccusatives. While this direction was originally proposed in Babyonyshev et al. (p. 24, fn. 27), it was dismissed on the grounds that the difference in case marking follows from a syntactic difference and '…*if children have these correct representations*, the bleached property will follow automatically.' (ibid., emphasis mine). In my opinion, this reasoning is unconvincing, as it is unclear from the data whether children are indeed aware of the syntactic difference(s) between the two types of unaccusatives.[9]

To conclude, this section showed that the interpretation Babyonyshev et al. offer for their findings rests on an unwarranted assumption and therefore cannot be maintained. Additionally, it was shown that the findings actually point in the opposite direction of the one adopted in Babyonyshev et al., namely that children acquiring Russian actually distinguish unaccusatives and unergatives, allowing Genitive marking with the former but not with the latter. Finally, it was shown that the data can be naturally accounted for without assuming the unergative misanalysis of unaccusative verbs. Let me now turn to an additional type of evidence taken to support the UMH, namely Nominative marker omission in the acquisition of Japanese.

3. Japanese evidence for the UMH
3.1. Theoretical background

Japanese is underlyingly an SOV language, allowing for various word-order permutations as long as the verb remains sentence-final (Kuno 1973). Turning to case marking, the Nominative marker *ga* usually marks subject NPs (i.e. *Mary* in (20)) and the Accusative marker *o* marks direct objects (i.e. *John* in (20)-(21)). Additionally, the topic marker *wa*

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[8] Note that this is not incompatible with the claim that Genitive response is *preferred* with non-specific nominals. Crucially, even if such preference does exist, it is rooted in pragmatic, and not syntactic conventions, which could certainly be unknown to children at this age.

[9] The question arises as to the nature of the 'bleached' property. Babyonyshev (1996) proposes that in contrast with regular unaccusatives, which subcategorize for a NP, bleached verbs subcategorize for a small clause; an additional difference is attributed to the properties of T: the T found with negated bleached unaccusatives is assumed to be 'defective' in being unable to check case features. All the distinguishing properties of bleached unaccusatives are assumed to follow from these two differences.

marks specific NPs, replacing both the Nominative and the Accusative case markers (i.e. *Mary* in (21)).

(20) Mary-ga   John-o   butta.
     Mary-NOM   John-ACC   hit
     'Mary hit John.'

(21) Mary-wa   John-o   butta.
     Mary-TOP   John-ACC   hit
     'Speaking of Mary, she hit John.'

As it is well known, the colloquial language allows some markers to be dropped (Ono 2001; Saito 1985; Takezawa 1987). Specifically, *wa* can always be dropped, while *o* can be dropped only when the NP is linearly adjacent to the verb and c-commanded by it at S-str. (Takezawa 1987). Machida et al. (2004) assume that *ga* can never be dropped; thus, even though case drop is judged less ungrammatical with subjects of unaccusatives than with subjects of transitives and unergatives, it is still considered deviant. The phenomenon of case marker omission is illustrated in (22)-(25).

(22) Dare-*(ga) sono hon-o   katta   no?
     who-NOM   that book-ACC bought Q
     'Who bought that book?'

(23) John-ga   nani-(o)   katta   no?
     John-NOM   what-ACC bought Q
     'What did John buy?'

(24) [Nani-*(o)]$_1$ John-ga   t$_1$ katta   no?
     what-ACC   John-NOM   bought Q
     'What did John buy?'

(Ono 2001: (2)-(4))

(25) a. Dare-ga   kita no?
        who-NOM   came Q
        'Who came?'
     b. ??Dare kita no?

(Miyamoto et al. 1999: (3))

Thus, (22) shows that *ga* omission is ungrammatical when it marks the subject of a transitive verb; (23)-(24) show that *o* omission is grammatical, but constrained by adjacency; finally, (25) shows the status of *ga* omission with an unaccusative verb. Note that due to the fact that the topic marker overrides both Nominative and Accusative markers, and due to the fact that it can always be dropped, it is impossible to determine the original case marker of NPs which could have been topics (i.e. could have been marked with *wa* prior to omission). Therefore, in order to determine the original case marker of a case-less NP, only those NPs which could not have been topics must be examined (e.g. indefinites, *wh*-phrases). This is why all the relevant NPs in the examples above are *wh*-phrases.

3.2. Acquisition data

Turning to acquisition, Machida et al. (2004) analyze the empirical findings of Ito & Wexler (2002), who examine the spontaneous production transcripts of one child acquiring Japanese between the ages 1;11-3;7. They recognize three developmental stages, as shown in (26); as before, the results below address only indefinite NPs, as these NPs could not have been marked with the topic marker prior to omission.

(26)   Development of Nominative omission:

       Stage 1 (1;11-2;1): Nominative is omitted with all verb types.

       Stage 2 (2;2-3;0): Nominative is omitted significantly more frequently with unaccusatives than with unergatives.[10]

       Stage 3 (3;1-3;7): Nominative is never omitted with any verb type.

                                                                      (Machida et al. 2004: (5))

How to account for this developmental curve? Evidently, the 1st stage does not demand a special explanation – it seems that the child simply has not started using case marking; indeed, Accusative case is also frequently omitted at this stage. In order to account for the 2nd stage, Machida et al. assume that the child *distinguishes* the syntactic analyses of unaccusative and unergative predicates, in addition to the assumed difficulty with A-chains (i.e. A-Chain Maturation Hypothesis). With this in mind, the authors suggest that in child grammar, movement of unaccusative subjects to Spec TP is optional: if the unaccusative subject is raised to Spec TP, it will surface with Nominative case, but if the unaccusative subject is left in situ, it will surface without case marker.[11] Omission in the latter case is suggested to result from overgeneralization of the Accusative marker omission, which occurs in more than 90% of the relevant cases at this stage. Recall that omission of Accusative is possible under adjacency and c-command at S-Str.; Nominative omission with unaccusatives would be significantly more frequent than Nominative omission with unergatives, because only unaccusative subjects can remain c-commanded by the verb and adjacent to it at S-str.[12] Importantly, the mere existence of the 2nd stage is taken to support the A-Chain Maturation Hypothesis; presumably, the ungrammaticality of A-chains is what allows the child to leave the unaccusative subject in its base generated position.

    Nevertheless, if the A-Chain Maturation Hypothesis was the sole principle guiding the child, we would expect that all unaccusative subjects will be left in situ at this stage, and consequently, that all unaccusative subjects will be produced case-less. Clearly, this is not the case, as more than 60% of unaccusative subjects appear with Nominative. The optionality of case marking is suggested to result from the assumption that raising the subject of unaccusatives to Spec TP is as 'bad' as leaving it in situ. Specifically, the movement analysis would violate the A-Chain Maturation Hypothesis but not the EPP, while the in situ analysis

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[10] The unaccusative verbs are further classified in the original work into 'existential' (e.g. *be, exist*) and 'normal unaccusatives' (e.g. *fall, break*); Nominative is omitted in 32.7% of the former cases, and in 34.2% of the latter cases; Nominative is omitted with 17.6% of unergative and transitive subjects.

[11] Whether the movement is overt or covert, the word order remains SV, due to the SOV nature of Japanese.

[12] It remains unclear, however, why Nominative case is nevertheless omitted with 17.6% of unergative and transitive subjects.

would violate the EPP but not the A-Chain Maturation Hypothesis. Under this view, then, theoretical principles are seen as violable constraints, being ranked with respect to each other in the induced violation (à la Optimality; see Prince & Smolensky 1993).[13]

The reader might rightly wonder why this account is referred to as supporting the UMH; so far, the analysis of the 2nd stage relied on the assumption that the child distinguishes the representations of unaccusative and unergative verbs. In fact, the UMH is suggested to be supported by the 3rd stage, where the child ceases to distinguish the two verb classes, disallowing Nominative case drop with both of them. This lack of distinction, in contrast with the distinction observed at the 2nd stage, is taken to reflect the unergative misanalysis. To cite Machida et al., 'What we suggest is that at the third stage … the two types of verbs are in fact being analyzed as the same type. Given that the unaccusative replicates the nominative case marking pattern of unergatives … we surmise that the learner is "misanalyzing" unaccusatives as unergatives at this stage.' (Machida et al. 2004:96).

3.3. Re-examination

As it was discussed in the previous section, Machida et al. take the 2nd stage to provide support for the A-Chain Maturation Hypothesis, and, more importantly for our purposes, take the 3rd stage to provide support for the UMH. In this section, I show that both conclusions are not well-grounded. Specifically, I show that the proposed developmental curve is unnatural, leaving unanswered the most important question in acquisition studies, namely what would lead the child to abandon grammar$_1$ in favor of a later grammar$_2$. Additionally, I show that the A-Chain Maturation Hypothesis does not constitute the only possible explanation of the 2nd stage, thereby weakening the argumentation of Machida et al. Let me start with the former, showing that invoking the UMH to account for the 3rd stage is hardly desirable.

Recall that at the 2nd stage the child is assumed to know the correct syntactic analysis of unaccusatives (and unergatives), while at the 3rd stage this knowledge is assumed to be overridden by other considerations; finally, and crucially, at the final stage of the adult speaker of Japanese, this knowledge is used once again. While the resulting developmental curve superficially resembles a U-Shape, which is certainly attested in language acquisition, this similarity quickly dissolves once the analysis is examined more carefully: the term U-Shape denotes successful performance at the initial and final stages of acquisition, with poorer performance at the intermediate stages. The term itself, therefore, is merely a description of an attested state of affairs, and should therefore be accounted for. The commonly assumed explanation of U-Shaped development (e.g. children's errors with the past-tense *–ed* morphology in English) is that initially, the child merely imitates the adult language, producing the relevant forms without analyzing them; at the intermediate stage, the child arrives at some generalization of the produced forms, which resembles the target (adult) analysis but differs slightly, causing the child to produce occasional errors (e.g. *goed* instead of *went*); at the final stage, the child arrives at the adult analysis, producing the relevant forms without errors. Thus, the term U-Shape applies to certain phenomena, but in itself does not constitute their explanation; it, *per se*, is subject to extensive analysis. In contrast, the account of Machida et al. suggests a 'U-Shaped explanation', in that it presupposes a usage of certain knowledge at the initial and final stages, but not at the intermediate stage. The problem with

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[13] It should be noted that whether or not the EPP is respected with unaccusative (and passive) verbs is debatable. In fact, Miyagawa & Babyonyshev (2004) argue that precisely with these verbs the EPP does not need to be satisfied in the adult Japanese.

such an explanation is that it is hard to conceive of a plausible motivation which could lead the child to abandon the correct analysis used at the 2nd stage in favor of an incorrect analysis used at the 3rd stage.

In fact, examining the account more closely, it becomes evident that precisely this issue is left unclear, due to an internal inconsistency: if the child can misanalyze unaccusatives as unergatives at the 3rd stage, it becomes unclear why shouldn't this option be available already at the 2nd stage, in which case no Nominative omission would be expected. Recall that the optionality of Nominative drop was based on the assumption that raising the subject of unaccusatives to Spec TP violates the A-Chain Maturation Hypothesis, but not the EPP, while leaving it in situ violates the EPP but not the A-Chain Maturation Hypothesis. But if so, it is unclear why couldn't the child choose to represent unaccusatives as unergatives already at the 2nd stage: this misanalysis does not violate either principle, and should therefore be preferred.[14] Thus, the 'U-Shaped' analysis proposed in Machida et al. faces the difficulty of explaining the passages from 2nd stage to the 3rd one, and, not less importantly, from the 3rd stage to the final one in course of acquisition.

Turning to the A-Chain Maturation Hypothesis, and the account of the 2nd stage, it is in fact debatable that Nominative case can never be omitted in adult Japanese. This raises the question whether the 2nd stage should be interpreted as a deviation from the adult grammar in the first place. Recall that it was noted already in §3.1 that while Nominative drop with unaccusatives is marginal, it is nevertheless considered better than Nominative drop with unergatives and transitives. In fact, some researchers, like Kageyama (1993), claim that unaccusative subjects differ from unergative and transitive subjects in that they *allow* Nominative omission, providing the judgments in (27)-(28): (27) shows that omission of Nominative marking an unaccusative subject is possible, and (28) shows that omission of Nominative marking an unergative subject is impossible. (Although the nominals in these examples are not *wh*-elements, they could not have been marked with the topic marker, due to its ungrammaticality inside subordinate clauses.)

(27) Tanaka-san-(ga)   nakunatta no   o   siranakatta.
      Tanaka-   NOM   died   NOML ACC knew-NEG
      '(I) did not know that T. had died.'

(28) Tyuukakuha-*(ga)   demosuru   no   o   mita yo.
      Tyuukakuha- NOM demonstrate NOML ACC saw affirm.
      '(I) saw Tyuukakuha demonstrate.'
                                          (Oshita 1997: (154a), (155a), citing Kageyama 1993: (56))

Furthermore, some researchers take the possibility of case omission to be independent of the case marker itself, and instead, to depend on the structural position of the nominal. This direction is further supported by the data in (29): some transitive verbs in Japanese assign Nominative to their direct objects and it seems that precisely in these cases Nominative can be omitted (see also Dubinsky 1992). [15]

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[14] Two objections can be raised: one could suggest that the unergative misanalysis itself is subject to maturation, or alternatively, one could suggest that children are constrained by UTAH at the 2nd stage (UTAH requires that identical thematic relationships between items be represented by identical structural relationships at D-str.; see Baker 1988). The former option is rather ad hoc; the latter is inconsistent with the 3rd stage: if UTAH constraints the child's grammar at the 2nd stage, it is unclear why wouldn't it do so at the 3rd stage as well.

[15] While the number of predicates marking their direct objects with Nominative is rather small, the predicates themselves are extremely frequent. Among them are: *iru* 'to need', *hosii* 'to want', *wakaru* 'to understand',

(29) John-ga   nani-(ga)   wakaru   no?
  John-NOM   what-NOM   understand Q
  'What does John understand?'

                           (Ono 2001: (5))

Given the findings above, it seems that (at least for some speakers) Nominative case omission is possible in the adult language, provided the nominal remains adjacent to the verb and c-commanded by it in S-str.[16] Thus, an alternative way to account for the 2nd stage emerges, thereby weakening the argumentation of Machida et al. Evidently, much more data on the status of Nominative case omission in adult Japanese are necessary in order to reach any solid conclusion. Given the unclear status of the phenomenon, the question arises whether the findings are informative to the question at hand, namely the acquisition of the syntactic analysis of unaccusative verbs. In my view, they certainly are: recall that the child allowed Nominative omission with unaccusative subjects significantly more than with unergative and transitive subjects at the 2nd stage. Be the analysis of Nominative omission with unaccusative verbs as it may, the distinction between unaccusative and unergative verbs at the 2nd stage is clearly at odds with the UMH.

 Returning to the 3rd stage, recall that the analysis of Machida et al. was shown to be implausible, raising the question of how to account for the lack of Nominative case omission observed at this stage. Crucially, any present or future alternative account would heavily depend on the status of Nominative case drop with unaccusatives in the adult language, which was shown to be debatable. If the majority of native speakers judge it as ungrammatical (calling for a separate explanation for the data in (27)-(28)), then the 3rd stage could merely show that the child has finally acquired the conditions on case drop. If Nominative case drop with unaccusatives is judged grammatical, in conformance with the data in (27)-(28), then the existence of a stage in acquisition in which the child would cease to omit Nominative would be puzzling. Nevertheless, let us not forget that the findings supporting the existence of the 3rd stage are available for only one child, and could possibly reflect his unique behavior. Once again, much more data – this time, acquisition data – are required in order to arrive at solid conclusions.

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tanosii 'to enjoy', *umai* 'to be good at', *mazui* 'to be bad at' etc. (see the exhaustive list in Kuno 1973, pp. 90-91). Thus, there is little doubt that the child is exposed to them. A question immediately arises whether the child omits Nominative with such predicates as well. Unfortunately, this is unclear from the data of Sumihare, the Japanese child analyzed in Machida et al. The data of another child, Aki, analyzed in Miyamoto et al. (1999) show that he indeed omits Nominative marking direct objects of transitive verbs (at the 2nd stage); however, the percentage of omission with these verbs remains unclear.

 [16] An anonymous reviewer presents the following example as conflicting with this direction:

(i) Dare-*(ga)   Tokyo-ni   tuita   no?
 who-NOM   Tokyo-LOC   arrived   Q
 'Who arrived in Tokyo?'   (Ono 2001: (14b))

According to the judgment, Nominative case omission in (i) is ungrammatical, even though it marks the subject of an unaccusative verb. Note, however, that in this particular example, the Nominative argument is not adjacent to the verb, due to the intervening locative phrase (*Tokyo-ni*). The ungrammaticality, then, could be due to the lack of adjacency required for case omission, rendering the example irrelevant to the issue at hand.

4. Conclusion

To conclude, this paper showed that the proposal that young children initially assign an unergative analysis to unaccusative verbs (UMH) cannot be maintained. Furthermore, this paper showed that the findings originally taken to support the UMH should rather be interpreted as supporting the early acquisition of unaccusatives. Paradoxically, it seems that the Russian and Japanese data reviewed here should rather be cited along with data from Romance acquisition of auxiliary selection (Snyder, Hyams & Crisma 1995), acquisition of subject-verb order in Italian, Catalan and Hebrew (Lorusso, Caprin & Guasti 2005; Cabré Sans 2004; Friedmann 2007, respectively), or acquisition of the aspectual modification by *te-iru* in Japanese (Shimada & Sano 2007) – all of which provide additional evidence in favor of the early acquisition of the unaccusative syntax. This radically different way to interpret the data originally taken to support the UMH becomes available once our attention is drawn to what children know, rather than to what they do not know. Specifically, it becomes evident that children acquiring Russian distinguished unaccusatives and unergatives, once we focus on the finding that they allowed Genitive case marking both with unaccusative subjects and direct objects, but disallowed it with unergative subjects; similarly, it becomes evident that the child acquiring Japanese distinguished the two verb types, once we focus on the finding that he allowed Nominative case drop with unaccusatives significantly more than with unergatives.

   As it was discussed in the introduction (§1), proposals like the A-Chain Maturation Hypothesis (Borer & Wexler 1987, 1992) and the Universal Phase Requirement (Wexler 2004) predict that children younger than 5 years old will refrain from using unaccusative verbs. Recall that this prediction was immediately falsified by cross-linguistic data showing that unaccusative verbs are used productively already by much younger children. Therefore, something must be added to or altered in the formulation of such proposals, in order to render them compatible with these data. The UMH provides an elegant solution to this problem, suggesting that young children can avoid the A-chain in their analysis of unaccusative verbs by assigning them an unergative representation. Adopting this solution, however, creates dependency between proposals like the A-Chain Maturation Hypothesis and the Universal Phase Requirement and the UMH. Since my work showed that the UMH cannot be maintained, it follows that such proposals cannot be maintained as well. Clearly, this verdict is not final, as there might be a way to reformulate both proposals, rendering them compatible with the early acquisition of unaccusativity (this will not be an easy task, however; see fn. 2 in this work). Crucially, such proposals become severely weakened without the UMH, raising the question whether one should strive to hold on to them at any price. Hopefully, future research – both in theoretical linguistics and acquisition studies – will provide solid answers to this and related questions.

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Creating as putting something into the world

Eva Dobler

Dobler (to appear) shows that there are two groups of causative verbs. Whereas the direct object of verbs expressing a change of location (e.g. *put*) can be interpreted inside the result-state clause, the same is not true for the direct object of change-of-state verbs (e.g. *close*). In this paper, I show that creation verbs of the *build*-type pattern with verbs of putting. Interestingly, the distinction cannot be caused by different result-state clauses (PPs vs. APs) but is due to the semantic category of the verb. Finally, I illustrate that this proposal has a crucial advantage over previous decompositional approaches (cf. Dowty 1978).

1. Introduction

After a break of some decades, semantic decomposition had a come-back in recent years. The position that I am taking with respect to decomposition follows von Stechow (e.g. 1996) and differs thus from the approaches Generative semanticists used to take. The idea is neither that decomposition takes place in a separate semantic component nor is it assumed that every single verb undergoes decomposition. Instead, the assumption is that certain complex verbs involving causation are decomposed inside the syntactic component. In particular, the causative part is separated from the so-called result-state clause which only expresses the state caused by the event:

(1)   a. Naoko was giving ferrets to passers-by.
       b. Naoko was causing [passers-by to have ferrets].

These complex syntactic structures allow a straight forward solution for ambiguities with adverbials like *again* or *for*:

(2)   Naoko was giving ferrets to passers-by for twenty minutes.
       a. Over a period of twenty minutes, Naoko continued to give away ferrets.
       b. The recipients were in possession of the ferrets for a period of twenty minutes.

According to structural decomposition, the interpretation in (2a) follows from adjoining *for* to the causing event whereas the reading in (2b) is the result of adjoining *for* to the result-state clause. It is a highly debated question in this context if the direct object (DO) is an argument

of the result-state clause, the causative event or both. In Dobler (to appear), I showed with data from English and German that there is no straightforward answer to this question. Instead, the answer depends on the type of verb that we are looking at. So far, I identified two contrasting groups of causative verbs, namely change-of-state verbs on the one hand and verbs of putting on the other hand. The examined data suggest that the DO of change-of-state verbs is indeed a direct argument of the verb in addition to the AP that expresses the result state. By contrast, verbs of putting seem to embed a small clause that consists of the DO and the locative PP.

This paper is organized as follows. I will first review the basic motivation for structural decomposition. In section 3, I will then use the interaction between the adverb *again* and an existential operator in object position to show that creation verbs of the *build*-type pattern with verbs of putting. I will demonstrate that the distinction between these two kinds of verbs on the one hand and change-of-state verbs on the other hand cannot be caused by different result state clauses (PPs versus APs) but is really due to the semantic category of the verb. In section 4, I will introduce a revised version of my previous proposal and show how it can be extended to creation verbs. Finally, I will illustrate that under this analysis, the opacity of creation verbs is no longer a problem.

2. Causative verbs and 'again'

The main argument for structural decomposition is based on the adverb *again*; in particular, on the observation that the adverb *again* can trigger two kinds of interpretations. In the repetitive interpretation of the sentence in (3) below, it is presupposed that the whole event has already taken place at a previous occasion (3a). In the second reading of the sentence in (3b), the presupposition is no longer that the event occured at a previous time; instead, what is presupposed is merely that the result state itself already held before.

(3)   Naoko dyed her guinea pig green again.
       a. Presupp.: Naoko has dyed her guinea pig at a previous time.   (repetitive *again*)
       b. Presupp.: Naoko's guinea pig was green at a previous time.   (restitutive *again*)

Crucially, von Stechow (1996) pointed out that in German, there is a correlation between the position of *again* and the available interpretation. As can be seen in (4), the restitutive reading is only available if *again* follows the definite direct object (4b). That is, in contrast to (4b), (4a) has only one interpretation, namely the interpretation that there was a previous '*dying green*'-event.

(4)   a. Naoko färbte <u>wieder</u> ihr Meerschweinchen grün   (rep./#rest.)
          Naoko dyed   again   her guinea pig   green
          'Naoko dyed her guinea pig green again.'

       b. Naoko färbte ihr Meerschweinchen <u>wieder</u> grün.   (rep./rest.)
          Naoko dyed   her guinea pig   again   green
          'Naoko dyed her guinea pig green again.'

Under a decompositional approach, the explanation for these facts is straightforward because it allows the adverb to modify the result-state clause separately. Von Stechow proposes for *again* the representation in (5):

(5)   Let P be a property of eventualities and let e be an eventuality.
      ‖again‖(P)(e) is defined only if   e' [‖MAX‖(P)(e') = 1 & e' < e].
      Where defined, ‖again‖(P)(e) = 1 iff P(e) = 1.

(von Stechow 1996:95, ex. 3-7)

MAX is a symbol of type $<<s,t>,<s,t>>$. ‖MAX‖(P)(e) = 1 iff P(e) and there is no e' such that e is a proper part of e' and P(e') = 1.

(von Stechow 1996:96, ex. 3-8)

According to the semantic interpretation in (5), *again* triggers the presupposition that the property of its sister (P) must have already held at some previous time (e'); this previous time (e') must not overlap with the actual time (e). This interpretation of *again* is then combined with a decomposed structure (6):

(6)
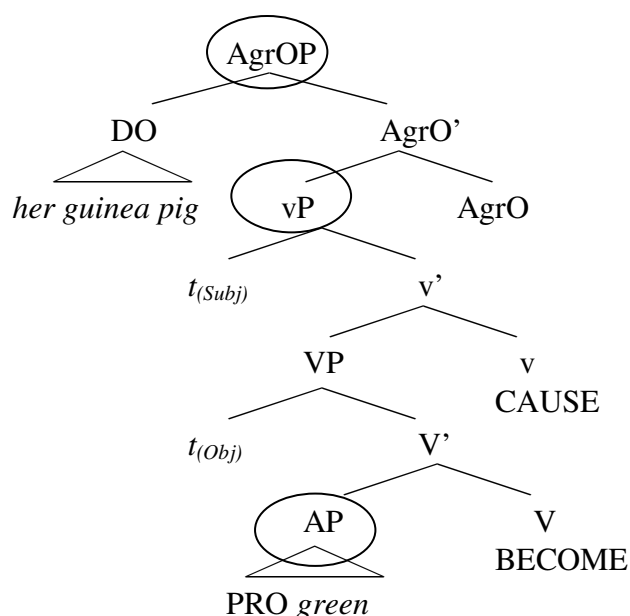
Note that von Stechow's analysis presupposes that the definite DO always surfaces outside the VP in German. Thus, when *again* precedes the definite DO, the adverb must be adjoined to a projection outside of little vP. Consequently, whenever it precedes the DO, it has automatically scope over the whole event and can only recieve a repetitive interpretation. By contrast, if *again* follows the definite DO, it might be attached to little vP or to a lower projection like AP. In the former case, it will once more receive a repetitive interpretation. In the latter case, however, the sister of *again* is the result-state clause and this will trigger a restitutive interpretation.

For the rest of this paper, I will focus on the low adjunction site of *again*. More precicely, I will follow Nissenbaum (2006) and use the interaction between *again* and an existential operator to show that the VP-structure of verbs of putting and creation verbs differs from the VP-structure of change-of-state verbs.

*3. The interaction between 'again' and the existential operator*

Indefinite DPs have the ability to introduce an existential operator. In English, this existential operator can be interpreted in two positions, i.e. its surface position or the position where it was merged into the structure. Consequently, the combination of an existential operator with an adverb like *again* gives rise to additional ambiguities. For the sake of simplicity, I want to illustrate this first with a sentence where the existential operator is in subject position (7):

(7)   Someone is sneezing again.
       a. There is someone sneezing right now and the same person has sneezed before.
       b. There is someone sneezing right now and somebody else has sneezed before.

In (7a), the existential operator is interpreted in SpecIP, that is outside the scope of *again*. In (7b), the existential operator is interpreted in SpecvP, that is inside the scope of *again*. Note that in both cases, we are dealing with repetitive *again* which is presumably attached to little vP. Therefore, the only thing that changes between the two examples is the position where the existential operator is interpreted:

(8)
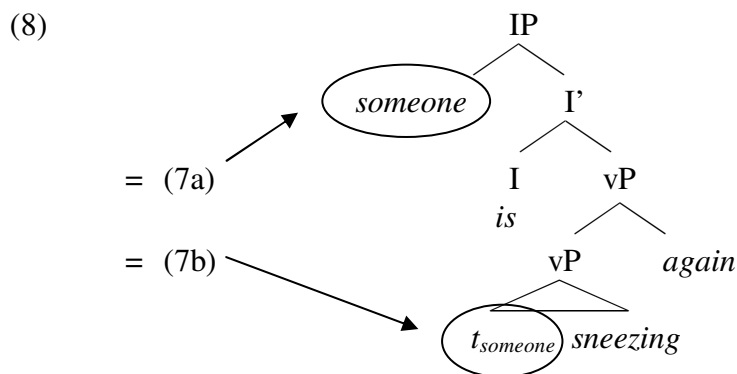
This interaction between the existential operator and the adverb *again* can tell us if the DO is base generated inside a result state clause (XP). If the DO originates inside the result-state clause, it should be possible to get a reading where the existential operator is interpreted inside this clause:

(9)
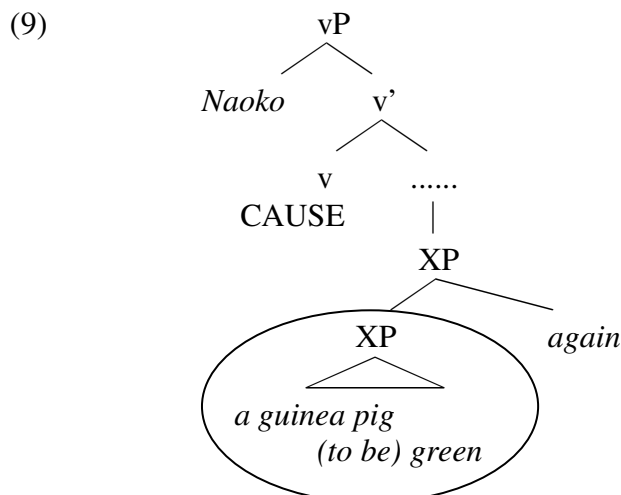
Hence, this structure predicts a reading under which restitutive *again* has wider scope than the existential operator in object position. As I illustrated in Dobler (to appear), this reading indeed exists; however, it is only available with verbs of putting:

(10) *Context: Until about 800 years ago, camels used to live on the island of Montreal.*
       'Today, scientists put a camel on the island of Montreal again.'

Since there was no previous *putting*-event, *again* must take scope below the CAUSE operator in little v. In addition, we are not talking about some specific camel that was in Montreal before. Hence, the context in (10) requires an interpretation where the scope of *again* is below the putting event but above the existential operator introduced by the internal argument *a camel*. This means that the sentence in (10) has an interpretation where restitutive *again* has wider scope than the existential operator introduced by the DO. By contrast, change-of-state verbs and resultative constructions lack this interpretation. Consider the example in (11) in the given context:

(11) *Context: Naoko owned a bunch of guinea pigs. Due to a genetic aberration, one of the guinea pigs had green fur and Naoko liked it very much. Unfortunately, the guinea pig died after a couple of months. Since she missed the green animal every time she looked into the cage, Naoko decided*
       #' ...to dye a guinea pig green again.'

In (11), the context requires a restitutive interpretation of *again* because there was no previous event in which a guinea pig was dyed. Furthermore, the guinea pig that is dyed by Naoko was never before green. Consequently, the existential operator must have narrow scope. The fact that this sentence is not acceptable in the given context shows that restitutive *again* cannot have wider scope than the existential operator introduced by *a guinea pig*. This sentence is only felicitous if there was a previous dying event (= repetitive *again*) or this specific guinea pig was green before (= wide scope for the existential operator). Neither reading corresponds to the context given in (11) because there was no previous dying and the only guinea pig that was originally green is now deceased.

The fact that restitutive *again* cannot have wider scope than the existential operator suggests that the DO cannot be a part of the result-state clause but must be merged into the structure higher. This way, an existential operator in object position will always have wider scope than restitutive *again*. In this respect, change-of-state verbs and resultative constructions contrast with verbs of putting. The latter must have a result-state clause that contains the DO because restitutive *again* can have wider scope than the existential operator as has been shown in example (10) above. What is crucial for this paper is that creation verbs pattern with verbs of putting in this respect:

(12) *Context: On some Pacific island, a mountain basically vanished in the course of a major earthquake. Since the mountain was sacred, the inhabitants of the island were devastated.*
       'Finally, they built a mountain (on the island) again.'

If we assume that the previous mountain was not man-made but had been there ever since the island emerged, there was no preceding building event. Thus, *again* must not have scope over the verb but over the location as well as the existential operator introduced by *a mountain*.

What is repeated is just the state that there is a mountain on the island (= restitutive *again*). First, there used to be a mountain; then there was a time without a mountain and now, as a result of the building event, the state of there being a mountain is restored. Note that this holds whether the location is spelled out or left implicit. Similar to the example in (12), this interpretation is also available in the sentences in (13) and (14):

(13)   *Context: In a small town in Italy, they built a straight tower that over the centuries*
         started to lean to one side. This tower became a tourist attraction. Thus when it finally
         collapsed, the town feared a major loss of income.
         'Consequently, they built a leaning tower again.'

                                                                   (example due to Jonathan Bobaljik, p.c.)

(14)   *Context: Donald built a brick wall with red bricks and grey bricks. He arranged them in*
         a way that the red bricks formed the shape of a house. Over the years, the colours of the
         bricks faded and the house was no longer visible.
         'Donald painted a house on the wall again.'

Since all of these examples include PPs, it is tempting to assume that the difference between the two constructions is due to a difference in syntactic categories: change-of-state verbs come with APs whereas verbs of putting and creation verbs involve PPs. However, the contrast holds even if the AP is replaced with a PP as is demonstrated with the example in (15):[1]

(15)   *Context: Clyde collected a couple of white shells and one pink shell at the beach.*
         When Bonnie cleaned the house, she accidentally broke the pink shell. Hoping that
         Clyde would not notice the mishap,…
         #'Bonnie painted a shell in pink again.'

Just as the sentence in (11), the sentence in (15) is only felicitous if there was a previous painting event or if the shell was pink previously, that is, it is felicitous if *again* has scope over the whole event or if the existential operator has wider scope than *again*.

Concluding, I have shown in this section that the VP-structure of creation verbs should be analyzed similar to the VP-structure of verbs of putting. In the following section, I will introduce my proposal.

4. To BE vs. not to BE

As we have seen in section 2, the correlation between the position of *again* and the availability of a restitutive interpretation strongly supports a decompositional approach. At this point, I want to propose a revise version of my previous analysis and extend it further to creation verbs of the *build*-type.

A major difference between the two groups of verbs is that only change-of-state verbs express that an object is undergoing a change with respect to its characteristics. That is, a brown guinea pig can have green fur as a result of having its fur dyed. The internal argument of a change-of-state verbs thus is directly manipulated and successful manipulation entails a change of state. Similarily, the closing of a door results in the closing of an opening. The

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[1] Thanks to Marcel den Dikken for pointing this out to me.

opening in the wall does not change location; instead it merely changes its state to being closed for a certain period of time. By contrast, verbs of putting do not change the state but the location of their DO. The state/properties of a guinea pig will not change as a result of being put into a cage. I propose that this difference between the two groups is reflected by a difference in operators. In particular, I assume that the structure of verbs of putting includes a BE operator that anchors the object in space and time (16):

(16) $\|BE\|(p)(x)(s) = T$ iff x is in s & p is T in s

This operator is missing in change-of-state verbs because no change of location is taking place; the internal argument of change-of-state verbs does not change its position in the course of time whereas the internal argument of verbs of putting does. The vP of the sentence in (17a) is given in (17b). Note that I understand v to have the meaning proposed by Kratzer (1996); that is, little v combines an agent with an event.

(17)   a. Scientists put a camel on the island of Montreal.
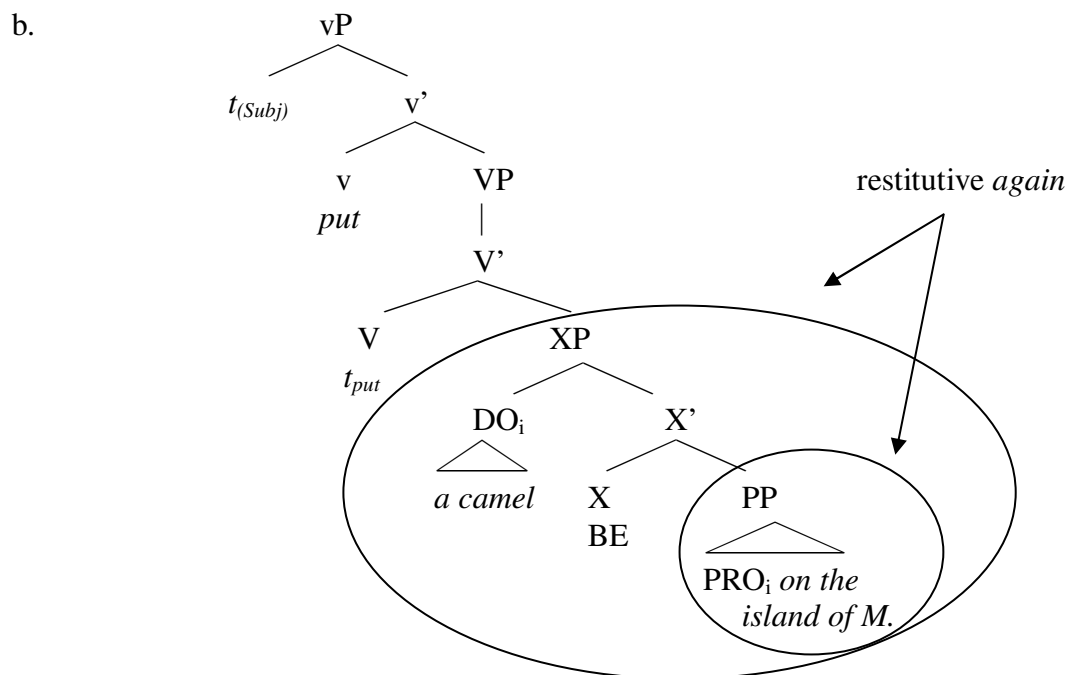
As (17b) shows, the presence of the BE-operator creates two result-state clauses. In addition to the PP small clause, there is the small clause headed by BE which contains the DO and the PP small clause. No matter if the adverb *again* is adjoined to the PP or to the XP, the result will be a restitutive reading. However, if the sister of *again* is the PP, an existential operator in DO position will have wider scope than resitutive *again*. If *again* is adjoined to the XP, then restitutive *again* will have wider scope than the existential operator unless the DO moves to a higher position. As a consequence, sentences with verbs of putting can have all of the readings listed in (18) depending on the position of *again* or the DO, respectively:
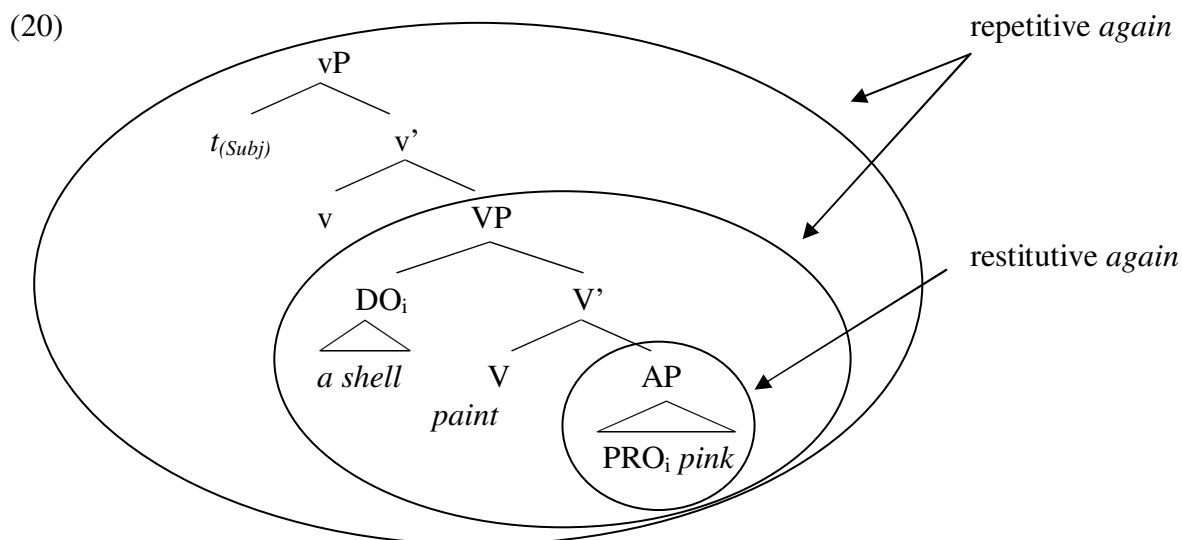
(18) a. existential operator > repetitive *again*
      b. existential operator > restitutive *again*
      c. repetitive *again* > existential operator
      d. restitutive *again* > existential operator

Note that the repetitive readings in (18a) and (18c) presuppose that *again* is adjoined higher in the structure than shown in (17); for example, it could be adjoined to the VP or the vP as illustrated in (19):

(19)
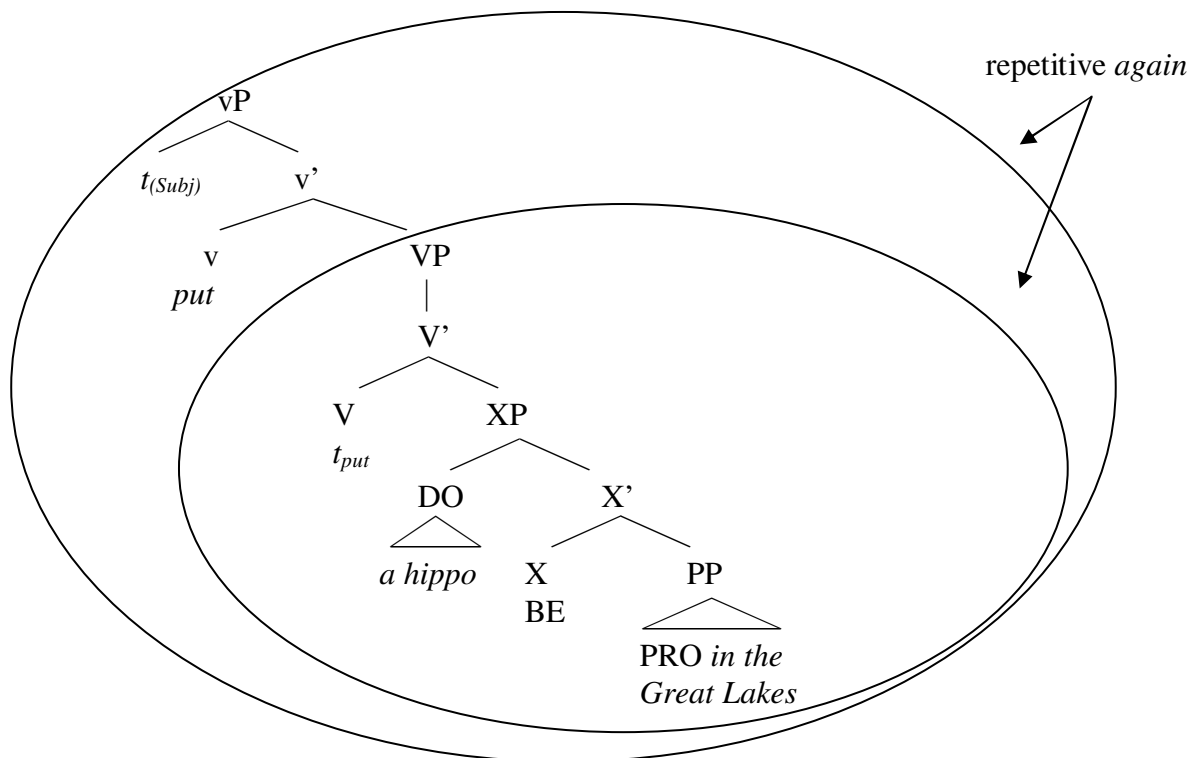
As far as change-of-state verbs are concerned, everything looks very similar with one crucial difference: change-of-state verbs lack the BE-operator. Therefore, only one result-state clause is available in their vPs, i.e. the AP small clause (20). Note further that I have abandoned the BECOME operator of previous proposals. Its original purpose in Generative Semantics was the distinction between stative (e.g. *The door is closed*) and inchoative sentences (*The door closed*). Note that a change of state does not need to be expressed by an operator because the fact that the result-state is caused directly by the event implies that the event brings about a change of state even in the absence of a BECOME operator.

(20)

Just as with verbs of putting, attachment of *again* to the VP in (20) results in a repetitive reading. Therefore, the only position where adjunction of *again* leads to a restitutive reading is below the position of the DO. Consequently, restitutive *again* can never have wider scope than an existential operator in object position. This explains why change-of-state verbs differ from verbs of putting in that only the former lack the reading in (21d):
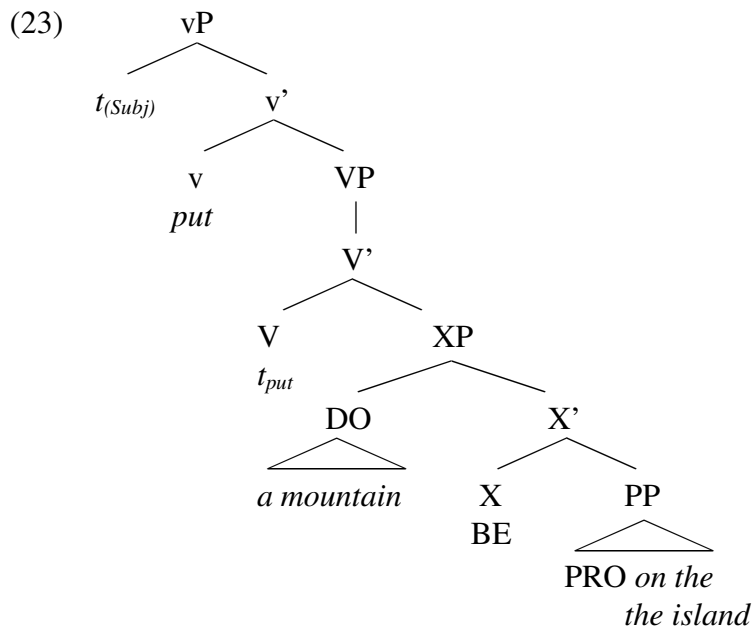
(21) a. existential operator > repetitive *again*
      b. existential operator > restitutive *again*
      c. repetitive *again* > existential operator
      d. ~~restitutive *again* > existential operator~~

As illustrated in (22), I propose a similar structure for deadjectival verbs with the difference that their root starts as head of the AP and then moves from there into the verbal domain:

(22)
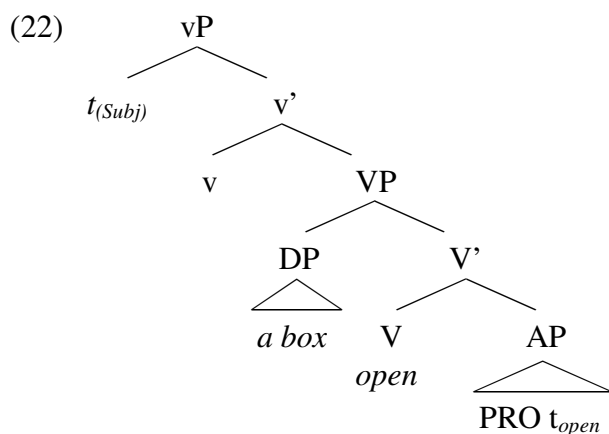
As we have seen in section 3, creation verbs of the *build*-type pattern with verbs of putting. I propose that this is due to the fact that creation is essentially the same as bringing something into existence in the world. Moreover, just as changing the location of an object requires that the object is anchored in space and time, bringing something into existence also means that the object of creation needs to be anchored in space and time. Creation does not alter the

properties of an existing object, instead it changes the existence of an object in the world. Consequently, creation verbs just like verbs of putting require a BE-operator (23).

(23)

```
                    vP
                   /  \
              t(Subj)   v'
                       /  \
                      v    VP
                     put    |
                            V'
                           /  \
                          V    XP
                        t_put  /  \
                              DO    X'
                             /\    /  \
                        a mountain  X    PP
                                   BE   /\
                                   PRO on the
                                      the island
```

Yet there is a crucial difference between verbs of putting and verbs of creation. Whereas the locative PP is obligatory for verbs of putting, it is optional for verbs of creation. Thus, it is necessary to create a second interpretation for BE that allows the absence of a locative argument (24):

(24) $\|BE\text{-}2\|(x)(s) = T$ iff x is in s

In summary, I have provided an analysis that accounts for the difference between verbs of putting and change-of-state verbs. Furthermore, this proposal explains why verbs of creation pattern with verbs of putting. In addition, I will show the last section of this paper that this analysis for verbs of creation has an advantage over comparable analyses.

5. *Dowty's problem*

One major problem for decompositional approaches is that creation verbs are opaque. That is, the sentence in (25a) cannot be paraphrased as (25b) because the house does not exist at the beginning of the event but rather comes only into being as a result of the building process.

(25)   a. Donald built a house.
       b. There existed a house at time t, and this house was the theme of a building
           event at t.

This poses a challenge to more general proposals for complex verbs (e.g. Dowty 1979, Krifka 1992, Parsons 1992) when they are applied to creation verbs. The example in (26) illustrates how the meaning of *build* would be represented under a decompositional theory in the sense of Dowty:

(26)   CAUSE (λwλt. BECOME$_{w,t}$ (λwλt.   x [house$_{w,t}$(x) & exist$_{w,t}$(x)]) (λwλt. building$_{w,t}$ (Donald))

There are the two operators CAUSE and BECOME. CAUSE combines two eventualities with each other in a way that one eventuality is the direct cause of the other (e.g. Lewis 1973). The BECOME operator expresses a change of state as shown in (27).[2]

(27)   ‖BECOME‖(P)(e) = 1 iff e is the smallest event such that P is not true of the pre-state of e but P is true of the target state of e.

<div align="right">(von Stechow 1996:96, ex. 3-11)</div>

And this is where Dowty's approach runs into problems. If the meaning of BECOME is applied to *building a house*, the resulting interpretation is something along the lines of (28).

(28)   ‖BECOME‖(‖a house exists‖)(e) = True iff e is the smallest event such that 'a house exists' is not true of the pre-state of e but 'a house exists' is true of the target state of e.

The crucial part of (28) is '[a house exists] is not true of the pre-state of e' because this means that prior to Donald's building a house, there was no house at all. Since there is no further restriction to a certain context, Donald is not only causing his own house to exist but he is responsible for the first house ever; prior to Donald's house, no house existed. As illustrated in (29), my analysis differs considerably from this approach and as a consequence, Dowty's problem never arises.

(29)   ‖VP‖ = ‖build‖(p<s,t>) = λe.building(e)   e'[p(e') = 1   cause(e, e')]

The representation in (29) means that there is a building event (e) and there is an eventuality (e') such that p is true in (e') and this eventuality (e') is caused by the building event (e). p(e') refers to the result state clause. Consequently, the meaning of p depends on the respective XP in the tree structures of section 4. In the sentence 'Donald is building a house', p(e') stands for 'There is a house in e'. Therefore, the interpretation of 'Donald is building a house' is that there is a building event (e) and there is an eventuality (e') such that it is true in (e') that there is a house in (e') and this eventuality (e') is caused by the building event (e). One crucial difference to Dowty's approach is that there is no BECOME operator. As mentioned above this does not cause any problems as the BECOME operator only expressed a change of state that is already implied by the fact that eventuality 1 is the direct cause of eventuality 2. Furthermore, CAUSE is not a separate operator in little v in (29) but it is part of the entry for *build*. It ensures that the house that exists in (e') is a direct result of the building event in (e). In conclusion, (29) says that it is true that there is a house in (e') and the fact that this is true is directly caused by the building event in (e).

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[2] In this representation, *e* stands for eventualities. Importantly, *cause(e')(e)* is only true iff *e* is the main cause for *e'*, and *e'* would not hold if *e* had not taken place (e.g. Lewis 1973, Dowty 1979).

6. Conclusion

In this paper, we have seen that the interaction between word order and interpretation strongly suggests that a structural analysis for *again* is the right approach. This presupposes structural decomposition of verbs with a complex event structure. Using the interaction between the existential operator and restitutive *again*, I have shown that there are two groups of causative verbs. These groups are verbs describing a change of state on the one hand, and verbs of putting and creation verbs on the other hand. I have proposed that the difference is caused by a BE operator that is only present when a theme undergoes a change in location, i.e., is brought into existence at a new location. It is only in these contexts that this operator is required because its purpose is to anchor an argument in space. Finally, I have shown that if we take this approach, the opacity of creation verbs causes no problems; in other words, Dowty's problem does not arise.

Acknowledgments

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Positive and negative polarity: a matter of resumption

Anamaria Fălăuş

It has been recently argued (Szabolcsi 2004) that the distribution of positive polarity items can be accounted for in terms of negative polarity items-licensing. I present empirical evidence in favor of the strong relation between NPIs and PPIs on the basis of two types of polarity items in Romanian: n-words and the PPI *oarecare*. I argue that these dependent elements are sensitive to the same semantic property, namely antimorphy. This generalization provides strong support for Szabolcsi's claim that positive polarity is not just a prohibition to appear in the scope of negation, but rather 'halfway licensing' of polarity sensitive items.

1. Introduction

In this paper, I present evidence in favor of a unifying account of positive and negative polarity. While negative polarity is a well-attested phenomenon and there are many different analyses that try to account for the restrictions on the distribution and interpretation of negative polarity items, positive polarity has received much less attention in the literature. Recently, however, Szabolcsi (2004) has put forth a unifying account of these two phenomena and defended the hypothesis that positive polarity is not just a prohibition to appear in the scope of negation, but rather 'halfway licensing' of polarity-sensitive items. More specifically, the positive polarity item, together with the semantic operator that normally anti-licenses it, behaves like a negative polarity item (NPI), subject to familiar constraints on NPI-licensing. On the empirical side, this study focuses on the properties of two semantically dependent types of items in Romanian: n-words and *oarecare*-indefinites. I argue that these elements are both sensitive to the same semantic property, namely antimorphy: the former are licensed only in antimorphic contexts, the latter are anti-licensed in the same antimorphic environments. The existence of such correspondences, together with the shared distributional properties, provides strong support for the relation between negative and positive polarity items, as implemented in Szabolcsi's proposal. At a more theoretical level, I argue that resumptive quantification is the semantic mechanism underlying the interpretation of both positive and negative polarity.

2. Classification of polarity items

Polarity items are typically classified according to the negative strength of the contexts that determine their distribution: Negative Polarity Items (NPIs) need to be licensed by a 'negative' operator, whereas Positive Polarity Items (PPIs) cannot be in the scope of such an operator. One of the most influential views of negative polarity maintains that the relevant semantic property for the licensing of NPIs is downward entailingness (Ladusaw 1980). Elaborating on this proposal, subsequent research has shown that different types of polarity items are sensitive to different types of licensers (Zwarts 1993) and therefore several classes need to be distinguished. In this paper, I adopt Van der Wouden's (1997) classification of polarity items according to three types of operators: downward entailing, antiadditive and antimorphic. The definitions of these properties are given in (1):

(1) a. An operator Op is DOWNWARD ENTAILING iff:
    Op (X or Y) → Op (X) and Op (Y)
  b. An operator Op is ANTIADDITIVE iff:
    Op (X or Y) ↔ Op (X) and Op (Y)
  c. An operator Op is ANTIMORPHIC iff (i) **and** (ii):
    (i) Op (X or Y) ↔ Op (X) and Op (Y)   (ii) Op (X and Y) ↔ Op (X) or Op (Y)

The defining property of downward entailing contexts is that they allow inferences from sets to subsets. Thus, if *Few politicians discuss pollution* is true, we can infer that *Few politicians discuss water pollution* is also true, and therefore *few politicians* creates a downward entailing context. The classes defined by the formulas in (1b) and (1c), that is antiadditive operators like *nobody* and antimorphic functions like the sentential negation *not*, are even stronger forms of negation, relevant for the distribution of polarity items (see section 3 for further details on these semantic properties). Van der Wouden's classification of polarity-sensitive items is given in (2):

(2)   (a) positive polarity items

Negation/Operators	Strong	Medium	Weak
Minimal/Downward entailing (*few*)	*	√	√
Regular/Antiadditive (*nobody*)	*	*	√
Classical/Antimorphic (*not*)	*	*	*

   (b) negative polarity items

Negation/Operators	Strong	Medium	Weak
Minimal/Downward entailing (*few*)	*	*	√
Regular/Antiadditive (*nobody*)	*	√	√
Classical/Antimorphic (*not*)	√	√	√

The two tables above indicate that NPIs and PPIs are not in complementary distribution, but rather show a mirror image typology: for example, weak NPIs are licensed in all types of negative contexts, whereas strong PPIs are ruled out from the scope of downward entailing, antiadditive and antimorphic operators. Thus, each class of NPIs has a positive polarity counterpart. Take, for instance, polarity-sensitive items of medium strength, whose distribution is illustrated in (3)-(4) below:

(3)   a. ***Few** participants have paid *yet*
      b. **Nobody** has paid *yet*

(4)   a. **Few** participants *would rather* pay in advance
      b. ***Nobody** *would rather* pay in advance

NPIs like *yet* are illegitimate in the scope of a downward entailing operator (3a) and need to be licensed by an antiadditive operator like *nobody* (3b). On the other hand, the PPI *would rather* can occur in the scope of the downward entailing *few* (4a), but is anti-licensed by the antiadditive operator *nobody* (4b)[1].

This classification suggests that the connection between positive and negative polarity cannot be accidental: the fact that negative polarity items are licensed in exactly the same contexts that anti-license positive polarity items should be taken as a starting point for developing a unifying theory of polarity. This is precisely the line of argumentation pursued by Szabolcsi (2004). On the basis of the distributional properties of *someone*-like PPIs, she puts forth a theory of positive polarity which is shown not to be just a prohibition to appear in the scope of negation, but rather 'halfway licensing' of polarity-sensitive items. Specifically, Szabolcsi shows that PPIs - together with the semantic operator that normally anti-licenses them - form a non-lexical NPI, subject to familiar constraints on NPI-licensing.

(5)   <u>Unlicensed NPIs</u>   <u>Licensed NPIs</u>
      a. *He applied [*anywhere*].   a'. I do**n't** think he applied [*anywhere*].
      b. *He [did**n't** apply *somewhere*].   b'. I do**n't** think he [did**n't** apply *somewhere*].

As illustrated in (5), the PPI *somewhere* is anti-licensed by negation (5b), i.e. can only be interpreted with wide scope with respect to negation. However, when further embedded in an NPI-licensing context, as in (5b'), *somewhere* can take scope below negation. The distribution of the cluster *NOT + somewhere* is in fact parallel to that of typical NPIs like *any*, which are only licensed in the scope of a negative operator (5a-a').

Szabolcsi's discussion of the distributional properties of *some(thing)*-PPIs shows that negative and positive polarity are not independent phenomena and therefore a unifying theory is desirable. Furthermore, once we adopt Van der Wouden's typology of polarity items, Szabolcsi's proposal leads to the expectation that '*whatever property is desired by some NPI will turn out to be detested by some PPI and/or to function as a rescuer thereof*' (Szabolcsi 2004 : 430)

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[1] The sentence in (4b) is acceptable in the context of denial or metalinguistic negation. In this paper, I set aside the issue of metalinguistic negation, which behaves differently from (regular) negation with respect to polarity items: it does not license NPIs and it does not anti-license PPIs (Van der Wouden 1997:149-151).

In the following sections, I show that this prediction is borne out in Romanian by discussing the distribution of two types of polarity-sensitive items: n-words and PPIs *un N oarecare* ('whatsoever'), whose respective distribution I argue to be sensitive to **antimorphy**.

3. N-words as NPIs in Romanian

N-words are morphologically negative elements that need to be licensed by negation. In this respect, Romanian qualifies as a strict negative concord [NC] language, in which n-words obligatorily co-occur with sentential negation, regardless of whether they appear in preverbal (6a) or postverbal position (6b):

(6)   a. Nimeni *(**nu**)   mananca   sushi.   [NC]
          nobody   NEG   eat.3SG   sushi
          'Nobody eats sushi.'
       b. Mircea *(**nu**)   vorbeste   nicio limba   straina.
          Mircea   NEG   speak.3SG no   language   foreign
          'Mircea doesn't speak any foreign language.'

(7)   *Nu am   stiut   ca   ai   cerut   nicio bursa.
         NEG   have.1 SG   known   that   have.2 SG   asked for   no   grant
         'I didn't know you had asked for any grant. '

The sentences in (6) show that n-words need to be licensed by negation. In this respect, they are just like NPIs, which are also semantically deficient expressions and are grammatical only in he scope of an appropriate licensor. The ungrammaticality of the sentence in (7) indicates that the licensing relation is subject to locality constraints: n-words need to co-occur with *clausemate* sentential negation, i.e. the matrix negation cannot license an n-word in a subordinate clause. Furthermore, just like in the case of typical NPIs (8b), the licensing of n-words is subject to intervention effects (Linebarger 1987), as illustrated in (8a) below, where the universal quantifier *always* intervenes between the sentential negation and the n-word:

(8)   a. *Nu am   participat intotdeauna   la nicio competitie.
          NEG have.1SG   partcipated always   to no   competition
       b. *I did**n't** *always* trust *anyone*.

These facts show that n-words are similar to NPIs with respect to their licensing condition. However, the distribution of Romanian n-words is much more restricted than that of typical NPIs, like *any* in English. More specifically, they cannot occur in other polarity contexts, such as the scope of a downward entailing operator (9), scope of negative predicates (10a), the antecedent of conditionals, restriction of a universal quantifier (10b) or *before*-clauses (10c):

(9)   ***Putini** politicieni au   nicio propunere.
        Few   politicians have.3PL   no   proposal
        'Few politicians have any proposal.'

(10) a. *Cosmin **refuza** sa faca niciun compromis.
Cosmin refuse.3SG SUBJ make.3SG no compromise
'Cosmin refuses to make any compromise.'
b. ***Toti** cei care au participat la nicio conferinta sunt prezenti la
All those who have.3PL participated to no conference be.3PL present at
sedinta.
meeting
'All those who have attended any conference are present at the meeting.'
c. *Paul a demisionat **înainte** sa vorbeasca cu niciunul din
Paul have.3SG resigned before SUBJ talk.3SG with none of
colegi.
colleagues
'Paul has resigned before talking to any of his colleagues.'

The ungrammaticality of Romanian n-words in polarity contexts indicates that their licensing condition is much stricter than that governing the distribution of NPIs like *any*. Besides clausemate negation, the only other context which licenses Romanian n-words is the operator *fără* ('without'):

(11) Anca a luat aceasta decizie **fără** nicio ezitare.
Anca have.3SG made this decision without no hesitation
'Anca has made this decision without any hesitation.'

The question that arises at this point is what is the common semantic property of sentential negation and the operator *without* that is relevant for the licensing of n-words. I argue that the semantic feature responsible for the licensing of n-words in Romanian is antimorphy, the strongest form of negation. The validity of the inferences in (12) illustrates the antimorphy of sentential negation. For reasons of convenience, I use English examples, but the same conclusion holds for Romanian:

(12) a. John does**n't** smoke *or* drink. ↔ John does**n't** smoke *and* does**n't** drink.
b. John does**n't** smoke *and* drink. ↔ John does**n't** smoke *or* does**n't** drink.

The following inferences show that *fără* ('without') is also an antimorphic operator (Giannakidou 1997, Błaszczak 2002, Pereltsvaig 2004):

(13) a. Paul a plecat **fără** să doarmă sau să mănânce. ↔
'Paul left **without** sleeping *or* **without** eating.'
Paul a plecat **fără** să doarmă si **fără** să mănânce.
'Paul left **without** sleeping *and* eating.'

    b. Paul a plecat **fără** să doarmă *si* să mănânce. ↔
      'Paul left **without** sleeping *and* eating.'
      Paul a plecat **fără** să doarmă *sau* **fără** să mănânce.
      'Paul left **without** sleeping *or* **without** eating.'

Both the inferences in (12a-13a) and (12b-13b) need to be valid in order for an operator to create an antimorphic context. The only operators that meet this condition are sentential negation and *without*. The contexts in which n-words are ungrammatical are either merely downward entailing, as in (9) or antiadditive (10), as illustrated below for the scope of negative predicates (14), *before*-clauses (15) or the restriction of a universal quantifier (16):

(14) a. He **refuses** to eat *or* sleep. ↔ He **refuses** to eat *and* **refuses** to sleep.
      b. He **refuses** to eat *and* sleep. ←/→ He **refuses** to eat *or* **refuses** to sleep.

(15) a. He left **before** eating *or* sleeping. ↔ He left **before** eating *and* **before** sleeping.
      b. He left **before** eating *and* sleeping. ←/→ He left **before** eating *or* **before** sleeping.

(16) a. **Every** student who smokes or drinks will be punished. ↔
        Every student who smokes and **every** student who drinks will be punished.
      b. **Every** student who smokes and drinks will be punished. ←/→
        Every student who smokes or **every** student who drinks will be punished.

The fact that the inferences in (b) are not valid clearly shows that these contexts are not antimorphic. The same conclusion holds for *if*-antecedents or other polarity contexts where n-words are ungrammatical. The antiadditivity of these contexts, together with the antimorphy of sentential negation and *without*, indicate that n-words are subject to the licensing condition in (17):

(17) Romanian n-words are only licensed in the immediate scope of an antimorphic operator.

Van der Wouden discusses other NPIs whose distribution is sensitive to antimorphy, such as the Dutch items *ook maar* 'at all' and *mals* 'tender' (in its idiomatic reading), who can only occur in the scope of a (local) antimorphic operator, i.e. sentential negation or the antimorphic adverb *allerminst* 'not-at-all', as illustrated in (18) (examples taken from Van der Wouden 1997:125-128):

(18) a. Zijn oordeel   was **allerminst** mals.
        His judgement was not-at-all   tender
        'He was pretty harsh in his judgement.'
      b. De kritiek   zal **niet** mals   zijn.
        the criticism will not tender be
        'The criticism will be harsh.'
      c. *Ik denk niet dat de   kritiek   mals   zal   zijn.
        I   think not that the   criticism   tender will be

These facts lead Van der Wouden to postulate the existence of the class of *strong NPIs* who need to be in the immediate scope of an antimorphic operator.[2] Given their sensitivity to antimorphy, I argue that Romanian n-words are strong NPIs, subject to the licensing condition in (17). This generalization captures the restricted distribution of n-words in Romanian and provides support for a typological view of NPIs, which are shown to be sensitive to different semantic operators. Although there are certain differences between negative concord and NPI-licensing,[3] I defend the claim that the integration of n-words into a typological approach has the advantage of establishing a connection with the rest of the polarity-sensitive items and thus constitutes a step forward to a unitary analysis.[4]

4. Positive polarity in Romanian

We have identified one class of NPIs whose distribution is governed by antimorphic operators. On Szabolcsi's proposal, we expect to find a positive polarity class which is also sensitive to this type of operator. In this section, I show that this prediction is borne out. I discuss the distribution of *un N oarecare* in Romanian and I argue that this type of indefinite is also sensitive to antimorphy.

4.1. *Un N oarecare-indefinites*

As discussed in Savescu-Ciucivara (2005), the indefinite *un NP oarecare* contains the indefinite article *un* (masculine)/*o* (feminine) and the morphological complex determiner

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[2] The notion of *strong* NPI is misleading in the literature. The classification adopted here should be distinguished from the one given by Zwarts (1993), where strong NPIs are those licensed by antiadditive operators (for a recent discussion of these NPIs, see Gajewski 2008). In this latter typology, Romanian n-words would correspond to so-called *superstrong NPIs*.

[3] As pointed out by a reviewer, the most important difference is in terms of c-command : whereas n-words even when they precede sentential negation, typical NPIs cannot occur in subject position of a negated clause. In previous work (Fălăuş 2007), I discuss various differences between negative concord and NPI-licensing in Romanian and argue they should be analyzed as two different phenomena. Consequently, the only claim that is relevant for the unitary approach to polarity pursued in this paper is that Romanian n-words have the licensing condition of strong NPIs. With respect to the semantics of n-words, I defend the hypothesis they are negative quantifiers, unlike typical NPIs (see section 5 for more details on the analysis of Romanian negative concord).

[4] The licensing condition of n-words is subject to variation across languages. As far as Romanian negative concord is concerned, I argue that the relevant semantic property is antimorphy. However, it has been claimed (Giannakidou 1997 a.o.) that a monotonicity-based typology is not appropriate for other negative concord languages (Greek, Slavic) and that it should be replaced with a system based on the notion of *veridicality*. A reasonable question that arises in view of these facts is whether all these different cases could be subsumed under a unitary (semantic) system. In spite of the impressive amount of work on polarity items, the existence of such a system still constitutes a theoretical and empirical challenge.

oarecare, which is made up from the interrogative pronoun *care* ('which') and the (interrogative) particle *oare*. It is generally used to indicate lack of knowledge or indifference with respect to the identity of the individual variable introduced by the noun it modifies:

(19) A :   Cu   cine   vorbeai   la telefon ?
             with who   talk.PAST.2SG   at phone
             'Who were you talking to on the phone?'
      B :   O femeie **oarecare**, gresise   numarul.
             A woman whatsoever mistake.PAST.3SG   number
             'Some woman, she had the wrong number.'

(20) Fiecare poveste contine   o morala **oarecare**.
      Every   story   contain.3SG   a moral   whatsoever
      'Every story contains some moral.'

The sentence with *oarecare* in (19) conveys that the speaker does not know the identity of the individual on the phone. In (20), the use of *oarecare* indicates indifference with respect to the exact nature of the moral contained by every story. An important property of this item is that in modal contexts, *un N oarecare* acquires a free-choice reading, as in (21)-(22):

(21) Contacteaza o secretara **oarecare**   si   cere-i lista   studentilor.
      Contact.2SG a secretary whatsoever   and   ask-her list-the   students.GEN
      'Contact a secretary whatsoever and ask her the list of students.'

(22) Maria   poate   să   rezolve o problemă **oarecare**.
      Maria   can.3SG SUBJ solve   a problem   whatsoever
      'Mary can solve any problem whatsoever.'

The use of *oarecare* in (21) indicates that any secretary in the relevant domain of quantification is a good option. As shown in Savescu-Ciucivara, the sentence in (22) is ambiguous between two possible readings: either it means *There is a certain problem that Mary can solve; the speaker does not know which problem it is* or, under the free-choice reading, the sentence gets interpreted as *No matter what problem Mary is faced with, she is able to solve it.* Adopting Kratzer and Shimoyama's (2002) analysis of German *irgendein*, the free-choice flavor of *oarecare*-indefinites can be derived *via* Gricean resoning. As a domain widening indefinite, the use of *un N oarecare* indicates the existence of a set of individual alternatives without any further restriction on the domain of quantification. It follows that *o problema oarecare* denotes the set of all problems. On hearing the sentence in (22), one can infer there is no subset of problems that Mary cannot solve and consequently, that she can solve any problem in the domain.[5] Although in modal contexts the use of *oarecare* signals that any individual in the domain of discourse can satisfy the existential claim, it cannot be argued to be simply a free-choice item, as it freely occurs in episodic contexts (unlike FC *any*,

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[5]   This way of presenting the derivation of the free-choice flavor is a simplification. As far as its interpretation is concerned, I believe that *un N oarecare* is best qualified as 'a free-choice existential', a label that Chierchia (2006) puts forth for the Italian item *un N qualsiasi*. Since the main focus of this paper is the (anti)licensing condition governing the distribution of certain items, I abstract away from the implicatures involved in their interpretation. The analysis I'm pursuing here if fully compatible with the implementation of further pragmatic constraints.

which can appear in an episodic sentence only in *subtrigging* contexts, as discussed in Dayal 1998):

(23) Acum doi ani s-a urcat intr-un tren **oarecare** si nu
Now two years REFL-have.3SG climbed in a train whatsoever and NEG
s-a mai uitat inapoi.
REFL-have.3SG more looked back
'Two years ago, he got on some train and didn't look back anymore'

Elaborating on Savescu-Ciucivara's proposal, I argue that the distribution of *oarecare*-indefinites is that of a positive polarity item and I show that the semantic property that they are sensitive to is antimorphy. In this sense, they constitute the positive polarity counterpart of n-words, whose distribution is restricted to the scope of antimorphic operators.

4.2. PPI properties of **oarecare**-indefinites

Several distributional properties show that *un N oarecare* is a PPI in Romanian. First, just like *someone*-PPIs discussed in Szabolcsi (2004), *un N oarecare* cannot be in the scope of negation:[6]

(24) I did**n't** call *someone*. * not > some
Nu m- am inscris la un curs oarecare. * not > oarecare
NEG REFL-have.1SG registered to a course whatsoever
'I didn't register for any course.'

The ban to appear in the scope of negation only holds for clausemate negation: as illustrated in (25), both s*omeone*-PPIs and *un N oarecare* can scope below **superordinate** negation:

(25) I do**n't** think that you will invite *someone*. √ not > [CP/IP some
Nu cred ca s-a inscris la un curs oarecare.
NEG think.1SG that REFL-have.3SG registered to a course whatsoever
'I don't think that he has registered for any course.' √ not >[CP/IP oarecare

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[6] *Un N oarecare* can appear in the immediate scope of clausemate negation if focused, acquiring a *not-just-any* reading. As mentioned by Szabolcsi, the properties of *someone* are also different in denial/contrastive contexts. In this paper, I set aside the issue of the relation between focus and PPIs and abstract away from the *not-just-any*–reading of *un N oarecare* (see Savescu-Ciucivara 2005 for a possible account of this interpretation). The asterisks thus only mark the non-focused reading of *someone/oarecare* in the scope of negation.

Furthermore, both *someone*-PPIs and *un N oarecare* can take scope below merely downward entailing operators like *few*, as in the sentences in (26) below:

(26) **Few** of us knew *someone* in Patagonia.   √ few > some
      Puţini participanti castigasera   un premiu oarecare   inainte de aceasta
      few   participants win.PAST.3PL a prize   whatsoever before of this
      competitie.
      competition
      'Few participants had won a prize whatsoever before this competition.'
                                                                               √ few > oarecare

So far, it seems that both these types of items are anti-licensed only by clausemate negation. However, there are two more properties that support the analysis of *oarecare* as a genuine PPI - an item that is not simply prohibited from appearing in the scope of negation. First, the relation between *oarecare* and the negation is subject to intervention effects: both *someone*-PPIs and *un N oarecare* can scope below negation if there is another operator intervening (the phenomenon is also known as *shielding*):

(27) I do**n't always** call *someone* before my arrival.   √ not > always >some
      Mircea **nu** a   plecat de la fiecare sedinta sub un pretext oarecare.
      Mircea NEG have.3SG left   from every   meeting under a pretext whatsoever
      'Mircea hasn't left every meeting under some pretext.'   √ not>every>oarecare

These facts lead to the conclusion that PPIs like *someone* and *oarecare* avoid being in the *immediate* scope of clausemate negation. However, this conclusion cannot account for so-called *rescuing* effects. Consider the examples in (28)-(29):

(28) a. He **rarely** did**n't** write back to *someone*.   √rarely >not >someone
      b. **If** we do**n't** ask *someone*, we'll never know.   √if >not >someone

(29) a. **Putini** studenti **nu** au   scris   un articol oarecare   inainte de
         Few   students NEG have.3PL   written   an article whatsoever before   of
         sustinere.
         defense
         'Few students didn't write some paper before their defense.'   √few>not>oarecare
      b. **Daca nu** ai   o ipoteza   oarecare, nu   poti   critica   alte
         If   NEG have.2SG   a hypothesis whatsoever NEG can.2SG criticize other
         analize.
         analyses
         'If you don't have a hypothesis whatsoever, you can't criticize other analyses.'
                                                                          √if>not>oarecare

In all of these sentences, the PPI can be in the immediate scope of clausemate negation when further embedded in an NPI-licensing context (downward entailing like the scope of *rarely* or *few*, as in (28a) and (29a) or antiadditive like *if*-antecedents, in (28b) and (29b)). The rescuing effects constitute a strong argument in favor of an analysis of positive polarity as a more complex phenomenon. Although the facts have been known ever since Jespersen (1939) and

later mentioned in Baker (1970), Szabolcsi was the first to discuss them in detail and to propose a full-fledged theory of positive polarity.

In the following subsection, I introduce Szabolcsi's proposal for positive polarity and show that the relevant property for the distribution of *oarecare* is antimorphy.

4.3. *Oarecare*-indefinites are weak PPIs

The sentences with *someone* and *oarecare* above show that reducing the distribution of PPIs to a prohibition to appear in the scope of negation is a simplistic view. More specifically, PPIs are ruled out in the immediate scope of *clausemate* negation only (super-ordinate negation and *intervention/shielding* effects), and, moreover, they can happily scope below a clausemate negation if further embedded in an NPI-licensing context (*rescuing*). On the other hand, we have seen (section 3) that there are classes of NPIs that need precisely the type of licenser that PPIs avoid: clausemate negation without intervention. All of these distributional properties indicate a strong connection between positive and negative polarity.

In view of these similarities, Szabolcsi (2004:419) argues that *someone*-PPIs are double NPIs, whose distribution is governed by the following licensing condition:

(30) PPIs do not occur in the immediate scope of a clausemate antiadditive operator AA-Op, **unless** [AA-Op > PPI] itself is in a (weak) NPI-licensing context.

On the basis of the striking distributional similarities between *someone* and *un N oarecare* illustrated in the previous section, we could conclude that this generalization also applies to Romanian *oarecare*-indefinites. However, the sentences in (31)-(32) show that *un N oarecare* can take scope below an antiadditive operator, such as the scope of a negative predicate or the scope of *before*:

(31) Am   refuzat o bursa oarecare   fără   sa   stiu   de ce.
      have.1SG   refused a grant whatsoever without SUBJ know.1SG   why
      'I refused some grant without knowing why.'   √ Refuse > oarecare
(32) Inaintea unei   competitii   oarecare,   trebuie sa   dormi   bine.
      before a.GEN   competition   whatsoever must   SUBJ sleep.2SG   well
      'Before any competition whatsoever, you must sleep well.'   √ Before > oarecare

The fact that *oarecare* can occur in the scope of these operators indicates that these PPIs are subject to a stronger licensing requirement than *someone*-PPIs. The licensing condition of *un N oarecare* must therefore be reformulated. I propose the following generalization:

(33) *oarecare*-PPIs do not occur in the immediate scope of a clausemate antimorphic operator AM-Op, **unless** [AM-Op > PPI] itself is in a (weak) NPI-licensing context.

We have already seen that *un N oarecare* is anti-licensed by the antimorphic sentential negation. As expected under this condition, the only other operator that anti-licenses Romanian *un N oarecare* is *without*, which I have argued to be an antimorphic operator.

(34) *Am   venit la petrecere **fără**   un cadou   oarecare.   *without>oarecare
      Have.1SG come to party   without a present   whatsoever
      'I came to the party without any present whatsoever.'

The analysis of *oarecare* as a PPI subject to the licensing condition in (33) also predicts that this configuration can be rescued when further embedded in an NPI-licensing context. This prediction is borne out, as illustrated in (35), where the presence of the negation *nu* allows *oarecare* to take scope below *fără* ('without'):

(35) Am   ajuns   cunoscut **nu fără**   un merit oarecare.
      Have.1SG became famous   NEG without a merit whatsoever
      'I have become famous not without some merit.'   √ not>without>oarecare

These facts support the conclusion that the semantic property that *oarecare*-indefinites are sensitive to is antimorphy. In this respect, they constitute the positive polarity counterpart of n-words, which I have shown to be strong NPIs, that is NPIs that need to be licensed by antimorphic operators (see (17)). The existence of this type of PPIs provides further empirical support for a fine-grained typology of polarity items (Van der Wouden 1997), as well as for Szabolcsi's account of positive polarity as halfway-NPI-licensing.

5. Interpreting negative and positive polarity - resumptive quantification

In the previous sections, I have shown that there are two classes of semantically dependent items in Romanian that are sensitive to antimorphy: on the one hand, n-words need to be in the immediate scope of an antimorphic operator (sentential negation and the operator *without*) and on the other hand, *oarecare*-indefinites are PPIs that are excluded from the immediate scope of this type of operator, unless further embedded in an NPI-licensing context.

I now adopt Szabolcsi's analysis of PPIs and defend the hypothesis that the relevant semantic mechanism of interpretation for polarity, both positive and negative, is resumptive quantification.

5.1. Resumptive quantification and negative concord

The hypothesis that resumptive quantification is the relevant mode of composition for negative concord has already been defended in the literature (Zanuttini 1991, Deprez 2000, de Swart & Sag 2002). The basic intuition underlying these approaches is that n-words are negation-containing elements and through resumption, they combine and form one polyadic negative quantifier. The basic property of resumptive quantification that makes it relevant for polarity is that it involves quantification over pairs of variables.

In Fălăuş (2007), I have adopted the approach developed by de Swart & Sag (2002) and argued that resumption is responsible for the interpretation of strict negative concord in

Romanian. The derivation in (36) (using de Swart and Sag's notation) illustrates this for a sentence with two n-words:

(36) a. Niciun copil nu stie nicio poveste.
      No child neg knows no story
   b. $No_{x,y}$ (Child x, Story y, Know)
   c. $\neg\exists x$, x : child, $\exists y$, y: story, Know (x,y)
   d. It is not the case that there is a pair x: child, y: story, such that x knows y

Under one of the two possible readings of (36a),[7] the two n-words combine and are reinterpreted as only one complex negative quantifier that ranges over pairs, as in (36b). The resumptive negative quantifier thus binds the sum of all the variables of the composing monadic quantifiers, in this case the two n-words. The sentence ends up having an interpretation with only one negation, also called the negative concord reading, paraphrased in (36c).

    Szabolcsi argues that NPI-licensing also involves the formation of a resumptive quantifier. Thus, the same mechanism as in (36) is responsible for interpretation of the sentence in (37), where weak NPIs like *any* are involved:[8]

(37) Nobody talked to any man about any woman on any day.

This extension from negative concord to NPI-licensing relies on the crucial assumption that NPIs also contain negation (abstracting away from the issue of the strength of this negation), just like n-words. Whether or not this is indeed the case is a controversial matter, but note that Postal (2005) provides convincing evidence that an approach to NPIs as negation-containing expressions accounts for many of their otherwise 'mysterious properties' (Postal 2005:3).

    Note that once we assume resumptive quantification for NPI-licensing, we can account for intervention effects. Since resumption factors out the negative component of the NPI, the presence of an intervening operator separates the negation from its restriction (Linebarger 1987). Consequently, no operator can intervene between the licenser and the licensee, as they both need to end up forming one (binary) quantifier over pairs of variables.

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[7] The other possible reading is the double negation one, equivalent to 'Every child knows (at least) a story.', where each negation is interpreted separately. Note that more syntactic approaches to NC (e.g. Zeijlstra 2008) cannot derive this second interpretation of a sentence with two n-words.

[8] The question of whether negative concord and typical NPI-licensing are different phenomena is a complex issue. Szabolcsi distinguishes NPI-licensing as involving binary quantification from negative concord, which (adopting de Swart and Sag's analysis) is assumed to be n-ary resumption. Note however, than (strict) negative concord also involves a licensing step – n-words are strong NPIs than need an antimorphphic operator. Although there are several distinctions (e.g locality, quantificational properties) between *any*-NPIs and n-words, this does not invalidate the hypothesis that the same interpretation mechanism is relevant for the two types of NPIs. I believe a unifying account is possible, but I will have to leave the details of this issue for further research.

The configuration relevant for both (strict) negative concord and NPI-licensing is given in (38): (taken from Szabolcsi 2004:435)

(38) $[[_{\text{licenser}}\ \mathbf{neg}\ ...]\ ...\ [_{\text{NPI}}\ \mathbf{neg}\ ...]]\ \rightarrow\ \mathbf{no\langle x,y\rangle}\ ...[[_{\text{licenser}}\ ...\ x\ ...]\ ...\ [_{\text{NPI}}\ ...\ y\ ...]]$

At this stage of the discussion, we have reached two important conclusions. On the one hand, we have seen that resumptive quantification can derive the interpretation of sentences involving NPIs, either strong (Romanian n-words) or weak (like *any*). On the other hand, the distributional properties of the two classes of polarity-sensitive items in Romanian (n-words and *oarecare*-indefinites) provide support in favor of a unifying account of negative and positive polarity, such as the one defended in Szabolcsi (2004). The next step is to extend the analysis to PPIs and to show how they can be analyzed against this general background.

5.2. Resumptive quantification and positive polarity

In order to derive the distribution of *someone*-PPIs, and to derive the connection between positive and negative polarity, Szabolcsi analyzes the PPI as a double NPI, more specifically as containing two negations or NPI-features. Consequently, the underlying representation of a PPI is $\neg\neg\exists$.[9] Once we assume this lexical semantics for PPIs like *un N oarecare*, we can account for its distribution, subject to the licensing condition established in section 4.3 and repeated below as (39):

(39)   *oarecare*-PPIs do not occur in the immediate scope of a clausemate antimorphic operator AM-Op, **unless** [AM-Op > PPI] itself is in a (weak) NPI-licensing context.

In a positive context like (40) or in the scope of downward-entailing operator (41), the two negations in the representation of *oarecare* stay *in situ*, cancel each other out semantically and the PPI gets an existential interpretation:

(40)   Am intalnit un prieten oarecare
       'I met some friend.'
       $\neg\neg\exists x\ [\text{friend}(x)\ \&\ \text{I met}(x)]$

(41)   Putini studenti au scris un articol oarecare.
       'Few students wrote some article or other.'
       Few $x[\text{student}(x)]\&[\neg\neg\exists y[\text{article}(y)\ \&\ \text{wrote}(y)(x)]]$

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[9] Adopting the system developed in Postal (2000), Szabolcsi assumes that *some* is just one of the possible Spell-out forms of the configuration $\neg\neg\exists$. In this respect, *some-any-no* form a paradigm and the way it gets spelled out will depend on the context where this occurs. For the purposes of this paper, I will focus on PPIs, but I think the proposal can be extended to different types of polarity items (n-words, *vreun*) in Romanian (for details, see Fălăuş (in preparation)). This does by no means imply that *un N oarecare* is part of the same (morphological) paradigm as n-words. The only property that is relevant for the present discussion is their sensitivity to the same semantic property, but a full-fledged account of polarity items in Romanian also needs to take into account further constraints on their lexical representations.

Szabolcsi identifies the two negations in contexts like (40)-(41) with semantically negative features,[10] and assumes that in these contexts, the features are 'inactive'. Something different happens when the negative features in the representation of the PPI are in the immediate scope of a clausemate antiadditive (in the case of *someone*) or antimorphic (for *un N oarecare*) operator, as in (42). In this case, the features get activated and need to be licensed. And for Szabolcsi, this licensing relation is achieved through binary resumption.

(42) Nu am scris un articol oarecare.   *not > oarecare
       'I didn't write some article'

In (42), both negative features in the representation of the PPI get activated, but, crucially, only one can be licensed by resumption with the higher operator *not*. The only way to rescue this illegitimate configuration is to embed it in a context where there is another NPI-licenser, as in (43):[11]

(43) a. Putini studenti nu au scris un articol oarecare
          'Few students didn't write any article whatsoever'
       b. Few x[student(x)]&[¬ [¬¬∃y[article(y) & wrote(y)(x)]]]

The downward-entailing operator *few* in (43) can check the negative feature which remained unlicensed in a sentence like (42). This is the mechanism responsible for the 'rescuing' of positive polarity items.

Thus, the mechanism that allows the rescuing of a PPI is the same as the one at work for NPI-licensing/negative concord, as represented in (44) below:

(44) NPI-licensing $[[_{\text{licenser}} \textbf{neg} ...] ... [_{\text{NPI}} \textbf{neg} ...]]$
                        $\textbf{no<x,y>} ...[[_{\text{licenser}} ... x ...] ... [_{\text{NPI}} ... y ...]]$

      PPI-rescuing $[[_{\text{licenser}} \textbf{neg} ....] [_{\text{licenser}} \textbf{neg} ...[_{\text{PPI}} \textbf{neg neg}...]]]$
                        $\textbf{no<x,y>}...[_{\text{licenser}} ...x ... \textbf{no<z,w>} [_{\text{licenser}} z...w...y]]$

The analysis of PPI-rescuing as NPI-licensing is further supported by the fact that rescuing is subject to familiar intervention effects (see example (8), section 3), as illustrated by the

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[10] Szabolcsi shows that in the case of PPIs like *someone*, the first negative feature needs to be checked by an antiadditive operator, whereas the second negative feature can be checked by a merely downward entailing licenser. *Oarecare*-indefinites have the same underlying representation ¬¬∃, but the first feature needs to be checked by an antimorphphic operator.

[11] For ease of exposition, I simply represent licensing as negation cancellation, but recall that licensing is binary resumption: each negation in the PPI forms a binary resumptive quantifier with its licenser.

ungrammaticality of (45), where the universal quantifier *every* intervenes between the licenser *few* and the negative feature in the PPI:

(45) *Putini studenti din fiecare universitate nu au scris un articol
few students from every university NEG have.3PL written an article
oarecare.
whatsoever
'Few students from every university didn't write any paper whatsoever'

We can conclude that positing the existence of two negative features in the semantic representation of PPIs accounts for their distribution and their similarities with NPIs[12].

6. Conclusions and further issues

In this study, I have provided empirical support for Szabolcsi's analysis of positive polarity as halfway-licensing, by discussing the licensing conditions of two classes of polarity-sensitive items in Romanian: n-words and *un N oarecare*, which are both shown to be sensitive to antimorphy. Thus, Romanian provides further empirical arguments for the link between positive and negative polarity, which cannot be viewed as accidental. Consequently, I defend the claim that an analysis that postulates the same mechanism of interpretation for both negative and positive polarity is empirically and theoretically superior[13].

One of the most important points of Szabolcsi's analysis (elaborating on a proposal put forth in Postal 2000) is the assumption that positive and negative polarity are both interpreted through resumptive quantification. While this has been an influential position in the literature on negative concord (NPI-licensing), the extension to positive polarity is a recent move and constitutes an important step towards a unifying account of the polarity phenomenon. A further implication of this account is that any analysis of NPI-licensing and/or negative concord also should be extended to positive polarity facts.

Another important advantage is that polarity-sensitive negation-containing expressions approach is neutral as to how additional lexical properties of the polarity item may result in scalar implicatures. This is a welcome result for NPIs that denote scale-endpoints, such as *any* or *a bit*, as it has already been shown that the computation of ordered alternatives plays a crucial role in the interpretation of these items. Moreover, the free-choice reading of a PPI like *un N oarecare* is not surprising and can be derived through Gricean reasoning without necessarily extending the scalar implicature approach to all polarity-sensitive items.

There are several questions that still need to be answered under this type of approach. An important one is why do PPIs behave like *weak* NPIs, i.e. why does the first negation need to

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[12] With respect to the well-known cross-linguistic variation in the licensing of polarity-sensitive items, Szabolcsi suggests that it can be implemented by positing semantically different negative features in their syntactic representations. As for any other unifying account, variation is a complex issue whose details still need to be worked out.

[13] A reviewer points out to me that a more convincing way to make this argument would be to discuss other approaches to negative concord and see how they would integrate the connection with the positive polarity facts. Such a discussion is beyond the scope of this paper (but see Fălăuş 2007 for more arguments in favor of the NC approach adopted here), especially since most analyses of negative concord don't have anything to say about positive polarity. As far as I can tell, an approach to negative polarity that could successfully be extended to positive polarity (and also account some further lexical constraints on their interpretation) is the one put forth in Chierchia (2006), but I will leave this issue for future research.

be deleted by a strong (antiadditive or antimorphic) kind of licensor, whereas the second licensing step is satisfied by merely downward entailing contexts. Also, the issue of wide variation among polarity items cross-linguistically remains open for any attempt to find a unitary account. However, I believe that this way of connecting positive and negative polarity on the one hand, and positive polarity and free-choice effects, on the other, is a step further in the understanding of the distribution and interpretation of semantically dependent items.

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The palatal element hides in (some) non-palatals: the case of Mandarin Chinese

Alja Ferme

This paper deals with restrictions holding between onsets and rimes in Mandarin Chinese words. Based on general principles of the theory of Government Phonology it proposes a new melodic structure of the Chinese onset segmental inventory and provides an explanation for traditional systematic gaps in the distribution of i-rimes. The proposal follows the idea that *i* is never lexically present in the vocalic part of the syllable, but always originates in the preceding consonant (as an operator I). While I operator is responsible for the i-glide in i-rimes, I head prohibits its occurence.

1. Introduction

In this paper I will argue against the previously established analyses of the melodic structure of (Mandarin) Chinese consonants. In particular, based on the distributional facts of i-rimes I will propose that velar and retroflex consonants contain the element that is usually phonetically associated with palatality. In this way some aspects of Chinese phonotactics will fall out of the proposed analysis. In §2 the traditional structure of the Chinese word will be presented, followed by the new analysis in §3. In §3.1 two basic principles the analysis relies on will be discussed, then a closer look will be taken at i-rimes (§3.2), which will be followed by a criticism of one of the previous analyses within the same theoretical framework (§3.3). §3.4 will provide a new view at the structure of Chinese onsets and its consequences for the distributional facts of i-rimes. In §3.5 a brief look will be taken at rimes different from i-rimes and some problematic cases will be pointed out.

The proposal will be couched within Government Phonology framework (Kaye et al. 1985; 1990).

2. Traditional structure of the Chinese word

There are severe phonotactic restrictions holding within the Chinese phonological word. A Chinese word in most cases consists of one syllable with strictly limited structure.

Following Ramsey (1987) the Chinese word is traditionally divided into an initial (the initial consonant) and a final (the rest of the syllable), which I will refer to as rime in the remainder of the paper. The rime consists of at least one element (the main vowel) or at most three elements (the medial, the main vowel and the ending).[1] While there are (traditionally) 21 candidates for the initial, the rest of the components are more limited as to what segments they can host. Thus, in the medial only *i, u, ü* can be found, the main vowel can either be *a, e, i, u, ü*[2] and the ending can host either *i, u, n, ng, r*.[3] For instance in a word like *huang*,[4] *h* is the initial, while *uang* is the

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[1]The traditional categorisation loses a little of its credit, when one reads that the medials in traditional Chinese poetry did not matter in rhyming while the main vowel and the ending did (see Li 1998). If they all belonged to the same syllabic constituent they would be expected to behave as a unit.

[2]Interestingly, Ramsey (1987:44) considers all rimes beginning with *i*, including rimes like *-ing* as in *ling* (except the open ending i-rime as in *li*) as containing a medial, not the main vowel *i*.

[3]Throughout the paper the official Chinese romanization system (pinyin) is used. Phonetic value (in IPA symbols) of the analysed segments can be found in table 1.

[4]The examples will not be glossed since their only function is to represent grammatical Chinese syllables in terms of phonotactics. If we

final that consists of the medial *u*, the main vowel *a* and the ending *ng*.

It is widely attested that languages allow for more contrasts in onsets of syllables than in codas (Blevins 1995:227), so the above constraints do not make Chinese special in any major way.[5] However, if we take a closer look at distributional facts of the above-stated permissible segments in each of the syllabic positions, we will immediately get struck by the fact that even these segments are not in free distribution and that table 1 displays some systematic gaps.[6] What is more, we will see that there seems to be an interdependency of syllabic positions imposing further constraints on the overall structure of the syllable. This has led phonologists to propose some sort of a templatic nature of a Chinese word (cf. Goh 1996, Kaye 2001b). A Chinese template consists of precisely four positions: two pairs of a consonantal position followed by a vocalic one. Each position is restricted to what sort of melodic material it can host and whether or not it can remain empty.

In this paper we will focus on gaps in the distribution of rimes beginning with *i*, henceforth called i-rimes. The rimes beginning with *u*, though indespensable for getting the whole picture of Chinese phonological system, will be left aside for further research. We will not so much be interested in a few scattered, most likely historical gaps in the distribution of i-rimes(like with an initial *f*); what we will focus our attention on are systematic gaps occurring with all the members of a natural class. Let us take a look at these.

Table 1 reveals a large gap in i-rimes with two big groups of inital segments: non-palatal affricates/fricatives and velars. However, another big group of segments, palatal affricates/fricatives, occur in exactly the opposite environment, namely, exclusively before i-rimes.

Naturally, what we are interested in is the question *why* the distribution is as it is. If the two traditionally recognized parts of the Chinese syllable (the initial and the rime) acted as independently from each other as the tradition suggests, these restrictions would not be expected to occur. Is there more to the Chinese syllable then than meets the eye? What is it and how does it constrain the form of a syllable? Let us take a look at what a phonological theory can tell us about it.

3.   The analysis
3.1.   Basic principles

The phonotactic restrictions of i-rimes and the 21 Chinese initials will be given within Government Phonology (GP) framework. The analysis will crucially rely on some basic principles of the theory.

The first one is called Free Distribution Principle (FDP). It states that "any onset should occur with any nucleus unless excluded by some explicit constraint" (Kaye 2001b:4). According to this principle we would expect no restrictions in occurrence of initials and rimes in Chinese syllables unless constraints can be found as inhibitors of the occurrence. The principle itself does not say anything explicit about the nature of such a constraint, however, it is expected that these constraints are as general as possible and following from the general theoretical principles. What we want to avoid if the Free Distribution Priciple is to keep any credit is a language-specific, descriptive or non-explanatory nature of constraints. Needless to say, a constraint stating that "in Chinese palatal consonants cannot be followed by anything else but an i-rime" will not be satisfactory for the explanatory reasons but can function as a pretheoretical observational starting-point.

The second principle the analysis will rely on is Kaye's Phonological Epistemological Principle (PEP) which states that "the only source of phonological knowledge is phonological behaviour" (Kaye 2001b:1). This means that phonetic cues are of secondary importance and should as such give way to conclusions based on phonological behaviour of segments in question. In practice, this means that even though in GP the building blocks of melody, i.e. elements, have been assigned some rough correlates in phonetics, like palatality or velarity, we will not rely on these but priority will be given to the phonological behaviour of the elements, for instance, combinatorial possibilites of elements in the melodic makeup of a segment, their status within a melodic expression etc.

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wanted to gloss them, we would have to assign each of them a tonal pattern. Tone, however, is beyond the scope of this paper.

[5]In this analysis I will generally refer to inital consonants and the following vowels as onsets and nuclei, respectively. To refer to the traditional view on Chinese phonological system, it seems inevitable to use the terms like initals and rimes. These, however, are different from the above-mentioned onsets and rimes as is made clear in the paper.

[6]The table is taken from Ramsey (1987), supplemented by data from Goh (1996), which appear in parenthesis. The same data will be used later in table 3.

	i [i]	ia [ia]	ie [ie]	iao [iau]	iou [iəu]	ian [iɛn]	in [in]	iang [iaŋ]	ing [iŋ]	e [ə]	ei [ɛi]	a [a]	ai [ai]	ao [au]	ou [ou]	an [an]	en [ən]	ang [aŋ]	eng [əŋ]
b [p]	bi	(bia)	bie	biao		bian	bin	(biang)	bing		bei	ba	bai	bao		ban	ben	bang	beng
p [pʰ]	pi	(pia)	pie	piao		pian	pin	(piang)	ping		pei	pa	pai	pao	pou	pan	pen	pang	peng
m [m]	mi		mie	miao	miu	mian	min		ming		mei	ma	mai	mao	mou	man	men	mang	meng
f [f]											fei	fa			fou	fan	fen	fang	feng
d [t]	di	dia	die	diao	diu	dian	(din)	(diang)	ding	de	dei	da	dai	dao	dou	dan	den	dang	deng
t [tʰ]	ti		tie	tiao		tian	(tin)	(tiang)	ting	te	tei	ta	tai	tao	tou	tan		tang	teng
n [n]	ni		nie	niao	niu	nian	nin	niang	ning	ne	nei	na	nai	nao	nou	nan	nen	nang	neng
l [l]	li	lia	lie	liao	liu	lian	lin	liang	ling	le	lei	la	lai	lao	lou	lan		lang	leng
z [ts]										ze	zei	za	zai	zao	zou	zan	zen	zang	zeng
c [tsʰ]										ce	cei	ca	cai	cao	cou	can	cen	cang	ceng
s [s]										se	(sei)	sa	sai	sao	sou	san	sen	sang	seng
zh [tʂ]										zhe	zhei	zha	zhai	zhao	zhou	zhan	zhen	zhang	zheng
ch [tʂʰ]										che		cha	chai	chao	chou	chan	chen	chang	cheng
sh [ʂ]										she	shei	sha	shai	shao	shou	shan	shen	shang	sheng
r [ɻ]										re				rao	rou	ran	ren	rang	reng
j [tɕ]	ji	jia	jie	jiao	jiu	jian	jin	jiang	jing										
q [tɕʰ]	qi	qia	qie	qiao	qiu	qian	qin	qiang	qing										
x [ɕ]	xi	xia	xie	xiao	xiu	xian	xin	xiang	xing										
g [k]										ge	gei	ga	gai	gao	gou	gan	gen	gang	geng
k [kʰ]										ke	kei	ka	kai	kao	kou	kan	ken	kang	keng
h [x]										he	hei	ha	hai	hao	hou	han	hen	hang	heng
	yi	ya	ye	yao	you	yan	yin	yang	ying	e	ei	a	ai	ao	ou	an	en	ang	eng

Table 1: Traditional structure of the Chinese word: combining initials and rimes

3.2.   The shape of i-rimes: are they lexical?

Taking a closer, yet pre-theoretical look at i-rimes it can be easily noticed that apart from their i-part most of them closely resemble rimes without medials (compare [iaŋ] with [aŋ], [iau] with [au] and other pairs).[7] Considering these similarities between the two sets of rimes, we expect that they are not two different lexical sets but one can be derived from the other. Due to existence of u-rimes beside i-rimes that exhibit similar facts, we assume that rimes without medials are the ones that all other types are derived from, for a simple reason that they only involve addition of components and not deletion and addition as would be the case if we wanted to derive, say, u-rimes from i-rimes.

The question now arises how to derive i-rimes from rimes without medial. In GP melodic material cannot appear out of nowhere but needs to be present locally at all stages of derivation. So, if we take a random candidate out of our 21 Chinese initial group, say, *n* and combine it with rime *ao* we end up with a Chinese syllable *nao*. How do we ever get *niao* as our result? Furthermore, we can observe that not all of the 21 initials can be followed by an i-rime. This is highly suggestive of a proposal that the nature of the onset will determine what rimes can follow it.

3.3.   On Kaye's analysis

Let us first take a look at an analysis which is also couched within GP framework and strongly relies on Free Distribution Principle.

Kaye (2001b) (following Goh (1996)) treats i-rimes slightly differently from what will be the proposal of this paper: it does not abandon them altogether. Due to the existence of i-rimes with some non-palatal onsets *d,t,b,p,m* (assuming that the palatal element is the source of *i*) Kaye concludes that some i-rimes are lexical, while others can be derived. However, some on the surface identical rimes, as i.e. in *xie* and *bie*, can either be derived or lexical: in *xie* the i-glide can be contributed to the rime from the palatal onset, on the other hand, *bie* does not have a palatal onset, therefore the i-glide has to appear as a lexical part of the vowel. He also finds cases where due to the existence of both a palatal and a non-palatal form of a consonant (*n,l*) the source of the i-glide in the rime cannot be determined.

Following from FDP and his assumption of the existence of lexical i-rimes is that all onsets will be followed by these rimes. Table 1 reveals that this is not the case with velar and retroflex onsets, therefore other stipulations are needed to account for this absence. For example, rime -i can occur after U-headed and A-headed onsets only (Kaye 2001b:12). This excludes velars, which are headless, and retroflex segments, which are I-headed. Although this looks as a constraint FDP allows for, it is in my view too language specific and as such non-explanatory. Having no universal value it cannot be given more credit than a mere observation.

In this paper we will try to do away with different sources of the same surface rimes by proposing that the only lexical vowel is a. This implies that no i-rime is ever lexical and the glide is always a part of the onset. This view has been proposed in Neubarth & Rennison (2002). Moreover, I will try to abandon Kaye's observational constraints and propose such onset segmental inventory that FDP will (without any constraints) generate precisely the existing set of Chinese syllables.

3.4.   I in onsets

Having abandoned i-rimes as lexical constructs from the Chinese phonological system we are left with an onset as the only source of *i*. Let us explore this possibility.

Since we want the onsets in Chinese to be the source of the traditional medials it is crucial to give up a belief in precisely 21 initial candidates. Thus the examples from above, *nao* and *niao*, crucially involve two different onsets *n* and *nʲ*, as has already been proposed by Kaye (2001b). This means that the onset position in Chinese allows for

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[7]This statement might seem too strong, since there are several rimes without medial that do not have correlates in i-rimes and also some i-rimes displaying different shapes from rimes without medial. Neubarth & Rennison (2002) propose that these rimes are underlyingly the same but their different surface realisation is the result of independent phonological processes. The analysis of these is beyond the scope of this paper.

even more contrasts and thus increases the number of lexical segments that has been proposed by traditional view. Since the onset position has been the position of most contrasts this should not seem problematic in any way.

In this paper I will adopt Kaye's [2001b] proposal that onsets followed by a non-lexical i-rime contain element I as an operator in their melodic makeup, but doing so with a slight change, namely, that onsets followed by i-rime in general (since no i-rime is lexical) contain I operator.

Adopting the view that the i-rime set of onsets is derived from basic onsets by means of addition of operator I conforms to the assumption that a more complex segment implies the existence of a less complex one (cf. Moren 2007). As a consequence we expect that each onset with an operator I will have its counterpart without an operator I.

It can be quickly noticed that not all initials can take i-rimes. According to the above theory this means that certain onsets cannot contain operator I in their melodic makeup. In what follows I will try to explain why precisely these initials cannot take i-rimes while others can.

GP assumes that two elements of the same kind cannot co-occur in the same melodic expression regardless of their status (head or operator) (Kaye (2001a), also cf. Neubarth & Rennison (2002:4)). The consequence of this assumption in our case is that onsets which contain I as a head will not be able to take another I as an operator or the other way around. In other words, the consonants with I head will never have palatal counterparts, while consonants without I will always have them. Bearing this in mind leaves us to determine the makeup of consonants in Chinese regarding element I.

The three logical posibilities of occurrence of I in a consonant are the following: (i) I is a head, (ii) I is an operator, (iii) I is absent. According to the general assumption just stated above, consonants belonging to (i) will have no variant with I operator. In effect this means no palatal counterpart, which means in traditional view no i-rime. Group (iii) on the other hand will occur with rimes without medials, but will not be prohibited from having a counterpart with a I operator. Group (ii) thus consists of palatal counterparts of (iii).

Well equipped with these theoretical asumptions it is time to determine the makeup of actual Chinese consonants and account for distributional facts from table 1, which shows that most of the consonants can appear with rimes without a medial. The only striking systematic gap appears with palatals *j,q,x*. This is most easily explained if we assume that these segments are the palatal counterparts of some other set that lacks i-rimes. How do we recognize this set?

Its characteristic is that these consonants do not appear with i-rimes. Table 1 displays that the following consonants cannot take i-rimes: *z,c,s,zh,ch,sh,r,g,k,h*. We will assume that there should be a minimal change in the melodic makeup of the palatal and non-palatal series (in terms of I). Since *j,q* are affricates and *x* is a fricative it is expected that the non-palatal variants are such as well. This leaves us with *zh,ch,sh* or *z,c,s* as possible candidates.

Recall that there are two theoretical reasons not to appear with i-rimes with regard to the melodic makeup of a segment: (i) I is absent, or (ii) I already appears as a head. The set we are looking for will have the former shape.

The data from Taiwanese provide the final piece of the puzzle. According to Neubarth & Rennison (2002), in Taiwanese palatals *j,q,x* and non-palatals *z,c,s,zh,ch,sh* fall into the the coronal series *z,c,s*. This process can be viewed as neutralisation, which is in GP generally considered as loss of melodic material. For this reason we can conclude that *z,c,s* in Taiwanese are the least complex in terms of segmental makeup, this means without I altogether.

Based on the evidence from Taiwanese we thus conclude that *j,q,x* is the series with an I operator and as such the palatal counterpart of the series without I (*z,c,s*). The series without palatal counterparts is I-headed (*zh,ch,sh*). As such these onsets never appear with i-rimes.

The velars *g,k,h* and *r* show identical phonological behaviour as the retroflex series in a very crucial respect: they never appear with i-rimes. In addition, there are no candidates among the onsets that do take i-rimes that have not been assigned non-palatal counterparts yet. Since there seem to be no palatal variants of *g,k,h,r*, we must conclude that these consonants also contain I as a head in their melodic makeup, which consequently prevents them from having I-operator counterparts.

head I	ch	zh	sh	-	-	-	-	k	g	r	ng	h
operator I	q	j	x	p^j	b^j	m^j	(f^j)	t^j	d^j	l^j	n^j	y
I absent	c	z	s	p	b	m	f	t	d	l	n	

Table 2: Chinese onset segmental inventory

	e	ei	a	ai	ao	ou	an	en	ang	eng
b		bei	ba	bai	bao		ban	ben	bang	beng
p		pei	pa	pai	pao	pou	pan	pen	pang	peng
m		mei	ma	mai	mao	mou	man	men	mang	meng
f		fei	fa			fou	fan	fen	fang	feng
d	de	dei	da	dai	dao	dou	dan	den	dang	deng
t	te	tei	ta	tai	tao	tou	tan		tang	teng
n	ne	nei	na	nai	nao	nou	nan	nen	nang	neng
l	le	lei	la	lai	lao	lou	lan		lang	leng
z	ze	zei	za	zai	zao	zou	zan	zen	zang	zeng
c	ce	cei	ca	cai	cao	cou	can	cen	cang	ceng
s	se	(sei)	sa	sai	sao	sou	san	sen	sang	seng
	e	ei	a	ai	ao	ou	an	en	ang	eng
bʲ		bi	(bia)	bie	biao		bian	bin	(biang)	bing
pʲ		pi	(pia)	pie	piao		pian	pin	(piang)	ping
mʲ		mi		mie	miao	miu	mian	min		ming
dʲ		di	dia	die	diao	diu	dian	(din)	(diang)	ding
tʲ		ti		tie	tiao		tian	(tin)	(tiang)	ting
nʲ		ni		nie	niao	niu	nian	nin	niang	ning
lʲ		li	lia	lie	liao	liu	lian	lin	liang	ling
j		ji	jia	jie	jiao	jiu	jian	jin	jiang	jing
q		qi	qia	qie	qiao	qiu	qian	qin	qiang	qing
x		xi	xia	xie	xiao	xiu	xian	xin	xiang	xing
ʲ		yi	ya	ye	yao	you	yan	yin	yang	ying
zh	zhe	zhei	zha	zhai	zhao	zhou	zhan	zhen	zhang	zheng
ch	che		cha	chai	chao	chou	chan	chen	chang	cheng
sh	she	shei	sha	shai	shao	shou	shan	shen	shang	sheng
r	re				rao	rou	ran	ren	rang	reng
g	ge	gei	ga	gai	gao	gou	gan	gen	gang	geng
k	ke	kei	ka	kai	kao	kou	kan	ken	kang	keng
h	he	hei	ha	hai	hao	hou	han	hen	hang	heng

Table 3: Structure of the Chinese word: combining onsets and rimes

The above analysis (shown in table 2) based on the overall symmetry of the consonantal system in terms of the occurrence of I in onsets greately changes table 1. Firstly, by assuming the existence of a greater number of possible onsets it fuses the i-rimes with rimes without medials and shows that the former do not exist, they are just an illusion created by palatal onsets. Moreover, it dispenses with two traditional systematic gaps: (i) the absence of rimes without medials following palatals *j,q,x* and (ii) the absence of coronals *z,c,s* before i-rimes. The gaps disappear if we consider palatals *j,q,x* to be a variant of *z,c,s* before what is traditionally called i-rimes.

Secondly, the analysis also provides an account based on general, not language-specific theoretical principles for traditional i-rime gaps occurring with *r,g,k,h,zh,ch,sh* by providing the reason for absence of their palatal counterparts. The simple reason is that they contain I as a head and as such do not allow for the I operator in the same segment. Note that the analysis does not rely on any phonetic similarities among the members of the set *r,g,k,h,zh,ch,sh* but solely on their phonological behaviour.

The revised system can be found in table 3. Some rimes that are listed in the same column appear to have quite different surface realisations. With respect to columns ei, ai and an see footnote 7. In columns ei, ou, en and eng, operator I from the onset position of palatal consonants spreads into the nuclear position. In columns ei and ou, endings i and u influence the phonetic interpretation of the empty nucleus with non-palatals, cf. Neubarth & Rennison (2002:8). The gap with palatals in column e is not necessarily a gap: combining palatal onsets with rimes e and ei yields the same result. Finally, the gap in column e with labials probably contains forms with -u rime, see §3.5.

3.5.   Beyond i-rimes

Although u-rimes are beyond the scope of this paper a glance at their distribution shows that an analysis somewhat similar to that of i-rimes could be applied for them. Let us sketch it briefly.

In GP labiality is connected with element U, therefore labialised onsets would be predicted to contain operator U. These are the consonants that are followed by u-rimes. On the other hand, consonants generally not followed by u-rimes would be predicted to contain U as head. These consonants seem to be the labials *p,b,m,f*. However, there is rime *-u* that does appear after them. I expect precisely forms *bu, pu, mu, fu* to fill the gap in column e in table 3, the details however still need to be worked out. The analysis of u-rimes would thus have to be able to account for this fact as well.

Besides rimes without medial, i-rimes and u-rimes Chinese also displays ü-rimes, which like i-rimes and u-rimes again seem to be a combination of ü and a rime without medial. In GP the melodic makeup of ü is generally represented by the combination of elements I and U. Since we have proposed that glides in rimes are in fact operators in onsets, we will assume that in the case of ü-rimes both I and U will be operators in the onset. Let us see where this assumption gets us. A closer look reveals that ü-rimes seem to occur only after onsets that also take i-rimes. Effectively this means that they occur with palatal onsets.[8] There is however a set of consonants that do take i-rimes but not ü-rimes, namely the labials *p,b,m,f*. Above we have proposed that precisely these consonants contain U as a head. It follows from a general principle prohibiting a double occurrence of the same prime in one segment that these consonants will not be able to contain an operator U. This is exactly what the distribution of ü-rimes shows.

However, there are two consonants our theory would predict to occur with ü-rimes, but in reality never do, namely *d,t*. These are precisely the two consonants that for Kaye (2001b) do not contain I operator. By proposing so, the problem of absence of ü-rimes does not appear for Kaye. On the other hand, these two consonants do appear before i-rimes, therefore he needs to predict the existence of lexical i-rimes. This, we have shown, is unsuitable for other reasons. Acknowledging that *d,t* are problematic for our theory at the present stage we leave this problem unsolved for the time being and call for further research.

4.   Conclusion

In this paper I proposed a new analysis of the melodic structure of segments that can appear word-initially in Mandarin Chinese regarding their ability to precede what is traditionally called i-rimes. The analysis was led by phonological behaviour of consonants combined with the idea of the overall symmetry of the consonantal system. The merit of this proposal is that it goes beyond observation and provides explanation stemming from general principles of Government Phonology.

The proposal followed the idea that *i* is never lexically present in the vocalic part of the syllable, which means that there are no lexical i-rimes. The source of *i* in these rimes is always the consonant. We determined the status of element I and its general behaviour in these consonants and reached the following conclusions: consonants without I and consonants with I-head do not appear with i-rimes, while I-operator consonants (the palatal counterparts of the I-less consonants) always do. Applying the Free Distribution Principle to the Cartesian product of the proposed onset segmental inventory and the set of rimes without medial explains the systematic gaps in the distribution of i-rimes.

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[8]After palatals we can also find a rime *-iong*, which is phonetically realized with u, not ü. The question why we get this sort of phonetic realization is left for further research.

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Intertwined clauses, interacting propositions
A note on the interpretive aspects of sentence amalgamation

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This paper studies the interpretive aspects of sentence amalgamation. It is argued that the amalgamation of clauses affects the way their propositions are interpreted. The effect is such that the second(ary) proposition weakens or strengthens a part of the main proposition. The observation underlying this, is that amalgams convey two types of messages about the content kernel that is associated with both clauses.

1. Introduction

The notion 'syntactic amalgam' goes back to Lakoff (1974), who discusses a range of constructions that involve entangled clauses. Consider the following examples:

(1)   Ed bought you can imagine how many books.

(2)   Charlotte is going to I think it's Paris.

In both examples, the matrix clause is interrupted by some other clause, which I will call the 'interrupting clause' (IC). In the type illustrated in (1), the main clause is interrupted by a clause containing a *wh*-element. I will refer to this type as *wh*-amalgams. The IC in (2) is an embedded *it*-cleft, examples of this type will be referred to as *cleft*-amalgams.[1] Typically, amalgams involve a constituent that can be associated with both the matrix and the interrupting clause. That is, *books* in (1) is understood as the object of *bought* in the matrix, but also as part of the clausal complement of *imagine* in the IC. *Paris* in (2) is understood as the complement of the preposition *to*, but also the predicate of the cleft in the IC.

The literature on sentence amalgamation is mostly concerned with the question how the two clauses are syntactically related to each other. Lakoff (1974) and more recently Tsubomoto & Whitman (2000), analyse the IC as an adjunct to an empty DP in the matrix. Grosu (2006) analyses the ICs of *wh*-amalgams as complex XPs that are embedded in the

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[1] The names in the original work of Lakoff (1974) for the different types are Andrews- and Horn-type amalgams, referring to respectively Avery Andrews and Larry Horn. The more transparent terminology in this paper is adopted from Tsubomoto & Whitman (2000).

matrix. Finally, Van Riemsdijk (1998, 2006) and Guimarães (2004), consider amalgams to be parallel (not subordinated) clauses that share a constituent.

   What has not received much attention since Lakoff (1974), is that syntactic amalgams have particularly interesting interpretive aspects. Lakoff (1974) observes that *wh*-amalgams must have 'the force of an exclamation', and cleft-amalgams involve 'a hedged assertion'. However, these aspects do not distinguish amalgams from their non-amalgamated counterparts, since Lakoff's observations about exclamation and hedging hold for (1)′ and (2)′ as well:

(1)′   You can imagine how many books Ed bought!

(2)′   I think it's Paris that Charlotte went to.

Here, the clauses stand in a normal embedding relation with respect to another. Still, how we interpret amalgams, is intuitively different from how we interpret their non-amalgamated counterparts. The aim of this paper is to refine this intuition, and to obtain more insight in how this effect comes about. The data are primarily English; Dutch data are used when they are more convenient for the point illustrated. For the present purposes, I will not make any specific assumptions about the syntactic derivation of amalgams.

   The paper is organized as follows. In section 2., I lay out some basic points and assumptions concerning amalgams. In section 3., I discuss the notion 'content kernel', the sentences that are part of an amalgam, and the propositions they express. Section 4. investigates the restrictions on embedding verbs and subjects in interrupting clauses. In section 5., I argue that amalgams have specific rhetorical effects, and that ICs typically express subjective content, on a par with parenthetical constructions. Section 6. concerns a couple of new questions that can be raised based on this study, and section 7. concludes the paper.

2. Preliminary remarks: ellipsis and presupposition

A first remark concerns the incompleteness of the IC in amalgams. It has been noted in the literature that the ICs of *wh*-amalgams structurally look like indirect *wh*-questions, of which the complement has undergone a type of ellipsis known as *sluicing* (see Ross 1969 and Merchant 2001). Example (3a) illustrates an indirect *wh*-question, (3b) a regular case of sluicing, and (3c) a *wh*-amalgam:

(3)   a. I don't know [what Ed bought].
      b. Ed bought something, but I don't know what ~~Ed bought~~.
      c. Ed bought [I don't know what ~~Ed bought~~].

Unlike (3b), (3c) is ungrammatical if *Ed bought* is not sluiced in the IC, i.e. sluicing in *wh*-amalgams is obligatory (Lakoff 1974, Grosu 2006). In the IC of cleft-amalgams, it is the relative clause that normally follows the *it*-cleft that is elided:

(4)   Charlotte is going to [I think it's Paris [~~that Charlotte is going to~~]].

Note that in both cases, the elided material surfaces in the matrix clause. Examples (5a) and (6a) are then the full-fledged clauses that are part of an amalgam, (5b) and (6b) are their basic structural representations that I will use throughout the paper. Here, MC stands for matrix clause, EC for embedded clause, and IC for interrupting clause:

(5) a. [MC Ed bought [IC you can imagine [EC how many books ~~Ed bought~~]]]
     b. [MC γ[IC β [EC *wh-α γ*]]]

(6) a. [MC Charlotte is going to [IC I think [EC it's Paris [EC ~~that Charlotte is going to~~]]]]
     b. [MC γ[IC β [EC *it*+BE α [EC ~~γ~~]]]]

An important aspect of *it*-clefts is that they trigger logical presuppositions (Gazdar 1979, Delin 1992). This is illustrated in (7), where (7a) and its negated counterpart (7b) have the same implication ('>>'):

(7) a. It's the president that Charlotte met.
     b. It's not the president that Charlotte met.
        >> Charlotte met someone.

In the next section, I show that it is this fact rather than the amalgamation of clauses as such, that restricts the possible readings associated with embedding verbs in cleft-amalgams.

3. Amalgamated clauses and propositions

In this section, I discuss the propositional content of amalgams. Section 3.1. concerns the structural position of the content kernel of amalgams. In 3.2., I argue that amalgams express two separate propositions about the content kernel, based on syntactic observations concerning the clausal status of the IC. Finally, the propositional contents of amalgams are compared to those of their non-amalgamated counterparts in 3.3.

3.1. One content kernel

As described in the introduction, amalgams involve a constituent that seems to play a double role. I will refer to this constituent as the 'content kernel', a term adopted from Van Riemsdijk (1998, 2006) and Schelfhout et al. (2004). In this section, I briefly discuss the grammatical properties of the content kernel, especially in relation to the position in which it surfaces in amalgams.

Example (8) shows that the content kernel of *wh*-amalgams can be associated with different grammatical functions in the matrix clause:

(8) a. Ed met [you can imagine *who*] in the theatre.
     b. Ed is going to [you will never guess which *city*] for Christmas.
     c. Ed gave [you know which *girl*] a book.
     d. Ed was [you can imagine how *happy*] when he won the lottery.

In (8a) *who* is associated with the object of *met*. In (8b), *city* is understood as the complement in the PP that is started by *to* in the matrix. In (8c), *girl* is understood as the indirect object of *gave*. In (8d), the AP *happy* is associated with the predicate of *was*.[2]

The content kernel of a cleft-amalgam is the predicate of the *it*-cleft in the IC. Example (9) shows that this constituent, too, can be associated with different grammatical functions in the matrix clause:

(9) a. Charlotte met [I think it was *the president*].
     b. Charlotte is going to [I think it's *Paris*].
     c. Charlotte gave [I think it was *her mother*] an expensive necklace.
     d. Charlotte was [I think it was *extremely happy*] when she won the lottery.

In (9a), the DP *the president* is understood (at least in some belief world) as the object of *met*. In (9b), the DP *Paris* is associated with the complement of *to* in the matrix. In (9c), *her mother* is understood as the indirect object of *gave*. Finally in (9d), *extremely happy* is associated with the predicate of *was* in the matrix.

If we compare amalgams to their non-amalgamated counterparts, we witness the following pattern in the positions where the content kernel (italicized) is selected (boldfaced) and realized:

(10) a. [$_{MC}$ Ed **bought** [$_{IC}$ you know *how many books*.]]
      b. [$_{MC}$ You know [$_{EC}$ *how many books$_i$* Ed **bought** t$_i$.]]

(11) a. [$_{MC}$ Charlotte is going **to** [$_{IC}$ I think it's *Paris*.]]
      b. [$_{MC}$ I think [$_{EC_1}$ it's *Paris$_i$* [$_{EC_2}$ that Charlotte is going **to** t$_i$.]]]

In amalgams, the content kernel is a constituent that is selected by an element in the matrix clause, but it is realized in the IC. In the non-amalgamated counterparts, the same constituent is part of an embedded clause that is selected by the matrix clause.

> **Observation 1**
> In a sentence [$_{MC}$ γ [$_{IC}$ β α γ]], α is selected by some γ, and γ surfaces in MC.

> **Observation 2**
> In a sentence [$_{MC}$ β [$_{EC}$ γ α]], α is selected by some γ in the embedded clause, and the embedded clause is selected by some β in the matrix clause.

3.2. Two main clauses

This section provides the foundation for the assumption that the IC is a *main clause* and thereby, as is relevant for the present purposes, expresses a proposition.

First, let us consider the relation between the two clauses in amalgams. Examples (12) and (13) illustrate amalgams and their counterparts:

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[2] Note however, that *city* in (8b) and *girl* in (8c) are not complete arguments. What is understood is *a city* and *a girl*, or arguably *some city* or *some girl*. Most likely, this is because these elements are not in a *wh*-position in the matrix. This touches the question what the exact syntactic position the content kernel is, an issue that is beyond the purposes of this paper.

(12) a. [Ed bought [you can imagine how many books]].
     b. [You **can imagine** [how many books Ed bought]].

(13) a. [Charlotte is going to [I think it's Paris].
     b. [I **think** [it's Paris [that Charlotte is going to]].

The non-amalgamated counterparts clearly involve the selection of a clausal complement by the matrix (embedding) verb. So, the relationship that holds between the clauses in (12b) and (13b) is one of embedding. In the amalgams in (12a) and (12a), there is nothing in the matrix clause that selects a clausal complement. The only thing selected by the matrix verb, is the constituent contained within the IC (see observation 1). The IC seems to be a non-embedded clause with respect to the matrix. In fact, as I will show below, the IC has the properties of a *main* clause.

    If the IC is a main clause, we expect that it can never be used as a subject of a sentence. The data in (14) show that this is indeed impossible for cleft-amalgams.

(14) a. *[I think it's Buenos Aires] is the birthtown of Borges.
     b. *[I think it's extremely happy] is what Charlotte will be if she wins the lottery.

However, Grosu (2006) argues for *wh*-amalgams, that what I have called an interrupting clause, is in fact a complex, homocategorical XP with obligatory internal sluicing. This is based on the observation that what is missing in the matrix corresponds systematically to something in the IC. In his approach, the *wh*-amalgam in (15) is analysed as follows:

(15) Ed was [AP you can imagine how happy ~~Ed was~~] when he won the lottery.

Here, *you can imagine how* modifies the content kernel *happy*, and the whole (here an AP) is normally embedded in the matrix. So, the 'IC' (modulo the content kernel) is a modifier of some sort, and not a sentence. Under this assumption we predict that this complete XP can be subject to a sentence. This seems to be correct considering the possibility of (16):

(16) a. [DP You know who] wanted to go to Ed's birthday party.
     b. There was a lot of [DP you know what] on the floor.

There is reason, however, to assume that the phrases '*you know who/what*' in (16) are a distinct type within the class of *wh*-amalgams. As pointed out in Grosu (2006), the DP in (17) cannot have undergone sluicing. It rather seems to have undergone the type of ellipsis in (17b), or no ellipsis whatsoever:

(17) a. [You know who *(~~really likes Ed~~)] really likes Ed.
     b. [You know who (I have in mind)] really likes Ed.

Furthermore, *wh*-amalgams in which the *wh* belongs to a referential DP or an AP cannot be subjects. This contrast that is even better illustrated in Dutch, due to the word order alternation in main (VO) and subordinated (OV) clauses. Consider (18) and (20) for English, and (19) and (21) for Dutch. To facilitate the correct reading of the English examples, note

that the sentences in (18) have different intonation. Informally put: in (18b), but not in (18a), the pitch accent must be on the *wh*-constituent.

(18) a. You know [who wants to kill me].
　　　b. [You know who] wants to kill me.

(19) a. Je　　weet wel　　[wie mij　wil　　vermoorden].
　　　　　you　know AFF　　who me　　wants　kill-INF
　　　　　'You know [who wants to kill me].'
　　　b. [Je　　weet wel　　wie] wil　　mij　vermoorden.
　　　　　 you　know AFF　　who wants　me　kill-INF
　　　　　'[You know who] wants to kill me.'

(20) a. You　know [which professor wants to kill me].
　　　b. *[You know which professor] wants to kill me.

(21) a. [Je　　weet wel　　[welke　professor　mij　wil　　vermoorden]].
　　　　　you　know AFF　　which　professor　me　wants kill-INF
　　　　　'You know which professor wants to kill me.'
　　　b. *[Je weet wel　　welke　professor] wil　　mij　vermoorden.
　　　　　 you know AFF　　which　professor　wants　me　kill-INF
　　　　　'You know which professor wants to kill me.'

A similar contrast can be witnessed in predicate topicalization (22), which is possible with *you know what* (albeit marginally), as is illustrated in (23), but not with *you know how exhausted* (24):

(22) Completely exhausted is what Steve will be after running a marathon.

(23) a. Steve was [you know what] after running a marathon.
　　　b. [You know what] is exactly what Steve was after running a marathon.

(24) a. Steve was [you know how exhausted] after running a marathon.
　　　b. *[You know how exhausted] is exactly what Steve was after running a marathon.

These data suggest a distinction within the class of *wh*-amalgams. In the phrases '*you know who/what*', the 'IC' behaves more like a complex DP than a clause. From now on, I will regard these phrases as an exception. As such, they are not part of the present discussion, but see section 6. for some additional remarks.

　　In sum, the examples in this section show that the IC in amalgams is a clause that behaves like a main clause, and bears no relationship in terms of *embedding* with respect to the matrix clause in which it appears.

Observation 3
In a sentence [MC γ [IC β α]], IC is a non-embedded clause with respect to MC.

3.3. Disentangling the propositions

Let us now have a look at the propositional contents of amalgams, and compare those to the propositional contents of their non-amalgamated counterparts. For simplicity's sake, I use a basic predicate logic representation. As was mentioned in 2., amalgams involve embedding verbs. These verbs play an important role in the propositional content of amalgams (see also section 4.). This type of verbs take clausal complements, and express relations of individuals to sets of worlds (Partee 1974, Chierchia & McConnell-Ginet 1992). I will indicate these predicates with SMALL CAPS, and use '^' as intensional operator (based on Montague 1973, see also Chierchia & McConnell-Ginet 1992 and Larson 2002) which should be read as *that* (to be distinguished from Boolean *and* '∧'). P denotes the complex proposition of a clause including those of its *embedded* clauses, and *p* denotes a simple proposition. In agreement with the observation that the IC is not embedded in the matrix, and for ease of representation, I distinguish between P_1 and P_2 for 'matrix proposition' and 'IC proposition' respectively.

Example (25) is an indirect *wh*-question and the associated propositional content:

(25) [MC I don't know [EC which book Ed bought]].
  $P = \exists x \, [\text{book} \, (x) \wedge [\text{Ed bought} \, (x)] \wedge \neg \text{KNOW} \, (I, x)]$ $= (p \wedge q \wedge r)$

Let us now look at the propositional content of the amalgamated counterpart of (25). As described in the previous sections, the matrix clause is 'missing' a constituent (here the object of *bought*), which I have refered to as the content kernel. Considering that this constituent is selected by the matrix clause, let us here assume that this content kernel is at least semantically present in the matrix clause.[3] The propositional structure of a *wh*-amalgam is then illustrated in (26):

(26) [MC Ed bought [IC I don't know which book]].
  $P_1 = \exists x [\text{book} \, (x) \wedge [\text{Ed bought} \, (x)]]$ $= (p \wedge q)$
  $P_2 = \exists x [\text{book} \, (x) \wedge [\text{Ed bought} \, (x)] \wedge \neg \text{KNOW} \, (I, x)]$ $= (p \wedge q \wedge r)$

The matrix proposition is that there is a book such that Ed bought it. The second proposition that I don't not know which book. Note that also P_2 contains the proposition that there is an *x* such that Ed bought *x* (*q*). This corresponds to the sluiced material that is part of the IC.

As described in the previous section, *it*-clefts are presupposition triggers. As a consequence, the propositional content of an embedded *it*-cleft is as follows:

(27) I think it's the president that Charlotte met.
  $P = \exists x [\text{Charlotte met} \, (x) \wedge \text{THINK} \, (I, {}^{\wedge} \text{president} \, (x))]$ $= (p \wedge q)$

Notice that the *de re* reading is the only reading that (27) can get, while a similar construction without the *it*-cleft is ambiguous for both the *de dicto* and the *de re* reading, as is illustrated in (28):

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[3] At this point, this is not *obviously* so, since we may also assume that all that the matrix clause expresses is that there is an *x* such that Ed bought *x*. In section 4., it will become clear why P_1 is to be formulated as in (26).

(28) I think [that Charlotte met the president].
      THINK (I, $^\wedge\exists x$[Charlotte met (x) $\wedge$ president (x)])
      $\exists x$[Charlotte met (x) $\wedge$ THINK (I, $^\wedge$ president (x))]

Contrary to (27), (28) does not imply the existence of an individual that Charlotte met. Thus, when an *it*-cleft is the complement of a verb like *think*, the scope of the intensional operator introduced by the embedding verb is restricted to the predicate of the cleft.

   The same applies to cleft-amalgams, illustrated in (29). The proposition of the matrix clause is that there is someone that Charlotte met. The proposition of the IC is that Charlotte met someone and that I think that it is the president:

(29) Charlotte met I think it's the president.
      $P_1 = \exists x$[Charlotte met (x)] $= p$
      $P_2 = \exists x$[Charlotte met (x) $\wedge$ THINK (I, $^\wedge$ president (x))] $= (p \wedge q)$

We can conclude that the propositional contents of amalgams are semantically equivalent to the propositional contents that are expressed by their non-amalgamated counterparts. The latter consistently express ($p \wedge q$). The matrix clause propositions (P_1) express p, and all IC propositions (P_2) express ($p \wedge q$), i.e. P_2 entails P_1. The propositional content of amalgams is then $p \wedge (p \wedge q)$, which is equivalent to ($p \wedge q$). This leads to the following observations:

Observation 4
In a sentence [MC …[IC … α]], where P_1 is the proposition of the MC and P_2 of the IC, P_1 is always entailed by P_2.

Observation 5
For any sentence A [MC γ [IC β α]], and its counterpart A′ [MC β [EC γ α]], it holds that [[A]] = [[A′]].

4. Inside the interrupting clause

In order to understand the interpretive effect of sentence amalgamation, we will have to look beyond the propositional content. The interrupting clauses of the amalgams discussed so far seem to involve specific embedding verbs and subjects. In 4.1., I discuss the restrictions on the use of embedding verbs in amalgams compared to similar non-amalgamated structures. In 4.2., I observe that negation and modality interact with these restrictions. Section 4.3. discusses the role of the subject in the ICs.

4.1. Restrictions on embedding verbs in amalgams

In section 2., it was observed that the ICs of *wh*-amalgams look like indirect *wh*-questions. Since only a subset of embedding verbs can 'host' an indirect question, it is no surprise that the *wh*-amalgam in (30b) is out: the non-amalgamated counterpart sentence (i.e. the indirect question) is ungrammatical as well.

(30) a. *You believe how many books Ed bought.
     b. *Ed bought you believe how many books.

However, not all embedding verbs that can be used to construe indirect *wh*-questions, can be used in *wh*-amalgams. Consider examples (31) and (32):

(31) a. You wonder/ask which books Ed bought.
     b. *Ed bought you wonder/ask which books.

(32) a. You heard which books Ed bought.
     b. *Ed bought you heard which books.

Wonder and *ask* in (31) are interrogative verbs, and *hear* in (32) is an evidential verb. Importantly, the non-amalgamated sentences in (31a) and (32a) are perfectly grammatical, but they can only be understood as indirect *wh*-questions. The counterpart sentences of grammatical *wh*-amalgams allow for a second reading, namely the one of an exclamative ('EXCL'). This is illustrated step-by-step in the data in (33) - (35). Example (33) illustrates a regular *wh*-exclamative, (34) is an embedded *wh*-exclamative, and (35) a grammatical *wh*-amalgam:

(33) How many books Ed bought!   (EXCL)

(34) You know how many books Ed bought.   (EXCL)

(35) Ed bought you know how many books.

Recall that (34) corresponds to the IC including its sluiced material. Thus, the possibility of *wh*-amalgamation seems to depend on the exclamative reading being available in its interrupting clause. Note that when a *wh*-exclamative is embedded this way, the result is an indirect rhetorical question. The ICs of *wh*-amalgams thus look like sluiced rhetorical *wh*-questions rather than indirect *wh*-questions.[4] This leads us to the following observation, which can be seen as a elaboration and refinement of Lakoff (1974:323):

Observation 6 (first version)
In a sentence [MC γ [IC V *wh*-α γ]], the IC must allow for an exclamative reading.

A well-known restriction on the embedding of *wh*-exclamatives is that they require a *factive* predicate (see Elliott 1974, Grimshaw 1979, and Zanuttini & Portner 2003). This explains why the examples in (31) - (32) are out: interrogative and evidential verbs are not factive.[5] Observation 6 can now be reformulated as a restriction on the embedding verb:

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[4] For ease of representation, I will regard the rhetorical reading as a sort of exclamative, and indicate the availability of that reading consistently with 'EXCL'. I return to the rhetorical aspect of amalgamation in section 5.
[5] The contrast between non-factive and factive verbs is illustrated in (i) where only (ia) implies that Ed bought books:
(i) a. I forgot that Ed bought books.
    b. I believe that Ed bought books.

Observation 6 (second version)
In a sentence [MC γ [IC V *wh*-α γ]], the IC must allow for an exclamative reading; therefore V must be factive.

The ICs of cleft-amalgams also involve embedding verbs. Example (36) shows cleft-amalgamation with epistemic verbs, (37) shows that evidential verbs can be used in this type of amalgam as well:

(36) a. I think/guess/doubt/am sure/believe it's Paris that Charlotte is going to.
      b. Charlotte is going to I think/guess/doubt/am sure/believe it's Paris.

(37) a. I heared/saw/witnessed/observed it was the president that Charlotte met.
      b. Charlotte was in a meeting with I heared/saw/witnessed/observed it was the president.

So far, it seems that there are no special restrictions on cleft-amalgams if we compare them with the embedded counterparts. However, none of the verbs in (36) - (37) is factive. A well-known class of factive embedding verbs are 'emotives' like *be surprised* and *hate*. Within the class of epistemic predicates, *remember* and *forget* are factive. Consider (38) and (39):

(38) a. I am surprised/hate that it's the president that Charlotte met.
      b. *Charlotte met I am surprised/hate that it's the president.

(39) a. I forgot/remember that it's the president that Charlotte met.
      b. *Charlotte met I forgot/remember that it's the president.

So, the *it*-cleft in cleft-amalgams cannot be embedded in a factive predicate. The observed restriction is then as follows:

Observation 7 (first version)
In an amalgam [MC …[IC V *it*+BE α]], V must be non-factive.

We have seen that factivity, or the lack thereof, plays an important role in both types of syntactic amalgams. Recall that *it*-clefts are triggers of logical presupposition. Taking into account that factive verbs are presupposition triggers as well (as is widely assumed, see Karttunen 1974, Gazdar 1979, Heim 1992, and many others), the presence of a presupposition can now be generalized to both types of amalgams. However, there is a difference between what is presupposed in a *wh*-amalgam, and in a cleft-amalgam. Informally put, the content kernel α is part of the presupposition of *wh*-amalgams, but not of the presupposition of cleft-amalgams. This is exemplified in (40) and (41), and their respective presuppositions, where the content kernels are italicized:

(40) Ed bought I forgot how many *books*.
      >> Ed bought *books*.

(41) Charlotte is going to I think it's Paris.
      >> Charlotte is going somewhere.

This difference is due to the way presuppositions must be derived from *it*-clefts, namely by substitution of the relativizer (which is not present in the amalgam, but recall the embedded

counterparts of cleft-amalgams) with an existentially quantified phrase (see Gazdar 1979, reformulated in Delin 1992:291). The observations concerning amalgamation and presupposition are then as follows:

> **Observation 8**
> In an amalgam [MC …[IC V *wh*-α]] where P_1 is the proposition of the MC and P_2 of the IC, P_2 presupposes $\exists x(P_1)$ where $x = α$.
> **Observation 9**
> An amalgam [MC …[IC V *it*+BE α]] where P_1 is the proposition of the MC and P_2 of the IC, P_2 presupposes $\exists x(P_1)$.

4.2. The role of negation and modals

Based on the observations in 4.1., we arrive at a small set of embedding verbs that can be realized as V in the ICs of amalgams: basically factives for *wh*-amalgams, and non-factives for cleft-amalgams. In this section, this generalization will be extended to capture an interesting interplay of embedding verbs, negation and modal verbs.

Consider the contrast between the ungrammatical (42) repeated from (30), and (43):

(42) a. *You believe how many books Ed bought.
      b. *Ed bought you believe how many books.

(43) a. You will never/won't believe how many books Ed bought.   (EXCL)
      b. Ed bought you will never/won't believe how many books.

Importantly, (43a) only has the exclamative reading; it cannot be read as an indirect question. The verb *believe* is probably the most prototypical non-factive embedding verb. However, when it is part of a complex predicate like in (43), a factive reading seems to become available. Consider (44) and its presupposition:[6]

(44) You will probably never believe that Ed bought books.
      ≫ Ed bought books.

Apparently, there is an interplay of modality and negation that facilitates an exclamative reading of examples like (43).[7] Modals like *may* and *must* have a similar effect on the evidentials described in section 4.1., consider (45):

(45) a. You may have heard which books Ed bought.
      b. Ed bought you may have heard which books.

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[6] Note that I have chosen to use *you* as the subject in this example. This is because the sentence *I will never believe that Ed bought books* seems to constitute a contradiction. The apparent 'factivity' of (44) may be related to some interplay of beliefs of the speaker and the (alleged) beliefs of the addressee. This puts into question the exact nature of the presuppositions discussed in this paper. The subjects of the IC are topic to section 4.3., but I will not make further assumptions about presuppositions and propositional attitude verbs. For this, the reader is referred to the literature cited in this paper, in particular Heim (1992).

[7] The interaction between negation and exclamatives has been discussed in the literature, see for example Portner & Zanuttini (2000) and Villalba (2004).

However, the basic observation is the same: *wh*-amalgams depend on the availability of an exclamative reading, hence the predicate in which the *wh*-exclamative is embedded must (as a whole) be factive.

> **Observation 6 (final version)**
> In a sentence [MC γ [IC V *wh*-α γ]], V must be factive or part of a factive predicate in order for IC to be exclamative.

The examples of cleft-amalgamation discussed in this paper suggest that the cleft is always embedded. The contrast in (46) shows that 'bare' clefts are possible, but not in cleft-amalgams:

(46)   a. It's Paris that Charlotte is going to.
       b. *Charlotte is going to it's Paris.

This is consistent with observation 7, as the bare cleft in (46) is not *non*-factive. The data in (47) and (48) show that *it*-clefts realized with modals instead of *is*, bring about the required non-factivity in the absence of an embedding verb:

(47)   a. It seems/appears to be Paris that Charlotte is going to.
       b. Charlotte is going to it seems/appears to be Paris.

(48)   a. It must/could/may be Paris that Charlotte is going to.
       b. Charlotte is going to it must/could/may be Paris.

Importantly, the reading of the modals in (48) is epistemic and cannot be deontic. Taking into account that the non-factive embedding verbs that are used are epistemic verbs (including evidentials, see also Rooryck 2001), we can conclude that the IC in cleft-amalgams must express epistemic modality in the broad sense. Thus, observation 7 can be refined as follows:

> **Observation 7 (final version)**
> In an amalgam [MC …[IC V *it*+BE α]], IC must express epistemic modality. Consequently, either V must be non-factive, or *it*+BE must be non-factive.

4.3. The subject of the interrupting clause

The examples that illustrate the observations about amalgams so far give rise to the suspicion that the choice of subjects is restricted in their interrupting clauses. That is, most of the *wh*-amalgams have *you* as the subject of the IC, whereas *I* seems to be the preferred subject of cleft-amalgams. This section explores if this is due to an actual restriction on amalgams. In this section, term 'subject' refers to the subject of the IC (the one belonging to the embedding verb).

In addition to *you*, *wh*-amalgams also allow for a first person subject, both singular (49) and plural (50):

(49)   a. I can't believe how many books Ed bought.   (EXCL)
       b. Ed bought I can't believe how many books.

(50) a. We can imagine how many books Ed bought. (EXCL)
      b. Ed bought we can imagine how many books.

Interestingly, *we* in (50) is understood as speaker *and* audience, i.e. it reads as 'we all', or 'both you and I'. By contrast, a third person subject in the IC produces a very marginal *wh*-amalgam, as can be witnessed in (51):

(51) a. Steve/he can imagine how many books Ed bought ($^?$#EXCL)
      b. Ed bought $^#$Steve/*he can imagine how many books.

The non-amalgamated counterparts are perfectly acceptable with third person subjects, but those cannot (easily) be read as exclamatives. So, as is consistent with the observations about *wh*-amalgams so far, the choice of subject correlates with the requirement of exclamative reading of the IC. However, there are particular contexts in which cases like (51b) are acceptable, namely those contexts in which *Steve* is part of the audience (the domain of discourse):

(52) *Context*: Speaker A gives a speech about Ed, who is leaving the workplace. Part of the
      audience is Ed's office mate Steve, who knows Ed better than anyone else. The speaker
      mentions an incident where Ed bought a particular book:
      a. *A*: '… well, *Steve* knows which book Ed bought that one time!'
      b. *A*: '… we will never forget that time Ed bought, well, *Steve* knows which book! …'

This effect can be described as some sort of 'conspiracy' between the speaker and his audience, a rhetorical effect that will be discussed further in the next section.

    There is one other interesting choice of subject that can be seen in *wh*-amalgams, namely the use of *God*. Although this is a third person, *God* is probably not to be seen as part of the domain of discourse the way I argued for *Steve* in (51). By contrast, however, the exclamative reading is available in (53) without context:

(53) God knows how many books Ed bought. (EXCL)

In sum, as long as the exclamative reading is available in the IC, there is no restriction on the subject of the *wh*-amalgam, although third person subjects need context.

    First person singular subjects (*I*) seem to be the most common for cleft-amalgams. Example (54) shows that a first person plural is also possible:

(54) a. I/we think it's Paris that Charlotte is going to.
      b. Charlotte went to I/we think it's Paris.

Interestingly, the use of *we* in (54) is understood as the speaker and other(s) on whose behalf he speaks, rather than to speaker and audience as in the case of *wh*-amalgams. As out-of-the-blue utterances, cleft-amalgams (unlike their counterparts) seem awkward with second and third person subjects:

(55) a. You/Steve think(s) it's Paris that Charlotte went to.
      b. $^?$*Charlotte went to you/Steve think(s) it's Paris.

Again, this is not a restriction on the subjects in cleft-amalgams, as these examples are acceptable in certain contexts. For instance, the use of *you* improves when the cleft-amalgam is followed by a second *it*-cleft that expresses a (contrasting) belief of the speaker. Consider the following context:

(56) *Context*: Speaker A and B are discussing the future whereabouts of Charlotte. Speaker B has indicated that he thinks Charlotte is going to Paris.
        A: 'Charlotte is going to *you* think it's Paris, but *I* believe it's Barcelona.'

In this case, *you* and *I* must express contrastive focus marked by stress. Unlike in (54), we cannot stress the verb *think* here.
    Similarly, the context in (57) makes a third person subject acceptable:

(57) *Context*: Speaker A is talking about Charlotte. A knows that Charlotte has met someone, but has no idea who it is. He does know who Steve thinks that Charlotte has met.
        A: 'Charlotte met Steve thinks it was the president.'

Thus, cleft-amalgams, too, have no semantic or syntactic restriction as to what can be realized as the subject of its interrupting clause, but subjects other than *I* require context.

Observation 10
In a sentence [MC …[IC SUB V α]], there is no principled restriction on what can be the subject of the interrupting clause.

This is unsatisfying, as it doesn't provide any answer to the issue *why* some subjects seem preferred while others need rather particular contexts. In the following, I will speculate about this issue.
    For *wh*-amalgams, the preference for a second person subject is probably a consequence of the required exclamative reading. Consider the *you* in constructions like (58) versus the *you* in a embedded *wh*-exclamative (59):

(58) a. You never know.
        b. You've got to be kidding me.

(59) You will never guess how many books Ed bought.   (EXCL)

Both cases involve a generic rather than a specific use of *you*. This is better illustrated in Dutch, which has two forms for you, *je* and *jij*, and the latter is not allowed in generic uses.[8] Consider examples (60) - (62):

(60) Je/*jij   weet maar nooit.
        you   know just never
        'You never know.'

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[8] I thank Jack Hoeksema for pointing this out to me.

(61) Heb je/*jij ooit zo'n   mooi   meisje gezien?   (EXCL)
      Have you   ever such.a beautiful girl seen
      'Have you ever seen such a beautiful girl?'

(62) Ed   heeft je/$^?$*jij kunt wel raden   hoeveel   boeken gekocht.
      Ed   has   you   can AFF guess how.many books bought
      'Ed has bought you can guess how many books.'

Jij is completely out in (60). This also holds for the exclamative reading of (61), although *jij* would be fine if the sentence is understood as a direct question instead of a rhetorical question. Interestingly, the use of *jij* in *wh*-amalgam (62) requires a context such as the one in (56). In this case, *you* is understood contrastively in the domain of discourse, i.e. as 'you and not someone else'.

Recall that the IC of a cleft-amalgam expresses epistemic modality. As a consequence, they reveal a propositional attitude: they say something about the cognitive relation that its subject bears with respect to the proposition of its complement clause.[9] The reason why subjects other than *I* require further context, is most likely related to this aspect of cleft-amalgams. After all, a speaker more usually expresses his or her own beliefs or assumptions regarding a proposition rather than someone else's. In this regard, an interesting contrast can be witnessed between (55) above and (63):

(63) a. Steve said [it's Paris that Charlotte is going to].
      b. Charlotte is going to [Steve said [it's Paris]].

Unlike (55b), (63b) does not need a particular context. The reportative *said* in (63a) allows for an intensional reading (as embedding verb) and an evidential reading. The relevant distinction is that only the evidential reading of (63a) can be an answer to the question '*Where is Charlotte going to?*'. Thus, this evidential use is associated with epistemic modality (see also Rooryck 2001 and Simons 2007). In agreement with observation 7, *said* can only have the evidential reading in (63b). As a consequence, (63) reflects a propositional attitude of the speaker, in that the speaker doesn't seem to commit (completely) to the truth of the proposition *Charlotte is going to Paris*. This is related to the effect of 'hedging' that I address in the section below.

5. The pragmatic effect of amalgamation

We seem to be gradually moving from semantic to pragmatic observations. In the section to come, I investigate the rhetorical aspects that are associated with amalgams. In 5.1. I argue that the exclamative aspect that we have observed in *wh*-amalgams has the effect of strengthening, whereas hedging in cleft-amalgams has the effect of weakening. In section 5.2. I relate these effects to types of propositions. Finally in 5.3., I offer an answer to the question that was the starting point of this paper: the interpretive difference between amalgams and their embedded counterparts, and how it comes about.

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[9] The description as such corresponds to the traditional view on propositional attitudes. For discussion and other views, the reader is referred to Heim (1992), Moltmann (2003) and Schroeder (2006).

5.1. Strengthening and weakening

At several points in the discussion, it was observed that *wh*-amalgams depend on the availability of an exclamative reading. Let us first consider the effect of a regular *wh*-exclamative:

(64)   How *many books* Ed bought.   (EXCL)

An important aspect of exclamative that has already been discussed in section 4.1., is their factivity. An another aspect is what Zanuttini & Portner (2003) call 'widening'. In their words: '*Exclamatives introduce a conventional scalar implicature to the effect that the proposition they denote lies at the extreme end of some contextually given scale*'. (Zanuttini & Portner 2003:47). Widening in examples such as (64) affects the domain of quantification of the amount of *books* that Ed bought. Informally put, relative to a contextually given scale, the amount of books that Ed bought is surprisingly large.

Interestingly, when (64) is embedded as in (65), it seems that widening can be to either side of the scale:

(65)   a. You won't believe how many books Ed bought.   (EXCL)
       b. Ed bought you won't believe how many books.

In this case, the amount of books is understood as either surprisingly large or surprisingly small. Note that the latter is only available in a context where Ed was expected to buy a large amount of books. This leads to the following observation:

Observation 11
In a sentence [MC γ [IC V *wh*-α γ]], the quantificational domain of α is widened on a contextually given scale for α.

In cases like (65) it is clear which sort of scale it is that is 'contextually given'. This also holds for cases in which the content kernel is a predicate like *happy* (8d). For predicates like these, and amounts like in (65), widening can be approached in terms of degrees. A more interesting effect of widening can be witnessed when the scale is unclear, and the gradability of the relevant constituent is questionable:

(66)   a. $^?$*What kind of woman Ed met.
       b. You can imagine what kind of woman Ed met.   (EXCL)
       c. Ed met you can imagine what kind of woman.

The interpretation of *what kind of woman* in (66) has a negative aspect. We can imagine a scale of kinds of women ('bad' and 'good' as it seems); the exclamation pushes the woman in question to the bad side of that scale. It seems that here, the implicature is conversational and not conventional (see also Levinson 1983 for a similar observation regarding a similar example of a *wh*-amalgam).[10]

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[10] Rett (to appear) argues that *wh*-exclamatives such as (66a) are out, because like *which*, *what* cannot range over degrees. In her approach, the degree reading is obligatorily present in *wh*-exclamatives. Subsequently, the question can be raised why impossible exclamatives such as (66), are grammatical when they are embedded. For related discussion, see Abels (2004).

Another relevant aspect of *wh*-amalgams (and their counterparts) is a sense of 'conspiracy' between the speaker and his audience. Conspiracy can be seen as a rhetorical effect, and is not necessarily part of the interpretation, as can be seen in the contrast between (67) and (68):

(67) a. You can guess/can imagine/know how many books Ed bought.
       b. Ed bought you can guess/can imagine/know how many books.

(68) a. You will never guess/can't imagine/won't believe how many books Ed bought.
       b. Ed bought you will never guess/can't imagine/won't believe how many books.

I assume here, that the generic *you* is understood as the speaker's audience. In (67), it seems that the speaker assumes a shared knowledge concerning the amount of books Ed bought. Interestingly, conspiracy cancels the factor of surprise in the domain of discourse. That is, for the outside world the amount of books may be surprising on a given scale, but in the domain of discourse there is shared knowledge that makes that this was to be expected. This can also be observed for (52) in the previous section, although in this case, the conspiracy is between the speaker and *Steve*. By contrast, (68) does not involve conspiracy, because the audience is not assumed to possess the speaker's knowledge about the number of books; this is the consequence of the negation of the embedding verb. Note that here, the surprise factor is preserved in the domain of discourse.

> **Observation 12**
> If V is not negated in [$_{MC}$ …[$_{IC}$ SUB V *wh*-α]], there is a sense of conspiracy between the speaker and the subject of the IC predicate.

Both widening and conspiracy with the audience can be seen as ways of the speaker to *strengthen* the proposition that he expresses.

In section 4., I observed that cleft-amalgams reveal the speaker's propositional attitude by expressing (epistemic) modality. This affects the inferences that can be made with respect to the predicate of the cleft (the content kernel). Consider the examples and the corresponding inferences ('≈') below, where '◊' indicates possibility:

(69) Charlotte is going to Paris.
      ≈ $\exists x$[Charlotte is going to $(x) \wedge$ Paris(x)]

(70) I think that Charlotte is going to Paris.
      ≈ ◊ $\exists x$[Charlotte is going to $(x) \wedge$ Paris(x)]

(71) Charlotte is going to I think it's Paris.
      ≈ $\exists x$[Charlotte is going to $(x) \wedge$ ◊ (Paris(x))]

From (69) the hearer can infer that Charlotte is going somewhere, namely to Paris; from (70) that it's *possible* that Charlotte is going to Paris. By contrast, from (71) it can be inferred that Charlotte is going somewhere, and it's possible that she is going to Paris. In other words, only the content kernel in a cleft-amalgam is interpreted under the scope of a modal operator in the IC.

Observation 13
In a sentence [MC …[IC V it+BE α]], as a consequence of the epistemic modality expressed by IC, α is interpreted under the scope of the modal operator ◊.

Put differently, by uttering a cleft-amalgam such as (71), the speaker does not commit to the truth of the complete proposition '*Charlotte is going to Paris*'. In the literature, this is known as 'hedging', which is associated with epistemic modality (see Coates 1983, Palmer 1986, Papafragou 2006 and others).

Like conspiracy, hedging is a rhetorical effect. Not only can a speaker express his doubts regarding a (part of a) proposition, it also allows him to say things without taking responsibility for their truth. In this sense, hedging is to be regarded as a way of the speaker to *weaken* the proposition that he utters.

5.2. Subjective content and illocutionary force

The aspects weakening and strengthening suggest that in amalgams, the interrupting clauses express different types of messages than the matrix clauses. In this section, I evaluate the status of what is expressed in the IC in relation to what is expressed by the matrix. This extends to a discussion about illocutionary forces in syntactic amalgams.

In the following, I discuss the content of the ICs in isolation. Example (72) represents the full-fledged interrupting clause of a *wh*-amalgam:

(72)   [IC You won't believe [EC how many books ~~Ed bought~~.]]   (EXCL)

In terms of illocutionary force, this sentence is exclamative (or at least non-declarative in its reading as a rhetorical question). As independent utterance, (72) reflects the speaker's opinion about a state of affairs. This is surprise, or even dismissal, in this case. This is the consequence of the implicatures discussed in 5.1. In short, (72) expresses *subjective* content.

Turning to cleft-amalgams, consider (73):

(73)   [IC I think [EC it's Paris [EC ~~that Charlotte is going to~~.]]]

As was observed in 4.2., the ICs of cleft-amalgams must express epistemic modality. As a consequence, the sentence is not strictly declarative. Its illocutionary force is better described as 'modalized declarative'. As independent utterance, (73) reflects the speaker's knowledge about a state of affairs. Thus, the content expressed by IC of cleft-amalgams, too, can be regarded as subjective.

The following examples show that the matrix clauses of amalgams are restricted to declarative sentences, i.e. the matrix cannot be interrogative, exclamative or modalized declarative. Examples (74) - (76) illustrate this:

(74)   a. *Did Ed buy you can imagine which book?
        b. *How strange that Ed bought you can imagine which book!

(75)   a. *Is Charlotte going to I think it's Paris?
        b. *How strange that Charlotte is going to I think it's Paris!

(76) a. *Charlotte is probably going to I think it's Paris.
     b. *Charlotte must go to I think it's Paris.

Thus, the matrix clauses of amalgams are obligatorily (non-modalized) declarative. As such, they always describe a state of affairs. The question that we can raise now, is if an amalgam has one or more illocutionary forces. Compare example (77a) with (77b):

(77) a. [You can imagine [how many books Ed bought]].   (EXCL)
     b. Ed bought you can imagine how many books.

In (77a), the whole utterance has exclamative force. This is not the case in (77b): remember that the matrix is (strictly) declarative. Here, the exclamative force is only associated with the IC. This means that a *wh*-amalgam has two sentential forces. This is especially clear when we formulate the IC as a direct rhetorical question:

(78) a. Can you believe how many books Ed bought for his girlfriend?   (EXCL)
     b. Ed bought [can you believe how many books?] for his girlfriend.

Clearly, the IC in a *wh*-amalgam can be interrogative while the matrix maintains its declarative force.
     Strictly speaking, the IC of a cleft-amalgam does not have an illocutionary force different from the matrix clause:

(79) a. I think it's Paris that Charlotte is going to.
     b. Charlotte is going to I think it's Paris.

However, the IC of a cleft-amalgam must be modalized, whereas the matrix clause must be non-modalized. For now, let us distinguish between these types of declaratives. Arguably, then, the illocutionary force of (79a) is modalized declarative, whereas (79b) has a declarative matrix and a modalized declarative IC. That the force of the IC is in fact independent is again better illustrated when it is construed as a question. Consider (80):

(80) a. Did Steve say it's Paris that Charlotte is going to for a conference?
     b. Charlotte is going to [did Steve say it's Paris?] for a conference.

In sum, the IC expresses subjective content, and its illocutionary force is independent from the illocutionary force of the matrix.[11]
     These properties are reminiscent of a type of constructions that is commonly described as 'parentheticals'.[12]

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[11] The possibility of combining of different sentence types has also been described for sentence coordination. Mittwoch (1976:26) illustrates the combination declarative and interrogative:
(ii) He worked and scraped all his life and what has he got out of it.
She argues that the combination of clauses is not restricted to matching sentence types, i.e. the higher clause that contains these sentences does not have such a requirement. For related discussion and examples see also Verstraete (2005).
     [12] The term parenthetical refers to expressions that are linearly integrated in a clause (a host) in the absence of a clear syntactic relationship with that host. For discussion concerning their interpretation, see Hand (1993), Asher (2000) and Rooryck (2001).

(81) a. Ed - how smart he is! - read all the books that he bought.
      b. Ed - didn't I tell you so? - read all the books that he bought.

(82) a. Charlotte went to Paris, I think.
      b. Charlotte, I think, went to Paris.

As is illustrated by (81), the illocutionary force of parentheticals is independent from their host (here exclamative and interrogative). Note that these parentheticals have the same rhetorical effect as *wh*-amalgams. Example (82) shows the parenthetical use of *I think*, which has the same 'hedging' effect that is associated with cleft-amalgams.

However, contrary to amalgams, parentheticals seem completely independent from their host. That is, there is no material inside the the parenthetical that is associated with some argument position in the host clause. Consequently, the content of the parenthetical potentially has a scope different from the content that is expressed by the IC in an amalgam. Put simply: the subjective content that is expressed in a parenthetical seems to concern the entire propositional content of the host, or at least allow for that reading. This is best illustrated by the interpretations of (82a). Contrary to the cleft-amalgam, the parenthetical *I think* can concern the entire proposition *Charlotte went to Paris*, i.e. the *de dicto* reading. The *de re* reading is available as well. This reading is, for instance, triggered when *Paris* is focused (see section 6. for further discussion about scope).

By contrast, the scope of the subjective content that is expressed in IC of amalgams, is restricted to the content kernel. The observations are then as follows:

Observation 14
In a sentence [MC …[IC … *wh*-α]], the matrix clause must be declarative, and the IC is an exclamative that reflects the speakers opinion about P_1 concerning α.

Observation 15
In a sentence [MC …[IC V it+BE α]], the matrix clause is declarative, and the IC is a modalized declarative that reflects the speakers knowledge about P_1 concerning α.

5.3. Syntactic amalgamation as pragmatic separation

In this final section, I turn back to the starting point of this study: the refinement of the intuitive difference between amalgamated sentences and their non-amalgamated counterparts, how the difference comes about, and why.

Based on the observations above, we can draw the conclusion that amalgamation changes the roles of the clauses involved. This change is such that what would normally be the matrix clause becomes a clause that has a parenthetical, or secondary, status. Vice versa, the embedded clause becomes the matrix clause in an amalgam. What syntactic derivation underlies this, is a question I have to leave open here. For now, I will limit myself to the reason why.

Remember that the IC is a sentence in which material that is associated with the matrix clause, has been elided. Examples (5) and (6) are repeated in (83) and (84):

(83) a. [MC You can imagine [EC how many books Ed bought.]]
      b. [MC Ed bought [IC you can imagine [EC how many books ~~Ed bought~~.]]]

(84) a. [MC I think [EC it's Paris [EC that Charlotte is going to.]]]
      b. [MC Charlotte is going to [IC I think [EC it's Paris [EC ~~that Charlotte is going to~~.]]]]

If the IC in amalgams has a parenthetical status, the difference between amalgams and their counterparts could be connected to the status of this embedded clause. After all, it is this clause that surfaces as the matrix clause. In relation to the evidential use of embedding verbs, Simons (2007) argues that the embedded clause in examples such as (85) is has main point status ('•'), whereas the matrix functions as an evidential (or, semantically parenthetical):

(85) [MC I heard [EC that Charlotte went to Paris.]]
        • Charlotte went to Paris.

The working definition of 'main point' in Simons (2007:1035) is '… *the main point of an utterance U of a declarative sentence S is the proposition p, communicated by U, which renders U relevant*.' Let us now look if we can make a distinction between main point and secondary point in the embedded counterpart sentences:

(86) You can imagine how many books Ed bought.   (EXCL)

(87) I think it's Paris that Charlotte is going to.

If there is a main point in these sentences, it is indistinguishable from the whole utterance, unlike (85). The main message of (86) is uttered by the whole: a rethorical indirect *wh*-question. Similarly, the main message of (87) hinges upon what is expressed by the matrix clause: a hedged assertion concerning a part of the embedded clause.

By contrast, we can clearly distinguish a main point from another type of message in amalgams:

(88) Ed bought you can imagine how many books.
        • Ed bought books.

(89) Charlotte is going to I think it's Paris.
        • Charlotte is going somewhere.

These main points look suspiciously familiar. They correspond literally to the presuppositions that I argued to be inherent to amalgams in section 4.1. The difference between an amalgam and its embedded counterpart is not the presence of this presupposition; the embedded counterpart has exactly the same presupposition. The realization of this content in the matrix clause has as a result that only in amalgams this presupposition is the main point of the utterance.

Observation 16
In a sentence A of the form [MC γ [IC β [EC α γ]]], the presupposition of the IC has main point status.

This underlies the observation that the matrix clause in amalgams is strictly declarative: it can only express the presupposed content of the IC.

In conclusion, an amalgam is a complex utterance that expresses two types of messages. The declarative matrix clause expresses content that is presupposed by the interrupting clause. The first has main point status, the second has the status of a parenthetical, as it expresses subjective content. Quite contrary to what the term syntactic amalgam suggest, its effect is best described as 'separative'.

6. Further considerations

A few issues in this paper have been touched upon, but not discussed in much detail. This section addresses a few of these loose ends: the syntactic derivation of amalgams and their place in the domain of parentheticals, *I think*-parentheticals in relation to cleft-amalgams, and the mysterious difference between the 'you know who/what' cases and *wh*-amalgams. Finally, I describe a surprising parallel between cleft-amalgams and a type of relative construction.

In 5.2., it was argued that the ICs of amalgams are, at least as far as their contents are concerned, similar to parentheticals. To account for the independence of the IC syntactically, De Vries (2007) is of particular interest. In his approach, parenthetical clauses are a special kind of adverbial phrases, that are merged into the host the result of a non-restrictive merge operation that places the parenthetical clause outside the c-command domain of the matrix clause. A challenge for the parenthetical approach is the fact that there is material that is associated with both the matrix and the IC, i.e. the two clauses are not as independent as regular parentheticals. This, and to what extent the syntactic derivation could capture the interpretive observations about amalgams in the present study, are questions I leave open for future research.

Next, it will be of interest to consider cleft-amalgams in a more general context of evidential use of embedding verbs such as *think* and *believe* (see Rooryck 2001, Simons 2007). Consider example (90), in which the use of *I think* bears striking resemblance to cleft-amalgams:

(90)   Charlotte is going to I think Paris.

In Dutch, evidential parentheticals such as *I think* can be realized in both possible orders *ik denk* ('I think') and *denk ik* ('think I'). The latter is on a par with the German *glaube ich* that is discussed in great detail in Steinbach (2007). However, *ik denk* can only appear in particular positions, and cannot have a comma intonation. This is illustrated by the examples in (91) and (92):

(91)   a. Charlotte   heeft dacht   ik haar moeder een   ketting   gegeven.
           Charlotte   has   thought I her mother a   necklace   given
           'Charlotte has, I thought, given her mother a necklace.'
       b. Charlotte   heeft ik dacht   haar moeder$_{*(F)}$ een   ketting   gegeven.
           Charlotte   has   I thought her mother   a   necklace   given
           'Charlotte has given a necklace to I thought her mother.'

(92)   a. Charlotte, dacht   ik/ *ik   dacht,   heeft haar moeder een   ketting   gegeven.
           Charlotte, thought I/ I   thought, has   her mother a   necklace   given
           'Charlotte, I thought, has given her mother a necklace.'

    b. Charlotte   heeft haar moeder een   ketting   gegeven, dacht ik/ *ik dacht.
       Charlotte   has   her   mother a   necklace given,   thought I/   I thought.
       'Charlotte has given her mother a necklace, I thought.'

A question that arises here, is to what extent *ik dacht* and *dacht ik* have the same scope. In (92), *dacht ik* has scope of the the whole matrix proposition. The intuitive difference between (91a) and (91b) is that *ik dacht* only has scope over *haar moeder*, while *dacht ik* can still have scope over the whole proposition. Note that *ik dacht* needs focus on *haar moeder*. Since focus is a presupposition trigger, (91b) has exactly the reading that we observed for similar examples of cleft-amalgams. This can be the starting point for a study concerning evidential parentheticals, and the relation between their possible positions, intonation, and scope as the hedge of the main proposition.

    A bit more can be said about the recalcitrant behaviour of the '*you know who/what*' and the '*God knows…*' constructions, within the class of *wh*-amalgams. Example (93) illustrates that the embedding verb and subject seem restricted to *you* and *know* in *wh*-amalgams of the '*you know who/what*' type:

(93) a. *[You can imagine/will never guess who] likes Ed.
      b. *[Steve knows what] was on Ed's desk.

The '*God knows…*'- constructions are similarly restricted. Unlike the '*you know who/what*' phrases, '*God knows who/what*' cannot be the subject of a sentence (94a). In addition, it seems impossible to use any other embedding verb than *know* (94b):

(94) a. *[God knows who] wants to kill me.
      b. *Ed bought God can imagine/will never guess how many books.

These restrictions suggest that both constructions are idiomatic expressions, but clearly more data are needed to support such a claim.

    Finally, there is an interesting parallel between cleft-amalgams and the following type of relative construction:

(95) a. Anna eats [what we assume to be tuna fish] tonight.
      b. Anna is [what people call 'a social cat'].

(96) a. Anna eats what is unmistakably tuna fish.
      b. Anna ate what is proved to be tuna fish.

Examples of this type are known in the literature as Transparent Free Relatives (TFRs, see for example Wilder 1998, Riemsdijk 2000, Grosu 2003, and Schelfhout et al. 2004). First, like (cleft-) amalgams, the TFR contains a constituent that is selected by the matrix clause. Second, TFRs can have the effect of hedging: it cannot be inferred from (95a) that it was *tuna fish* that Anna ate, only that she ate *something*. Interestingly, in (95b) it is not the truth of the proposition that is hedged, but rather the appropriateness of the use a term contained in that proposition ('*a social cat*'). This blend of mention (TFR) and use (matrix) resembles a phenomenon that has been described as 'mixed quotation' (Davidson 1979). However, not all TFR constructions have the effect of hedging as (96) illustrates. It will be of interest to see to

what extent this construction type can be compared to (cleft-) amalgams, and can be regarded as a kind of parenthetical construction.

7. Conclusion

In this paper, I argued that the interpretive effect of amalgamation is the separation of two types of messages about the same content kernel. The matrix clause is a declarative sentence, and expresses the presupposed content of the interrupting clause. This content is understood as the main point of the utterance. The interrupting clause expresses a secondary type of information, and has the status of a parenthetical. The subjective content expressed in this clause has the effect of strengthening or weakening. This effect follows from the observations that I have made with respect to the semantic and pragmatic properties of the interrupting clause.

Acknowledgements

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Valence changing operations:
Where does morpho-phonology interfere?

Lior Laks

This study addresses the correlation between valence changing operations and morpho-phonology in Modern Hebrew. I examine the formations of reflexive, reciprocal and decausative verbs and the selection of their morphological output. I show that morph-phonological constraints affect the application of valence changing operations that apply in the lexicon in contrast to the ones that apply in the syntax. The paper reveals the unique morpho-phonology of the lexicon the position of morphology as an independent component of the grammar.

1. Introduction

This paper examines the interaction between valence changing operations and morpho-phonological constraints in Hebrew. It is commonly assumed the different thematic realizations of the same concept are derived from the same basic entry via thematic (valence changing) operations, as demonstrated in (1) and (2).

(1)   a. The sun melted the ice.
      b. The ice melted.

(2)   a. John washed himself.
      b. John washed.

The intransitive verb in (1b) is derived from the transitive one in (1a), while the reflexive verb in (2b) is derived from the transitive verb in (2a). In both cases, the syntactic valence of the verb is reduced. Thematic operations usually result in at least two predicates that denote the same concept. In Semitic languages such as Modern Hebrew (hereafter MH), thematic operations usually has a morphological manifestation (3).

(3)   a. Dan nigev   et   acmo.
          Dan wiped   ACC   himself
          'Dan wiped himself.'

  b. Dan hitnagev.
     Dan   wiped-REFL
     'Dan wiped.'

The two thematic realizations *nigev* (3a) and *hitnagev* (3b) are also morphologically distinct. That is, valence changing operations are, to a great extent, manifested in morphological processes. Thematically related verbs in MH share the same consonants and are represented in different prosodic templates called binyanim (Berman 1978). The binyan determines the phonological shape of the verb, i.e. its vowels, prosodic structure and affixes (if any). The phonological shape of a verb, unlike that of a noun, is essential for determining the shape of the other forms in the inflectional paradigm (Berman 1978; Bolozky 1978; Bat-El 1989; Aronoff 1994).

(4)   MH binyanim[1]

Past	Present	Future
pa'al	po'el/ pa'el/ pa'ol	yi-f'a/ol
nif'al	nif'al	yi-pa'el
hif'il	ma-f'il	ya-f'il
pi'el	me-fa 'el	ye-fa 'el
hitpa'el	mi-tpa'el	yi-tpa'el

In this paper, I examine the morpho-phonology of three types of predicates derived via valence changing operations: reflexives, reciprocals and decausatives (5).

(5)   MH valence changing operations

Type of derived verb	Examples			
Decausatives	kimet → hitkamet	'wrinkle' → 'become wrinkled'
Reflexives	serek → histarek	'comb' → 'comb oneself'
Reciprocals	xibek → hitxabek	'hug' → 'hug each other'

While valence changing operations apply cross-linguistically, languages demonstrate various differences with regard to operations such as reflexivization (Reinhart & Siloni 2005; Horvath & Siloni 2005). Reinhart & Siloni (2005) suggest that thematic operations can apply in the lexicon or in the syntax, according to a parametric choice. In this framework, the grammar includes an active lexicon (Levin and Rappaport Hovav 1994, 1995, Reinhart 2002, Siloni 2002), which is more than a mere list of items, and allows the application of derivational operations. The lexicon is regarded as an interface between the conceptual system and the computational system. From the thematic point of view, it contains coded concepts, along with their thematic grids, and it functions as a computational component, which can perform valence changing operations pre-syntactically.

    Nonlexicalist approaches reduce the operative role of the lexicon entirely, transferring all derivational procedures to syntax (Marantz 1997, 2000a, 2000b, 2001; Borer 1998, 2001, 2004; Doron 2003; Arad 2003; Manzini and Savoya 2004 among others). Such theories view the lexicon as a mere list of roots, whose argument can be manipulated only in the syntax, by

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[1]The system of binyanim names verbs according to the traditional practice of associating the consonantal root *p/f , ' , l* with a vocalic template.

merging with functional heads. Theories that are couched within this framework eliminate the lexicon as an active component altogether, and instead suggest architecture of the grammar as a single generative engine, that replaces the active lexicon with non-computational lists of items. I will advocate the view of the lexicon as a computational component with regard to valence changing operations as well.

Following Reinhart and Siloni (2005), I assume these operations in MH apply in the lexicon, in contrast to passivization that applies in the syntax (Horvath & Siloni 2005). The distinction between lexical and syntactic valence changing operations is manifested in a cluster of semantic-syntactic properties such as ECM formation, nominalization, idiom formation and semantic drift (Horvath & Siloni 2005). For examples, MH passive verbs do not have derived nominalizations, while reflexives, reciprocals and decausatives do. In Laks (2006, 2007b), I show that lexical and syntactic operations have different morpho-phonological behavior. While passivization shows a relatively steady and predictable morphology, lexical operations are unpredictable with regard to the shape of their output forms. MH passivization is performed mainly via melodic overwriting in which the vocalic pattern of the verb changes (e.g. *siper* 'tell' ➔ *supar* 'be told').[2] Lexical operations are manifested in various morphological processes including melodic overwriting, affixation, gemination and a combination of several processes.[3] In contrast to passivization, it is impossible to provide an exact prediction of the output of lexical operations. However, it is possible to identify patterns regarding the derivational relations between the binyanim. Another unique feature of lexical operations is what I label 'chain derivations'. The output of lexical operations can feed further lexical operations, as the derived predicate is part of the lexicon and, therefore, accessible. The verb *hilbiš* 'dress', for example, is derived from the transitive verb *lavaš* 'wear' by causativization. The output form *hilbiš* is used as an input for the derivation of the reflexive form *hitlabeš* 'dress oneself'. Anderson (1992) claims that a lexical rule might presuppose the application of another lexical operation, but it is not expected to presuppose the application of a syntactic rule, since such rules do not apply within the lexicon. Lexical rules apply to one another's output, but not to the output of syntactic rules. Applying this observation to the two kinds of thematic operations, lexical operations can apply in a chain, but cannot follow syntactic operations. The two types of morpho-phonology I propose demonstrate which types of morpho-phonological processes apply in the lexicon and which types apply post-lexically with regard to thematic operations. These morphological differences between passivization and other operations support the claim that such operations do not apply in the same module of the grammar. Assuming that thematic operations can apply in a different components, every different locus shows relatively different (thought partially overlapping) morpho-phonological manifestations. Such a distinction helps set a parametric choice and facilitates acquisition.

This paper addresses the correlation between MH valence changing operations and their morphological manifestation. I will show that morpho-phonological criteria play a central role in a choosing a binyan for verbs that are derived by thematic operations. I argue that these criteria are unique to morpho-phonological processes that apply in the lexicon in contrast to those that apply in the syntax, thereby supporting the existence of two types of operations and two types of morpho-phonology (Aronoff 1976; Anderson 1977; Scalise 1984, 1988; Perlmutter 1988; Booij 1990; Borer 1991 among others).

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[2] See Laks (2006) for the case of *nif'al* passive forms.
[3] This distinction does not relate to inflectional morphology. See Laks (2006) for a separate discussion.

2. Binyan selection

The selection of a certain binyan for a verb can be predicted on the one hand but is subject to a great deal of variation and idiosyncrasy on the other hand. Previous studies have addressed different aspects of the relations between form and meaning with regard to the verbal systems of Modern Hebrew (Berman 1978; Bolozky 1978; 1999, Schwarzwald 1981; Nir 1993; Bat-El 1994; Ussishkin 1999; Ravid 1990; Doron 1999; 2003; Siloni to appear). The criteria I suggest in the following sections focus on the choice of binyan for MH verbs. These criteria are divided into two main types: thematic-semantic criteria and morpho-phonological criteria.

2.1. Thematic-semantic criteria

Thematic-Semantic considerations mainly relate to the theta grids of verbs and to operations they undergo. In addition, other semantic properties also intervene in their formation.

2.1.1. Base vs. derived form

MH binyanim are divided into two maim groups. *Pi'el* and *hif'il* are used for verbs that are basic entries in the lexicon, i.e. not derived by thematic operations (e.g. *xipes* 'look for', *himtin* 'wait'). *Hitpa'el* and *nifa'l* are chosen for predicates that have undergone some kind of reduction in their theta grids (Reinhart and Siloni 2005) as a result of a thematic operation. In both cases, the verb loses one argument thus becomes syntactically reduced.[4] These are forms that are not listed as basic entries in the lexicon but as entries derived from another basic entry. These are mostly derived counterparts of transitive verbs in *pi'el* and *hif'il* (e.g. *hitraxec* 'wash oneself') but also some decausative, reflexive or reciprocal verbs without a transitive alternate. For example, the reciprocal verb *histoded* 'talk discreetly to each other' is derived from the noun *sod* 'a secret,' but has no transitive counterpart (*soded). I assume an active morphological component in the lexicon that determines in which binyanim verbs are realized. These criteria strengthen the claim that some verbs are listed in the lexicon as basic entries while others are listed as sub-entries, derived by thematic operations, as it also has morphological evidence. It offers a unified analysis for the division of labor between binyanim.

It should be pointed out that the above characteristics are tendencies rather than a complete dichotomy of the division of labor between binyanim. There is a group of derived verbs in *hif'il* and *pi'el*, some of which are derived from homophonous transitive verbs (e.g. *hexmir* 'make/get worse'). There are also instances of basic entries in *nif'al* and *hitpa'el* (e.g. *nitpal* 'pick on X', *hit'alel* 'abuse'). I do not account for these forms in this paper.

2.1.2. Semantic blocking and resemblance

Semantic factors that do not relate to the theta grid of verbs also affect the choice of binyan. Semantic blocking is a case where formation of a word is blocked in order to avoid a semantic clash with another word that already exists in a language. For example, the verb *šataf* 'wash' does not have a reflexive counterpart in *hitpa'el*. The form *hištatef* is already occupied for a totally different verb 'take part'. This could affect the lack of this form as a reflexive one. The degree to which semantic blocking can apply differs with regard to different operations

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[4] Binyan *pa'al* is used for both forms, as it is neutral with respect to transitivity (see Berman 1980).

and relations between binyanim. There are hardly any cases of blocking with regard to the *pi'el-hitpa'el* paradigms, as this is an unmarked paradigm that is hardly subject to any irregularities (see 2.2.1). *Hitpa'el* verbs derived from *pi'el* can share more than one meaning (e.g. *hitnaka*, derived from *nika* 'clean', is both reflexive and decausative). There is a greater degree of blocking with regard to the *hif'il/pa'al – nif'al/hitpa'el* paradigms. For example, the transitive verbs *rašam* 'register' hir*šim* 'impress' share the same stem consonants. Their derived counterparts are formed in different binyanim in order to prevent the unification of the two verbs. The reflexive counterpart of *rašam* is derived in *nif'al* (*niršam*, and not **hitrašem*), while the decausative counterpart of *hiršim* is formed in *hitpa'el* (*hitrašem*, and not **niršam*). Blocking also correlates with paradigm contrast, discussed in Kenstowicz (2005). Kenstowicz discusses several cases in which the phonology conspires to ensure that two members of a paradigm remain phonologically distinct. He presents data where phonologically motivated processes fail to apply in order to maintain a paradigmatic contrast. Blocking the formation of verbs in a specific binyan could be motivated by paradigmatic contrast with another existing form.

Semantic resemblance also plays a role in choosing a binyan. Verbs that belong to a specific semantic class tend to occur in the same binyan. There are, for example, two relatively new verbs that denote sleeping, *xarap* 'sleep deeply' and *šanac* 'take a noon nap'. The former is based on the noun xrop 'a nap' and the latter is derived from the acronym word *šnac* (=*šnat cohorayim*) 'a noon nap'. The choice of *pa'al* in innovation is very exceptional. In this case, I believe it stems from semantic resemblance to other verbs denoting sleeping, e.g. *yašan*, *nam* 'sleep' and *nax* 'rest'.

Semantic resemblance and blocking seem to play a relatively minor role in the selection of binyan, in comparison to the other criteria I propose, yet it should still be taken into consideration as well.

2.2. Morpho-phonological constraints

I adopt the notion of Optimality Theory (Prince and Smolensky 1993) that explains cross-linguistic variation in terms of different ranking of conflicting constraints. There are several competing morpho-phonological constraints that favor one binyan over the other. The notion of two competing forces is in the spirit of Optimality Theory. I contend that both markedness and faithfulness constraints play a role in choosing a binyan between the two thematically distinct verbs: base and derived form.

2.2.1. Markedness constraints

Markedness constraints reflect universal markedness, based on phonetics and comparative empirical facts about languages. Such constraints require that marked structures will not surface. The *pi'el-hitpa'el* paradigm is the most common one. Both binyanim, as well as *hif'il*, share the same prosodic structure in their past, present, future and infinitive forms; hence their inflectional paradigm is unified (6). In contrast, the binyanim pa'al and nif'al do not have the same prosodic structure in their inflectional paradigms (7). In *pa'al*, the future and infinitive forms contain a consonant cluster, while the past and present forms do not. *Nif'al* past and present forms consists of a consonants cluster, while the future and infinitive forms do not. There is no such alternation in the prosodic structure of the binyanim in (6).

(6)   Uniform inflectional paradigms

	pi'el	hitpa'el	hif'il
Past	kines	hitkanes	hixmis
Present	mekans	mitkanes	maxnis
Future	yekanes	yitkanes	yaxnis
Infinitive	lekanes	lehitkanes	lehaxnix
	'gather'	'gather around''	'let in'

(7)   Non-uniform inflectional paradigms

	pa'al	nif'al
Past	lamad	nilmad
Present	lomed	nilmad
Future	yilmad	yilamed
Infinitive	lilmod	lehilamed
	'study'	'teach'

There are morpho-phonological constraints on the output that block the use of other binyanim, making them more marked than *pi'el* and *hitpa'el*. Specifically, tri-consonants clusters are mostly forbidden in the verbal system of MH. *Hif'il*, *pa'al* and *nif'al* cannot host verbs with more than three consonants, as this would yield tri-consonantal clusters.[5] *Pi'el-hitpa'el* is therefore regarded as the unmarked derivational paradigm. *Pi'el* is preferred for the formation of basic entries. New verbs that are not basic entries are formed in *hitpa'el* as it is a part of the unmarked paradigm *pi'el-hitpa'el*. The morphological system shows a strong tendency to choose *hitpa'el* and maintain paradigm uniformity across the various inflections of the binyan.

2.2.2. Faithfulness constraints

Faithfulness constraints require identity across various forms of the paradigm and therefore penalize every change, such as deletion, epenthesis and stress shift. Some basic entries are derived in binyan *hif'il*. There is a tendency to form verbs in *hif'il* when the base is a monosyllabic word that begins with a consonant cluster (e.g. *kraš* 'crash' → *hikriš* 'crash an application') (Bolozky 1978, 1999, Bat-El 2002). Why is it so? Bat-El (1994) suggests that speakers aim at faithfulness to the base form with regard to the adjacency of the consonants. *Hif'il* is the only binyan where the cluster remains intact throughout the whole inflectional paradigm.

   Most derived forms of *pi'el* verbs are in *hitpa'el* due to the markedness constraint discussed in 2.2.1. The *pi'el-hitpa'el* paradigm is very stable and is hardly subject to irregularities.[6] However, the derived forms of *hif'il* and *pa'al* demonstrate an intriguing variation with regard to their binyan. The derived counterparts of *hif'il* and *pa'al* verbs exhibit an intriguing variation. Some are formed in *nif'al* while others are formed in *hitpa'el* (8).

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[5] There are a few cases where *hif'il* host verbs with tri-consonantal clusters.
[6] There are rare exceptions, e.g. *'ilec* 'force' – *ne'elac* 'be forced' (*hit'alec*).

(8) Derived counterparts of *hif'il/pa'al* verbs

Base		Derived form	
a. hirgil	'make X get used to'	hitragel / *nirgal	'get used to'
b. hirdim	'put to sleep'	nirdam / *hitradem	'fall asleep'
c. katav	'write'	hitkatev / *nixtav	'correspond'
b. pagaš	'meet'	nifgaš / *hitpageš	'meet each other'

The derived counterpart of *hirgil* (8a) is formed in *hitpa'el*, while that of *hirdim* is formed in *nif'al* (8b). There seems to be no apparent reason for preferring any of the binyanim in both cases. I argue that the variation of some derived forms stems from a non-crucial ranking of two constraints. On the one hand, *hitpa'el* is favored because of markedness. *Hitpa'el* is the preferred unmarked output binyan, as opposed to *nif'al*. *Nif'al*, as well as *pa'al*, is less productive due to the complex morphology of its inflectional paradigm (Schwarzwald 1996). It does not preserve its syllabic structure throughout its inflectional paradigm (e.g. *nimšax-yimašex* 'last'). This results in a phonological load expressed by prosodic shifting (Bat-El 2002). *Hitpa'el* is prosodically consistent throughout the paradigm. On the other hand, binyan *nif'al* is preferred because of a faithfulness constraint. In this case, the constraint preserves the adjacency of the consonants of the form. *Hif'il* and *nif'al* share the same prosodic structure of the past and present forms, as both forms contain a consonant cluster. Markedness involving uniformity across the inflectional paradigm competes with faithfulness requiring (partial) uniformity of the derivational paradigm. Owing to the competing constraints, we find both forms of verbs as derived counterparts of *hif'il*.

These two competing constraints also cause a notable degree of variation that is also manifested in the occurrence of the same derived verb in two binyanim. For example, the verb *hirtiv* 'make X wet' has two decausative counterparts, *nirtav* and *hitratev* 'become wet'. There is no difference in the thematic grids of the two verbs and in their truth conditions. They may differ with regard to register and sometime one form is newer than the other. There are also case where each of the form has a unique meaning but there is at least one meaning that both from share. Compare for example *niftar* and *hitpater*. *Niftar* has a unique meaning of 'pass away' (9a) while *hitpater* has a unique meaning of 'resign' (9b). However, both verbs share the meaning of 'get rid of' (9c).

(9) a. Dan niftar /   *hitpater   me-hetkef lev.
        Dan passed-away   resigned   from- attack heart
        'Dan passed away because of a heart attack.'
    b. Dan hitpater /   *niftar   mi-mekom avodato.
        Dan resigned   passed-away from-place work-HIS
        'Dan resigned from his job.'
    c. Dan sof sof niftar /   hitpater   me-ha-orxim.
        Dan finally passed-away resigned   from-the-guests
        'Dan finally got rid of the guests.'

In addition to the markedness and faithfulness constraints discussed above, there are several morpho-phonological constraints that motivate the choice of *nif'al* over *hitpa'el* (Laks 2007a). These are faithfulness constraints within the derivational paradigm that block the application of a phonological process. There are four groups of verbs divided according to their first stem consonant. These verbs show a clear tendency to prefer *nif'al* over *hitpa'el*, as a result of the following constraints. Note that these constraints relate to verbs in binyan *hif'il* and *pa'al*, as

in these cases morphology is in a crossroad; it has to choose between two compatible binyanim.

2.2.2.1. Block deletion/epenthesis - t and d initial stems

Hebrew has a constraint that prohibits homorganic clusters. Verbs whose initial stem consonant is *t* or *d* are usually not derived in *hitpa'el* since such derivation creates the homorganic /tt/ or /dt/ clusters. Such a sequence in Hebrew is dealt with either via vowel epenthesis or deletion of a consonant (e.g. *katavti* 'I wrote' vs. *yaradeti* 'I went down'). In both cases a phonological process has to apply. Forming a verb in *nif'al* prevents the application of deletion or epenthesis and therefore allows the output to be faithful to the base form.

(10) *hif'il/pa'al* → *nif'al* with /t/ or /d/ initial consonants

Base		Derived form	
hidlik	'turn on'	nidlak / *hidalek, *hitdalek	'get turned on'
hitrif	'drive mad'	nitraf / *hitaref, *hittared	'get mad'
hidhim	'amaze'	nidham / *hidahem, *hitdahem	'become amazed'
hitmi'a	'assimilate'	nitma / *hitama, *hittama	'become assimilated'
tala	'hang'	nitla / *hitala, * hittala	'hang oneself'
daxaf	'push'	nidxaf / * hidaxef, * hitdaxef	'push oneself'

Further support for this constraint can be found in *pi'el* verbs that do not have a derived counterpart in *hitpa'el*. The verb *diber* 'talk' has a reciprocal counterpart in *nif'al*, *nidbar* 'talk to each other'. The *pi'el-nif'al* paradigm is rather rare. The reciprocal verb is formed in *nif'al* in order to prevent a /t/ deletion in *hitpa'el* (*hitdaber* → *hidaber*).

    In addition, there are *pi'el* verbs that do not have derived counterparts at all. To some extent, this is arbitrary and can be related to the relatively low productivity of lexical operations (Aronoff 1976 among others). Nonetheless, many of these *pi'el* verbs begin with *t* or *d*. I contend that they do not have derived counterparts in *hitpa'el* as such derivations would lead to the application of deletion (11).

(11) *pi'el* transitive verbs with no derived counterparts

Base		Derived form
tiyev	'improve'	*hitayev
tipel	'take care of'	*hitapel
tipeax	'hang'	*hitapeax
tinef	'make X dirty'	*hitanef
te'er	'describe'	*hita'er
tiken	'fix'	*hitaken
tiyeax	'cover up'	*hitayev
tigen	'fry'	*hitagen
te'em	'coordinate'	*hita'em
dika	'turn on'	*hidaka
dimyen	'imagine'	*hidamyen
dilver	'deliver (technology)'	*hidalver

2.2.2.2. Block metathesis

Some verbs with a strident as their initial stem consonants do not have a derived form in *hitpa'el*, as this would result in metathesis (e.g. **hitsarek* → *histarek* 'comb oneself', derived from *serek* 'comb'). Again, the selection of *nif'al* allows avoiding the application of this process.

(12) *hif'il/pa'al* → *nif'al* derivations with initial stridents

Base		Derived form		
hicmid	'stick'	nicmad / *hictamed	'become stuck'	
zarak	'throw'	nizrak / *hizdarek	'throw oneself'	
hiš'ir	'leave'	niš'ar / *hišta'er	'remain'	
hizkir	'remind'	nizkar / * hizdaker	'remember'	

2.2.2.3. Block prosodic and vocalic alternation

Verbs whose initial stem consonant is a glottal stop have an identical prosodic structure in *hif'il* and *nif'al*. [7] The initial vowel /i/ of *hif'il* (past form) is lowered to /e/, which is also inserted after the first stem consonant (e.g. *he'evir* 'transfer'). The prefix in other tenses is a low vowel /a/ that is also inserted after the first stem consonant (e.g. *ya'avir* 'transfer-Fut.'). A similar pattern occurs in the past and present forms of *nif'al* that consist of a consonant cluster. Compare, for example, *ne'elam* 'disappear' to *nirdam* 'fall asleep' (Bolozky 1994-5, Schwarzwald 2001). *Hif'il* and *nif'al* verbs share an identical prosodic structure of CVCVCV in all their inflectional paradigms (Schwarzwald to appear). *Nif'al* is more faithful to *hif'il* than *hitpa'el*, hence it is preferred. Furthermore, such verbs share the same prosodic structure in all tenses of *nif'al*, similarly to *hif'il*, *pi'el* and *hitpa'el*. They do not demonstrate the morphological complexity of *nif'al* and this provides *nif'al* with another advantage over *hitpa'el*.

(13) *hif'il* → *nif'al* derivations with glottal stops

Base		Derived form		
he'eliv	'insult'	ne'elav / * hit'alev	'become insulted'	
he'eniš	'punish'	ne'enaš / * hit'aneš	'become punished'	
he'ešim	'blame'	ne'ešam / * hit'ašem	'blame'	
he'exir	'befoul'	ne'exar / * hit'axer	'become befouled'	

2.2.2.4. Block stop-fricative alternation

Verbs whose first consonant stem is /f/, /v/ or /x/ usually have a derived counterpart in *nif'al* in order to maintain the fricative consonant. As these fricatives tend to surface as stops in post-consonantal position, derivation in *hitpa'el* may result in an alternation.

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[7] The glottal stop is deleted by most speakers.

(14) *hif'il* → *nif'al* with /v/, /f/ or /x/ initial consonants

Base		Derived form	
hivhil	'frighten'	nivhal / * hitbahel	'become frightened'
hifsik	'stop X'	nifsak / *hitpasek[8]	'stop'
hixšil	'fail X'	nixšal / *hitkašel	'fail'

Note, however, that this constraint yields only partial uniformity within the relations between *hif'il* and *nif'al*, as the future and imperative forms of the latter consist of a stop rather than a fricative consonant (e.g. *yi**b**ahel* 'become frightened-Future'). Nonetheless, choosing *nif'al* yields partial uniformity, while choosing *hitpa'el* yields no uniformity.

Further evidence for this constraint can be found in denominative verbs. There are nouns with initial clusters whose denominative verbs are formed in *pi'el* and not *hif'il*, such as *bilef* 'trick' derived from *blof* 'a bluff'. The reason for this could be paradigm uniformity. If the verb were derived in *hif'il*, it would undergo spirantization yielding **hivlif*. This would result in an undesirable /b/~/v/ alternation throughout the derivational paradigm. Although the stop~fricative alternation has long been subject to free variation and lack of stability (Ornan 1973, Schwarzwald 1976, Adam 2002), there are no cases where a *hif'il* or *nif'al* verb with a /b/ or /p/ initial stem consonant is preceded by a vowel.[9]

It should be pointed out that the above constraints manifest a strong tendency, but there is a certain amount of irregularities (e.g. *hicdik* 'justify' → *hictadek* / * *nicdak* 'justify oneself'). This is also typical to the morphology that applies in the lexicon, in contrast to the one that applies in the syntax. The latter is rather predictable and seems to be less restricted by morpho-phonological constraints.

3. Blocking thematic operations

Morpho-phonology can also restrict the application of thematic operations. Some transitive verbs, whose external theta role is a cause, have no decausative counterpart (e.g. *hecik* 'hassle'). I argue that this results from their irregular morpho-phonology. Most of them have stems with only two consonants. Such verbs have different morpho-phonology in the possible output binyanim when decausativization applies (e.g. *he'ir* 'wake X up' → *hit'orer* 'wake up'). The formation of such verbs is considered exceptional and unproductive in terms of innovation. I assume that such forms are lexicalized and their formation is not a part of the morphological component in the lexicon. I argue that their irregular morpho-phonology blocks the derivation of their decausative counterparts. Examining their thematic grids does not explain why they do not undergo this operation, as there is no observed difference compared to other verbs that undergo this operation. This case gives further rise to a surface-based account, in which forms are derived from actually occurring words, rather than a system in which forms are derived by relating to an entity that never occurs in isolation on the surface (Ussishkin 1999, 2005). If we assumed that such decausative verbs are derived on the base of roots, there would be no reason for their relatively low productivity. Note that there are also some transitive verbs that do not undergo passivization (e.g. *tiyev* 'improve'). This restriction does not result from morpho-phonological reasons, but from thematic ones (Doron 1999, 2003; Landau 2002).

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[8] This form also alternates with the *pa'al* verb *pasak*.
[9] For historical reasons, there are cases of /k/ initial stem in these binyanim, e.g. *hiksim* 'charm'.

4. Conclusions

The analysis reveals the effect of morpho-phonological criteria on thematic operations. This interaction seems to be unique to the lexicon, as it is not attested in syntax. The four constraints I discussed demonstrate a clear case where the output of thematic operations is dependent on morpho-phonological considerations.

Further support for these blocking constraints should be attested in experiments of verb formations. I expect speakers not to form some derived counterparts of *pa'al* and *hif'il* in *nif'al* based on the constraints I presented. In addition, binyan switching in child language can also indicate that the above constraints restrict some case of verb formation in *hitpa'el*. Berman (1980, 1982, 1993) shows case studies of binyan switching in the development of derivational relations between verbs, where MH speaking children used a verb in wrong binyanim. In one of the stages of language acquisitions, Berman discussed switching between intransitive binyanim nif'al and hitpa'el (e.g. *nirdam* → *hitradem* 'fall asleep'). I assume that the constraints I discuss would also prevent changing some *nif'al* form into *hitpa'el* (e.g. nidham 'become amazed' would not turn into *hitdaham or *hidahem).

The analysis lends support for the unique type of morpho-phonology that applies in the lexicon. It supports the position of morphology as an independent component that interacts with the lexicon while taking into account both morpho-phonological and thematic considerations.

Acknowledgements

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Semantics of pre-classifier adjectives[1]

Xu-Ping Li

I argue in this paper that the pre-classifier adjectival modification of *big/small* is a distinctive linguistic phenomenon. Classifiers are ambiguous between a counting reading and a measure reading. The pre-classifier *big/small* modifies the quantity denoted by classifiers when they are characterized with the measure reading. From another perspective, the pre-classifier *big/small* deviates from adnominal and predicative *big/small* and they measure quantity only. This proposal correctly predicts that only a restricted set of adjectives like *big/small* can function as pre-classifier modifiers. Besides, I also claim that *big/small* quantifies over single atoms but not the plurality of atoms.

1. Introduction

The semantics of gradable adjectives has been extensively explored within the framework of 'degree-based approach' in the past decades (e.g. Montague 1970, Kamp 1975, Kennedy 1997, and many others). For example, according to Kennedy (1997), gradable adjectives denote measure functions from objects to abstract representations of measurement, or scales and degrees.

According to this approach, the semantics of size adjective of *big* can be used predicatively, as in (1.a), or attributively, as in (1.b).

(1)   a. John is big
         b. John is a big student.

Big in (1.a) is a one-place predicate of type <e, t>. But for the adnominal modifier *big* in (1.b), we assume that a standard shift operation from <e, t> to <<e, t>, <e, t>> applies to it, which allows predicate adjectives to be used attributively. In other words, the attributive *big* is of type <<e, t>, <e, t>>. *Big* in both cases projects the scale of size and the entity x is larger than some context dependent standard d_s. Thus the attributive reading can be derived from the predicative reading. The semantics of predicative *big* and attributive *big* are represented as in (2.a) and (2.b) respectively.

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[1] Abbreviations used in this paper: Cl—classifier, Perf—perfective, DE—modification marker de, Part—particle.

(2)   a. $\| \text{big} \| = \lambda x.$ size $(x) > d_s$, where the degree of the individual x on the scale of size is
            larger than d_s, a contextually appropriate standard of comparison (cf. Kennedy 1997).
       b. $\| \text{big} \| = [\lambda P \lambda x.\ P(x)\ \&\ \text{size } (x) > d_s]$ (student), where x is a student and the Degree
            of x on the scale of size is larger than d_s, a contextually appropriate standard of
            comparison, with respect to other students.

One of the differences between these two uses of *big* is that the comparison domain of
attributive *big* is usually provided by the nominal head it modifies, like *student* in (2.b), but
for the predicative *big*, the choice of domain is open. Put explicitly, for attributive *big*, the
individual *John* is compared in the domain of *students* only, but for predicative *big*, the
domain of comparison is context dependent, and we can put John in the domain of men,
students, boys etc for comparison.

   In this paper, we will compare two types of adjectives in Chinese NPs—adnominal and
pre-classifier *da/xiao* 'big/small'. The contrast is illustrated in (3). Then we will figure out
whether the semantics of *big/small* in (2) is also applicable to them.

(3)   a. wo   chi   le   yi   tiao   da   huanggua.
           I   eat   Perf one   Cl   big   cucumber
           'I ate a big cucumber.'
       b. wo   chi   le   yi   da   tiao   xiao huanggua.
           I   eat   Perf one   big   Cl   small cucumber
           I ate a small cucumber, which is big (for my stomach).'

The size adjective *da* 'big' can either be located in the adnominal position, as in (3.a) or the
pre-classifier position, as in (3.b). The interpretation of (3.a) is more or less equivalent to the
attributive *big* in 'a big cucumber' in English. And the semantics of the attributive *big* in (2.b)
is applicable to it. But *da* 'big' in (3.b) does not modify the cucumber itself, or else (3.b)
would mean that the cucumber is big and small at the same time. Obviously, it is a
contradiction to say so. What (3.b) asserts is that the quantity of the consumed cucumber is
big with respect to some other standard, such as my consumption ability. Intuitively, pre-
classifier adjectives behave very differently from adnominal adjectives, but how to represent
this difference in a formal way? This is the core issue to be pursued in this paper.

   Section 2 lists some of the striking differences between adnominal and pre-classifier
adjectives, arguing that adjectives at these two different syntactic positions are characterized
with fundamentally different semantic features. Section 3 examines the subtypes of pre-
classifier adjectival modifications to figure out different functions of classifiers in internal
measurement and external measurement. In section 4, we argue that classifiers are ambiguous
between a topological reading and a measure reading. The pre-classifier adjectives modify the
quantity denoted by classifiers when they are characterized with the measure reading. In
section 5, I conclude the paper by summarizing the semantic distinctions between adnominal
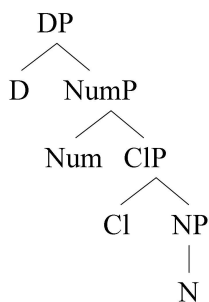and pre-classifier *da/xiao*.

2. Adnominal and pre-classifier adjectival modifications

Chinese bare nouns are mass (Chierchia 1998a,b), and they cannot be counted directly
without the aid of classifiers, as illustrated in (4).

(4)   a. yi   *(ben)   shu
            one   Cl-volume book
            a book
     b. liang *(ge) ren
            two   Cl man
            two men
     c. yi   *(zhang) zhi
            one   Cl-piece paper
            a piece of paper

Chinese, being a classifier language, has a classifier projection between NP and NumP, as illustrated in (5). See Tang (1990) and A. Li (1999) for details.

(5)

```
        DP
       /  \
      D   NumP
          /  \
        Num   ClP
             /  \
            Cl   NP
                 |
                 N
```

We assume that adnominal adjectives are located below the node of ClP and pre-classifier adjectives are located above ClP. Although these two types of adjectives are within the nominal domain, they have very different syntactic and semantic properties.

    Firstly, different adjectives, either gradable or absolute, either attributive or measuring, can be used in adnominal position, as in (6.a). But only a restricted set of adjectives can appear before classifiers. Generally speaking, only measuring adjectives like *da/xiao* 'big/small', *zheng* 'whole' are allowed, not attributive adjectives, like *xinxian* 'fresh' or *lüse* 'green', as in (6.b).

(6)   a. wo   chi le   yi   tiao lüse-de   / xinxian-de / da   huanggua.
            I   eat   Perf one Cl$_{bar}$ green DE / fresh DE / big   cucumber
            'I ate a bar of green/ fresh/ big cucumber.'
     b. wo   chi le   yi   (*lüse-de) / (*xinxian-de) / da   tiao huanggua.
            I   eat   Perf one   green DE /   fresh DE   / big Cl$_{bar}$ cucumber
           'I ate a (*green)/(*fresh)/ big bar of cucumber.'

Secondly, relative clauses can only replace adnominal adjectives, not pre-classifier adjectives. As shown in (7), the relative clause *[that mum bought]* can only be an adnominal modifier not a pre-classifier modifier.

(7)   a. wo   chi le   yi   tiao [$_{RC}$ mama mai   de] huanggua.
            I   eat   Perf one Cl$_{bar}$ mum bought DE cucumber
            'I ate a bar of cucumber that Mum bought.'

b. * wo chi le yi [_{RC} mama mai de] tiao huanggua.
    I   eat Perf one   mum   bought DE Cl_{bar} cucumber

Thirdly, adnominal adjectives can be modified by degree adverbials, like *hen* 'very', *geng* 'more' and *zui* 'most', as in (8.a), but pre-classifier adjectives cannot be modified by degree adverbials, as in (8.b).

(8)   a. wo chi le yi   tiao hen / geng / zui da de   huanggua.
         I   eat Perf one Cl   very / more / most big DE cucumber
         'I ate a very big/ a bigger/ the biggest cucumber.'
      b. *wo chi le   yi   hen / geng / zui da   tiao huanggua.
         I   at Perf one very / more / most big Cl   cucumber
          'I ate a cucumber which is very big/ bigger/ biggest (for my stomach).'

Fourth, adnominal adjectives can be converted into predicative adjectives, but not pre-classifier adjectives. (9.c) can only be derived from the adnominal *da* 'big' in (9.a), not from the pre-classifier *da* 'big' in (9.b), because (9.c) only means that 'the cucumber itself is big in terms of size'.

(9)   a. wo chi le yi   tiao hen da de huanggua.   ➔
         I   eat Perf one Cl   very big DE cucumber
         'I ate a big cucumber.'
      b. wo chi le yi   da tiao huanggua.   ➔ //➔
         I   eat Perf one big Cl   cucumber
         'I ate a cucumber that was big (for my stomach).'
      c. wo chi-de huanggua hen da.
         I   eat   cucumber very big
         'The cucumber I ate was very big.'

Finally, the adnominal *da/xiao* can only appear before nouns denoting what Rothstein (2004, 2007) called 'naturally atomic entities', like *man*, *book*, *apple* etc, which come into existence with discreteness, but the pre-classifier *da/xiao* doesn't have this constraint.

(10) a. *ta he le yi   ping da shui.
         he drink Perf one Cl_{bottle} big   water
         'He drank a bottle of big water.'
      b. ta chi le yi   ge da   pingguo.
         he eat   Perf one Cl big apple
         'He ate a big apple.'
(11) a. ta he le yi   da ping   shui.
         He   drink Perf one big Cl_{bottle} water
         'He drank a bottle of water, which is big (for him).'
      b. ta   chi le yi   da   ge pingguo.
         He   eat Perf one big Cl apple
         'He ate an apple, which is big (for him).'

The adnominal *da/xiao* can only modify nouns denoting naturally atomic entities, i.e. discrete entities like *apple*, but not those denoting non-atomic entities, i.e. homogeneous entities like *water*, as in (10). Note that ontological feature of natural atomicity, i.e. the distinction of homogeneity/discreteness, is not consistently reflected as the mass/count distinction at the grammatical level (Rothstein 2007, cf. X.-P. Li 2008 for the discussion of natural atomicity in Chinese). But pre-classifier *da/xiao* are compatible with both 'mass classifiers' and 'count classifiers' in Cheng & Sybesma's terms (1998), as in (11.a) and (11.b) respectively.

Relying on the above differences, X.-P. Li (2007) proposes that the adnominal and pre-classifier adjectives have distinctive semantic representations. That is, the adnominal adjectives are attributive, that is, they predicate a size property of an entity and are interpreted via intersection, while the pre-classifier adjectives do not have any modificational relation to the noun or the classifier and they express measure with regard to some standard.

As argued before, the attributive *big/small* in English is of type $<<e, t>, <e, t>>$, which is type-lifted from the predicative *big/small* at $<e, t>$. The adnominal adjectives *da/xiao* in Chinese shares the same semantics with attributive *big/small* in English. So the interpretation of attributive *big/small* represented in (2.b) is applicable to the adnominal *da/xiao*. The adnominal *da/xiao* are of $<<e, t>, <e, t>>$ and denote functions from sets of entities to sets of entities that are only *da* 'big' or *xiao* 'small'.

Recall the example of (3.b), *yi da tiao xiao huanggua* 'one big Cl small cucumber'. Firstly, we said before that pre-classifier *da* 'big' does not modify the noun *cucumber*; otherwise, we would express a contradiction by saying that 'it is a big and small cucumber'. Secondly, the use of pre-classifier *da/xiao* has nothing to do with the actual size of the entity itself. For example, if I eat a very small cucumber (i.e. small in terms of size) but I am quite full, it is still legitimate to say 'I eat a big Cl cucumber.' So it's obvious that the pre-classifier *da/xiao* does not intersect with the noun and they don't attribute the property of size. Instead, they denote some measure function with respect to some context-dependent criterion.

How the measure reading of pre-classifier adjectives is compositionally worked out is not worked out in detail in X.-P. Li (2007) and a formal semantic representation of the pre-classifier adjectives is still lacking there. In the next section, we will address this issue in detail.

3. Internal and external measurements of pre-classifier adjectives

Cheng & Sybesma (1998) argue that only 'mass classifiers', like *box*, *bottle* etc, can be modified by the pre-classifier *da/xiao*, because they are lexical and retain some nominal features, while the so-called 'count classifiers', like the general classifier *ge*, are functional and the pre-classifier *da/xiao* cannot be applied to them. X.-P. Li (2007) claims that the pre-classifier adjectival modification has nothing to do with the lexical/functional distinction of classifiers, but with the measurement constraint.[2] That is, any classifiers can be modified by

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[2] In X.-P. Li (2007), I also argue against Cheng & Sybesma's (1998) proposal of associating lexical/functional distinction with mass/count distinction at the classifier level and show that the classification of classifiers into individual Cls and mass Cls needs reconsideration.

X.-P. Li (2008) further argues that there are individual Cls and non-individual Cls in Chinese, which are distinguished according to the ontological distinction of discreteness and homogeneity. But there is no such a distinction of count Cls and mass Cls.

the pre-classifiers *da/xiao*, as long as an appropriate context can be construed to induce a measurement reading on the noun.

The pre-classifier *da/xiao* can evaluate two types of measurement with respect to different measurement standards—internal measurement (IM) and external measurement (EM) respectively. Specifically, in (12.a), the criterion of comparison for IM is provided internally by classifiers, but in (12.b), the criterion for EM is provided externally and is heavily context-dependent.

(12) wo he le   yi da ping   shui.
      I drink Perf one big Cl-bottle water
      a. 'I drank a large portion of water out of that bottle.'   (IM)
      b. 'I drank a bottle of water, which is big (too much) for me.' (EM)

In (12.a), *da* 'big' is used in a partitive context, where some water is taken out of the whole bottle of water and the quantity of the water drunk is larger than that what is left in the bottle. In (12.b), the quantity of the water I drank is large with respect to my stomach, which is an external criterion, which says nothing about the absolute quantity of the water drunk out of the bottle.

3.1. Internal measurement
3.1.1. Partitive contexts

IM can be used in partitive contexts, where it asserts that the entities referred to by nouns are divided into two asymmetrical parts. These parts are marked as *big* or *small* with respect to the unit. The unit is introduced by the classifier.

(13) a. zheli you yi ping   shui, wo   he   le   yi da   ping,   ta he   le   yi
          here have 1 Cl-bottle water I   drink Perf 1 big Cl-bottle he drink Perf 1
          xiao ping
          small Cl-bottle
          'There is a bottle of water. I drank a large part of it and he a small portion.'
      b. zhe ge xigua   tai da   le,   wo zhi neng chi yi   xiao ge.
          this Cl watermelon   too big Part I   only can eat one   small Cl
          'This watermelon is too big, and I can only eat a small part.'

By partitive, we mean that a certain part of entity is taken from the unit or whole. As in (13.a), *yi ping shui* 'a bottle of water' is a unit formed by the classifier *ping* 'bottle', and this unit is divided into two parts—a large part for me and a small one for him. Note that *da/xiao* at pre-classifier position does not modify classifiers like *ping* 'bottle', or else there will be a small bottle of water and a big bottle of water. It is contradictory to the scenario described in (13.a). Similarly, nouns modified by individual classifiers like *ge* can also have a partitive reading. The appropriate reading of (13.b) is that I can only eat a small part of that big watermelon. It can never mean that 'the watermelon itself or the unit of the watermelon is small'. The pre-classifier *xiao* has no modification relation on the individual classifier *ge*, though the classifier *ge* directly follows the adjective *xiao*.

3.1.2. Accumulation contexts

The opposite process of division or portioning-out is to fill in or to accumulate. IM can also be used in accumulation contexts, where it asserts that the entities represented by nouns are accumulated in certain containers introduced by classifiers. The pre-classifier *da/xiao* expresses the proportional relation of the capacity of container and the quantity of the entity stuff contained in it.

(14) a. tamen   jian   le   yi   da   dai   laji
          they   collect Perf one   big   Cl_bag rubbish
          'They picked up a bag of rubbish, which is (almost) full.'
      b. ta xie   le   yi   da   ye   de 'wo ai   ni'.
          he write Perf one big   Cl_page   DE I   love you
          'He wrote so many "I love you" that the paper is almost filled.'

By accumulation, we mean that things are accumulated into some container embodied by classifier. (14.a) can never imply that 'the bag is big' or 'the rubbish is big', so the pre-classifier *da* 'big' neither modifies the classifier *dai* 'bag' nor the noun *laji* 'rubbish'. The most plausible interpretation of (14.a) is that the rubbish is accumulated in a bag and the rubbish makes the bag look full. In other words, we actually measure the (quantity of) rubbish with respect to the capacity of the bag. Along the same line, in (14.b), the paper can be seen as a metaphorical container and the characters are accumulated inside. The number of characters is evaluated with respect to the space of the paper. The paper is almost full of characters.

3.1.3. Pre-classifier da/xiao as a partitive marker

IM in partitive contexts expresses how to divide a unit into parts and IM in accumulation contexts expresses how to form a unit or part of a unit. There are two steps to take in order to get an IM reading in both contexts. Firstly, the unit formed by the classifier is treated as a criterion, say, as a limit of a container, for partition or accumulation of the entities represented by the noun. Secondly, the pre-classifier *da/xiao* works as a partitive marker, which shows the part-whole relation of an atomic entity denoted by Cl+N.[3] That is what we mean by internal measurement. We are going to provide the semantic representation of the pre-classifier *da/xiao* in Section 4.

Based on this account, we can make the prediction that only adjectives that show the part-whole relation are able to be used as pre-classifier modifiers. This prediction is born out by the use of adjective *zheng* 'whole' at the pre-classifier position. For example, the substitution of pre-classifier *da/xiao* by *zheng* 'whole' in (13.b) and (14.b) is illustrated as in (15).

(15) a. tamen   jian   le   yi   *zheng*   dai   laji
          they   collect Perf one   whole   Cl_bag   rubbish
          'They picked up a whole bag of rubbish.'
      b. zhe ge   xigua   tai   da   le,   wo chi bu   xia   yi   *zheng* ge.
          this Cl   watermelon   too   big Part I   eat not down one whole   Cl
          'This watermelon is too big, and I cannot eat the whole.'

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[3] We will discuss the notions of atomic entities and atomizing function in detail in section 4.

3.2. External measurement

In EM, the norm of comparison is provided externally from the context. The pre-classifier *da/xiao* with an EM reading is at least available in the following two contexts.

3.2.1. Consumption contexts

The verbs used in consumption contexts are similar to those in partitive contexts. But the comparison criteria of the pre-classifier *da/xiao* in the consumption context come from some external sources not from classifiers.

(16) a. wo   chi   le   yi   da   tiao   huanggua
          I   eat   Perf one   big   Cl_bar cucumber
          'I ate a cucumber which is big (for my stomach).'
       b. ni   yi   ge shangwu   kan-wan   le   zheme   yi   da   ben   shu.
           you   one   Cl morning   read-finish Perf such   one   big   Cl-volume book
           'You finished reading such a book during one morning.'

Take (16.a) for an example, the pre-classifier *da* 'big' does not mean the cucumber is big and actually it may be of small size itself. The appropriate interpretation is that the cucumber consumed accounts for a large space in the stomach. In (16b), compared with the normal reading speed, the book was read in a fast speed. Put in a different way, the number of pages finished in a morning is large with respect to the expectation. But the book is not necessarily thick or big, because it can be a thin and small book but hard to follow and difficult to understand. It's supposed to be finished within 3 full days, but you finished it within one morning. So it is true to say that you finished reading *yi da ben shu* in this case.

Note that in the case of (16.a), even if you only eat 1/3 of a cucumber, and that part of cucumber made you feel full, it is still true to say *yi da tiao huanggua*. What matters here is the proportional relation between the quantity of consumed entity and the external criterion, say, my consumption capacity. This clearly tells us that external measurement is neither related to the size of the entity itself nor the absolute quantity of the entity or part of entity. The decisive factor of licensing pre-classifier *da/xiao* is that the proportional relation must hold between some external criterion and the quantity of the entity, either part of an atom or a single atom, or even several atoms. We will discuss this issue in detail later on in Section 4.

3.2.2. Expectation contexts

The fourth type of measurement is not dependent on the choice of verbs. It is highly context-dependent.

(17) a. wu-mao-qian   mai   le   yi   da   ge mangguo
          50 cents   buy   Perf one   big   Cl mango
          '(I spent) 50 cents buying such a mango, which is bigger (than expected).'
       b. che   shang   you   lai   le   yi   da   qun   xuesheng.
           bus   on   again come Perf one   big   Cl-group   student
           'Another big group of students got on the bus.'

In (17.a), suppose that there are three types of mangos—*da mangguo* 'big mango', *xiao mangguo* 'small mango' and *zhong mangguo* 'medium-size mango'. Generally speaking, with 50 cents you can only buy a small mango, but today you get a medium-size mango. Put differently, compared to your past experience, today you spent 50 cents buying *yi da ge mangguo* 'one big Cl mango'.

Suppose that there is a group consisting of five students in the case of (17.b). It is neither the case that the students are big nor that the group itself is big, but the number of students is big with respect to some standard externally provided. When the bus is empty, the bus driver might think it is only a small group of passengers, but when the bus was already crowded, these five students might be seen as a big group. So the absolute size of the group itself is not responsible for the licensing of pre-classifier *da/xiao*, but what matters is the relation between the quantity/number of the entities denoted by Cl+N and the contextually dependent standard.

The licensing of gradable adjectives like the pre-classifier *da/xiao* always requires a comparison between the entity represented by the noun and some standard. In the first three types of measurement, the standard of comparison can be implied by verbs. For example, in the partitive context, the atom/unit to be partitioned is considered to be the standard; in the accumulation context, the container into which the stuff is accumulated is seen as standard; in the consumption context, the consumption capacity or ability is taken as the standard. But for the fourth type of measurement, the standard of comparison is highly context-dependent and cannot be inferred from the verb. Generally speaking, when the speaker utters sentences like in (17), (s)he actually implies some expectation, with which to be compared with the entity(-ies) represented by Cl+N. As in (17.a), the medium-size mango you bought with 50 cents is bigger than what I expected. In (17.b), the size of the group of students is bigger than what the bus driver expected. Thus I use the notion of expectation to characterize the context of the last type of measurement.

To sum up, in IMs, classifiers function as the standards of comparison, and the pre-classifier *da/xiao* is a partitive marker, which shows the part-whole relation of the theme denoted by nouns and standard denoted by classifiers. In EMs, the standard of comparison are provided externally and inferred from context and the pre-classifier *da/xiao* shows the relation between entities represented by Cl+N and the external criteria.

4. Semantics of pre-classifier adjectives
4.1. Semantics of adnominal adjectives

Before getting into the semantics of the pre-classifier *da/xiao*, we will firstly represent the semantics of adnominal *da/xiao* in the environment of numeral phrases.

According to Chierchia (1998a,b), Chinese nouns are mass and mass nouns are inherently plural. That means that we have no access to atoms in the denotation of Chinese bare nouns. Rothstein (2007) introduces the notion of M-ATOMs (Measured atoms) as the minimal atoms in the Boolean semi-lattice, which are what the counting function applies to. So it is more precise to say that Chinese nouns do not denote sets of M-ATOMs. Following Rothstein (2007), the M-ATOM makes a standard use of MEAS function from individuals to ordered pairs of <n, U>, where the first element is a natural number and the second element is a unit of measurement U. This is also called the 'atomizing function'.

She also argues that bare mass nouns are root nouns which are inherently plural, following Chierchia (1998a,b) and single count nouns are the result of applying the M-ATOM function to the root nouns and the operation yields a set of M-ATOMs, which implies that English count nouns have a covert lexicalized classifier built into the lexicon (see Borer 2004 for a syntactic proposal). The crucial point in her claim for us is that in order to count, the root nouns must be applied by the MEAS function to produce M-ATOMs.

I claim that Chinese classifiers are the spell-out of M-ATOM function. Classifiers apply to the root nouns, i.e. the mass domain denoted by Chinese bare nouns and they introduce measure units, which individuate atoms from the mass domain. Classifiers are lexical and they have topological properties, i.e. shape-based features, so the device of unit also attributes some property to the entities denoted by nouns.

(18) a. yi   duo   hua
         one   Cl$_{blossom}$ flower
      b. yi   duo   mogu
         one   Cl$_{blossom}$ mushroom
      c. yi   duo   yun
         one   Cl$_{blossom}$ cloud
      d. ‖ yi duo yun ‖ = λx. cloud(x) & MEAS(x) = <1, blossom>

The classifier *duo* 'blossom' in (18) is prototypically used to modify *flowers* and its use can be extended analogically from flowers to flower-like entities, like *cloud*, *mushroom* etc. For example, in (18.c), *duo* 'blossom' not only atomizes the denotation of bare noun *cloud* into an atomic unit but also attributes the property of being flower-like to *cloud*. Its interpretation is formalized as in (18.d), where *duo yun* 'blossom of cloud' is the M-ATOM for counting and the number of atom is one.

Now let's represent the meaning of the adnominal *da/xiao* in the environment of NumPs.

(19) ‖ yi$_{-one}$ tiao$_{-Cl}$ xiao$_{-small}$ huanggua$_{-cucumber}$ ‖
      = λx. x∈{λy. cucumber(y) & MEAS(y)=<1, tiao>} & size (x) < d$_s$, a context-dependent standard.

The variable y has the properties of being a cucumber and being a unit introduced by *tiao*. In other words, *tiao huanggua* 'Cl cucumber' denotes a set of atomic cucumbers. And x is member of the set of atomic entities and the size of the atom x is small with regard to some context-dependent standard. It's worth noting that adnominal adjectives *da/xiao* are intersected with atoms denoted by Cl+N not with entities denoted by N.

When the NumP denotes a plural entity, the semantic representation of (19) can still hold if we adopt the plurality operator * (Landman 1989), which applies to sets of atoms and turns them into corresponding sets of pluralities through sum. For example, *liang tiao xiao huanggua* 'two small cucumbers' can be represented as in (20).

(20) ‖ liang$_{-two}$ tiao$_{-Cl}$ xiao$_{-small}$ huanggua$_{-cucumber}$ ‖
      = λx. x∈ *{λy. cucumber(y) & MEAS(y)=<1, tiao>} & | x |=2 & size (x) < d$_s$, a context-dependent standard.

The plurality operator * turns the set of atomic cucumbers into the set of pluralities of atomic cucumber by sum. Now x is member of the set of plural entities and whose cardinality is two. The atoms constituting the plural entity of x are small in terms of size with respect to some standard. Note that adjectives of *big/small* are distributive when they project a scale of size. For example, in expressions like 'these two cucumbers are small or *these two small cucumbers*', though the predicate of *being small* is predicated of the plural entity—*these two cucumbers*, this property is distributed over the proper parts of the plural entity. It implies that each cucumber must be *small*. Due to the distributivity of *big/small*, the semantics of adnominal *da/xiao* can be represented through the plural entity *x*, as shown in (20), by which we can get the entailment that each atom of the plural entity is *small* in terms of size.

4.2. Semantics of pre-classifier adjectives

Which constituent do pre-classifier adjectives modify? The noun or the classifier? Or something else? The example of (13) is repeated here as in (21).

(21) a. zheli you yi ping shui,   wo he le yi da   ping, ta he le   yi xiao
        here have 1 Cl   water I   drink Perf 1 big Cl   he drink Perf 1 small
        ping
        Cl
        'There is a bottle of water. I drank a large portion and he a small portion.'
     b. zhe ge xigua   tai da le,   wo zhi neng chi yi   xiao ge.
        this Cl watermelon   too big Part I   only can eat one   small Cl
        This watermelon is too big, and I can only eat a small part.'

Non-atomic entities like *water* cannot be modified by adjectives like *big/small*, so it is impossible for *da/xiao* in (21.a) to cross the classifier to modify the noun. Similarly, the pre-classifier *xiao* in (21.b) does not mean that the size of *watermelon* is small, because we already know from the adnominal adjective *big* that the watermelon is big. This tells us that there is no modificational relation between pre-classifier *da/xiao* and the noun. In other words, unlike the adnominal *da/xiao*, the pre-classifier *da/xiao* is not intersective with nouns.

What about classifiers? If they modify classifiers, then in (21.a) we would get two bottles of water—a big one for me and a small one for him. But this interpretation is contradictory to the scenario described by (21.a). The only plausible reading is that a bottle of water is divided into a large part and a small one. In (21.b), *yi xiao ge* can only mean 'a small part of watermelon'. So it seems that the pre-classifier *da/xiao* does not modify the classifier either.

Note that it has been noted by many (Cheng& Sybesma 1998, Stavrou 2003, Landman 2004 and many others) that container classifiers like *bottle*, *box*, *cup* etc are ambiguous between a container reading and a measure reading. For example, *three bottles of water* can either mean 'three concrete bottles of water' or 'as much water as three bottles'. In the container reading, container classifiers perform the MEAS function, which brings us a set of M-ATOMs for grammatical counting. In the measure reading, container classifiers denote an abstract measure function, which is responsible for quantity measurement. It is similar to the standard measure function denoted by *kilo* and *pint* etc. I dub the former as the counting reading, and the latter the measure function.

I extend their analysis of container classifiers into Chinese classifiers in general in two aspects. Firstly, the ambiguity between the measuring and counting readings not only holds of container classifiers but also of other types of classifiers, including individual classifiers, like *tiao* 'bar', *ben* 'volume' etc, and group classifiers, *qun* 'group'. Secondly, the pre-classifier *da/xiao* is licensed only when classifiers express the measure reading.

   We already know that the example of (22) is ambiguous between IM and EM readings.

(22) wo   chi   le   yi   da   tiao   huanggua.
      I   eat   Perf one   big   Cl   cucumber
      a. I ate a large part of a cucumber.   (IM)
      b. I ate a cucumber, which is big (for my stomach). (EM)

We are not going to repeat the differences between IM and EM here. Let's look first at the internal measurement. We first define the status of the classifier *tiao* before starting. The classifier *tiao* is a representative individual classifier in Chinese and it modifies nouns denoting natural atomic entities. It has the lexical meaning or 'topological feature' of being long and slender (X.-P. Li 2008). That means that count classifiers are not functional at all, as claimed by Cheng & Sybesma (1998), but lexical. In a precise way, just like container classifiers, individual classifiers are also nominal.

   The counting reading of classifiers is closely related to the existing form or structure of the entities denoted by nouns. For example, to emphasize *a bottle of water* with the counting reading, the water must be contained in a real bottle, not in a glass or a cup. The containers of bottle, glass and cup are topologically distinctive and they introduce different measure units to the noun and thus different M-ATOMs are formed for counting. To emphasize *yi tiao huanggua* 'one Cl_{bar} cucumber' with a counting reading, the entity of cucumber must exist in its natural shape of being long and slender, which must be consistent with the topological features expressed by classifiers. Then an M-ATOM of cucumber can be introduced by *tiao* through the atomizing function and finally we can count. If I cut a *tiao* cucumber into small dices or pieces, its existing structure is changed and can no longer be measured as *tiao*. So we can on longer count M-ATOMs of *tiao* cucumber.

   Now let's turn to the measure reading of classifiers. Suppose that there is a cucumber in the fridge. I cut this cucumber into small dices and made a cucumber salad. I ate several spoons of the salad and then put the rest in the fridge. If the quantity of these several spoons of cucumber is as much as, say, 2/3 of a cucumber. I can still say (22) to get an internal measurement. It means that the part of cucumber I ate is partitioned from a single atomic cucumber and the quantity of the part of cucumber that was eaten is larger than that of what is left. In the reading, the classifier does not introduce M-ATOMS for counting but introduce an abstract unit to measure quantities. For example, the quantity of the part of cucumber I ate is measured with respect to the unit introduced by the classifier *tiao*, so the final result can be 2/3 *tiao*, 3/4 *tiao* and so on. Container classifiers like *tablespoon* are accepted as a standard measuring unit, but the measuring unit implied by individual classifiers like *tiao* is non-standard, temporary and context-dependent. In this reading, the existing form of the entity denoted by N does not matter. For example, as long as the quantity requirement is satisfied, the cucumber I ate can be sliced, diced or smashed and whatsoever.

   This measuring reading is used a lot in mathematics and recipes. For example, you will find from recipes something like '1/2 red bell pepper, chopped' or '1/4 teaspoon lemon pepper'. In fact, in the first example, a measure unit is missing between *1/2* and *red bell*

pepper. The right interpretation is that chopped red bell pepper is as much as half a unit of a normal bell pepper. The equivalent expression in Chinese is '1/2 ge$_{-Cl}$ hongjiao$_{-red\ pepper}$, qieshu$_{-chopped}$', where the classifier *ge* can act as a temporary measuring unit in that context.

To summarize so far, classifiers in Chinese are always ambiguous between the counting reading and the measuring reading. The former emphasizes the consistency of the topology expressed by the classifier with the existing form of the entity denoted by the noun. The classifiers have the atomizing function and introduce M-ATOMS for counting. In the measure reading, classifiers are not to count but to measure. They introduce abstract measure units to entities denoted by nouns. The existing form or structure of the entity denoted by the noun is not related in this case.

What I mean by that the pre-classifier adjectives, like *da/xiao*, do not modify classifiers is that they don't modify classifiers when they have the counting reading. As explained above, in terms of IM, (22) means that the quantity of cucumber, either diced or sliced, is as much as, say, 2/3 of the whole unit. So the pre-classifier *da/xiao* modifies classifiers when they express the measure reading.

The semantics of pre-classifier da/xiao can be represented as in (23).

(23) ‖yi$_{-one}$ da$_{-big}$ tiao$_{-Cl}$ huanggua$_{-cucumber}$‖
= λx. x∈{λy. apple(y) & MEAS (y)= < 1, ge >} & {∀z. z≤x & Quantity (z)>d$_s$, a context dependent criterion}.

The semantic representation in (23) looks quite similar to that of adnominal *da/xiao* in (19). Their similarity is that both the adnominal and the pre-classifier *da/xiao* apply to atoms represented by Cl+N. They have more differences than similarities. One of the distinctions is that they project different scales of measurement. In particular, the adnominal *da/xiao* projects a scale of size, but the pre-classifier *da/xiao* projects a scale of quantity. Besides, we know that pre-classifier *da/xiao* can be used in partitive contexts, where *da/xiao* quantifies over part of an atomic entity. In other words, in order to show the semantics of pre-classifier *da/xiao* correctly, a part-whole relation must be shown and parts of atoms are measured along the scale of quantity, like the variable *z* in (23).

Let me elaborate the external measurement a bit. EM means that we use external comparison criterion to evaluate the entity denoted by Cl+N. For example, in (22), the criterion is my consumption ability. As long as I feel full after eating a cucumber, or part of a cucumber, it is legitimate to say something like (22). The absolute quantity of the cucumber is not a decisive factor, and the quantity of cucumber that made me full can be half or 2/3 of a cucumber. The existing form or structure is not related here, and the cucumber can either be sliced or diced and whatsoever. What the classifier *tiao* does here is first to introduce M-ATOM function to individuate atoms of cucumbers and then show the part-whole relation between the cucumber eaten and the cucumber atom, i.e. the cucumber eaten is a part of the cucumber atom, which is represented by '$z \leq x$' as in (23).

This analysis offers a quick answer to the question why only a restricted set of adjectives like *big/small* is licensed before classifiers. It is cross-linguistically true that the quantity is usually modified by measuring adjectives like *big/small*, as in (24). Note that in Chinese, as in (24.d), the notion of quantity can be realized by the noun *liang* 'quantity' in a more direct and obvious way, which can be modified by *da* 'big' too. So the quantity denoted by classifiers is equivalent to the noun *liang*. It is no surprise now that the pre-classifier *da/xiao* can be used before classifiers.

(24) a. a large/small quantity of …   (English)
      b. une   grande / petite quantité de…   (French)
         a   large   / small quantity of
      c. kamud gedola / katana   (Hebrew)
         quantity big   / small
      d. da   liang   (Mandarin Chinese)
         big   quantity

4.3. Distributive da/xiao

The reviewer points out that throughout the article each example contains the numeral *yi* 'one', so is it a mere accident or is it equivalent to the indefinite article as in English or French? I would say that it is a mere accident. Firstly, as predicted correctly by Chierchia (1998b), in classifiers languages like Mandarin Chinese, there is no definite/indefinite article at all. So the number *yi* 'one' before classifiers can not be taken as a counterpart of indefinite articles in Romance and Germanic languages. Secondly, 'a large quantity' can be directly expressed as *da liang* 'large quantity' without any numeral in Mandarin, as in (24.d). Thirdly, in addition to *yi* 'one', other numerals like *liang* 'two' or *san* 'three' can also be used, as in (25). Thus, *yi* 'one' before *da/xiao* is not an indefinite article but a numeral to modify classifiers.

(25) a. wo   ling le   liang da   xiang pingguo
         I   carry Perf two   big   Cl_box apple
         'I carried two full boxes of apples.'
      b. wo   chi   le   liang da   ge pingguo
         I   eat   Perf two   big   Cl apple
         'I ate two apples, each of which is big (for my stomach).'

Some readers may feel puzzled why you can put two quantifying elements like *liang* 'two' and *da*+quantity (denoted by classifiers) 'a large quantity' simultaneously before a noun. It is ungrammatical to say something like '*I ate two a large quantity of apples' in English. It is a redundant quantification. This is indeed a puzzle.

Expressions like *a large quantity of …* in English express absolute quantities of entities, which is similar to quantifiers like *many*, *some* etc. Thus it is true that we cannot put *two* and *a large quantity of* together. Although we claim that the pre-classifier *da/xiao* modifies the quantity expressed classifiers, it does not express the absolute quantity of entities but shows relative quantities, i.e. different degrees of quantity. Put otherwise, the pre-classifier *da/xiao* only expresses 'positive degrees' and 'negative degrees' on the scale of quantity respectively (Kennedy 1999).

I assume that the pre-classifier *da/xiao* projects as the head of a functional phrase, say, degree phrase, DegP. I don't attempt to define formally what the DegP is, and I just want to demonstrate at which level pre-classifier *da/xiao* works. Since the pre-classifier *da/xiao* has its own projection, it won't compete with numerals or quantifiers for a higher node. The redundant quantification does not exist now.

Now we also have to figure out whether the DegP sits above ClP or NumP. Recall the examples in (25). (25.a) means that each box of apples is heavy with respect to my energy or

ability, but not that the collectivity of two boxes of apples are heavy. Similarly, (25.b) expresses that each apple can potentially make me full. In spite of that, I still ate two of them and felt extremely full. It suggests that the pre-classifier *da/xiao* only modifies single atoms denoted by Cl+N but not the sum of atoms, i.e. plurality of atoms. It means that pre-classifier adjectival modification works at a local level. That is, the DegP can only have a scope over ClPs but not over NumP. It is only possible for da/xiao to be located above ClP but below NumP. If preceding the numeral, *da/xiao* would have a scope over the NumP, which can induce the collective reading rather than the distributive reading that we expect. So the structure of the NumP with pre-classifier da/xiao can be represented as in (26).

(26)

```
            DP
          /    \
        D      NumP
             /      \
           Num      DegP
        liang 'two'  /    \
                   Deg     ClP
                 da 'big'  /    \
                         Cl      NP
                    xiang 'box'   |
                                  N
                            pingguo 'apple'
```
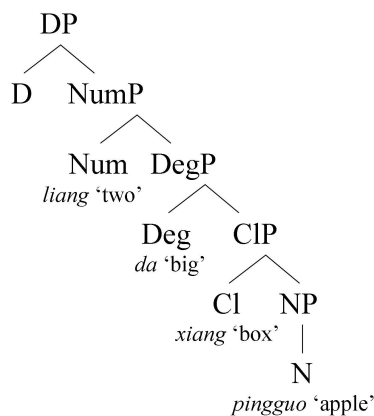
The semantics of pre-classifier *da/xiao* worked out in (23) can still hold of NumPs denoting plural entities if we adopt the plurality operator* (Landman 1989).

(27) $\|$ liang$_{-two}$ da$_{-big}$ tiao$_{-Cl}$ huanggua$_{-cucumber}$ $\|$
= $\lambda x.\ x \in {}^*\{\lambda y.\ (apple(y)\ \&\ MEAS(y) = <1, ge>)\}\ \&\ |x| = 2\ \&\ \{\forall z.\ z \leq x\ \&\ Quantity(z) > d_s,$ a context dependent criterion$\}$.

The variable y represents a set of atoms. The plurality operator * turns the set of atoms into the set of pluralities and x is a member of it. The cardinality of the plural entity is two. But what we want is not that the quantity of the plural entity is *big* but that the quantity of each atom constituting the plural entity is *big* with respect to some context dependent criterion. So it is of necessity to reflect this part-whole relation to the semantic representation of pre-classifier *da/xiao*, like 'z $\leq$ x' in (27), i.e. z is a proper part of the plural entity x.

4.4. Small numbers only

Before concluding, I would like to point out another puzzle. I find that though both numerals and quantifiers can appear before classifiers to quantify atoms formed by classifiers, they don't behave in the same way when a pre-classifier adjective appears in-between.[4]

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[4] I use the term of quantifier a little bit different from the standard way. In this paper, quantifiers refer to non-numerals, including *some, many/much, a lot of, (a) few, (a) little* etc.

Quantifiers like *xuduo* 'many', *yixie* 'some' and numerals like *liang* 'two' can both be used to quantify atoms in the same manner, as in (28).

(28) a. liang ge pingguo
          two   Cl apples
      b. xuduo   ge   pingguo
          many   Cl   apples
      c. yixie ge   pingguo
          some Cl   apples

But only numerals are compatible with pre-classifier adjectives, as in (29.a), but quantifiers are not, as in (29.b) and (29.c).

(29) a. liang da   ge pingguo
          two   big   Cl apple
      b. *xuduo da   ge pingguo
           many   big   Cl apple
      c. *yixie   da   ge pingguo
           some   big   Cl apple

I use the notion of vagueness to explain this asymmetry. Put briefly, though both numerals and quantifiers can quantify atoms, but numerals quantify precisely, from which we can get an exact number of atoms, and quantifiers quantify vaguely, from which no precise quantity of atoms is known. We know the pre-classifier *da/xiao* is to measure single atoms one by one in the contexts of IM or EM, so pragmatically small numerals are preferred and much easier to measure a limited number of atoms with regard to certain criterion.

This prediction is born out. Numerals larger than *ten* are not compatible with pre-classifier adjectives of *big/small*. Quantifier representing small numbers like *jige* 'several' is grammatical in the context of pre-classifier *da/xiao*. See the contrast in (30).

(30) a. shi   da   ge pingguo
          ten   big   Cl apple
      b. ji   da   ge pingguo
          several big   Cl apple
      c. *shi-yi   da   ge pingguo
           eleven   big   Cl apple
      d. *ershi   da   ge pingguo
           twenty big   Cl apples

It is now answered why quantifiers like *many*, *some* are ungrammatical with pre-classifier *big/small*, because those quantifiers are really vague in number, less than to talk about measuring atoms one by one as big or small. So the troublemaking phenomenon does not undermine our analysis proposed above but finally support our argument from the perspective of pragmatics.

5. Conclusion

In this paper, I present a contrastive analysis of two different types of adjective modification in Chinese nominals—adnominal and pre-classifier adjectival modifications. The adnominal *da/xiao* is attributive and intersective, i.e. predicating a size property of the entity denoted by noun. The pre-classifier *da/xiao* is not attributive but measuring, more precisely, quantity measuring. Classifiers can denote a measure reading and a counting reading. The pre-classifier *da/xiao* modifies quantities denoted by classifiers when they express a measure reading. There are two subtypes of measurement—internal measurement and external measurement with regard to different comparison criteria. Another point that is worth mentioning is that the pre-classifier *da/xiao* modifies individual atoms not the plurality of atoms.

Acknowledgements

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When tone prevents vowels from gliding
(and when it does not)

Cédric Patin

Since the mid-1970's it is well known that tone in many languages behaves independently from its tone bearing unit, and conspiracy arguments lead to consider tone as a distinct item. However, tone is commonly sensitive to some specific segments, and is sometimes involved in a specific relationship with its bearing units. Nevertheless, little attention has been paid so far to the fact that, in some languages, tone has a direct effect on the vowel to which it is associated.

In this article, it is demonstrated that a tone may prevent the deletion or the gliding of a vowel resulting from hiatus situations. This assertion is supported by a detailed analysis of similar phenomena in the Bantu language Shingazidja. In a first attempt of an OT analysis, it is proposed that the absence of gliding may result from the high ranking of a constraint $\acute{V}$-μ, which says that a *tone bearing unit* has to be moraic.

1. Introduction

It is well known since the mid-1970's that tone, in many languages, behaves independently from its tone bearing unit, and conspiracy arguments lead to consider tone as a distinct item.

Despite this, tone is commonly sensitive to some specific segments, such as voiced consonants (e.g. the so-called 'depressor consonants' of the Nguni languages). Moreover, tone and its bearing units are sometimes involved in a specific relationship: in the Mon-Khmer language Rengao, for instance, the higher register is associated to the modal voice and RTR vowels, while the lower register is associated to the breathy voice and ATR vowels (Yip 2002); in the Khoe language Shua, a super-high tone can only appear on the high vowels (Odden 2007).

However, little attention has been paid in the litterature to the fact that, in several languages, tone has a direct phonological effect on the vowel to which it is associated. In this article, I will demonstrate that a tone may prevent the deletion or the gliding of a vowel resulting from hiatus situations.

The paper is organised as follows: in section 2, I will remind to the reader some arguments supporting the independence of tone from its bearing units; in section 3, I will provide some data

demonstrating that tone, in several languages, prevents the deletion or the gliding of a vowel; in section 4, I discuss in detail similar phenomena occuring in Shingazidja, a Bantu language of Grande Comore; in section 5, eventually, I will propose a first attempt of an analysis sketched in the Optimality Theory framework (Prince & Smolensky 1993, McCarthy & Prince 1993a;b).

2. *The independence of segments and tone*

In this section, I will discuss some phenomena supporting an analysis of tone as an independent feature, distinct from the vowel to which it is associated. One of the major arguments in favor of the independence of tone vis-à-vis its bearing unit is the possibility for the former to be realised while the latter is deleted.

In many tonal languages (and especially in Benue-Congo), for instance, the deletion of a vowel resulting from the resolution of a hiatus situation does not imply the deletion of its tone. In (1), a famous example extracted from the Edoid language Etsako (Elimelech 1976), a tone is maintained while its tone bearing unit disappear.

(1)   ETSAKO; Edoid, Nigeria (Elimelech 1976)

    a.   (i)   ówà   *house*

          (ii)   ówǒwà   *every house*

    b.   (i)   ídù   *lion*

          (ii)   ídwǐdù   *every lion*

In (1aii) and (1bii), the reduplication of a VCV word creates a hiatus situation that is resolved by the deletion of the first vowel (now V_1) of the hiatus. The reduplicated forms of the words *ówà* 'house' and *ídù* 'lion' then lack a vowel (**ówàówà* → *ówǒwà* 'every house'; **ídùídù* → *ídwǐdù* 'every lion'). However, the tone that is underlyingly associated to the deleted vowel is maintained (the outputs of these reduplicated forms are not **ówówà* nor **ídídù*), and is reassociated to the second vowel (now V_2) of the reduplicated form, which then bears a contour tone. In Ogori, a Benue-Congo language of Nigeria, the same configuration leads to the deletion of the tone of V_2 (2).

(2)   OGORI; Benue-Congo, Nigeria (Casali 1997) [1]

    a.   / ɔ̀tɛ́lɛ́ ɔ̀kɛ̀ka / → [ɔ̀tɛ́lɔ́kɛ̀ka]

         pot   big

        big pot

    b.   / íjá   òsúda / → [íjósúda]

         woman old

        old woman

This kind of phenomena is not limited to African languages. In Naxi, a Tibeto-Birman language spoken in China, High-toned grammatical words are deleted in colloquial speech – *tá* in (3a) –, but their tones remain and are realised on the preceding word – *kʰà* in (3b).

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[1]Following Chumbow (1990).

(3)   NAXI; Tibeto-Burman, China (Michaud & Xueguang 2007)

    a.   ŋɤ̀   ʈʂʰɯ̄   kʰà   tá   ʈʂʰū lù tʰɣ̄   mɤ̀

        1stSG DEICT moment only here   reach affirm. fin. part.

        I've only just arrived (sustained speech)

    b.   ŋɤ̀ ʈʂʰɯ̄ kʰǎ ʈʂʰū lù tʰɣ̄ mɤ̀

        I've only just arrived (casual speech)

This property of the tone, i.e. its ability to be realised while its *tone bearing unit* disappear, is called *stability*. Along with other properties or manifestations of tone – e.g. the existence of *floating tones*, tone *melodies* or tones that are associated to several vowels –, *stability* constitutes a major argument in favor of the relative independence of tones and vowels.

3.   When vowels and tones are linked

Treating tone and segments separately, Autosegmental Phonology (Leben 1973, Goldsmith 1976) deals elegantly with phenomena such as *stability* or *mobility* – the fact that a tone can be parsed in a syllabe other than the one which carries it –, and accounts successfully for the widely observed independence of tones and segments. As Liphola & Odden (2000:177) said: "We offer the post-hoc observation, grounded in the descriptive literature covering a variety of tone languages, that tones tend to not interact with other phonological features."

On the other hand, by setting apart tones and segments, Autosegmental Phonology sometimes fails to accommodate the relationship that links the former and the latter. In this section, I will show that *deletion*, gliding and other processes that are involved in hiatus resolutions may depend on the tone(s) that are carried by the vowels. As far as I know, no specific study has been dedicated to this subject in the litterature.

In this paper, I will only discuss cases in which the tones prevent the occurrence of phenomena such as *vowel deletion* or *gliding*.[2] I will distinguish between two different situations. The first one involves languages or phenomena in which the tones of both V_1 and V_2 are relevant (section 3.1). The second situation involves languages or processes in which only the tone of only one of the vowels matters (section 3.2).

3.1.   When the tones of V_1 and V_2 are relevant

In some languages, the resolution of a hiatus depends on the tones that are carried by the first *and* the second vowels.

In Simakonde, a variety of the Bantu language Makonde spoken in Mozambican communities who have immigrated to Tanzania, an optionnal postlexical rule leads to the realisation of nouns as entirely High when they are followed by a demonstrative (Manus 2003) – compare

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[2]The opposite situation – i.e. phenomena in which the presence of a specific tone will lead to phenomena such as *vowel deletion* or *gliding* – is also reported. In Piro, a Chadic language spoken in Nigeria, "when a morpheme with a final vowel with a low tone is followed by another morpheme beginning with a vowel, the final vowel is deleted along with its tone" (Frajzyngier 1980:69).

for instance the realisations of the noun *ìpòòsò* 'present' in (4ci) and (4ciii). A hiatus situation resulting from the co-occurence of the final vowel of the noun and the initial vowel of the demonstrative is resolved by the gliding [3] of V_1 – cf. (4aii), (4bii) and (4cii).

However, the gliding of V_1 is possible *if and only* if the tone of the two involved vowels are *identical*, i.e. are High. In (4aiii), (4biii) and (4ciii), the gliding does not occur because the tone of V_2 is Low.

(4)   SIMAKONDE; Bantu [P23], Tanzania (Manus 2003:304)
        a.   (i)   lìjèémbè   *hoe*
              (ii)   líjémby' áálì   *this hoe*
              (iii) líjémbé àlììlá   *that hoe*
        b.   (i)   síjúùlù   *hat*
              (ii)   síjúlw' áásì   *this hat*
              (iii) síjúlú àsììlá   *that hat*
        c.   (i)   ìpòòsò *present*
              (ii)   ípósw' áâì   *this present*
              (iii) ípósó àììlá   *that present*

In the Cross-river language Gokana, a syllabic nasal loses its syllabicity "whenever its tone is identical to the tone of a preceding vowel" (Hyman 2003:35). In (5a), the velar nasal of the word *ŋ́gà* 'needle' is syllabic, because the verbal form *aè tú* 'he took' ends with a low-toned vowel. In (5b), this consonant loses its syllabicity since its tone is identical to the tone of the preceding vowel.

(5)   GOKANA; Cross-river, Nigeria (Hyman 2003:35)
        a.   aè sà ŋ́gà   *he chose a needle*
        b.   aè tú ŋ́gà   →   [túŋ.gàʔ]   *he took a needle*

In NEN (Mous 2003), a Bantu [A44] language of Cameroon, a final vowel is only realised when the underlying tone sequence of the last two syllables is *rising*. For instance, while a /CV̀CV̀/ word will be realised [CV̀C], a /CV̀CV́/ word will be realised [CV̀CV̀] (Mous 2003:287). As noted by Mous (2003:286), "the formulation of the tone and vowel reduction rule is cumbersome in any phonological framework that separates tones from vowels and that does not allow vowels and tones to be treated in one statement".

3.2.   *When the tone of only one of the two vowels matters*

In many languages, a hiatus is preserved if only one of the vowels bears a tone. This is for instance the case in Shingazidja, which will be discussed in more detail in section 4. In this section, some other cases are evoked.

In Nupe, a Benue-Congo language of Nigeria, a *falling tone* [4] on the first of two successive

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[3]Following the 'africanist' tradition and author's choices, I will use the symbol 'y' – instead of the API symbol 'j' – to represent the palatal glide.

[4]NB: lexically rare in the language.

vowels *prevents* (Smith 1967): i. the *deletion* of the vowel /ĩ/ when it occurs after an /e/ (6a) ii. the *deletion* of the vowel /a/ when it occurs before an /u/, leading to the *compensatory lengthening* of V_1 (6b) iii. the gliding of *i* when it occurs before an /u/ (6c).

(6)   NUPE; Nupoid [B.-C.], Nigeria (Smith 1967:163-165)

    a.   *e* + *ĩ* ⇒ deletion of *ĩ*:
        (i)   / bè bise ĩ /   →   [bè bise]   *with a hen*
        (ii)   / bè dê ĩ /   →   [bè dê $\boxed{ĩ}$]   *right outside*

    b.   *a* + *u* ⇒ deletion of *a* and compensatory lenghtening:
        (i)   / á u ta bàgá o /   →   [û: ta bàgô:]   *put it down over there*
        (ii)   / sàlâ u yì o /   →   [sàlâ $\boxed{u}$ jŏ]   *it's a drum*

    c.   *i* + *u* ⇒ gliding of *i*:
        (i)   / ebì u yì o /   →   [eb*j*ŭ jŏ]   *it's a kola-nut*
        (ii)   / mî̧ u yì o /   →   [mî̧ $\boxed{u}$ jŏ]   *it's me*

It has been said in section 2 that High-toned grammatical words of the Tibeto-Burman language Naxi are deleted in casual speech – cf. (3). However, Low-toned grammatical words are not deleted in casual speech, but are rather simplified to a *schwa* (7).

(7)   NAXI; Tibeto-Burman, China (Michaud & Xueguang 2007)

    a.   ... lī lā há (...)   ŋgī ŋgī   *nù̧*   mē...
        good old grandfather Li walk (reduplicated) ongoing aspect particle

        ...*good old grandfather Li was taking a stroll...* (sustained speech)

    b.   ... lī lā há (...) ŋgī ŋgī ə̀ mē... (casual speech)

In (7b), the word *nù̧* 'ongoing' is not deleted, but appears as a Low-toned *schwa*.

    The clearest example of the role of tones in the preservation of vowels is maybe Kimatuumbi, a Bantu [P13] language of Tanzania that has been clearly described by Odden (1996). In this language, a glide formation rule turns the high vowels /u̧/ and /i̧/ to their corresponding glides (respectively: w, y) when they occur before another vowel. In (8), the vowel of the class prefix is realised as a vowel before a consonant – (8ai), (8bi) –, and as a glide before a vowel – (8aii), (8bii).

(8)   KIMATUUMBI; Bantu [P13], Tanzania (Odden 1996:112)

    a.   (i)   mi̧-kaáte   4*loaves*
        (ii)   m*y*-oótó   4-*fires*

    b.   (i)   lu̧-toóndwa   11-*star*
        (ii)   l*w*-aaté   11-*banana hand*

However, the rule fails to apply under certain circumstances. Some morphemes are exceptions to the glide formation rule. According to Odden (1996:112), "this exceptionnality may be due to the fact that the vowels [of these morphemes] bear H-tone". In (9), the hiatus situations are not resolved by the gliding of V_1.

(9)   KIMATUUMBI; Bantu P13, Tanzania (Odden 1996:112)

    a.   kị́-ụkụmụ́   *the Ukumu family*   *kyúụkụmụ́

    b.   wangalị́-éka   *without having laughed*   *wangalyééka

    c.   naatị́-eká   *I laughed*   *naatyéeká

Gliding in Kimatuumbi also depends on the interaction between tone and length. A pre-vocalic High-toned vowel, for instance, will glide if and only if V_2 is short. In (10a), the vowel of class prefix *mụ́* receives a High tone because the preceding verb is low; it is then realised as a plain vowel. In (10b), the verb *aatị́kwịịbiiká* 'he put it in' ends with a High tone, so the vowel of the prefix of the object *mụ́-aanjuụ́* 'firewood' does not; the vowel then turns onto a glide.

(10)   KIMATUUMBI; Bantu P13, Tanzania (Odden 1996:122)

    a.   nịịbwenị mụ́-aanjuụ́   *I saw it in the firewood*

         *nịịbwenị mw-áanjuụ́

    b.   aatị́kwịịbiiká mwaanjụ́   *he put it in the firewood*

4. Case study: Shingazidja

In the preceding section, it has been shown that tone, in some languages, has a role on the syllabic status of vowels.

    In this section, I will discuss in detail the role of tone in the preservation of *vowel deletion* or *gliding* in Shingazidja, a Bantu [G44a] language spoken on Grande Comore (Comoros). Except when it is indicated, the Shingazidja data were gathered in Paris between june 2006 and january 2008. In section 4.1, I will demonstrate that the presence of a tone on a vowel prevents its deletion or reduction.[5] The data demonstrating that tone prevents vowels from gliding will be discussed in section 4.2.

4.1. Tone prevents vowel deletion

Among the situations in which a vowel may be suppressed or reduced in Shingazidja, two will be examined in this section. In section 4.1.1, it will be shown that the deletion of the last vowel of an utterance – here exemplified with isolated nouns – is blocked when it bears a tone. In section 4.1.2, I will provide examples demonstrating that the deletion of a vowel resulting from the resolution of a hiatus situation is blocked when V_1 is High-toned.

4.1.1. Evidence 1: isolated nouns

The Shingazidja nouns which have a disyllabic root are split in four tonal categories. Among them, one is characterised by the presence of a tone on the last syllable of the word – CAT1, e.g. (11a). Two other categories present a tone on their penultimate syllable: nouns which

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[5]It is not clear if tone prevents vowel deletion in fast-rate speech – my data are contradictory – or casual speech.
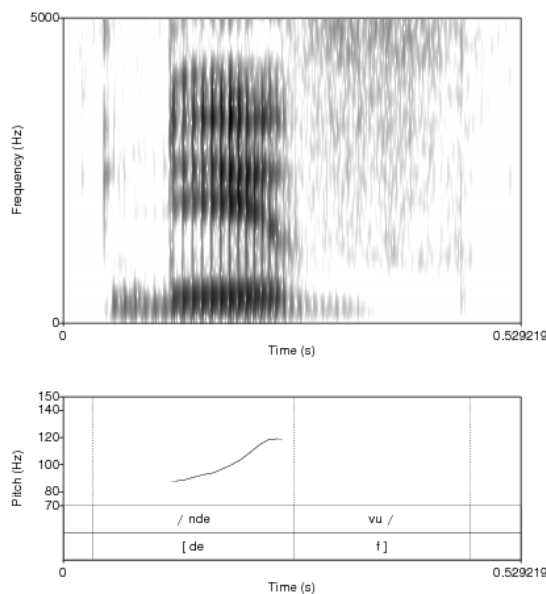
Figure 1: / ndévu /   [ɗéf]   *beard*

underlyingly [6] bears a tone on their penultimate syllable – CAT2, e.g. (11bi) – and nouns which do not underlyingly bear any tone – CAT3, e.g. (11bii).

(11)   a.   CAT 1:   mɓuú *baobab*, ɲoŋgá *horn*, ɲumɓá *house*, etc.
       b.   (i)   CAT 2:   ŋgúwo *clothes*, djapíso *curse*, ʃiβáa *prison(s)*, etc.
            (ii) CAT 3:   púzi *feather*, ńɗu *leg*, máha *year*, etc.

When the nouns that belong to the categories 2 and 3 are realised in isolation, their final vowel tends to be deleted, especially after fricatives – cf. (12) and the figure 1, illustrating the realisation of the word *ndévu* 'beard'.

(12)   a.   CAT 2
            (i)   djapís'   *curse*   (< djapíso)
            (ii) ɲóh'   *snake*   (< ɲóha)
       b.   CAT 3
            (i)   púz'   *feather*   (< púzi)
            (ii) ndóv'   *elephant*   (< ndóvu)

When the nouns that belong to CAT1 are realised in isolation, their final vowel is never deleted in normal speech rate – cf. (13) and the figure 2, illustrating the realisation of the word *mleví* 'drunkard'.

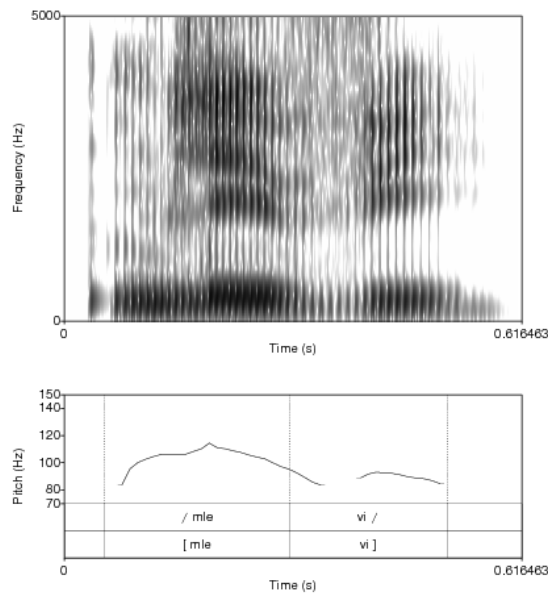[6]I mark the trigger syllable which underlyingly bears the tone by underlining it.

Figure 2: / mlevi /   [mle⁺ví]   *drunkard*

(13)   CAT 1

    a.   itasá   *lock*   (*itas'/*itás')

    b.   kofú   *sea snail*   (*kof'/*kóf')

    c.   mezá   *table*   (*mez'/*méz')

The presence of a tone on the last vowel of a word then prevents its deletion or reduction.

4.1.2. *Evidence 2: morpheme boundaries*

A second evidence demonstrating that tone prevents vowels from deletion comes from hiatus situations resulting from the co-occurrence of vowels in the verbal forms, at morpheme boundaries. When the morphemes *tsi-* (1sg past) and *rí-* (1pl past) precede a root beginning with /a/ or /e/, their final vowel /i/ tends to be deleted (the rule is optional but occurs frequently in normal speech rate) – cf. (14). In (14b) and (14c), for instance, the tone that is associated to the morpheme *rí-* shifts to the first syllable of the root, allowing the /i/ to disappear.

(14)   Cassimjee & Kisseberth (to appear) and personal data

    a.   tsi-alíka   >   tsalíka

         1sg(past)-invite

         I invited

    b.   ri-ámɓuha   >   rámɓuha

         1pl(past)-unstuck

         We unstuck

    c.   ri̱-énḓe   >   réṉḓe
          1pl(past)-go
          we went

When the first vowel of the root underlyingly bears a tone, the tone of the subject prefix *rí*-cannot shift. [7] Bearing a tone, the vowel of the prefix then cannot disappear (15b).

(15)   Cassimjee & Kisseberth (to appear) and personal data
         a.   (i)   rí̱-(y)e̱le
                       1pl(past)-wash
                       we washed
             (ii)   rí̱-(y)e̱ŋge
                       1pl(past)-hate
                       we hated
         b.   (i)   *rele/*réle/*relé
             (ii)   *reŋge/*réŋge/*reŋgé

4.2.   Tone prevents vowel from gliding

Besides avoiding the deletion of vowels, the presence of a tone also prevents gliding in Shingazidja. In section 4.2.2, some data demonstrating this phenomenon are proposed. Before discussing these examples, a small introduction to the tonology of Shingazidja, necessary for a comprehension of the alternations which will be proposed in section 4.2.2, will be provided (section 4.2.1).

4.2.1.   Tone shift & OCP phenomena

The tonal rules and phenomena of Shingazidja were identified and described by Tucker & Bryan (1989) and Cassimjee & Kisseberth (1989; 1992; 1993; 1998). [8]

     Shingazidja exhibits an 'unbounded' tone shift phenomenon. In (16a), the noun *waleví* 'drunkards' has a High tone on its final syllable in isolation. In (16bi), however, the tone originally associated to the last syllable of this same noun *waleví* shifts to the penultimate syllable of the adjective *wailí* 'two'. In (16ci), however, this noun receives the shifted tone of the verb *hawó̱no* 'he saw'.

(16)   a.   wa-leví
              2-drunkard
              drunkards
       b.   (i)   wa-lev̱i   wa-íḻi
                  2-drunkard 2-two
                  two drunkards
            (ii)   *waleví wailí*

---

[7] See section 4.2.1 for a short description of the tonal rules of Shingazidja.

[8] See also Patin (2007a) for a recent description of Shingazidja tonal phenomena showing similar results, and Philippson (1998; 2005) for a presentation of tonal phenomena in all the Comorian varieties.

c. (i)   ha-w<u>o</u>no   wa-lév<u>i</u>
            3sg(past)-see 2-drunkard
            he saw drunkards
    (ii) **hawóno waleví*

The shift of the first tone leads to the deletion of the second one. In (16ci) , the tone of the last syllable of *waleví* 'drunkards' is deleted because it is adjacent to the tone of the verb, which surfaces on the penultimate syllable of the noun. This deletion is triggered by the *Obligatory Contour Principle*, which prevents the adjacency of two identical elements – here, two High tones. In a sequence of High tones, then, the first one shifts to the syllable preceding the following one, and every other tone is deleted.

Eventually, it has to be noted that in Shingazidja, as in many other Bantu languages, the last syllable of the utterance is 'extraprosodic'. In Shingazidja, it means that the final syllable car bear a lexical tone – cf. the nouns that belong to category 1 (11a) – but cannot be the target of tone shift – cf. the nouns that belong to category 2 (11bi).

4.2.2. *Tones and glides*

In Shingazidja, a high vowel may glide when it follows an /a/. In (17), the /i/ turns to its glide counterpart when it is preceded by the low vowel.

(17)   Cassimjee & Kisseberth (to appear) and personal data

      a.   tsi-d<u>á</u>i   >   tsid<u>á</u>y
          1sg(past)-claim one's right
          I defend myself
      b.   tsi-f<u>á</u>i   >   tsif<u>á</u>y
          1sg(past)-be useful
          I was useful
      c.   ha-<u>i</u>-ré<u>ŋge</u>   >   ha-<u>y</u>-ré<u>ŋge</u>
          3sg(past)-OM9-take
          he took it (the ring)

However, the gliding is avoided in normal speech rate when the high vowel is High-toned. In (18a) and (18b), contrary to the verbal forms that are proposed in (17a) and (17b), the /i/ is the vowel in the hiatus that bears the tone. In this situation, /i/ is realised as a plain vowel, and not as a glide. Similarly, the object marker of class 9 is realised as a plain vowel in (18c) because its tone, blocked by the underlying tone of the root -*n<u>í</u>k*-, is not free to shift. In (17c), the shift of the tone allows the object marker to be realised as a glide.

(18)   a.   tʃa<u>í</u>   *tea*   *tʃay/*tʃáy
        b.   madjwa<u>í</u>   *eggs*   *madjway/*madjwáy
        c.   ha-í-n<u>i</u>ka   *hayníka
           3sg(past)-OM9-give
           he gave it (the ring)

Evidence in favor of the role of tone in the preservation of the syllabic nature of the high vowels also comes from alternations between plain vowels and glides depending on the tonal shape of the utterance (19). In (19ai), (19bi) and (19ci), a High-tone vowel is realised as a plain vowel. In (19aii), (19bii) and (19cii), however, the deletion of its tone resulting from the shift of a preceding tone leads to the gliding of these vowels. (19d) presents the opposite situation, since a vowel which may glide when the word to which it belongs is isolated has to be realised as a plain vowel when it bears a shifted tone (19dii).

(19) a. (i) nɗa-í̱=βi̱
              int-CLM9=int. part.
              which one (the arm)?
      (ii) mi-h̠ono nɗá-í > mi-h̠ono nɗá-y̱
              4-arm   int-4
              which arm?

b. (i) tʃaí̱ *tea*
    (ii) ŋgam-(w)a̱ndzo tʃái̱ > ŋgam(w)a̱ndzo tʃáy̱
            1sg(pres)-like   tea
            I want tea

c. (i) madjwaí̱ *eggs*
    (ii) ŋgam-l̠o   ma-djwái̱ > ŋgam-l̠o ma-djwáy̱
            1sg(pres)-eat 6-egg
            I ate eggs

d. (i) má̱u > má̱w *almond*
    (ii) ma̱ú nɗaru *three almonds*   *má̱w nɗaru/ʔma̱w nɗáru [9]

The forms proposed in (19bi) and (19bii) are illustrated, respectively, in the figures 3 and 4. The final vowel of the word *tʃaí* 'tea', since it bears a High tone [10], is realised as a plain vowel when the word is isolated; in the figure 3, the segment that corresponds to this vowel presents intense formants and is introduced by slow formant transitions. The final vowel of the word *tʃaí* 'tea' is realised as a glide when it does not bear a tone (19bii); in the figure 4, the segment that corresponds to this vowel presents less intense formants and is introduced by fast formant transitions. [11]

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[9]Under certain circumstances, tones can be deleted – see Cassimjee & Kisseberth (to appear), Patin (2007a;b).
[10]Which is downstepped because it is the last tone of the utterance.
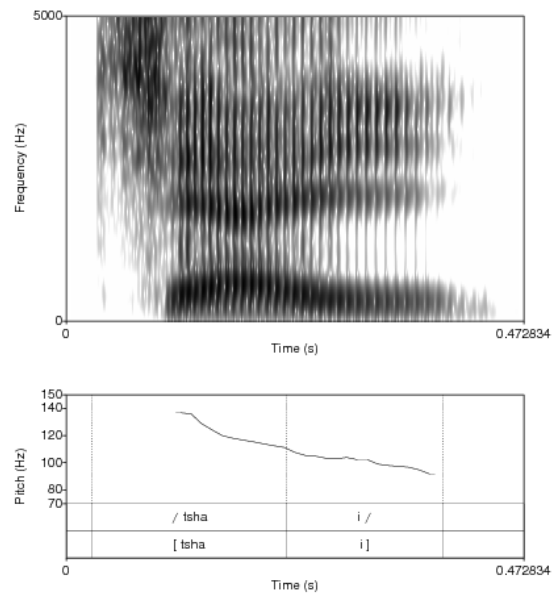[11]Besides these considerations, one can see a difference in duration between the two realisations of this segment.
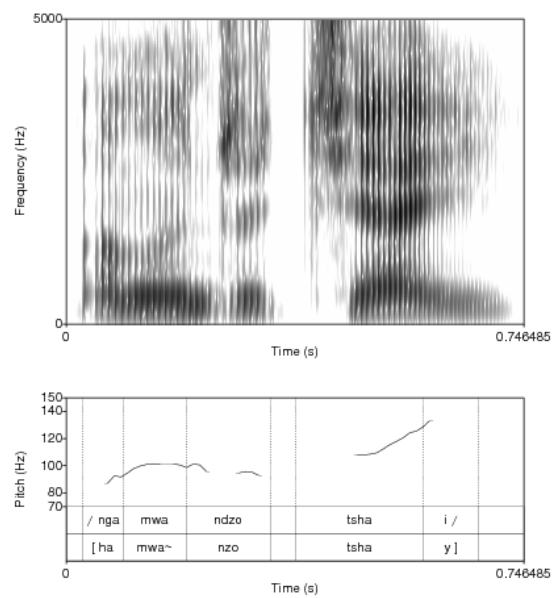
Figure 3: / tʃaí /   [tʃa↓í]   *tea*

Figure 4: / ŋgamwándzo tʃaí /   [hamwã̄nzo tʃáy]   *I want (like) tea*

5. An OT analysis of the tone-vowel interaction in Shingazidja

In this section, I will provide a first attempt of an OT analysis of the data discussed in the previous section. First, I will present an introduction to *Optimal Domains Theory* [ODT] (Cole & Kisseberth 1994; 1995, Cassimjee & Kisseberth 1998) and its application to the analysis of tonal systems, and a basic sketch of an analysis of the tonology of Shingazidja (section 5.1). Then, I will discuss the analysis of the tone-vowel interaction in an OT framework (section 5.2).

5.1. Optimal Domains Theory
5.1.1. An introduction to ODT

Cassimjee & Kisseberth (1998:38) defines ODT as follows:

> "Optimal Domains Theory adopts OT in all its essential aspects, but adds one additional ingredient: it assumes that just as segments are organised into domains (syllables), so features are also organised into domains ('featural domains' or 'F-domains'). Just as a segment that is not in a domain cannot be pronounced, so a feature that is not in a domain cannot be pronounced. The domain 'licences' the feature so to speak."

For instance, in (20a), all the vowels are nasal vowels because they are situated inside the domain of the feature [+nasal]. In (20b), however, only the last syllable of the sequence is a nasal vowel, because the domain of the nasal feature is restricted to the final syllable.

(20) a. $(c\tilde{v}c\tilde{v}c\tilde{v})_{[+nasal]}$
      b. $cvcv(c\tilde{v})_{[+nasal]}$

Just as all the other linguistic items, the domains are associated to specific constraints. In (21), the basic faithfullness constraints that are associated to domains are presented.

(21) *ODT faithfulness constraints* (Cassimjee & Kisseberth 1998)
      a. DOMCOR (F)
          there is a one-to-one correspondence between input F-specifications and output F-domains
      b. INCORPORATE (F)
          every F-sponsor is in a domain
      c. UNIQUENESS (F)
          there is only one sponsor of F in a domain
      d. EXPRESS (F)
          every element in the F-domain capable of expressing the feature F should realize (express) F
      e. B(ASIC) A(LIGNMENT) R(IGHT)
          align the Right edge of a Feature domain with the Right edge of the feature-sponsor to which it 'corresponds'

    f.   B(ASIC) A(LIGNMENT) L(EFT)
         align the Left edge of a Feature domain with the Left edge of the feature-sponsor
         to which it 'corresponds'

If the faithfulness constraints are undominated in the hierarchy of a language, the domain is restricted to the syllabe or mora to which it is underlyingly associated (the *sponsor*). In the northern dialect of the Bantu language Asu, for instance, the *High-tone domain* corresponds to its *sponsor* – i.e. a High tone is realised on the vowel which underyingly bears it (22).

(22)   ASU; Bantu [G22], Tanzania (Philippson 1991)
        /ku-fín-ik-ir-a/   >   ku(fî)nikira   *to cover*

In Bantu languages, this situations is however quite exceptional. In the previous section, it has been demonstrated that the tone in Shingazidja is frequently not realised on the vowel to which it is originaly associated. The domain of the tone is thus not, in this language, restricted to the sponsor of the tone.

    Cassimjee & Kisseberth (1998) proposed an application of ODT to the analysis of tonal systems. They proposed that the length of the domain depends on the ranking of *alignment constraints* – e.g. BAR (21e) and BAL (21f). In (23), two of these alignment constraints are presented.

(23)   a.   *MONOHD
          A domain cannot be monomoraic/monosyllabic
     b.   ALIGN PWD R
          Align the right edge of a domain with the right edge of the prosodic word

In (24), three different rankings involving alignment constraints are proposed.

(24)   a.   BAR » *MONOHD, ALIGN PWD R
          → (cv́)cvcvcvcv
     b.   *MONOHD » BAR » ALIGN PWD R
          → (cv́cv́)cvcvcv
     c.   ALIGN PWD R » BAR
          → (cv́cv́cv́cv́cv́)

If BAR remains undominated (24a), the domain of a tone will be restricted on its right to the right edge of the sponsor – e.g. in Asu (22). If *MONOHD dominates the faithfulness constraint BAR, the optimal domain will be composed of two syllables (24b), since it constitutes the minimal violation of the constraint *MONOHD. If ALIGN PWD R is undominated, the domain will expand up to the end of the word (24c).

5.1.2. *An ODT analysis of Shingazidja tonology*

In this spection, a simplified ODT analysis of the Shingazidja tonology is proposed, largely based on the analysis that was proposed in Cassimjee & Kisseberth (1998). This analysis is necessary to generate the placement of the tone(s) in an utterance, which will determine the

possibility for a vowel to glide. Due to space restrictions, I will not be able to provide a datailed analysis of the system – for further details, the reader may refer to Cassimjee & Kisseberth (1998) and Patin (2007a).

As noted before, Shingazidja presents an 'unbounded' tone shift phenomenon, and a rule that deletes every even-numbered tone. In (25) – extracted from (16), the tone of the verb *hawóno* 'he saw' shifts to the penultimate syllable of the utterance, and the tone of the noun *waleví* 'drunkards' is deleted.

(25)   ha-wọno   wa-lévị
        3sg(past)-see 1-drunkard
        he saw drunkards

The optimal candidate that corresponds to (25) is proposed in (26):

(26)   ha(wọno walé)vị

This candidate involves a domain which expands to its right, up to the end of the group. Then, the faithfullness constraint BAR has to be dominated by another constraint, ALIGN PP R, which is defined in (27).

(27)   ALIGN PP R
        Align the right edge of a domain with the right edge of the phonological phrase [12]

The deletion of the second tone will result from the high ranking of the constraint NO ADJ(ACENT) EDGES (28), which prevents the adjacency of two feature domains.

(28)   NO ADJ(ACENT) EDGES
        *)(

The respective rankings of these constraints and some other faithfulness constraints is presented in (29)

(29)   a. ALIGN PP R » BAR (⇐ *ha(wọ́)no mle(ví)*
        b. UNIQUENESS » ALIGN PP R (⇐ *ha(wọno mleví)*
        c. ALIGN PP R » NAE (⇐ *ha(wọnó) mle(ví)*
        d. NAE » DOMCOR (⇐ *ha(wọno mlé)(ví)*

A last issue is the realisation of tones inside the domain. Since Shingazdja presents an unbounded tone shift and not an unbounded tone spread, another constraint, preventing the expression of tones on all the vowels inside the domain except the last one, is necessary.

Cassimjee & Kisseberth (1998) proposed that each domain has a head which is correlated with the direction of the extension of the domain. In Shingazidja, the tone only appears on the last syllable of the domain (*ha(wọ́nó mlé)vị*), e.g. on its 'head'. To account for this restriction, the constraint *(H,nonhead) (30) has to be high-ranked.

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[12]Evidences that the *phonological phrase* is the domain of tone shift in Shingazidja are provided in Cassimjee & Kisseberth (1998) and Patin (2007a).

(30)   *(H,nonhead)
        do not express a H on a nonhead

A possible, simplified analysis of the example (25) is proposed in the tableau (31).

(31)   Shingazidj

/hawóno mleví/		UNIQUENESS	*(H,nonhead)	ALIGN PP R	NAE	BAR	EXPRESS H
a.	ha(w<u>ó</u>nó mlé)v<u>i</u>		*!*	*		**	
b.	ha(w<u>ó</u>)no mle(v<u>í</u>)			**!*			
c.	ha(w<u>o</u>no mlev<u>í</u>)	*!				***	***
d.	ha(w<u>o</u>nó) mle(v<u>í</u>)			**!		*	*
e. ☞	ha(w<u>o</u>no mlé)v<u>i</u>			*		**	**
f.	ha(w<u>o</u>no mlé)(v<u>í</u>)			*	*!	**	**

In (31), the optimal candidate is the candidate *e*, because it minimally violates the constraint ALIGN PP R, and does not violate the high-ranked, unviolalable constraints UNIQUENESS and *(H,nonhead).

5.2.   *Tone and gliding in Shingazidja*

This section is a first attempt of an analysis of the role of tone on the syllabic status of vowels in Shingazidja. The first section (section 5.2.1) discusses the analysis of gliding in OT and motivates a high ranking of the constraint ONSET, which states that a syllable must have an onset, in Shingazidja. Then (section 5.2.2), I will quickly discuss some corresponding phenomena involving *accents* in Romance languages. The last section (section 5.2.3) introduces a new constraint, V́-μ, and discusses its ranking in Shingazidja and beyond.

5.2.1.   *Gliding*

Many OT scholars who have studied gliding consider that this phenomenon is triggered by the high ranking of the markedness constraint ONSET (Rosenthall 1994, Hamman 2003, de Veer 2006), dominating one or more faithfulness constraint(s). The constraint ONSET is defined in (32).

(32)   ONSET
        A syllable must have an onset

Adopting an OT analysis, one has to consider that the constraint ONSET is high-ranked in Shingazidja. In this language, several phenomena are used to prevent hiatus situations (33), e.g.

the deletion of one of the vowels (33a), coalescence (33b), the insertion of a glide between the vowels (33c) or the gliding of one of the vowels (33d).

(33)   a.   deletion = ts*i*end*ɛ́* → tsend*ɛ́*   *I went*
       b.   coalescence = ma-índj*i* → méndj*i* [13]   *many (cats)*
       c.   glide insertion (optional) = tsiono ≈ tsi*wo*no   *I saw*
       d.   gliding = mu-ána → m*wá*na   *child*

I will consider, following Hall (2003)'s account of German, that ONSET dominates the constraint MAX-μ, defined in (34), in Shingazidja.

(34)   MAX-μ
       A mora in the input corresponds to a mora in the output

5.2.2.   *Gliding and prominence*

While the role of tone on the moraicity of vowels has been understudied, it is well known that stress or accent prevents vowels from gliding in Romance languages [14] – e.g. in Catalan (Cabré & Prieto 2004), Italian (de Veer 2006) or Romanian (Steriade 1984). In Spanish (Rosenthall 1994), for instance, the vowel /i/ preceding an /a/ will glide (35a) except if is a *stressed* vowel.

(35)   SPANISH (Rosenthall 1994:162)
       a.   grafía [gra.fía]   *written form*
       b.   agrafia [a.ɣrá.fja]   *agraphia*

Various constraints, whose definitions are roughly similar, have been proposed by scholars to account for the preservation of the syllabic status of vowels in these languages. Some of them are given in (36).

(36)   a.   IDENT/ś   (de Veer 2006)
            No vowel-to-glide mapping in heads of prosodic words (i.e. syllables which receive main stress)
       b.   IDENT-S'(SEG)   (Lambert 1999)
            Segments in the stressed syllable must have a one-to-one correspondence with their input segments
       c.   Max-T-IO   (Komen 2007)
            A vowel that bears lexical tone in the input should be realized in the output

To account for syllabic preservation in Shingazidja, I will propose that a constraint V́-σ/μ,

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[13]NB: the High-toned vowel is not preserved in this situation. I have no explanation so far to account for this exception.

[14]This is also the case in many other languages, such as German (Hall 2003), Chechen (Komen 2007) or Slovenian. This last case has been raised by Alja Ferme, who reviewed this paper and to whom I am grateful. In this language also a stressed vowel is not free to glide. Compare for instance the following variants, where the place of the stress differs: *naučil* [naˈučiw] ≈ [nawˈčiw] 'teach, *perfective past participle masculine*'(data: Alja Ferme, *p.c.*).

which belongs to the same constraint family, dominates the constraint ONSET. This constraint is defined in (37).

(37)   V́-μ
        a tone bearing unit has to be moraic

5.2.3. Shingazidja

The forms in (38), extracted from (19), are represented using the notion of domain. In (38a), the final vowel is situated inside a one-syllable domain, and is thus licensed to express its tone. In (38b), there is no domain corresponding to the underlying tone of the word *tʃaí* 'tea', because the existence of this domain would constitute a violation of OCP, i.e. here a violation of NAE. (38b) has indeed the same tonal pattern that the sentence *hawọno walévị* 'he saw drunkards' that was analysed in section 5.1.2. Then, the final vowel cannot express its tone, and thus is able to glide.

(38)   a.   tʃa(í)   *tea*
        b.   ŋgam-(w)ạndzo tʃái   >   ŋga(mwạndzo tʃá)y̱
              1sg(pres)-like   tea
              I want tea

The role of the High-ranked constraint V́-μ in Shingazidja is illustrated in (39).

(39)   Shingazidja

		/ngamwándzo tʃaí/	V́-μ	ONSET	MAX-μ
a.		ŋga(mwạndzo tʃá)i̱		* !	
b.	☞	ŋga(mwạndzo tʃá)y̱			*
		/tʃaí/			
a'.	☞	tʃa(í)		*	
b'.		tʃa(ý)	* !		*

In this tableau, the constraint ONSET dominates the faithfullness constraint MAX-μ. Then, the candidate *b*, which does not violate the constraint ONSET, is selected, even if it violates the faithfullness constraint. The candidate *b'* also respects the constraint ONSET, but it violates the constraint V́-μ. The candidate *a'* is thus selected.

What is important here is the fact that the position of the tone, which is determined by the constraints that were discussed in section 5.1.2, can determine the syllabic status of the vowels. In (40), extracted from (19), the shift of the tone – i.e. the length of the domain – conditions the realisation of the final vowel of the word *máụu* 'almond'.

(40)   a.   máụu   >   máw   *almond*
        b.   maụú nḍaru   *three almonds*   *máw nḍaru/$^{?}$mạw nḍáru

In other languages, however, ONSET will dominate V́-μ. In other words, the gliding will not be conditioned by the fact that the underlying vowel bears or not a tone. In Shimakonde, another dialect of the Makonde language (Liphola & Odden 2000), the presence of a tone on a vowel will not prevent its realisation as a glide. In the imperative forms in (41), a High tone is assigned to the penultimate vowel of the verb – cf. (41a). However, if the penult turns to a glide, the tone will be deleted.

(41)   SHIMAKONDE; Bantu [P23], Mozambique (Liphola & Odden 2000)

     a. (i)   liíma   *cultivate!*
        (ii)   lim-iíl-a   *cultivate for!*
        (iii) lim-ang-iíl-a   *cultivate for! (rep.)*
     b. (i)   loómba   *marry!*
        (ii)   loomb-w-a   *be married!*
     c. (i)   luúma   *bite*
        (ii)   luum-w-a   *be eaten*

In (41bii) and (41cii), for instance, the passive morpheme -*u*- turns to a glide before the final vowel /a/ [15] and then cannot bear a tone, contrary to the forms in (41bi) and (41ci), which do not incorporate the passive morpheme.

6.   Conclusion

In this paper, building on data coming from various languages, I have demonstrated that the presence of a tone may prevent the deletion or the gliding of a vowel. This assertion was notably supported by a detailed analysis of similar phenomena in the Bantu language Shingazidja. In a first attempt of an OT analysis, I proposed that the absence of gliding may result from the high ranking of a constraint V́-μ, which says that a *tone bearing unit* has to be moraic.

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[15]Alja Ferme asked me if the passive marker ever emerges as [u] and takes a tone. To my knowledge, the passive marker is always realized as [w] in Shimakonde (I found no example where the passive marker is realized as [u] in Liphola & Odden (2000) nor in Liphola (2001)). In other Bantu languages, however, the passive marker emerges as [u]. This is for instance the case in the Lunyala dialect of the Luluyia language (Marlo 2007) – e.g. *abhukúlúa* 'he is being taken' (vs. *abhukúlwá* in the Lumarachi dialect).

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The nature of cognate objects
A syntactic approach

Cristina Real Puigdollers

This paper provides an analysis of the so-called C(ognate) O(bject) C(onstruction) (*eg. He sighed a weary sigh*) on the basis of a syntactic theory of lexical decomposition. I examine the main properties of this construction and the differences it shows with respect to another one that has been related in the literature and that I will call the H(yponymic) O(bject) C(onstruction). Once these two structures are analyzed independently, we observe a difference between English and Romance with respect to their distribution. Finally, the paper is devoted to analyzing the cross-linguistic distribution of COs and to their co-relations with other unselected objects.

1. Introduction

This paper provides a survey of the Cognate Object Construction (COC) exemplified in (1):

(1)   a. John died a gruesome death.
        b. Harry lived an uneventful life.

(Jones 1988:89)

COs have received widespread attention in the lexical(/syntax)-semantics literature. The discussion has been focused on the borderline status of COs regarding the argument/adjunct dichotomy. In general terms, three proposals have been put forth: (i) those that analyze COs as arguments (Massam 1990; Hale & Keyser 1997; Pham 1998; among others), (ii) those that consider COs as adjuncts (Jones 1988; Zubizarreta 1987; Moltmann 1990; Mittwoch 1998) and, finally, (iii) those that argue that there are two types of COs, adjunct and argument COs (Pereltsvaig 1999a, 1999b, 2001; and Nakajima 2006).

One of the main problems in the discussion lies in the multiple meanings that the term *cognate* receives. As has been frequently pointed out (e.g. Jones 1988 or Pereltsvaig 2001), the different approaches in (i) and (ii) are based on the examination of different constructions. Theories of the (ii)-type take into account COs that are clearly adjuncts of the verb (see the examples in (2)), as shown by different properties such as case marking or the lack of selection restrictions; that is, they can appear with all kinds of predicates: unergatives, unaccusatives, passives, transitives, adjectives, stage-level and individual-level predicates.

Several languages such as (Modern and Biblical) Hebrew make extensive use of this construction to express manner adverbial modification. Due to lack of space, I will leave aside this kind of COs .

(2) a. Ein   hu mofi'a hfa'a   taxbirit   ba-mišpat.   [Hebrew]
        not   it   appears appearance syntactic in-the-sentence
        'It does not appear syntactically in the sentence.'

                                                                    (Mittwoch 1998:314)

     b. Ivan   ulybnulsja ščastlivoj   ulybkoj.   [Russian]
        Ivan-NOM smiled   happy   smile-FEM-INSTR
        'Ivan smiled a happy smile.'

                                                                    (Pereltsvaig 1999b:273)

Besides the examples in (2) the term CO has been applied to other construction type that displays different properties. This construction is exemplified in (3). I will refer to this construction as the Hyponymic Object (HO) construction since the object does not need to be morphologically related to the verb, but it can be any noun (or a CP in some cases, see (3c)), which is understood as a hyponym of the verbal root.

(3) a. Sam danced a jig.
     b. Bill dreamed a most peculiar thing.
     c. Bill dreamed that he was a crocodile.

                                                                    (Jones 1988:89)

For example, Jones (1988) treats COs and HOs as different constructions. For him, the former, (1), is a genuine CO and is analyzed as an adjunct, while the latter, (3), is described as an ordinary object. Jones sustains this hypothesis on empirical grounds that I summarize in (4) and (5).

(4) CO PROPERTIES
     a. *A silly smile was smiled.   [Passivization]
     b. *A silly smile, nobody smiled.   [Topicalization]
     c. *Maggie smiled a silly smiled and then her brother smiled.   [Pronominalization]
     d. *He smiled the smile for which he was famous.   [Definiteness Restriction]
     e. *What did he die?   [Questioning]
     f. ?He died a death.   [Modifier obligatory]
     g. *He died a suicide/ a murder.   [Object necessarily cognate]

(5) HO PROPERTIES
     a. The Irish jig was danced by Bernardette Dooley.   [Passivization]
     b. The Irish jig, nobody danced.   [Topicalization]
     c. I sang the aria then Tosca sang it.   [Pronominalization]
     d. Fred danced the slow number.   [No Definiteness Restriction]
     e. What did he sing?   [Questioning]
     f. She sang a song.   [Modifier non obligatory]
     g. He sang an aria / a song.   [Object not necessarily cognate]
                                                    (adapted from Massam 1990:164-165)

The contrasts between COs and HOs listed above have been challenged by Massam (1990) who argues that the differences between these constructions are spurious. For her, their different properties (if any) are brought about by the eventive meaning of these objects: the fact that Cognate Objects are interpreted as events.

In contrast, Romance languages have few examples of COs (these languages prefer these objects to be introduced as adjuncts, e.g. Sp. *María sonrió con una sonrisa malévola 'María smiled with a malevolent smile'*), but makes an extensive use of the HOC, compare (6) and (7).

(6) a. *María sonrió   una   sonrisa malévola.   [Spanish]
        María smiled   a   smile   malevolent
    b. *Gianni è morto   una   morte   lenta.   [Italian]
        Gianni is dead   a   death   slow

(7) a. La   Maria   va   ballar   una   sardana.   [Catalan]
       the   Maria   AUX dance   a   sardana
       'Mary danced a sardana.'
    b. Juan cantó una   canción preciosa.   [Spanish]
       Juan sang a   song   beautiful
       'Juan sang a beautiful song.'

However, the COC is not totally absent from Romance:

(8) a. Reir   la   risa de un niño   [Spanish]
       to.laugh the   laugh of a   child
       'To laugh the laugh of a child'

                                                   (Mendikoetxea 1999: 1578)
    b. Dorme il   sono del   giusto.   [Italian]
       sleeps the   sleep of.the   fair
       'He/she sleeps the sleep of the just.'

                                                     (Renzi 1988: vol.1, 60)
    c. Pleurer toutes   les   larmes de son   corps   [French]
       to.cry all   the   tears   of his   body
       'To cry all the tears of his/her body'

                                                       (Grevisse 1993:393)

The difference between these languages consists in the fact that the few COCs[1] found in Romance do not keep up with the alleged properties presented above. Keeping in mind the distinction between HOs and COs, I study the main properties of COs both in English and in Romance Languages, and I argue that COs in Romance are always identical to HOs.

In this paper I endorse Massam's proposal that COs in English are syntactic objects with the peculiarity of being interpreted as events. However, I depart from her analysis in a substantial point: the fact that the CO is interpreted as an event is a consequence of its structural position, which is different from the HOC. In this respect COs are similar to other

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[1] I leave aside certain constructions in Romance like Adverbial COs of the type: *Caminaban por un camino difícil* [Spanish] 'They walked [on] a difficult way' or: *murió de una muerte lenta* [Spanish] 'He died [of] a slow death' mentioned above.

objects found in English, such as Reaction Objects (e.g. *Mary smiled her thanks*) or Effected Objects (e.g. *Mary baked a cake*), which could be argued to be interpreted as events following Marantz (2005b). The contrast with Romance COs resides in the impossibility in these languages to have unergative verbs with complement DP objects interpreted in this way.

Having stated the puzzle, I argue that the contrast between English and Romance can be related to another kind of Unselected Objects, such as those that appear in resultative constructions. I observe that there is a cross-linguistic correlation between these constructions, a fact already observed by Tenny (1994) and Horrocks & Stavrou (2006). My proposal tries to give a unified account of the full range of phenomena mentioned above.

2. English cognate objects

COs have been classified as adjuncts because they show properties that are not characteristic of prototypical objects, as summarized in (4). Most of these properties, however, have been questioned in the literature. For example, as shown by MacFarland (1995) the lack of passivization is not a characteristic of all COs. The scarcity of examples is due to the non-referential status that these objects are frequently associated with, which makes them non suitable for being topics in English. If we make the CO referential by adding a restrictive relative clause, for example, the result is perfectly grammatical. On the same grounds, lack of topicalization is available for COs under the same conditions (10).

(9)   a. One of the silliest smiles I've ever seen was smiled by Mary.
       b. On the parade grounds commands must be roared, not whispered

(10)   The big cheery smile, Fran smile: it was Elsie who smiled the insipid smirky smile.
                                                                      (Massam 1990:181)

The lack of passives within the COC is one of the main arguments of the advocates of the adjunct CO hypothesis. For example, Jones (1988) defends the idea that COs are caseless based on the following proof: COs do not need to A-move for case reasons, since as NP adjuncts (adopting a modified version of the Case Filter), they do not need to receive case. As we have seen, the restriction in passivization can be explained in other grounds without the need to postulate any reduction of the Case Filter. Furthermore, it seems false that COs are caseless. If we compare their behavior with that of other modifiers and adjuncts, we can conclude that COs do receive structural objective case in English. For example, see the contrast between COs ((11a) and (12a)) and verbal modifiers ((11b) and (12b)): COs are not compatible with direct objects and impose a strong requirement of verbal adjacency (cf. Massam 1990).

(11)   a. *Mordred killed the knight a gruesome kill.
       b. Mordred killed the knight gruesomely.

(12)   a. Let Ben run (*quickly) a little run.
       b. Ben always runs (quickly) that way.
                                                                      (Massam 1990: 166)

The rest of the properties, like the Definiteness Restriction (DR) or the impossibility of resuming these objects with a pronoun can be explained following the same reasoning, namely, the semantic interpretation of the CO, which is not understood as a referential object. However, as pointed out by Massam (1990), the referential reading of the cognate is always a possibility and, hence, it is easy to find counterexamples to the properties discussed above.

Another special property of COs is that it is impossible for these complements to be resumed with a pronoun. Crucially, this test has also been argued to distinguish HOs from COs (cf. Jones 1988; Massam 1990).

(13) a. I sang the aria then Tosca sang it.
      b. *Maggie smiled a silly smiled and then her brother smiled it.

Once more, this property can be linked to the eventive interpretation of COs. Actually, pronominalization is possible with these objects in those cases where event anaphora is possible (as shown in the example below from Mittwoch 1998).

(14) a. A: John didn't wash his hands.   B: Yes, I saw it.
      b. Mona smiled a tantalizing smile. Penelope noticed it and decided immediately that she would photograph it.

                                                      (Mitwoch 1998: 310)

Therefore, the contrast stated in (13) only shows that COs do not refer to entities but to events. However, as we have seen, the contrast vanishes if COs are made referential.

(15) Mary screamed a blood-curdling scream and she screamed it practically in my ear.
                                                    (Kuno & Takami 2004:132)

One of the properties that have been used as an argument against the argumenthood of COs is their aspectual contribution to the interpretation of the predicate. At first sight, COs seem to behave in a different way than HOs, which clearly induce telic readings, as can be seen in the contrast between (16) and (17).

(16) a. She danced for hours / #in one hour.
      b. She danced a polka for hours / in one hour.

(17) a. She smiled for ten seconds / #in ten seconds.
      b. She smiled a winning smile for ten seconds / #in ten seconds.

As before this property could be reduced to the semantic properties of COs. Thus, it is well known that the denotation of the direct object contributes to the aspectual interpretation of the predicate (Krifka 1998, Verkuyl 1999, among others). As shown before, prototypical COs do not denote objects and thus they do not serve to delimit the event denoted by the verb.

However, several authors (e.g. Tenny 1994; MacFarland 1995; Horrocks & Stavrou 2006) have pointed out that COs delimit the event denoted by the verb despite their incompatibility with frame adverbials (cf. 17b). These authors argue that the activity of smiling in 17b seems to provide a limit that is imposed by the CO, and the incompatibility of the frame adverbial is due to the fact that it is not an incremental theme (i.e. the fact that it is not the progressive creation/consumption of the object what leads to the culmination of the event). They argue

that the fact that these objects somehow structure the event (the event of smiling arrives to a culmination when the smile is complete) can induce a telic effect. As shown in the examples below, if the verb does not have an object, the event is not structured and no modifier can appear referring to parts (or subparts) of it. The contrast in 18 illustrates this point.

(18) a.   He was in the middle of sighing a weary sigh when the phone rang.
      b. #He was in the middle of sighing when the phone rang.

(Horrocks & Stavrou 2006:3)

However, it is not clear why, if the CO was able to measure the event, the construction remains still incompatible with frame adverbials, contrary to what happens with HOs. Actually, the notion of Incremental Theme as stated by Dowty (1991) establishes that in certain predicates there is a homomorphism between the physical extent of the argument and the temporal progress of the event (Rappaport Hovav & Levin 2002). Formally, the relation between the predicate and the object would be a 'part-of' relation defined by Dowty (1991) in these terms, 'If *x* is part of *y*, then if a telic predicate maps *y* (as Theme) onto event *e*, it must map *x* onto an event *e'* which is part of *e*"(Dowty 1991:567). For example, in an event of "writing a letter" parts of the letter corresponds to subevents that are part of the whole event of writing a letter. If we apply this reasoning to a predicate such as "to sigh a weary sigh", we see that parts of the sigh do not correspond to parts of the event of sighing, instead in this sentence a part of a sigh corresponds by itself to a complete event of sighing.

Let us focus now in a predicate such as "to dance a dance". This predicate is ambiguous in this respect. In one reading, the reading in which "a dance" is understood as an event, it is not true that parts of the dance are homomorphic with parts of the event of dancing, since the object denotes a complete event of dancing by itself. In other words, the assertion that "when the event of "dance a dance" is half over, we can say that there exists a half dance" is false, since even when the event is half over we can say that there has been a complete event of dance.

However, in the other sense, the predicate acts as an Incremental Theme. In the reading in which the object is understood referentially, we observe that it is true that parts of the dance (e.g. some parts of a polka) can be identified with parts of the event. In other words, when the event of "to dance a (concrete, specific) dance" is half over, then it is true that there is a half of this specific dance (e.g. a polka) that has been completed. For this reason the sentence in (19) is compatible with both a frame adverbial (with a specific reading of a concrete dance (a polka)) and a durational adverbial.[2]

(19)   She danced a beautiful dance in an hour/ for an hour.

Therefore, in the case of "sigh a weary sigh" the object does not act as a measurer of the event. Instead, what the contrast in (18) crucially shows is the existence of event complexity in the COC. When the CO appears, the event denoted by the whole vP is structured allowing the modifier "in the middle of" to refer to any subpart of the event. In this case, the CO does not measure the event, but introduces another one, which the modifier can refer to.

The ambiguity of COs is made evident again by the two interpretations the adjectival modifier is subjected to. In the eventive interpretation, the adjectival modification of the noun

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[2] Note that only if *dance* is understood as an event we obtain an atelic interpretation of the predicate. When "a dance" is interpreted as specific, we obtain a repetitive reading with the durative adverbial like in 15b. That is, we understand that she danced a (completed) polka again and again for hours.

in (20b) is understood as semantically equivalent to the verbal modification of the derived adverb of manner in (20a), (see Jones 1988; Massam 1990; Mittwoch 1998; Huddleston and Pullum 2002; among others).

(20) a. He grinned wickedly.
      b. He grinned a wicked grin.

Instead, in the referential interpretation, the nominal just denotes an entity to which the adjectival modifier denotes a property (see Mittwoch 1998, for more details). For example, the sentence in (21) denotes a contradiction in the eventive meaning, but it is completely adequate in the referential interpretation of the nominal. Thus, in the sentence in (21b), the adjective *merry* denotes a property of an entity (a dance) and says nothing about the manner in which the event is achieved; ie. there is not contradiction in dancing sadly a dance that happens to have the characteristic of being merry.

(21) a. #She danced sadly a merry dance.   (CO)
      b. She danced sadly a merry dance.   (HO)

One more time we observe that the English CO is ambiguously standing in between a HO (in which the object has a referential reading) and a CO (with an eventive meaning). These two readings can be disambiguated through the presence of a manner adverb with a meaning opposite to the one denoted by the adjectival modifier. In the CO the interpretation is incoherent, while it is totally appropriate in the HO one.

   As shown by Massam (1990), the Definiteness Restriction (DR) of the nominal is crucially linked to their eventive meaning. As opposed to event nominalizations, which ban the presence of weak determiners (see Grimshaw 1990; Alexiadou 2001), nominals that refer in their unmarked case to a concrete object must be indefinites in order to receive an eventive meaning.

(22) a. The destruction of the city took place yesterday.
      b. A / *The nice peaceful smoke would make me feel better.
      c. A / *The carrot juice would be nice. (in the eventive sense)

                                                              (Massam 1990:186)

As we have observed, the DR can be cancelled out by making the CO referential, resembling HOs, ie. they can appear with definite determiners as in (23a), universal quantifiers as in (23b), and they can establish wide scope readings as in (23c).

(23) a. Who sneezed the high-pitched sneeze?
      b. Tom sneezed every sneeze that we heard that day.
      c. People are smiling a dumb smile these days.

                                                              (Massam 1990:169)

As we have argued this is due to the fact that COCs allow two possible construals as COs and as HOs, when the context allows it.

3. Cognate objects as events

The question now is whether the referential CO and the non-referential/eventive one have two different derivations. Massam (1990) and Horrocks and Stavrou (2006) reject this proposal. They defend the view that there is a single process by which a transitive verb is created from an intransitive one, namely, lexical subordination. In the case of the COs there is an additional subpart that derives the eventive nature of the object by a mechanism of coindexation with the manner component added by lexical subordination (Levin & Rapoport 1988). This coindexation is not present in HO, a fact that explains the contrast between HOs and COs in the passivization of the object. Then in Massam's proposal, HOs and COs have the same Lexical Conceptual Structure (LCS) with the only difference that the internal argument is coindexed with the subordinated action.

(24) a. Tosca sang.
      b. LCS: [x verb]

(25) a. Tosca sang an aria.
      b. LCS: [x CAUSE [y BECOME EXPRESSED]]by [x verb]

(26) a. John laughed.
      b. LCS: [x verb]

(27) a. John laughed a beautiful laugh.
      b. LCS: [x CAUSE [y_i BECOME EXPRESSED]]by [x verb]$_i$

Massam explains the lack of passivization by the mechanism of coindexation, establishing the generalization that direct objects cannot passivize if they contain a bound variable. This generalization can explain why the sentences in (28) are ungrammatical. Note that the bound variable does not need to be syntactically explicit (see (28b)) as in the case of COs.

(28) a. *His way was moaned out the door by Alfred.
      b. *A way was moaned out the door by Alfred.
      c. *Her thanks were smiled by Rilla.
      d. *A silly smile was smiled by John.

(29) a. Matilda was waltzed across the floor by Bill.
      b. A hole was poked in the screen by Linda.
      c. The Irish jig was danced by Bernadette

(Massam 1990:180)

The fact that inside the direct object there is bound variable that become free in a passivization structure explains the ungrammaticality of the sentences in (28) in contrast with (29). However, as seen in the preceding section, it seems to be unnecessary to appeal to binding theory to explain the above-mentioned contrast since lack of passivization is cancelled when the object is made referential. Nevertheless, in Massam's terms the eventive interpretation of the nominal is precisely a consequence of the mechanism of coindexation depicted in (27b). The problem of her account lies in the difficulty to explain how a lexical process (in the LCS) can produce a result similar to the one produced by the violation of the

binding principles, which apply to syntactic structures. Furthermore, this mechanism as stated in Massam can be said to be a stipulation of the theory in order to account for the above-mentioned facts. In this paper, I will endorse a modified version of Massam's proposal, assuming the existence of a process by which the descriptive insight of Massam can be captured without having to postulate an additional device, such as coindexation. Actually, as I assume, contrary to Massam, that arguments are projected directly into syntax without a mapping process from LCSs to argument structure representations, I put forth the proposal that COs and HOs correspond to different derivations. In the first case the object is interpreted as an event and this event interpretation is represented structurally. In the second case, the object is interpreted as referential. I will argue that both readings are obtained by the positions these elements occupy in the structure, assuming a strong version of homomorphism between syntax and semantics.

In order to show this point, let me first introduce Marantz's (2005b) theory of objects as events. The fact that DPs can be interpreted as events is analyzed in Marantz (2005b), which gives us two useful diagnostics in English: *re*-prefixation and the allowance of a benefactive double object construction. Both tests also show that the DP is interpreted as if it were linked to some event: similar to an event of creation. For Marantz (2005a, 2007) the prefix *re* always quantifies the inner subevent (below vP). For this reason *re* is only allowed with verbs that have a direct object (Horn's generalization) linked to some internal event. There is a contrast between incremental theme verbs (e.g. *bake*) and verbs of change of state (e.g. *open*). In the first case *re* quantifies over the object (over the change of state that has as result state the DP object). In the second, *re* quantifies over the change of state event that has as a result the state denoted by the root. Compare (31a) with (31b).

(30)   *John re-smiled.   (but ^{OK}John smiled again).

(31)   a. I re-built the house. (→ end state: a house)
         b. The door re-opened, I re-opened the door. (→end state: open)

(Marantz 2005:1)

Another way to identify DP objects that are interpreted as events is to observe closely the distribution of Benefactive Double Object (BDO) constructions. For Marantz, the BDOC is a kind of high/low applicative in the sense that as a high applicative it relates an event with a DP, but as a low applicative it is attached below vP. For this reason, BDOCs require the presence of an internal subevent in order to be licensed. Again we observe that incremental themes of the kind discussed by Marantz can appear in this construction.

(32)   John baked Mary a cake.

As pointed out by Marantz, COs in English behave as verbs of creation[3].

(33)   a. John smiled Mary a wicked smile.
         b. John danced me a nice dance.
         c. John re-danced the dance.

---

[3] The analysis of English COs proposed allows to capture the meaning of creation observed in the literature on English COs (Jespersen 1961; Quirk et al. 1985; Massam 1990; Nogawa 1995, 1996; Horrocks & Stavrou 2006; but see Mittwoch 1998 for arguments against this view).

From these examples we can conclude that English COs are linked to some subevent of change of state: COs add an eventive layer to the unergative verbal structure. Nevertheless, there is still the question whether there is a structural difference between COs and HOs. The difference between COs and HOs is expressed overtly in Icelandic since the two constructions are morphologically distinguished by case marking on the object. Thus, Svenonius (2001:17) points out that there are two kinds of COs[4] in Icelandic: one that bears dative case (34a) and another that bears accusative (34b).

(34) a. Hún grét sárum   gráti.   [Icelandic]
          she   cried bitter   tears-DAT
          'She cried bitter tears'
      b. Synja sönginn.
          sing   song-acc

                                                                 (Svenonius 2001: 15-16)

The difference between them is related to the referential properties of the object. Svenonius (2001) shows that when an adjective referring to a physical property (excluding, then, the eventive interpretation of the nominal) modifies the object, dative case is not licensed.

(35) a. Hann   dreymd hálfan   draum.   [Icelandic]
          he   dreamt   half   dream-ACC
      b. *Ham   brosti   hálfu brosi.
          he   smiled   half   smile-DAT

                                                                   (Svenonius 2001:16)

Svenonius argues that Dative objects and Accusative objects display a different behavior from the point of view of the aspectual contribution of the object. Thus, Dative Objects are interpreted always as linked to an event that is independent to the one expressed by the verbal predicate. This point is clarified by observing other Dative Objects in Icelandic. A broad set of Dative Objects is found in constructions in which the object undergoes a change of location. As in the example below, dative objects are licensed when a PP expressing a change of location of the object appears.

(36) a. Hann sló köttinn.   [Icelandic]
          he   hit the.cat-ACC
      b. Hann sló kettinum   í   vegginn.
          he   hit the.cat-DAT against the.wall

                                                                   (Svenonius 2001: 4)

Furthermore, dative-accusative alternation is found in the locative alternation: again, when the object denotes the location or the target of movement, it bears accusative case; while when the object expresses the undergoer of the change of location, it appears with dative case.

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[4] It seems that Icelandic has also adjunct COs in the sense described in the introduction and found in languages like Hebrew. The fact that these elements bear dative must not be understood as being like adjunct COs. Actually, dative objects do not behave as prepositional phrases: (i) they undergo object shift, (ii) they can be passivized and (iii) they show the same behaviour as accusative objects regarding particle shift (see Svenonius 2001, for more discussion).

(37) a. Vid hlódum vagninn   med heyi.   [Icelandic]
       we   loaded the.wagon-ACC with hay-DAT
    b. Vid hlódum heyinu   à vagninn.
       we   loaded   the.hay-DAT on the.wagon-ACC

(Svenonius 2001: 9)

Svenonius points out that dative objects are "only licensed in verb phrases which have two parts, an initiation of an event, and some result of that initiation" (Svenonius 2001:5). This contention, explicit with respect the examples in (37a) and (37b) in which we have an overt PP expressing the change of state event (in this case a change of location), can be generalized to cover Dative COs: in this case, the CO expresses the result of a change of state from non-existence to existence. In conclusion, the fact that in Icelandic there is a different case marking between these two COs might support the hypothesis that referential COs and eventive COs are in two different structural positions.

Therefore, in this paper, I propose to extend a modified version of the analysis of creation verbs by Mateu (2003) and Marantz (2005) to English COs. The analysis put forward here assumes a view of argument structure inspired in the works of Hale & Keyser (1991, 1993a, 1998, 1999, 2002); Mateu & Rigau (2000) and Mateu (2002). However, with Marantz (1993) among others, I depart from their assumptions in the fact that I consider the difference between l-syntax and s-syntax in Hale & Keyser's terms spurious: it reduces to the phase in which syntactic operations take place, below or above v^*. Lexicon then is not generative, it has no syntax and it is comprised of roots[5], which bear pure conceptual content, functional heads and grammatical features.

The analysis of English COs I want to endorse share some properties with the one proposed in Mateu & Rigau (2002) and Mateu (2000, 2002) for unselected objects (UO) of resultatives. Mateu & Rigau propose that resultatives are not obtained by the addition of a resultative phrase into a process event, as aspectual approaches commonly assume. Resultatives are rather analyzed in inverse terms: it is the process event what is added by lexical subordination into the resultative structure. However, in their theory, the mechanism of lexical subordination (to which I refer as manner incorporation) is a syntactic device: it follows from the general syntactic operation of *Merge*. Lexical subordination of the manner consists in taking two syntactic objects as in (38) (from Mateu 2000) and fuse them resulting in (39).

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[5] I follow some of the assumptions stated in Mateu (2002) theory of argument structure. The (non-trivial) assumption behind Mateu's theory is that roots are opaque elements to syntax and they cannot entertain any syntactic (and thus semantic in his isomorphic theory) relationship unless mediated by a relational (functional head). Roots then cannot project and always appear in complement position. This conception of roots departs substantially from commonly assumed perspectives on roots are those endorsed by Distributional Morphology theories in which roots can project (Marantz 1993, among other works). The distinction in Mateu aims to establish a crucial difference between the group of functional and lexical categories.

(38)

```
        V                                    V
      /   \                                /   \
     V     P                              V     N
     |    / \                             |     |
    [ ]  N   P                           [ ]  dance
         |  / \                                 •
        boy P   N                              ↶
            |   |
          into room
```

(39)

```
                    V
                  /   \
                 V     P
               /  \   /  \
              N    V N    P
              |    | |   / \
            dance boy P   N
                     |   |
                   into room
```
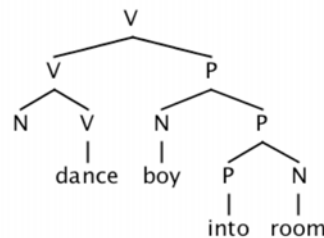
Crucially, in line with Massam (1990) the common process between the structure in (39) and the COC is the lexical subordination of the manner component into an event of causation or creation, respectively. However, lexical subordination as understood here is not a lexical rule but it is general syntactic process as in Mateu & Rigau's proposal, with the only difference that in the proposal defended here this process is seen as the direct adjunction of a root (and not of a lexically marked unergative verb) into the v head.

In order to present the analysis of COs, let me first introduced the analysis of Mateu (2003) and Marantz (2005b) of creation verbs. Abstracting away from the details, both authors assume that, contrary to affected objects, objects of creation verbs are not in a local relation with the verbal root (not in the specifier nor in the complement position).

(40)

```
              v
            /   \
           v     v
          / \   / \
       Root v  v  DP
```
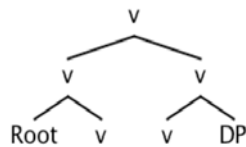
Marantz (2005b) establishes that the DP object is understood as an event in these cases, which can be interpreted semantically as denoting a change of state from non-existence to existence. In his proposal this interpretation is not obtained by any functional projection, but by the position in which the object remains. Marantz argues that in order to postulate any covert functional projection it is necessary to have a paradigmatic or a theoretical justification. As verbs of creation do not show any overt morpheme cross-linguistically, the presence of a change of state head is not justified.

However, as argued in Acedo Matellán (2008), the presence of a functional head denoting the change of state event could be justified on empirical reasons, since it would give a unified

account for the cross-linguistic distribution of resultatives and verbs of creation[6] attested in the literature. If we assume that creation verbs involve a functional head denoting a change of state, we can account for the cross-linguistic distribution of these constructions in an unified way: Romance languages need to incorporate this functional head of change of state (or location) into the verbal head, avoiding manner incorporation. In Marantz's theory it is difficult to determine how such process is ruled out in Romance if verbs of creation do not have a parallel structure to the one observed in the resultative family of constructions. For this reason I would endorse the analysis of Acedo Matellán (2008) for creation verbs, departing from Mateu (2003) and Marantz (2005b) in this respect. I will label this functional head as a Terminal Coincedence Relation (TCR) (see Hale 1986 or Hale & Keyser 2002), a functional head that denotes an event of change of location in which there is a relation between two elements, a figure and a ground, such that the edge of the figure coincides with the edge of the ground. Assuming a localist view of argument structure, in which a change of state is said to be derived from an abstract change of location, the functional projection interpreted semantically as a change of state event is identical to a preposition that denotes a change of location of the type previously described.

The symmetry between the CP and the vP domain can be strengthen if we observe that the two different interpretations associated with HOs and COs are similar to the thetic vs. categorical interpretations of sentences. These two interpretations are associated with the absence/presence of an explicit subject respectively. According to this distinction, in the thetic interpretation, the sentence *There arrived a man* is interpreted as being all a predicate. Instead, in the categorical interpretation, in the sentence "A man arrived", there are two assertions: the assertion of an entity, the subject, and the assertion of a property about it. Drawing a strong parallelism between the clausal level and the verbal domain, we assume that eventive COs are in the complement position of the TCR head, leaving the subject position of the predicative structure empty (in a parallel way as it happens in the clausal domain, see Cardinaletti 2004), obtaining thus a thetic interpretation of the object. That is, an interpretation in which "an assertion is being made as to the existence of an object or of an event involving the object" (Basilico 1998:542). In contrast, when the object moves up to the specifier/subject position of the change of state event, the object is singled out from the event and it is assigned a property to it, obtaining the categorical interpretation of the object, that can be linked to the hyponymy semantic relation widely observed in the literature. The HOC is then obtained by the movement of the CO from the complement position to the specifier of the TCR head, in which it arrives to a subject position of a change of state event. From this position it receives all its characteristic properties such as referentiality, the measuring out of the event, passivization, etc. Note that this movement salvages anti locality (Abels 2003) since as assumed by Hale & Keyser (2002) the TCR is a complex head that involves a Path

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[6] The cross-linguistic distribution of these constructions is related to the satellite-framed vs. verb-framed distinction stated by Talmy (2000) that split languages in two groups according to how languages expresses the different components of a motion event. This classification for example distinguishes Romance languages (verb framed) from Germanic languages (satellite framed) since the former expresses motion and path within the verb, while the latter expresses the path in an element outside the verb. This distinction has been extended to cover other constructions that do not involve motion, such as adjective resultative constructions (Mateu 2002) or Effected Objects Constructions (Mateu 2003; Acedo Matellán 2008). In this paper I will follow these latter works. Actually the contrast observed between English and Romance in the paper can be said to be derived from the same principles governing the satellite/verb framed distinction.

and a Place component, identified here with a Central Coincidence Relation (CCR) head and a TC one respectively as depicted in the figure below[7]:

(41)
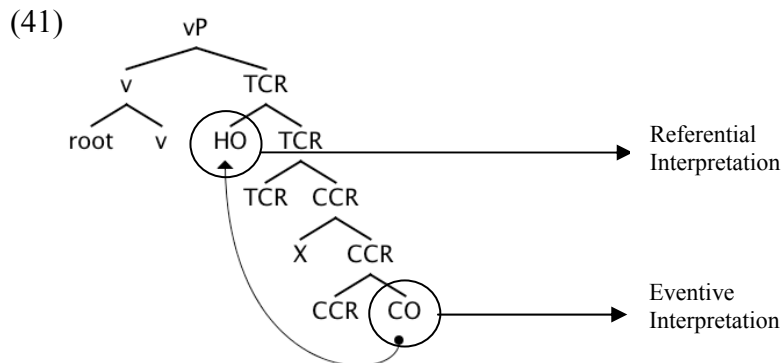
In this analysis the CO receives an eventive interpretation by being in the complement relation of a head denoting a change of state event. Then the stipulative mechanism of co-indexation of Massam is understood in this approach as a consequence of the structural position of the object. Lack of passivization is explained also on these grounds, since from this internal position the object cannot reach the edge of the vP phase in order to move up to the clausal domain.[8]

4. Cognate objects in Romance

As mentioned in the introduction, Romance languages have few examples of COs (apart from the widespread HOs like Cat. *ballar una sardana* 'to dance a sardana'). The few examples we may find are very restricted, non-productive and only used in very literary contexts. Actually Romance COs depart from English COs, in that the former displays properties commonly associated with HOs. For example, Romance COs do not show a definiteness restriction (42a), they can be pronominalized (with no need of having an event anaphora context) (42b) and, crucially, they never show ambiguities in the interpretation of the adjectival modifier (42c).

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[7] I adopt here Acedo Matellán's analysis of Complex Effected Object Constructions for COs, see for more details Acedo Matellán (2008). However, I depart from his assumptions in that I am assuming that not all Ground Objects undergo a movement to the specifier of a Path head, instead COs are characterized by being in a subject defective structure in the vP domain.

[8] I leave open here the possibility of relating the dative/accusative alternation of cognate objects in Icelandic with the more general case of alternation between accusative and dative in the prepositional domain, attested in some Indo-European languages, such as German o Latin. In these languages, ambiguous prepositions between a locative and directional meaning are disambiguated by the case marking in the object. In the locative interpretation the object of the preposition receives dative case, while in the directional preposition the object receives accusative case, as in the German example below.

(i) a. auf dem Berg   [German]
         on the-dat mountain   (locative interpretation)
     b. auf den Berg
         on the-acc mountain (directional interpretation)   (den Dikken 2003:22)

In a parallel way, in the analysis developed above, Dative Cognate Objects are located in the complement position of a central coincidence head, which can be identified with a locative preposition, while Accusative Cognate Objects are in the specifier position of a Terminal Coincidence Relation, that can be understood as a directional preposition.

(42) a. Pleurer toutes les larmes de son corps [French]
     to.cry all the tears of his body
     'Crying all the tears of his/her body'
  b. Si tu pots viure la ciutat jo també la vull viure. [Catalan]
     if you can live the city I too it will live
     'If you can enjoy the city, I want to enjoy it too.'
  c. Juan bailaba tristemente un baile alegre. (never contradictory) [Spanish]
     Juan danced sadly a dance merry
     'Juan was sadly dancing a merry dance.'

Since we have stated that there is a difference between COs and HOs and that this difference is syntactically represented in English, let us consider whether COs can have an eventive meaning in Romance.

Firstly, the example in (42c) shows that Romance COs do not received an eventive interpretation. In the English example, COs sentences are ambiguous between an interpretation in which the adjective scopes over the event and another in which the adjective modifies the nominal. However, in Romance, the first interpretation is never available as can be showed by the fact that the sentence in (42c) is never ambiguous in these languages.

Secondly, Marantz's tests discussed above are difficult to check in Romance. On the one hand, the BDO does not have an exact counterpart in these languages and therefore cannot be used for our purposes. On the other hand, *re* prefixation can have different properties in Romance languages. [9] However, in Iberoromance languages, although *re* is not very productive, *re* prefixation is similar to English since it can be attached to change of state predicates, but not to unergative ones. In the case of COCs, we observe that *re* cannot be prefixed in these constructions ((43a) vs. (43b)), despite appearing with a direct object, a fact that could serve to prove that in these languages COs are not linked to events.

(43) a. *rebailar un baile / *rereír la risa de un niño [Spanish]
     re-dance a dance / re-laugh the laugh of a child
  b. reabrir un caso
     re-open a case
     'to open a case again'

At this point, it is crucial that we observe that in these languages reaction objects (RO), effected objects (EO) and certain kinds of Incremental Themes, which show a similar behavior (see Marantz 2007), are not attested (see also Atkins, Kegl and Levin 1988, Martínez Vázquez, Mateu 2006, Acedo Matellán, 2008).

(44) a. *Juan asintió su aprobación. [Spanish]
     John nodded his approval

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[9] For example, in French, where *re* is more productive, *re* is different from the English counterpart, since it allows prefixation of unergative verbs (contra Horn's generalization) and gives rise to repetitive readings.
(i) Il faut qu'on redanse à Valence [French]
    It is necessary that we re-dance in Valence

b. *Rayó   unas palabras.
   scratched/scrawled-3SG   some words

(Martínez Vázquez 1998:259)

c. *El   Joan ha   fornejat el   pastís.[10]   [Catalan]
   the John has   baked   the   cake

(Acedo Matellán 2008:14)

The different behavior of these objects, frequently grouped under the label of Incremental Themes, in English and in Romance is made evident in the different analysis these objects have received in the literature. For example, Mateu (2000) puts forth an analysis of Incremental Themes as affected objects, an analysis that he changes later on in Mateu (2002) in the light of some relevant data. Interestingly, the relevant data he gives to support an analysis similar to the one given in (41) come from English, where Effected and Affected Objects (AO) show different properties. For example, contrary to AO, EO cannot appear in middle constructions.

(45) a.   These windows break easily.
     b.   *These mountains climb easily.

Again, in Romance these objects can appear felicitously in Middles as shown in the example below, behaving as AOs in this case.

(46) a.   Aquestes   muntanyes s'escalen   fàcilment.   [Catalan]
         these   mountains REFL-climb easily
         'These mountains can be easily climbed.'
     b.   Aquestes   finestres   es   trenquen   fàcilment.
         these   windows   REFL break   easily
         'These windows can be easily broken.'

Mateu (2002) undermines this contrast in the light of the syntactic differences between pronominal middles in Romance and their English counterparts. However, if we take this contrast in a wider perspective as the one provided by the set of examples above, we can draw the conclusion that the semantic label of Incremental Theme does not constitute a homogenous syntactic class of objects in both languages.

   In a similar way, other data shows that Incremental Themes of the kind discussed above behave in a different manner than typical affected objects in English, as shown in the examples below.

(47) a.   What he did to the window was break it.
     b.   *What he did to the mountain was climbed it.

(Mateu 2002:296)

Again, Romance examples behave differently allowing COs to undergo A'-movement, and reinforcing the idea that the nature of cognates is different in both languages.

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[10] Note that this sentence is ungrammatical in the creation verb reading not in the change of state interpretation,

(48) a. Era   la   noche   lo que   Juan quería   vivir.   [Spanish]
          was   the   night   what   John wanted   to.live
          'It was the night that John wanted to enjoy.'
      b. ?Lo que Juan lloraba   eran   lágrimas   de   gloria.
         what   John cried   were   tears   of   glory

Therefore, it seems that Romance COs differ substantially from English COs. I suspect that this distinction could be extended to Icelandic Dative COs, although a deeper analysis should be made in order to defend such claim. Interestingly, though, some of the objects that appear with dative case in Icelandic are not found in Romance, such as the dative object in the locative alternation, exemplified before in (37) and repeated here in (49), below.

(49) a. Vid   hlódum   vagninn   med   heyi.   [Icelandic]
          we   loaded   the.wagon.ACC   with hay.DAT
      b. Vid   hlódum   heyinu   à   vagninn.
          we   loaded   the.hay.DAT   on   the.wagon.ACC

                                                                        (Svenonius 2001:9)

As observed by Acedo Matellán (2008), languages that lack resultative constructions, such as Romance, also lack the locative alternation. See for instance the example in Catalan below. As we have observed, Catalan lacks the alternant in which the object is understood as the undergoer of the change of location and that in Icelandic bears dative case.

(50) a. *En Marc va   ruixar   aigua   sobre   la   planta   [Catalan]
          the Marc AUX spray   water   onto   the   plant
      b. En Marc va   ruixar   la   planta   amb aigua.
          the Marc AUX spray   the   plant   with water.
          'Marc sprayed the plant with water.'

                                                                   (Acedo Matellán 2008:11)

As opposed to English and Icelandic, then, and in Svenoniu's terms, we can say that Romance lacks the possibility of having a DP associated with an event (of change of state) that is not identified with the event introduced by v. That is, DP objects cannot be licensed if there is no event identification (Kratzer 1996).

   In the light of the above-mentioned evidence, the fact that Romance languages lacks (eventive) COs can be understood in a wider perspective, the one that seeks to explain the cross-linguistic distribution of resultatives (and similar) constructions among languages.

5. An analysis of Romance cognate objects

As seen in the previous section, Romance COs do not seem to be interpreted as events. Moreover, contrary to change of state verbs, COs, despite containing a direct object, seem to be simple from the eventive point of view. Let us observe the contrast between a change of state verb and a CO in Romance in the *again*-test (von Stechow 1996). The application of this test shows that the CO is not linked to any eventive functional head.

(51) *Again*-test
    a. Juan abrió   otra vez la puerta.   [Spanish]
       Juan opened again   the door
       'Juan opened the door again'
       = again can modify the change of state (restitutive reading, quantification over the change of state event)
       = again can modify the causative event (repetitive reading, quantification over the agentive/initial event)
    b. Juan bailó   otra vez la   polka.
       Juan danced again   the polka
       'Juan danced the polka again'
       = again can modify the change of state (restitutive reading)
       = again can modify the causative event (repetitive reading)

Consequently, if there is no any subevent of change of state within COCs, which is the relation that holds between the verb and the object in these structures? As observed by Hale & Keyser (2002), COs can be analyzed as establishing a semantic relation of hyponymy between the verbal root and the object. This predicative relation comes up by a head denoting a central coincidence relation (Hale 19986) similar to the predication head put forth in Bowers (1993). The CCR head denotes an abstract relation of semantic coincidence between the figure (the CO) and the ground (the root), similar to the part/whole relation. Therefore, the example, Cat. *El Joan balla les taronges* 'John dances oranges', is coerced as if the oranges were a kind of dance that happens to have this name. Note, also, that the reluctance of Romance COs to be non-referential can be derived from their structural position, since COs are subjects of a predicative structure.

(52)
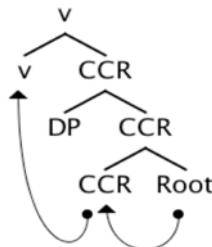
Thus, the parallel derivation between English COs and resultative constructions presented in section 3 allows us to capture the similar cross-linguistic distribution of both types of constructions, a fact generally observed in other works on COs, such as Massam (1988), Tenny (1994), Felser and Wanner (2001) or Horrocks and Stavrou (2006). If COs and UOs of resultatives share a similar derivation, the cross-linguistic distribution of COs is placed in a wider perspective. The question now can be rephrased as what determines the presence/absence of resultative constructions (and related phenomena) in some language. In other words, the proposal aims to explain why Romance languages generally disallow unergative predicates to enter in transitive constructions of change of state with the result state expressed outside the verb (by an AP, PP or DP). On this perspective the descriptive generalization stated in the unergative restriction of COs[11] and resultatives receives a

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[11] Nakajima (2006) argues that the unergative restriction on COs does not even hold in English, since some unaccusative predicates can take a cognate object. He gives the following examples:
(i) The apples fell just <u>a chore fall</u> to the lower deck.

theoretical explanation: unergative verbs are the simplest verbal forms consisting of a v head merged with a root, a result that is achieved by manner incorporation.

As pointed out in the section 3, Svenonius (2001) explains dative/accusative alternations in Icelandic, which correlate with a different aspectual interpretation of the predicate, from differences in the mechanism of *event identification* (in the sense of Kratzer 1996), which brings about the temporal identification of two subevents: the initial event introduced by v^* and the lower subevent of change of state, introduced in our proposal by the TCR head. As we have seen, the class of English COs examined here is interpreted as linked to an independent event, like the Icelandic Dative objects. In this paper, I argue that *event identification* is cancelled in these cases since manner incorporation takes place. When this process occurs, it is the adjoined root that identifies the initial subevent, avoiding identification with the lower one.

Unlike in English and Icelandic, the eventive interpretation of the CO is not available in Romance. As manner incorporation never happens in these languages, event identification always takes place, preventing Romance languages to have DP objects linked to an independent event. But, what prevents Romance to have manner incorporation? If we look at the derivation in (52), we observe that the root moves into the CCR head and, then, moves to the v head above. This mechanism of head movement prevents insertion of the root directly into the v head. Parametric variation can be stated in these terms: in Romance the functional head below v must move and adjoin to v, while in English this functional head can stay in situ, allowing the root to be adjoined to v.

In Romance manner incorporation is disallowed, since there is already one element adjoined to v, and under the assumption that recursive left-adjunction is prohibited (Kayne 1994). As in the syntactic domain, lexical differences among languages are related to their morphological properties. The requirement of head movement in this case can be seen as a morphological property: in some languages certain heads are affixal and must move, while in others they can stay in their base position. On these grounds, the differences between Romance and Germanic languages reduce to differences in the choice of inflectional features[12], a desirable conclusion on minimalist grounds (cf. Chomsky 1995 and further works). Within this approach parametric variation in the domain of the lexicon is treated in a uniform way with other domains of the syntax, in concordance with the perspective taken here that the systematic properties of lexical items are syntactic in nature.

(ii) The stock market dropped <u>250 points</u>.

His contention is based on the assumption that the underlined complements, which are extent predicates (often expressed by a Measure Phrase), are a kind of Cognate Object. Again, the analysis he gives lies on the granularity of the term *cognate object*. Thus, a coarse-grained interpretation of the term can be semantically appropriate to define a wide range of phenomena that does not need to be syntactically uniform. It is true that extent predicates share certain properties with COs: they are non-obligatory complements, they can measure the event denoted by the predicate, and they can be argued to establish a tight semantic relationship with the verbal root. However, if the unergative restriction is to be challenged by the sentences in (i) and (ii), a deeper analysis is required in order to determine to which verbal type these predicates belong, since extent complements of this kind are not present with the whole class of unaccusatives, but exclusively with those that express a scalar change of state (degree achievements, in Dowty 1979's Terminology), which are aspectually ambiguous between an achievement and an activity interpretation.

[12] Recall that the heads below v assumed here are considered to be pure functional heads.

6. Conclusions

In this paper I have argued that Romance languages lack the COCs of the type found in English. The COs examples attested in Romance are obtained in two ways; by adjunction, leading then to an adverbial meaning (adjunct Cognate Object), an option always available, or by creating a predicative relation between the object and the root denoting a semantic relation of hyponymy. In contrast, English COCs are obtained by manner incorporation into a transitive structure of change of state, a process not available in Romance languages. On our account, lack of manner incorporation is explained on morphosyntactic grounds. The analysis of English COs proposed here allows capturing the meaning of creation observed in the literature of COs (Jespersen 1961; Quirk et al. 1985; Massam 1990; Nogawa 1995, 1996; Pham 1998; Horrocks & Stavrou 2006; and also Marantz 2005).

The proposal defended here predicts the correlation of resultatives and COs (of this specific kind) among languages, a fact already observed by different authors, such as Tenny (1994) or Horrocks and Stavrou (2006). We leave for further research an exhaustive survey of this prediction. However, the works examined so far prove that this is the case. For example, Greek lacks both resultatives (Horrocks & Stavrou 2006; Giannakidou & Merchant 1999) and COs (Horrocks & Stavrou 2006). On the other hand, the prediction holds true for Chinese (resultatives (Huang 2006) and COs (Hong 1998)), German (see Kratzer 2004 for resultatives and Moltmann 1990 for COs) or Icelandic (Svenonius 2001).

Acknowledgements

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Semantics of evidentials: German reportative modals

Mathias Schenner

German features a variety of evidential strategies, i.e. ways to express the speaker's type of source of information for a proposition. The evidential (reportative) uses of the German modal verbs *sollen* 'should' and *wollen* 'want' are typically given a purely modal analysis that yields correct predictions for unembedded cases, but fails to account for many embedded occurrences. Based on a corpus and a questionnaire study it is argued that these modals can receive three distinct kinds of interpretation when they occur embedded in clausal complements (partly dependent on the embedding predicate). A revised analysis of reportative *sollen* is offered that involves a reportative presupposition and a conditionally activated assertive component. Finally, *sollen* is compared to other reportative strategies in German, especially the reportative subjunctive, and the effects of having multiple evidentials in a single clause are pointed out (evidential concord).

1. Introduction

Evidentials are, at a first approximation, linguistic markers that indicate the type of the speaker's source of information, e.g. whether the speaker witnessed the described event himself (direct evidence), inferred it from other information (inferred evidence) or only heard about it from someone else (reportative evidence). Languages differ in the number and kinds of evidence types they distinguish grammatically, but the three types just mentioned are the typologically most common ones (for comprehensive overviews cf. Willet (1988) and Aikhenvald (2004)). In some languages evidential marking is obligatory. For example, in Tariana, an Arawak language in northwest Amazonia, one out of an inventory of five evidential suffixes has to be attached to the main verb of every matrix clause (Aikhenvald 2004).

In contrast, most European languages, like English or German, do not seem to possess such fully grammaticalized systems for expressing evidential distinctions. However, the possibility for the speaker to express his source of information is most probably a universal feature of human languages. For example, in German, there are both lexical and grammaticalized means of expressing evidential meanings. Among the lexical strategies are certain (uses of) complement-

taking predicates (e.g. *sehen* 'see', *sagen* 'say', *hören* 'hear') and adverbials (e.g. *angeblich* 'allegedly', *laut*, *so*, *zufolge* 'according to'). Among the grammatical strategies for expressing inferential evidence are the constructions *scheinen* 'seem', *drohen* 'threaten', *versprechen* 'promise' plus *zu*-infinitive and *werden* 'become' plus infinitive. Diewald & Smirnova (2008) even argue that the latter four constructions build a paradigm in present-day German. This paper will focus on grammatical strategies to express reportative meanings, namely mood (the reportative subjunctive) and (at least) the modals *sollen* 'should' and *wollen* 'want'.

German modals in general (*können* 'can', *dürfen* 'may', *mögen* 'may', *müssen* 'must', *sollen* 'should', *wollen* 'want') are polyfunctional: They systematically allow for both a circumstantial (root) and an epistemic interpretation. For example, *können* in (1) and *müssen* in (2) can receive both circumstantial readings, as paraphrased in (1a) and (2a), and epistemic readings, as paraphrased in (1b) and (2b).

(1)   Anna kann in Paris leben.
        Anna can   in Paris live

        a.   'Anna is able to live in Paris (in view of her abilities).'
        b.   'Anna possibly lives in Paris (in view of what I know).'

(2)   Anna muss in Paris sein.
        Anna must in Paris be

        a.   'Anna is required to be in Paris (in view of her obligations).'
        b.   'Anna must be in Paris (in view of what I know).'

The modals *sollen* and *wollen* are special in that they give rise not to epistemic, but to evidential readings in addition to their circumstantial readings, as illustrated in (3) and (4). Both indicate that there is reportative evidence for (the truth of) the prejacent proposition. In the case of *sollen* the source of the report is subject-external (as is the source of the obligation in the circumstantial reading), in the case of *wollen* the source is the sentential subject itself (as is the source of the volition in the circumstantial reading).

(3)   Anna soll   in Paris sein.
        Anna should in Paris be

        a.   'Anna should be in Paris (in view of her obligations).'
        b.   'Anna is said to be in Paris.'

(4)   Anna will   in Paris sein.
        Anna want in Paris be

        a.   'Anna wants to be in Paris.'
        b.   'Anna claims to be in Paris.'

The following sections will focus on the reportative use of *sollen* 'should', henceforth, '*sollen*$_{\text{REP}}$', as illustrated in (3). Most of the results carry over to the reportative use of *wollen* 'want'. However, the latter is much less frequent than *sollen*$_{\text{REP}}$ and *wollen* shows additional syntactic and semantic idiosyncrasies that are beyond the scope of the current paper (see e.g. Maché (2008) for an interesting discussion of some of the subtleties involved).

2. A standard modal analysis

Intuitively, by uttering $sollen_{\text{REP}}(p)$ a speaker conveys that there is reportative evidence for p. But what does this exactly mean? In order to make this intuition more precise, the following questions are addressed in this section, resulting in a preliminary lexical entry for $sollen_{\text{REP}}$ in the final subsection 2.4.

(5)   a.   What exactly is the content of the reportative component? (cf. sec. 2.1)
       b.   What is the semantic status of this component (truth-conditional vs. illocutionary)? (cf. sec. 2.2)
       c.   Are additional meaning components conveyed (e.g. reduction/suspension of speaker commitment)? (cf. sec. 2.3)

2.1. Characterizing the reportative component

There are various ways to think about utterances and reports. In a simple case (sufficient for our purposes), an event of reporting involves a speaker, an addressee and a proposition that is conveyed. Like any event, a report is located at some spatiotemporal location (in some possible world). In our simplified setting, a report can be construed as a four-place relation, as in (6a), abbreviated in (6b) ('Δ' for 'dicendi').

(6)   General form of an report:
       a. x tells y in e that p
       b. $\Delta(e, x, y, p)$

Reports about reports differ in whether both the speaker and the addressee of the reported report are specified as in (7a), or only the addressee as in (7b), or only the speaker as in (7c).

(7)   a.   Anna told me that p, I've heard from Anna that p
       b.   Somebody told me that p, I've heard that p
       c.   Anna said that p
       d.   It is said that p, There are rumors that p

There are also reports about reports where neither the speaker nor the addressee of the original report is explicitly expressed.[1] A special case are reports about *rumors*, as in (7d). These are not reports about specific reports, but involve quantification over report events, roughly as in (8), a necessary condition for the truth of sentences like the ones in (7d). It is clear that additional conditions are at play, depending on the lexical items used. For instance, a rumor is not established by a single report, it requires some sort of spreading.

(8)   a.   There are report events (in some contextually salient spatiotemporal region) that involve members of some (contextually salient) speech community and convey that the proposition p is true

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[1]There are many more complex cases conceivable that will not be considered here, e.g. if the current reporter only *overheard* the original report or if he reports a report for which he only has reportative evidence.

b. $\exists e \exists x \exists y\ (x, y \in C \wedge \Delta(e, x, y, p))$, where C is a speech community

The crucial question in the present context is what kinds of report can be reported by using *sollen*$_{\text{REP}}$? And the answer is that many kinds of reports can. The default (e.g. in (3)) seems to be the rumor reading paraphrased in (7d). But *sollen*$_{\text{REP}}$ can also be used to report a specific utterance whose producer (and/or recipient) is explicitly mentioned, e.g. by an adverbial *laut X* 'according to X', as in (9a), or anaphorically inferred, as in (9b).

(9) a. Bea *soll*^{i} laut Anna$_i$ in Paris sein.
Bea should according to Anna in Paris be
'*Anna said that* Bea is in Paris.'
b. Anna$_i$ hat uns von Bea erzählt. Bea *soll*^{i} in Paris sein.
'Anna$_i$ told us about Bea. *She$_i$ said that* Bea is in Paris.'

This being said, I will not be concerned with distinguishing the various types of reported reports in the following. The simplified abstract utterance predicate $\Delta(x, p)$ (roughly, 'x said that p') is sufficient for the purposes of this paper and will be uniformly used to represent the reportative component of *sollen*$_{\text{REP}}$.[2]

2.2. *Truth-conditionality*

There is a long-lasting and still unresolved debate on whether epistemic modals are truth-conditional, i.e. contribute to the proposition expressed (cf. e.g. Papafragou (2006)). For evidentials, in particular *sollen*$_{\text{REP}}$, the same issue arises. Several tests for truth-conditionality have been proposed in the past, including semantic embeddability in the antecedent of conditionals or under factive verbs, challengeability or scope interaction with propositional-level operators like negation.[3]

For example, according to the *embedding test*, introduced by Wilson (1975), an item is truth-conditional if it can be semantically embedded in the antecedent of a conditional. Ifantidou (2001) has used this test to argue that that reportative and evidential adverbials in English are truth-conditional. For instance, *allegedly* in (10) is interpreted in the scope of *if*, as is brought out in the paraphrase in (10a). This reading is clearly different from the one in (10b), where the reportative part does not affect the condition in the antecedent.

(10) If the cook has allegedly poisoned the soup, the police should make an inquiry.
a. If it is alleged that the cook has poisoned the soup, the police should make an inquiry.

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[2]No specific model-theoretic interpretation of 'Δ' will be defended in this paper, the reader may use his favorite semantics of 'say' instead. However, cf. Brasoveanu & Farkas (2007) for some of the complexities involved.

[3]In recent semantic analyses of evidentials more specific diagnostics are used that are designed to test whether the element under investigation should receive a *modal* or an *illocutionary* analysis, the two dominant formal approaches to evidentials in the literature (cf. e.g. Faller (2006), Matthewson et al. (2007) and McCready (2008)). For a more comprehensive discussion of these diagnostics and their application to German *sollen*$_{\text{REP}}$ see Schenner (2008).

b. If the cook has poisoned the soup, as it is alleged, the police should make an inquiry.

When we try to apply the test to *sollen*_{REP}, we find both cases where *sollen*_{REP} falls within the scope of *if* and is hence truth-conditional, e.g. in (11), and cases where it does not fall within the scope of *if* and hence qualifies as non-truth-conditional, e.g. in (12) (cf. Faller (2006) for similar examples). In the consulted corpora, the latter cases are much more frequent, but there are also many cases that allow for both a truth-conditional and a non-truth-conditional reading.

(11) a. Wenn es morgen regnen *soll*, müssen wir die Fahrräder abdecken.
          'If *it is said that* it is going to rain tomorrow, we have to cover the bicycles.'
      b. Ich habe es nicht gerne, wenn es hinterher nur einer gewesen sein *soll*.[4]
          'I don't like it, if afterwards *it is said that* it has been only one.'

(12) a. Wenn Herr Schröder das gesagt haben *soll*, dann müßte er die Konsequenz daraus ziehen und sagen ...[5]
          'If Mr. Schröder said this (*as it is alleged*), he should draw the consequence and say ...'
      b. Die Dame müßte mindestens um zehn Jahre älter sein, als sie [tatsächlich] ist, wenn sie zu dem Bilde Modell gestanden haben *soll*.[6]
          'The woman would have to be at least ten years older than she actually is, if she had acted as a model for this painting (*as it is alleged*).'

According to the embedding test, *sollen*_{REP} has both truth-conditional and non-truth-conditional uses.[7] However, it can be argued that the seemingly non-truth-conditional uses in (12) are rather *parenthetical* uses, as their English translation by means of *as*-parentheticals also suggests. Parentheticals fail the embedding test, but they can nevertheless be handled in truth-conditional semantics (cf. e.g. Asher (2000), Potts (2005)). The conclusion is that *sollen*_{REP} is truth-conditional, but has assertive (non-parenthetical) and parenthetical uses (more on these in section 3.2).

2.3. *Speaker commitment*

Evidentials are often taken to not only indicate the type of source of evidence, but also a certain (increased or decreased) degree of speaker commitment. One can try to build scalar hierarchies that order evidentials according to their strength, i.e. the degree of speaker commitment they convey. A typical example is given in (13).

(13)   DIRECT > INFERRED > REPORTED

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[4] *Berliner Zeitung*, 02.07.2003, p.23.

[5] *Die ZEIT* 32/1985.

[6] *Vossische Zeitung (Morgen-Ausgabe)*, 03.03.1903, p.5-6.

[7] The type of conditional clause may influence the preferred reading; cf. the distinction between central and peripheral adverbial clauses in Haegeman (2006).

Given such a scale, by using a DIRECT evidential marker a speaker indicates a high degree of commitment, whereas using a REPORTED evidential marker would indicate a low degree of commitment. However, these hierarchies are best conceived of as partial orders (cf. Faller (2002:ch.2)) and as context-dependent, as reflected in the formal model of speaker commitment (changes) recently proposed by Davis et al. (2007).

Turning to *sollen*$_{\text{REP}}$, does it indicate (as part of its lexical meaning) a reduced degree of speaker commitment or even doubt or skepticism, as is sometimes suggested? Here we can rely on Mortelmans (2000:136), who showed in a corpus study that, while *sollen*$_{\text{REP}}$ is compatible with speaker skepticism, this usage is in practice very rare (in 5 out of 137 cases, only one of which was a declarative clause). In addition, the speaker's skepticism is usually explicitly marked.

We conclude that *sollen*$_{\text{REP}}$ does not lexically encode speaker doubt. Skeptic overtones are pragmatic effects. The shift of responsibility conveyed by *sollen*$_{\text{REP}}$ arises as part of the reportative (truth-conditional) meaning: The speaker is not committed to the reported proposition, but to the existence of a report of the embedded proposition.

2.4.   *A standard modal account*

There are surprisingly few formal accounts of the evidential readings of German modals, a notable exception being Ehrich (2001). She proposes roughly the following lexical entry for *sollen*$_{\text{REP}}$ (cf. Ehrich (2001:168)):

(14) $[\![soll]\!]^w = \lambda p.[$ for every world $w'Rw$ in which the claims of x_c in w are true, it holds that $w' \in p]$ (where x_c is understood as the contextually supplied source of the relevant claims)

The basic idea behind (14) seems to be that '*sollen*$_{\text{REP}}(p)$' is equivalent to 'x_c said that p' or, using the utterance predicate introduced in section 2.1, '$\Delta(x_c, p)$'. Using the formalism of Discourse Representation Theory (DRT) (Kamp & Reyle 1993), we get the Discourse Representation Structure (DRS) in (15b) for (15a), where Δ is understood as a relation between an individual and a DRS.

(15)   a.   Anna soll in Paris sein.
              'Anna is said to be in Paris.'
        b.   [a o: Anna(a), Paris(o), $\Delta(x, [: \text{in}(a,o)])$]

Reportative *wollen*$_{\text{REP}}$ receives a parallel treatment, with the minimal difference that the source of the reported speech act is not a contextually supplied individual or group but rather the sentential subject itself.

(16)   a.   Anna will in Paris sein.
              'Anna claims to be in Paris.'
        b.   [a o: Anna(a), Paris(o), $\Delta(a, [: \text{in}(a,o)])$]

This analysis of German reportative modals correctly captures that *sollen*_{REP} (and *wollen*_{REP}) are truth-conditional (as noted in section 2.2) and do not involve a dubitative component (as noted in section 2.3). Moreover, without further assumptions, it predicts that *sollen*_{REP} can be embedded (e.g. in complement clauses). Assuming that *sollen*_{REP} receives the same interpretation in unembedded and embedded contexts, this analysis predicts that (17a) is grammatical and interpreted as in (17b).

(17)　　a.　　Anna glaubt dass Bea in Paris sein soll.
　　　　　　　Anna thinks that Bea in Paris be   should
　　　　b.　　[a b o: Anna(a), Bea(b), Paris(o), think(a,[: $\Delta(x,$[: in(b,o)])])]

In the following section, this prediction will be tested by investigating embedded occurrences of *sollen*_{REP}.

3.　　Embedded evidentials: data and generalizations

Evidentials are typically considered to operate at the speech act level and hence to be unembeddable, cf. e.g. Aikhenvald (2004:8.1.3) for a list of languages that do not allow their evidentials to occur in embedded contexts. However, there are exceptions to this cross-linguistic tendency. Evidentials are embeddable in complement clauses in Tibetan (Garrett 2001), in Bulgarian (Sauerland & Schenner 2007), in German (see below) and even in certain types of complement clauses in Turkish (Schenner 2008). In all of these languages, the embeddability of evidentials is subject to certain restrictions. Reportative evidentials occur most naturally under *verba dicendi*, but there are additional types of embedding predicates that license evidentials in their complements.

　　Two questions will guide our investigation of the distribution of embedded *sollen*_{REP} in German. First, in complement clauses of which matrix predicates can *sollen*_{REP} occur (cf. sec. 3.1)? Second, how is embedded *sollen*_{REP} interpreted (cf. sec. 3.2)?

3.1.　　The distribution of embedded sollen_{REP}

In order to determine whether *sollen*_{REP} can occur in complement clauses, two strategies have been deployed: (a) a corpus study and (b) a questionnaire study.

　　In the corpus study, occurrences of embedded reportative *sollen* in the IDS and DWDS corpora[8] of written German were identified and collected. In total, about 300 corpus examples of reportative *sollen* in complement clauses of 160 different complement-taking predicates were considered. Some typical matrix predicates are listed in (18) in order of decreasing frequency:

(18)　　*bekannt sein* ('to be known') (9%), *kaum/schwer (zu) glauben* ('hard to believe') and
　　　　nicht glauben können ('cannot believe') (7%), *berichten* ('to report') (6,5%), *es heißt*
　　　　('they say') (3%), *schwer vorzustellen* ('hard to imagine') (3%), *behaupten* ('to claim')

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[8]For the IDS corpora (DeReKo) cf. http://www.ids-mannheim.de/kl/projekte/korpora/, for the DWDS corpora cf. http://www.dwds.de/.

(2,5%), *erfahren* ('to find out') (2,5%), *hören* ('to hear') (2,5%), *abstreiten* ('to deny')
and *leugnen* ('to deny') (2,5%), *dementieren* ('to deny') (2%), *wissen* ('to know') (2%),
kolportieren ('to hawk') (1,5%), *erzählen* ('to tell') (1,5%), *lesen* ('to read') (1%),
sagen ('to say') (1%), *bezweifeln* ('to doubt') (1%), *unwahrscheinlich sein* ('to be un-
likely') (1%)

In addition, a questionnaire study was conducted. 18 native speakers of German were asked
to rank the acceptability of a total of 25 test sentences on a scale ranging from 1 (totally unac-
ceptable) to 5 (perfect). The main goals were to confirm the results of the corpus study and to
identify matrix predicates that do *not* allow for embedded *sollen*$_{REP}$. The main results are sum-
marized in (19), where the matrix predicates are grouped according to the mean acceptability
value of sentences with *sollen*$_{REP}$ in their complement clauses.

(19)   a.   5-4: *hören* ('to hear'), *seltsam sein* ('to be odd'), *sagen* ('to say'), *lesen* ('to read'),
              erzählen ('to tell'), *erinnern* ('to remember'), *entdecken* ('to discover')
        b.   4-3: *interessant sein* ('to be interesting'), *wissen* ('to know'), *bedauern* ('to re-
              gret')
        c.   3-2: *glauben* ('to believe'), *träumen* ('to dream'), *fühlen* ('to feel'), *Hinweise
              geben* ('there be indications'), *bezweifeln* ('to doubt'), *lügen* ('to lie')
        d.   2-1: *möglich sein* ('to be possible'), *überzeugt sein* ('to be convinced'), *wünschen*
              ('to wish'), *vermuten* ('to suppose'), *hoffen* ('to hope'), *befürchten* ('to fear'),
              beobachten ('to observe')

The results of the corpus study and the questionnaire study match in the following sense: The
predicates that frequently occurred with embedded *sollen*$_{REP}$ in the corpora, received a high
acceptability rank in the questionnaire study (e.g. *hören* 'to hear'), while low ranked predicates
did not occur in the corpora at all (e.g. *hoffen* 'to hope'). The lists in (20) and (21) summarize
and tentatively systematize these findings by grouping the relevant predicates.

(20)   Predicates that allow *sollen*$_{REP}$ in their complement clause
        a.   speech/text production (utterance) predicates: e.g. *behaupten* ('to claim'),
              erzählen ('to tell'), *berichten* ('to report'), *kolportieren* ('to hawk')
        b.   speech/text perception predicates: e.g. *hören* ('to hear'), *lesen* ('to read')
        c.   epistemic (semi-)factives: e.g. *wissen* ('to know'), *bekannt sein/werden* ('to
              be/become known'), *erfahren* ('to find out'), *erinnern* ('to remember')
        d.   emotive (semi-)factives: *interessant sein* ('to be interesting'), *seltsam sein* ('to be
              odd'), *bedauern* ('to regret')
        e.   negative utterance (denial) predicates: e.g. *abstreiten* ('to deny'), *leugnen* ('to
              deny')
        f.   negative epistemic predicates: e.g. *kaum/schwer zu glauben* ('hard to believe'),
              nicht glauben können ('to cannot believe'), *bezweifeln* ('to doubt')

(21)   Predicates that do not (or only marginally) allow *sollen*$_{REP}$ in their complement clause
        a.   direct perception predicates: e.g. *beobachten* ('to observe'), *fühlen* ('to feel')
        b.   desire predicates: e.g. *wünschen* ('to wish'), *hoffen* ('to hope')

    c.   (non-factive, positive) epistemic predicates: e.g. *glauben* ('to believe'), *vermuten* ('to suppose'), *überzeugt sein* ('to be convinced')

    d.   (non-factive) emotive predicates: e.g. *befürchten* ('to fear')

    e.   predicates of (low positive) likelihood: e.g. *möglich sein* ('to be possible')

It is a non-trivial task to identify necessary and sufficient conditions for the embeddability of *sollen*_{REP}, given the heterogeneity of the licensing predicates in (20). However, we can identify three main groups that might allow embedded *sollen*_{REP} for different reasons (see below):

(22)   a.   communication predicates

        b.   (semi-)factive predicates

        c.   negative (denial/doubt) predicates

It is clear that the set of predicates that license embedded *sollen*_{REP} is distinct from the set of predicates that license embedded root phenomena, e.g. verb-second (V2) complement clauses in German (cf. e.g. Meinunger (2006), Truckenbrodt (2006)). There are both predicates that allow embedded V2 but not *sollen*_{REP} (e.g. *befürchten* 'to fear') and predicates that allow embedded *sollen*_{REP} but not V2 (e.g. *interessant sein* 'to be interesting').

    However, there is some kind of interaction. It has been argued that an embedded clause can have V2 order if and only if the containing sentence can be used in such a way that the embedded clause constitutes the main point of utterance (cf. Bentzen et al. (2007)). In such cases, the embedding predicate is used parenthetically (cf. Urmson (1952), Simons (2007)). And if so, *sollen*_{REP} can even occur in complement clauses of predicates in (21), especially non-factive epistemic and emotive predicates like *glauben* 'to believe' or *befürchten* 'to fear', as illustrated in (23a) and (23b).

(23)   (Anna does not want to meet Charly at the party today, and Bea knows this.
         Anna asks Bea, whether Charly will come. Bea answers:)

    a.   Ich glaube/befürchte, Charly *soll*   kommen.
        I   think/fear   Charly should come
        'I think / I'm afraid *it is said that* Charly will come.'

    b.   Charly ⊗ *soll*   ⊗ kommen ⊗. (⊗ = glaube/befürchte ich)
        Charly ⊗ should ⊗ come   ⊗ (⊗ = think/fear   I)
        'I think / I'm afraid *it is said that* Charly will come.'

    c.   ?Ich glaube/befürchte, dass Charly kommen *soll*.
        I   think/fear   that Charly come   should
        'I think / I'm afraid *it is said that* Charly will come.'

    This does not show that we should add (or move) these predicates to the list of *sollen*_{REP} licensers. It rather shows that *sollen*_{REP} occurs in (23a) and (23b) essentially unembedded. Both the dependent V2 construction in (23a) (cf. Reis (1997)) and the parenthetical construction in (23b) (cf. Steinbach (2007)) differ from canonical (verb-final) clausal complementation, syntactically as well as semantically. As expected, if *sollen*_{REP} is embedded in a canonical complement clause of *glauben* or *befürchten*, as in (23c), the sentence gets somewhat less acceptable. To conclude, the parenthetical use of matrix clauses can render *sollen*_{REP} acceptable under those predicates in (21) that allow for such a use.

3.2.   *The meanings of embedded* sollen_{REP}

In the previous subsection it was shown that *sollen*_{REP} can occur in complement clauses of a number of embedding predicates. But how is embedded *sollen*_{REP} interpreted? In a second step, the corpus examples were semantically evaluated and categorized. This often required a closer inspection of the linguistic context in which the examples occurred. As a result, the following three kinds of reading have been identified:

(24)   a.   A type reading: assertive (non-parenthetical, truth-conditional)
        b.   G type reading: global (parenthetical, non-truth-conditional)
        c.   C type reading: concord

The A type (assertive) reading is the one that the standard semantics for *sollen*_{REP} in section 2.4 predicts: *sollen*_{REP}(p) simply means 'it is said that p'. However, if we only consider embedded occurrences of *sollen*_{REP} this reading is surprisingly infrequent. While, by introspection, many corpus examples are in principle compatible with an assertive reading, this interpretation is in most cases contextually clearly dispreferred.

There are three factors that seem to favor an assertive reading: (a) if the embedding predicate is used parenthetically (cf. (23) above), (b) if the embedding predicate is factive and/or the embedded clause discourse-old or even echoic (cf. (25a)), (c) if the embedded clause is an indirect question (cf. (25b)). A real life example is given in (26).

(25)   a.   A: Maria *soll* in Paris sein.
                    '*It is said that* Maria is in Paris.'
              B: Ich weiß, dass Maria in Paris sein *soll*.
                    'I know that *it is said that* Maria is in Paris.'
        b.   Anna fragte, ob Charly zur Party kommen *soll*.
              'Anna asked whether *it is said that* Charly is coming to the party.'

(26)   90 mal 190 Zentimeter: Das waren die Abmessungen von Goethes bescheidenem Bett. Auf den Betrachter wirkt es heute ziemlich kurz, vor allem wenn er weiß, dass Goethe groß von Statur gewesen sein *soll*.[9]
        '90 x 190 cm: That was the size of Goethe's humble bed. To the beholder it seems quite short today, especially if they know that *it is said that* Goethe had been tall'

The C type (concord) reading of *sollen*_{REP}(p) is simply p, provided that it is embedded under a communication predicate. The existence of this very frequent reading, illustrated in (27), has been noted before by Letnes (1997). While an A type reading is in principle available for these sentences, it is contextually strongly dispreferred. For example, the author of (27a) clearly didn't intend to express that the newspaper had wrongly claimed that *it was said that* the princess gained her peerage dishonestly.

(27)   a.   Die Zeitschrift hatte fälschlicherweise behauptet, daß sich die Prinzessin ihren Adelstitel unredlich erworben haben *soll*.[10]

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[9]*Die ZEIT* 11/2004: "Wie man in Deutschland schläft und träumt".
[10]*Die Presse*, 19.12.1992.

'The newspaper had wrongly claimed that the princess gained her peerage dishonestly.'

b. Es ist irgendwie kindisch, daß gleich behauptet wird, daß MS dahinterstecken *soll*.[11]

'It is somehow childish that it is immediately claimed that MS is behind it.'

The G type (global) reading of embedded *sollen*$_{\text{REP}}(p)$ can best be paraphrased by a parenthetical construction: '*p*, as it is alleged'. Albeit its availability is somewhat unexpected, this type of reading is quite pervasive in all of the corpora that have been looked at. Some examples are given in (28). The term 'non-truth-conditional' for this reading is somewhat misleading and will be avoided in the following, but has been mentioned, because *sollen*$_{\text{REP}}$ in the G type reading fails the well-known embedding test for truth-conditionality, as mentioned in sec. 2.2.

(28) a. Daß er dem Schüler auch auf den Kopf geschlagen haben *soll*, streitet der Lehrer entschieden ab.[12]

'The teacher resolutely denies that he hit the pupil also on the head *(as it is alleged)*.'

b. Daß es in ganz China im Vorjahr "nur" etwas mehr als 60.000 Verkehrstote gegeben haben *soll*, erscheint angesichts dieser rauhen Sitten wie ein Wunder.[13]

'In view of these tough customs it seems like a miracle that there were "only" slightly more than 60.000 traffic deaths in China last year *(as it is alleged)*.'

c. Daß Legrenzi sein Lehrer gewesen sein *soll*, ist unwahrscheinlich.[14]

'That Legrenzi had been his teacher *(as it is alleged)*, is unlikely.'

d. Es ist schwer zu glauben, dass ich der Vater Deines Kindes sein *soll*.[15]

'It is hard to believe that I am the father of your child *(as it is alleged)*.'

To summarize, embedded *sollen*$_{\text{REP}}$ can be used in the following three ways (where 'CTP' stands for the complement taking predicate that embeds *sollen*$_{\text{REP}}$ and 'Δ' for the reportative component conveyed by *sollen*$_{\text{REP}}$):[16]

(29) Readings of CTP(*sollen*$_{\text{REP}}(p)$)
a. A (assertive)   CTP($\Delta(p)$)
b. G (global) $\Delta(p) \wedge$ CTP(p)
c. C (concord)   CTP(p)

The contextually preferred type of reading depends on a variety of factors, the probably most important being the type of the embedding predicate. Even the few examples given above

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[11]http://www.pro-linux.de/news/2002/4353.html, accessed 04.04.2007.

[12]*Salzburger Nachrichten*, 18.01.1997.

[13]*Salzburger Nachrichten*, 26.11.1994.

[14]*Salzburger Nachrichten*, 27.07.1991.

[15]*Berliner Zeitung*, 07.06.2005, p.17.

[16]If 'CTP(p)' entails '$\Delta(p)$', the G and C readings coincide. However, C readings cannot be reduced to G readings in general. The C reading of the following example (Uli Sauerland, p.c.) does not entail that somebody claimed or wrote that the princess is a fraud: *Keine Zeitung hat geschrieben, dass die Prinzessin eine Betrügerin sein soll* 'No newspaper wrote that the princess is a fraud'.

suggest that there are correlations between the type of the matrix predicate and the available readings of embedded $sollen_{REP}$. The three main types of $sollen_{REP}$ licensing predicates listed in (22) seem to be associated with the three types of reading distinguished in (24) and (29) as indicated in (30). The unembedded use of $sollen_{REP}$ patterns with the (semi-)factives.

(30)   Tentative correlations between the environment of $sollen_{REP}$ and its preferred reading:[17]

	environment	typical type of reading
a.	unembedded, under (semi-)factives	A (assertive)
b.	under negative (doubt/denial) predicates	G (global)
c.	under communication predicates	C (concord)

In this section, the distribution of embedded $sollen_{REP}$ and its possible readings have been characterized in a descriptive and informal way. The goal of the next section is to *explain* these findings by deriving the restrictions on embedding and the various readings from an adequate lexical entry for $sollen_{REP}$.

4.   Analysis revisited

The purely modal semantics of $sollen_{REP}$ introduced in section 2.4 wrongly assigns the A type (assertive) reading to all occurrences of $sollen_{REP}$. There are two main options for revising the analysis: (a) an *ambiguity* analysis that treats $sollen_{REP}$ as lexically ambiguous between A/G/C readings; (b) a *non-ambiguity* analysis that tries to derive the various readings of $sollen_{REP}$ from a single lexical entry. These two options are explored in the following subsections, first the ambiguity approach in section 4.1, then a presuppositional version of the non-ambiguity approach in section 4.2.

4.1.   Ambiguity analyses

One way to account for the additional readings of embedded $sollen_{REP}$ is to argue that it is lexically ambiguous between the standard semantics stated in section 2.4, a concord and a parenthetical reading. In the latter reading, the reportative component is not added to the local DRS, but to the global DRS. Informally stated and ignoring concord readings for the moment, we get the following two entries for $sollen_{REP}$:

(31)   a. $sollen_{REP:1}(p)$: add the condition '$\Delta(x_c, p)$' to the local DRS
         b. $sollen_{REP:2}(p)$: add the condition p to the local DRS and the condition $\Delta(x_c, p)$ to the global DRS

For example, using $sollen_{REP:1}$ we can derive the A reading of (32a), shown in (32b), and using $sollen_{REP:2}$ we can derive the G reading, shown in (32c).

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[17]These correlations are of different strength: While unembedded $sollen_{REP}$ can only get an A type reading, embedding under (semi-)factives frequently also allows for G type readings.

(32)   a.   Bea sagt/weiß, dass Anna in Paris sein *soll.*
                 Bea says/knows that Anna in Paris be   should
         b.   [a b o: Anna(a), Bea(b), Paris(o), say/know(b,[x: Δ(x,[: in(a,o)])])]
         c.   [a b o x: Anna(a), Bea(b), Paris(o), say/know(b,[: in(a,o)]), Δ(x,[: in(a,o)])]

There are other ways of implementing the basic idea that *sollen*$_{\text{REP}}$ has a non-parenthetical and a parenthetical reading, depending on one's favorite theory of supplements. For example, using the multidimensional framework of Potts (2005), we could replace (31) by (33).

(33)   a.   *sollen*$_{\text{REP:1}}$ $\rightsquigarrow \lambda p \lambda x_c \lambda w.[\Delta(p)(x_c)(w)] : \langle\langle s^a, t^a \rangle, \langle e^a, \langle s^a, t^a \rangle\rangle\rangle$
         b.   *sollen*$_{\text{REP:2}}$ $\rightsquigarrow \lambda p \lambda x_c \lambda w.[\Delta(p)(x_c)(w)] : \langle\langle s^a, t^a \rangle, \langle e^a, \langle s^a, t^c \rangle\rangle\rangle$

The difference between (33a) and (33b) is that the assertive (non-parenthetical) entry (33a) contributes the reportative component to the at-issue content, while the parenthetical entry (33b) contributes it as a conventional implicature in the sense of Potts (2005).

No matter what version, the ambiguity approach suffers from several problems. Without further assumptions, it radically overgenerates in two cases. First, it does not predict that (and hence cannot explain why) *sollen*$_{\text{REP:1}}$ cannot be embedded in many (especially non-factive) contexts. Second, it does not predict that *sollen*$_{\text{REP:2}}$ cannot be used in matrix clauses. Of course we could come up with some principles that restrict possible disambiguations of *sollen*$_{\text{REP}}$, e.g. along the lines in (34).

(34)   a.   Do not commit the speaker to p, if she uttered '...*sollen*$_{\text{REP}}$(p)...'
         b.   Prefer *sollen*$_{\text{REP:2}}$ to *sollen*$_{\text{REP:1}}$

However, this line of thought will not be pursued in this paper, since there is an additional reason to disfavor the ambiguity approach. By economy considerations, a non-ambiguity approach that does not require a duplication of lexical entries is to be preferred over the ambiguity approach. Hence we shift our endeavors to developing a non-ambiguity account of *sollen*$_{\text{REP}}$ in section 4.2.

4.2. Non-ambiguity analyses: a presuppositional account

If we want a single entry for *sollen*$_{\text{REP}}$, its meaning has to be, in a sense, positionally flexible, since the reportative component conveyed by *sollen*$_{\text{REP}}$ sometimes seems to be contributed to the local DRS, sometimes to the global DRS. This kind of movement is reminiscent of the projection behavior of presuppositions, "agile creatures eager to leave their homes" (Geurts 1999:114).

In presuppositional DRT, DRSes are constructed in two steps. First, a *preliminary DRS* for a sentence is built based on the lexical meanings of its parts. Presuppositions are explicitly represented where they are triggered. Second, the sentence is put in context, its presuppositions are resolved, ultimately leading to the *final DRS* of the sentence.

There are two basic options for the resolution of presuppositions (in the binding theory of presupposition, cf. van der Sandt (1992), Geurts (1999)): Binding, as in (35a), and accommodation, where we can further (minimally) distinguish between global (non-local) accommodation as in (35b) and local (non-global) accommodation as in (35c).

(35)   a.   If Anna owns a cat, <u>Anna's cat</u> is black.
        b.   If <u>Anna's cat</u> is black, she must be happy.
        c.   Either Anna doesn't have a cat or <u>Anna's cat</u> is in hiding.

The basic idea of our non-ambiguity analysis of *sollen*$_{\text{REP}}$ is that it triggers a reportative presupposition '$\Delta(x_c, p)$'. It turns out that the three readings of (embedded) *sollen*$_{\text{REP}}$ correspond to the three basic projection possibilities of this presupposition:

(36)

type of reading	resolution	configuration	typical environments
A (assertive)	local accomm.	$[\text{CTP}](\Delta(x_c, p))$	unembedded, under *know*
G (global)	global accomm.	$\Delta(x_c, p) \wedge \text{CTP}(p)$	under *doubt*
C (concord)	binding	$\text{CTP}(p)$	under *say*

There is one complication: In the G reading of *sollen*$_{\text{REP}}(p)$, the proposition p plays a double role, i.e. it is used twice in the semantic representation.[18] This will be reflected in the lexical entry.

The proposed semantics of *sollen*$_{\text{REP}}$ (somewhat simplified: extensional and ignoring tense) is stated in (37). It consists of two parts: (a) a reportative presupposition, (b) an assertive part that is only activated if the resolution of the reportative presupposition violates local informativity. (The second part is required for deriving the G reading, as shown below.)

(37)   *sollen*$_{\text{REP}}(p)$:   (a) $\partial[x_c \mid \Delta(x_c, p)]$
                                     (b) p, if the resolution of (a) violates local informativity

The idea that evidential expressions contribute a presupposition is not new (cf. e.g. Izvorski (1997)).[19] However, as will become clear in a moment, the presupposition of *sollen*$_{\text{REP}}$ in (a) does not behave exactly like a run-of-the-mill presupposition (if there is such a thing). More specifically, the projection profile of the *sollen*$_{\text{REP}}$ presupposition features a *low accommodation threshold* (thus the possibility of binding does not strictly exclude the possibility of accommodation). The second component in the semantics of *sollen*$_{\text{REP}}$ in (37) is an instantiation of the idea that an expression has to have some effect on its local DRS (local informativity). This condition is violated, for example, if the reportative presupposition of *sollen*$_{\text{REP}}(p)$ is non-locally accommodated. In such a case, local informativity is rescued by adding p to the local DRS (stripping off *sollen*$_{\text{REP}}$).

Let's look at some applications.[20] The simplest cases are occurrences of unembedded *sollen*$_{\text{REP}}$, as in (38a). Since binding is not an option here, the reportative component has to be accommodated in the local (= global) DRS, satisfying local informativity.

(38)   a.   Bea *soll*   in Paris sein.
              Bea should in Paris be
              '*It is said that* Bea is in Paris.'

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[18]This double usage is typical for supplemental expressions; cf. Potts (2005) for discussion.

[19]There is a conceptual problem with this idea: A core characteristic of presuppositions is that they are "taken for granted" – but evidential presuppositions typically are not (cf. Matthewson et al. (2007:36) for discussion). We will stick to the term 'presupposition' here, but use it in a technical sense for elements that can project.

[20]In the following examples, presupposed material is underlined, conditionally activated material is in italics.

    b.   [b o <u>x</u>: Bea(b), Paris(o), <u>Δ(x,[: in(b,o)])</u>, *in(b,o)*]

    c.   [b o x: Bea(b), Paris(o), $\overline{\Delta(x,[: in(b,o)])}$]

If *sollen*$_{REP}$ is embedded under an utterance predicate, as in (39a), its reportative presupposition can be bound to it. The presence of the conditionally activated complement of *sollen*$_{REP}$ might facilitate this process which results in the concord interpretation in (39c).

(39)   a.   Anna sagt dass Bea in Paris sein *soll*.
             Anna says that Bea in Paris be   should
             'Anna says that Bea is in Paris.'

    b.   [a b o: Anna(a), Bea(b), Paris(o), say(a,[<u>x</u>: <u>Δ(x,[: in(b,o)])</u>, *in(b,o)*])]

    c.   [a b o: Anna(a), Bea(b), Paris(o), say(a,[: in(b,o)])]

If the reportative presupposition cannot be bound, global accommodation is the preferred option, as illustrated in (40a). Since global accommodation is non-local here (in contrast to (38a)), local informativity is violated in (40c), which triggers the (b) component in (37). The resulting DRS in (40d) correctly captures the interpretation of (40a).

(40)   a.   Es ist schwer zu glauben dass Bea in Paris sein *soll*.
             It is hard   to believe that Bea in Paris be   should
             'It is hard to believe that Bea is in Paris (as it is alleged).'

    b.   [b o: Bea(b), Paris(o), hard-to-believe([<u>x</u>: <u>Δ(x,[: in(b,o)])</u>, *in(b,o)*])]

    c.   [b o x: Bea(b), Paris(o), hard-to-believe([: *in(b,o)*]), Δ(x,[: in(b,o)])]

    d.   [b o x: Bea(b), Paris(o), hard-to-believe([: in(b,o)]), Δ(x,[: in(b,o)])]

If *sollen*$_{REP}$ occurs in embedded contexts, local accommodation is also an option, albeit usually a dispreferred one (cf. section 3.2). For example, (39a), repeated as (41a), can get the interpretation in (41c), if local accommodation is enforced.

(41)   a.   Anna sagt dass Bea in Paris sein *soll*.
             Anna says that Bea in Paris be   should
             'Anna says that *it is said that* Bea is in Paris.'

    b.   [a b o: Anna(a), Bea(b), Paris(o), say(a,[<u>x</u>: <u>Δ(x,[: in(b,o)])</u>, *in(b,o)*])]

    c.   [a b o: Anna(a), Bea(b), Paris(o), say(a,[x: Δ(x,[: in(b,o)])])]

In section 3.2 it has been noted that (semi-)factive predicates seem to favor local accommodation readings. If we assume that presuppositions are resolved bottom-up, i.e. presuppositions of deeper embedded triggers are resolved prior to presuppositions of higher triggers, then we might be able to explain this finding. For example, semifactive *wissen* 'know' presupposes that its clausal complement is true. But the content of its complement in (42a) depends (assuming bottom-up resolution) on the resolution of the presupposition of *sollen*$_{REP}$. If the presupposition of *sollen*$_{REP}$(p) were accommodated globally, the complement of *wissen* and hence a presupposition of the sentence would be p, as shown in (42b). But this would render the contribution of *sollen*$_{REP}$ superfluous. By contrast, if the presupposition of *sollen*$_{REP}$ is accommodated locally, we get the sensible interpretation in (42c): "It is said that Bea is in Paris and Anna knows that".

(42) a. Anna weiß dass Bea in Paris sein *soll*.
    Anna knows that Bea in Paris be should
  b. [a b o x: A.(a), B.(b), Paris(o), know(a,[: in(b,o)]), Δ(x,[: in(b,o)]), in(b,o)]
  c. [a b o x: A.(a), B.(b), Paris(o), know(a,[y: Δ(y,[: in(b,o)])]), Δ(x,[: in(b,o)])]

5. *Other reportative strategies*

In this section additional reportative strategies in German and their interactions are sketched. The first subsection compares the reportative modals to the reportative subjunctive, another prominent evidential strategy in German. The second subsection focuses on the interplay of multiple evidential strategies in a single clause.

5.1. *Reportative subjunctive*

In addition to *sollen*$_\text{REP}$ there is another grammaticalized reportative strategy in German, namely the reportative subjunctive (cf. Fabricius-Hansen & Sæbø (2004)). In many contexts, the reportative subjunctive (RS) and *sollen*$_\text{REP}$ can be used interchangeably, e.g. embedded under utterance predicates, as in (43), or to indicate free indirect discourse, as in (44).

(43) a. Anna sagte, dass Bea in Paris gewesen *sei*.
    Anna said that Bea in Paris been be.RS
  b. Anna sagte, dass Bea in Paris gewesen sein *soll*.
    Anna said that Bea in Paris been be should
    'Anna said that Bea was in Paris.'

(44) a. Anna erzählte uns von ihren Freundinnen. Bea *sei* [RS] in Paris gewesen.
  b. Anna erzählte von ihren Freundinnen. Bea *soll* [REP] in Paris gewesen sein.
    'Anna told us about her friends. [*She said that*] Bea was in Paris.'

However, there are crucial differences between the RS and *sollen*$_\text{REP}$: First, unlike the RS, *sollen*$_\text{REP}$ can be used in unembedded sentences outside free indirect discourse, as shown in (45). Second, unlike the RS, *sollen*$_\text{REP}$ can be embedded in certain non-reportative contexts and receive an assertive (A type) reading, as illustrated in (46).

(45) a. *Bea *sei* [RS] in Paris gewesen.
  b. Bea *soll* [REP] in Paris gewesen sein.
    '*It is said that* Bea was in Paris.'

(46) a. *Anna weiß, dass Bea in Paris gewesen *sei* [RS].
  b. Anna weiß, dass Bea in Paris gewesen sein *soll* [REP].
    'Anna knows that *it is said that* Bea was in Paris.'

  Fabricius-Hansen & Sæbø (2004) proposed an analysis of the German reportative subjunctive that captures these properties. The basic idea is that the RS turns a DRS into a "DRS in intension" (a proposition) and additionally introduces the presupposition that somebody says that proposition.

There are two main differences between this analysis of the RS and our analysis of *sollen*_{REP} in (37) that are responsible for their different behavior in (45) and (46). First, the assertive component of *sollen*_{REP} is activated only if local informativity is violated, whereas it is always present in the case of the RS. Second, the projection profiles of the triggered presuppositions differ: While the RS presupposition has to be at least partly bound, the *sollen*_{REP} presupposition with its low accommodation threshold (cf. sec. 4.2) can easily be accommodated, e.g. in cases like (45) and (46).

5.2. *Multiple reportatives: evidential concord*

In addition to grammatical reportative strategies (*sollen*_{REP} and the reportative subjunctive), there are, of course, lexical ways to indicate reportative evidence in German, e.g. reportative adverbials (*angeblich* 'allegedly', *laut*, *so*, *zufolge* 'according to') or clausal complement taking communication predicates in non-parenthetical or parenthetical use (e.g. *sagen* 'say', *flüstern* 'whisper', etc.).

If two or more of these reportative strategies co-occur in the same clause, usually both a cumulative reading and a concord reading is available, as illustrated in (47). In most contexts the concord reading is strongly preferred.

(47)   a.   Anna *soll   angeblich* krank sein.
                Anna should allegedly sick   be
                Cumulative reading: 'It is said that it is said that Anna is sick.'
                Concord reading: 'It is said that Anna is sick.'
        b.   Anna *soll   laut*   Bea krank sein.
                Anna should according.to Bea sick   be
                Cumulative reading 1: 'It is said that Bea says that Anna is sick.'
                Cumulative reading 2: 'Bea says that it is said that Anna is sick.'
                Concord reading: 'Bea says that Anna is sick.'

Evidential concord is possible with more than two evidential expressions, as illustrated in (48a) with three reportatives, but there are limitations: There is no full concord reading for (48b) with four reportatives.

(48)   a.   Anna, *sagt$_i$* Bea, *soll$_i$ angeblich$_i$* gestern   angekommen sein.
                Anna, says Bea, should allegedly   yesterday arrived   be
                'Bea says, Anna arrived yesterday.' (full concord reading)
        b.   Anna, *sagt$_j$* Bea, *soll$_i$ laut$_i$*   Cynthia *angeblich$_i$* gestern
                Anna, says Bea, should according.to Cynthia allegedly   yesterday
                angekommen sein.
                arrived   be
                = 'Bea says: according to Cynthia: Anna arrived yesterday.'
                ≠ 'Bea and Cynthia say: Anna arrived yesterday.'

The phenomenon of evidential concord is reminiscent of the phenomenon of modal concord that recently attracted the attention of formal semanticists (cf. Geurts & Huitink (2006), Zeijlstra (2007)). It remains to be seen whether a uniform account of modal and evidential concord is viable.

6. Conclusion

This paper investigated reportative strategies in German, in particular the evidential use of the modal *sollen* 'should'. It has been argued that *sollen* in its reportative use is truth-conditional (cf. sec. 2.2) and does not lexically encode a reduced degree of speaker commitment (cf. sec. 2.3). In section 3 it has been shown that $sollen_{REP}$ can be embedded in complement clauses of at least three classes of embedding predicates: communication predicates, (semi-)factive predicates and negative (denial/doubt) predicates. Embedded occurrences of $sollen_{REP}$ can have one of three readings that have been labeled A (assertive), G (global) and C (concord). The availability of G and C readings is problematic for standard accounts of $sollen_{REP}$ and necessitates a more fine-grained analysis. In section 4, two proposals have been considered that are capable of deriving the additional readings. The presupposition-based non-ambiguity account from section 4.2 is favorable on conceptual grounds and invites for a straightforward analysis of the evidential concord phenomena mentioned in section 5.2 in terms of presupposition binding.

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Phasehood of DPs
A study of Japanese noun-verb incorporation

Mina Sugimura

Noun-Verb Incorporation (NVI) is optional with some nominals but obligatory with others in Japanese. In this paper, I argue that the obligatory or optional nature of NVI comes from a structural difference between nominals. I claim that one type of nominal can be realized either as a DP or an *n*P, and that the other type of nominal can only be realized as an *n*P, assuming that the structural realization is closely tied to the argument structure of the nominals. Based on this, I provide an explanation where an *n*P option yields an incorporated form via the operation *MOVE*, while a DP option provides an unincorporated form via the operation *AGREE*.

1. Introduction

What constitutes a phase has been controversial since the notion of phases was introduced by Chomsky (2000) years ago. In particular, which constituents constitute phases is still under debate. While the phasehood of CP and *v*P seems to be relatively established (Chomsky 2000, 2001), the phasal status of other categories (TP, VP, and so on) is still up in the air (Nissenbaum 2000).

In this paper, I examine the phasal status of DPs (Svenonius 2004). More precisely, by investigating two types of Japanese nominals with respect to Noun-Verb Incorporation (henceforth, NVI), I will show that the DP-as-a-phase approach provides a comprehensive analysis.

Cases to be examined are the following:

(1)　√benkyoo (*study*):
　　　a. Moti-ga　　benkyoo-sita.　　　(N + V incorporated form)
　　　　 Moti-$_{NOM}$　study-did
　　　b. Moti-ga　　[$_{DP}$benkyoo]-o sita.　(unincorporated form)
　　　　 Moti-$_{NOM}$　　study-$_{ACC}$　did
　　　　 'Moti studied.'

In (1), the *sino*-Japanese nominal *benkyoo* 'study' appears with a light verb *sita* (*su* + past tense *ta*) in either an incorporated form (1a), or unincorporated form (1b). Thus, incorporation

seems quite optional, and other nominals such as *ryokoo* 'travel', *kekkon* 'marriage', *kaiwa* 'conversation' pattern the same way.

Although NVI seems optional with this first group of verbs, this is not always the case, as shown below:

(2)   √syoosin (*promotion*):
    a. John-ga   butyoo-ni   syoosin-sita.   (N + V incorporated form)
       John-$_{NOM}$ section chief-to   promotion-did.
    b. *? John-ga   butyoo-ni   [$_{DP}$ syoosin]-o   sita.   (unincorporated form)
       John-$_{NOM}$ section chief-to   promotion-$_{ACC}$ did.
       'John obtained a promotion to section chief.'

                                                                     (Tsujimura 1990)

Notice that while the noun *syoosin* appears as an incorporated form (2a), it cannot appear as an unincorporated form (2b): in other words, NVI is obligatory here. Other nominals that pattern with *syoosin* are: *toochaku* 'arrival' *tanjoo* 'birth' *kaitoo* 'thaw' *joohatsu* 'evaporation' *ryuukoo* 'popularity' to name a few (Miyagawa 1989).

Note also that the Japanese light verb *su* 'do' is quite different from English 'do' in a sense that it is 'void' of meaning, while English 'do' has semantic content. Thus, in Japanese, what provides the semantic content of the predicate (i.e. theta-role bearing category) in sentences like (1) is the noun, *benkyoo*, and *su* merely functions as a category-changing suffix (1a), or as an expletive verb (1b). Following Grimshaw & Mester (1988), I call constructions like (1a) 'VN-*su* constructions', and the ones like (1b) 'light verb constructions.'

Thus, there are roughly two types of nouns with respect to the optionality of NVI, which is summarized in the table in (3):

(3)

	INCORPORATION	NON-INCORPORATION
√benkyoo (*study*)	Possible (1a)	Possible (1b)
√syoosin(*promotion*)	Possible (2a)	**Not Possible** (2b)

For the rest of the paper, I will call nouns where NVI is optional *study*-type nouns, and nouns where NVI is obligatory *promotion*-type nouns.

Throughout the discussions that follow, I will set aside (but will address it in the conclusion) the case with meaningful '*su*', the heavy verb, as in (4):

(4)   Émile-ga   shukudai-o   sita.
      Émile-$_{NOM}$ homework-$_{ACC}$ did
      'Émile did homework.'

The organization of this paper is as follows: Section 2 is a brief introduction to Miyagawa (1989) and Tsujimura (1990)'s analyses of the grammaticality contrast between (1) and (2), which rely on noun classifications and Grimshaw & Mester's (1988) Argument Transfer Theory. I will then point out theory-internal disadvantages with adopting the Argument Transfer Theory, suggesting that we should alternatively seek a syntactic analysis. Abandoning yet maintaining Miyagawa and Tsujimura's insight into the unaccusativity of the noun, I will then propose an alternative analysis in terms of phases in section 3. The analysis is based on the claim that two nominals have a different derivation in terms of their structural

realization, one of which is affected by a phase-sensitive constraint. I will then turn to section 4, discussing what implications my analysis brings about. Section 5 concludes this paper.

2. Previous analyses: Miyagawa (1989) and Tsujimura (1990)

Previous attempts of capturing the contrast in (1) and (2) have been made by Miyagawa (1989) and Tsujimura (1990). First, they attribute the optionality of NVI to the noun classification. According to Miyagawa and Tsujimura, *study*-type nouns are either transitive or unergative, whereas *promotion*-type nouns are necessarily classified as unaccusative. The diagnosis for unaccusativity to be used here is the Numeral Quantifier (NQ) test in (5):

(5) *Numeral Quantifier (NQ) Test*
NQ and its associated NP or its trace must be in a local relationship.

(Miyagawa 1989)

Putting aside the technical definition of 'local relationship', what (5) requires is that an NQ and its associated NP, or its trace, are next to each other. Thus, sentence (6a) is ungrammatical where the NQ *5-nin* 'five' and its associated NP *gakusei* 'student' are not in a local relationship, while (6b) is grammatical where they are next to each other:

Unergative Nominals
(6) a. *Gakusei ga   zibun-no   kane-de   5-nin denwa-sita.
        Students-$_{NOM}$ self-$_{GEN}$ money-by 5-$_{CL}$ telephone-did.
     b. Gakusei ga   *5-nin*   zibun-no kane-de   denwa-sita.
        Students-$_{NOM}$ 5-$_{CL}$ self-$_{GEN}$ money-by telephone-did.
        'Five students telephoned using their own money.'

(Miyagawa 1989)

Now, consider (7) and (8):

Unaccusative Nominals
(7) Syain-ga$_1$ (butyoo-ni)   t$_1$ *5-nin*   syoosin-sita.
     employee-$_{NOM}$ (section chief-to)   5-$_{CL}$ promotion-did.
     'Five employees obtained a promotion to section chief'

(8) Tokyuu-ga$_1$ Uenoeki   ni t$_1$ *5-dai* tootyaku-sita.
     limited express trains-$_{NOM}$ Ueno station   to   5-$_{CL}$ arrival-did
     'Five limited express trains arrived at Ueno station.'

(Miyagawa 1989)

In both of the examples above, the NQ and its associated NP (*5-nin* and *syain* in (7), *5-dai* and *tokyuu* in (8), respectively) are apart from each other on a par with (6a). Nonetheless, the sentences are grammatical. What this suggests is that the surface subject originates in the *v*P/VP-internal position, so that its trace could be in a local relationship with the NQ: in other words, the incorporated nouns *syoosin* 'promotion' in (7) and *tootyaku* 'arrival' in (8) are unaccusative, providing *v*P-internal positions for the surface subjects.

Once Miyagawa and Tsujimura established the fact that *promotion*-type nouns are unaccusative, they argue for the fact that they cannot occur in the light verb constructions such as (2b) follows from Burzio's (1986) generalization:

(9)   *Burzio's generalization*
        A verb assigns an external thematic role iff it can assign Case.

According to Miyagawa and Tsujimura, since *syoosin* 'promotion' is an unaccusative noun in (2b), the light verb that takes it as an object *somehow* has obtained the unaccusativity from the noun. This makes the verb unable to assign accusative Case due to (9), rendering the sentence ungrammatical. But how does the light verb inherit the unaccusativity from the noun?
     Here, Grimshaw & Mester's (1988) Argument Transfer Theory comes into play:

(10) *Argument Transfer*
        In the light verb constructions, a nominal must transfer at least one or possibly all of its theta-roles to the light verb *su*.

According to Grimshaw & Mester (1988), in both light verb constructions such as (1b) and VN-*su* constructions such as (1a) and (2a), a noun transfers its theta-roles to the verb *su*, and then the verb assigns those theta-roles to the clausal arguments. Recall that *su* is void of meaning, and therefore has an empty argument structure in its lexical entry. In other words, the function of *su* is merely to assign accusative Case. Thus, the noun, bearing an argument structure, transfers its theta-roles to the light verb, whereby the verb obtains a theta-role assigning ability. This operation is what Grimshaw & Mester call Argument Transfer. Of particular importance is that Grimshaw & Mester assume that for light verb constructions, the transfer operation happens in the syntax, while for VN-*su* constructions, it happens in the lexicon. In other words, VN-*su* forms are created by morphological compounding, where the noun yields all its theta-assigning capacities to *su*. Miyagawa (1987, 1989) in fact take up this position, positing the structure in (11):

(11)   V
          ╱   ╲
         N   V
         │   │
      benkyoo   su
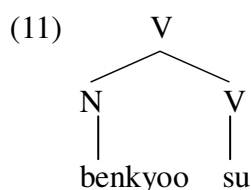
In (11), *su* is a head of the word, and its verbal feature percolates up to the upper node, creating a single verb. The argument structure of this complex predicate then projects the argument structure of the noun, just in the same way as *su* in the light verb constructions reflects it.
     Now we can explain the ungrammaticality of (2b). Since the noun *syoosin* is unaccusative, it has no external theta-role to transfer when Argument Transfer happens. Consequently, the light verb inherits the inability of assigning an external theta-role to its argument. Given Burzio's generalization in (9), which states that a verb can assign accusative Case iff it assigns an external theta-role, it follows that the light verb in (2b) cannot assign accusative Case to the noun. By contrast, the V-N complex in (2a) does not need to assign accusative Case; thus, the sentence becomes grammatical. The grammaticality of (1) also follows in a

straightforward manner: since the noun has an external theta-role, the verb can assign accusative Case to the noun in (1b) after argument transfer occurs.

The crucial aspect of Miyagawa and Tsujimura's analyses is that they attribute obligatory incorporation for *promotion*-type nouns to their unaccusativity. To do so, they adopt Grimshaw and Mester's (1988) Argument Transfer Theory, assuming the lexical analysis of incorporation for VN-*su* constructions (cf. Kageyama 1982). [1] However, since Argument Transfer only works through having all theta-roles assigned at D-structure due to the Projection Principle, the idea goes against the current Minimalist framework. In the Minimalist framework, only the interface levels PF and LF are postulated, thereby both D-structure and S-structure are no longer levels of syntactic component. Consequently, there is no motivation for having the Projection Principle as part of our grammar. Thus, we can no longer argue that all theta-roles must be assigned at D-structure since neither the Projection Principle or D-structure are theoretically motivated anymore. To state it differently, in the current Minimalist framework, theta-roles should be able to be assigned at LF (Saito & Hoshi 2000). Furthermore, the lexical incorporation analysis is only essential when we adopt Argument Transfer Theory. Thus, all these theory-internal disadvantages suggest that we should seek an alternative analysis that is up to date with the Minimalist framework, and one that adopts the syntactic analysis of incorporation.

In the following section, abandoning Argument Transfer Theory, yet maintaining Miyagawa and Tsujimura's unaccusativity account, I will propose an alternative analysis of optional or obligatory nature of NVI.

3. Noun-Verb incorporation by phase

In this section, I propose that the optionality or obligatoriness of incorporation comes from the structural difference between *study*-type nouns (1) and *promotion*-type nouns (2). Along the line of Distributed Morphology framework (Halle & Marantz 1993), I assume that all the words start off as category-neutral elements called *roots* $\sqrt{}$, that they are assigned categories

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[1] In fact, Miyagawa and Tsujimura need to assume the lexical incorporation. Consider the following examples:

(i)   a. Mary-ga   John-ni [DP toti-no   zyooto]-o   sita.
         Mary-NOM   John-to   land-GEN   giving-ACC did
      b. Mary-ga   John-ni toti-o   zyooto-sita
         Mary-NOM   John-to   land-ACC giving-did
      c. *Mary-ga   John-ni [DP toti-no t₁] zyooto₁-sita.
         Mary-NOM   John-to   land-GEN   giving-did
         'Mary gave a piece of land to John.'

As shown in (ia) and (ib), a ditransitive noun *zyooto* 'giving' is a *study*-type noun, and can be realized in one of the two ways: that is, either *zyooto-o sita* 'giving-Acc did', or *zyooto-sita* 'giving-did' is grammatical. Given this, the ungrammaticality of (ic) cannot be explained if the complex predicate is formed in the syntax. Since the noun has transferred its theta-roles to *su*, whereby the external argument *Mary* and the internal argument *John* appears outside of the DP, the sentence meets the conditions for Argument Transfer. As a result, the syntactic incorporation analysis cannot prevent noun-incorporation from happening in (ic). However, the lexical incorporation analysis makes a correct prediction. Since the noun *zyooto* is already part of the complex verb *zyooto-sita* when it appears in the syntax, the internal argument of this complex predicate always appears as an object of it, with an accusative Case marker *o* being assigned. Given this, the ungrammaticality of (ic) follows from the fact that *toti* 'land' is assigned a wrong Case. Therefore, as long as Miyagawa and Tsujimura adopt Argument Transfer Theory, they consequently need to adopt the lexical incorporation.

by category-defining elements like *n*, *a*, *v*. Assuming along with Marantz (1997), that D can put roots into a nominal context, I argue that *benkyoo* 'study' can be realized either as a DP or an *n*P, while *syoosin* 'promotion' can only be realized as an *n*P. I assume that whether the DP structure is available or not is determined by the nature of D, which causes D to be unable to merge directly with a root without an external argument (i.e. unaccusative roots).

Furthermore, I assume that NVI is triggered by an uninterpretable root feature *u*√ (Johns 2007). According to Johns, in Inuktitut, a language that has noun incorporation, what triggers incorporation is this *u*√ feature on C. This is attributed to the fact that in Inuktitut, a root element must appear on the leftmost edge (i.e. the highest C position in the tree), which is illustrated in the following example in (12a) and its structure in (12b):

(12) a. umia-liu-gaju-nngit-tuq
          boot-create-often-$_{\text{NEG.-PART.3s}}$
          He doesn't often make boats.

      b.
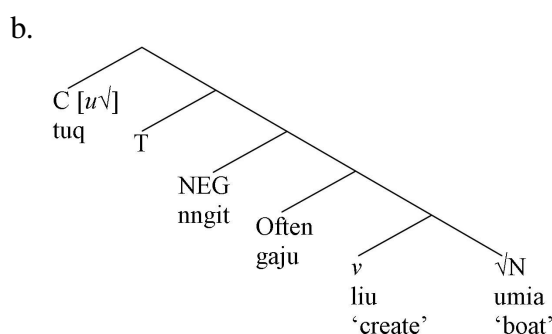
                                                                              (Johns 2007)

Assuming Chomsky's (2000, 2001) probe-goal feature checking system, in (12b) the *u*√ feature on C probes down to the closest root nominal *umia* 'boat', which triggers noun incorporation all the way up to C, with the noun picking up all the elements on its way. [2] Note that the *u*√ feature is analogous to the EPP feature, which requires movement of an element with phonological content: in our present case, movement of a nominal root. This in turn suggests that any root can be a target of movement since the probe *u*√ feature on C attracts the closest root as a goal. This is in fact the case, as illustrated in the following examples:

(13) a. qakuqtaq-taaq-tunga
          white-get/buy- $_{\text{PART.1s}}$
          'I bought something white.'
      b. miqsu-gaju-nngit-tuq   kamiing-nit
          sew-often-$_{\text{NEG.- PART.3s}}$ boot-$_{\text{MIK. PL.}}$
          'She hardly ever sews boots.'

                                                                              (Johns 2007)

In (13a), the adjectival root √*qakuqtaq* 'white' undergoes movement to the left edge of the clause, while in (13b) the verbal root √*miqsu* 'sew' does so.

---

[2] Johns (2007) analyzes all the incorporating verbs (i.e. *liu* 'create' in (12a)) as functional verbs, namely, light verbs. Therefore, those verbs have no lexical content, and thereby they are not roots.

In Japanese, however, only nominals can undergo incorporation, and what attracts nominals is the light verb *su*. For this reason, I assume that the $u\sqrt{}$ feature is placed on *v* together with the uninterpretable nominal feature [*un*] so that *v* bearing a feature bundle of [$u\sqrt{}$, *un*] can only target nominal roots. Furthermore, I posit the interpretable nominal feature [+*n*] on both *n* and D. The assumption here is based on the fact that both heads only appear with nominals: in other words, both *n* and D heads can put roots into a nominal context (Marantz 1997, 2001). Additionally, I assume that *n* also has a $u\sqrt{}$ feature but D does not. This assumption is motivated by the fact that *n* always and only takes bare roots, while D can either take bare roots or phrasal constituents.

Finally, my analysis relies on the following assumptions:

(14)   (a) DP is a phase (Svenonius 2004)
       (b) Only *MOVE*, not *AGREE* (Chomsky 2000, 2001), is subject to Chomsky's Phase Impenetrability Condition (PIC) (Bošković 2007)

The definition of PIC is roughly as follows:

(15)   *Phase-Impenetrability Condition* (PIC)
       [$_{XP}$ X [$_{ZP}$ [Z Y
       In a configuration like above, where ZP is a phase, Y cannot be accessed from X.

Bearing these assumptions in mind, let us first look at the following configurations for *study*-type nouns:

(16)   Configurations for √benkyoo 'study':
       a. Option 1   b. Option 2

```
        nP         v [u√, un]              DP          v [u√, un]
       /  \            |                  /  \            |
      /    \           su                /    \           su
  √benkyoo  n [u√, +n]             √benkyoo   D [+n]
```
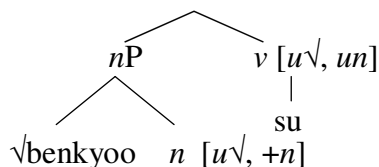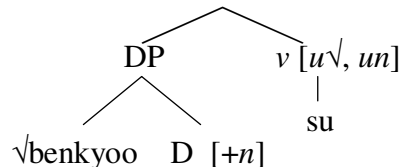
In (16), √*benkyoo* has two options in its structural realization. On the one hand, in (16a) the root is merged with *n* bearing both an interpretable [+*n*] feature and an uninterpretable feature [$u\sqrt{}$]. The root then gets selected by a light verb *su* containing a $u\sqrt{}$ feature and an uninterpretable nominal feature [*un*]. On the other hand, in (16b) the root is merged with D bearing only an interpretable [+*n*] feature. In both cases, the feature bundle of [$u\sqrt{}$, *un*] on *v* needs to be checked, but how it gets checked is different in each case. Departing from Johns (2007), I claim that a √ feature is different from an EPP feature in a sense that the former can be checked via either *MOVE* or *AGREE*, whereas the latter can only be checked by *MOVE*. Yet, the √ feature is very similar to the EPP feature in that *MOVE* is the default option for both.

Accordingly, the root √*benkyoo* in (16a) first moves to *n* to check its $u\sqrt{}$ feature. This operation creates the root-*n* complex structure bearing the feature bundle of [+√, +*n*], as shown in (17):

(17) Incorporated Version: root movement to *n*:

```
        nP            v [u√, un]
       /  \            |
      /    \          √su
 t√benkyoo  n [+√, +n]
           /    \
       √benkyoo   n
```
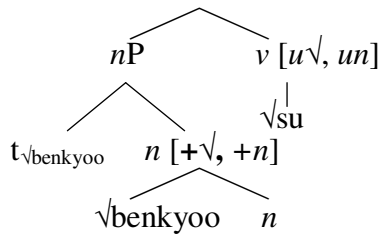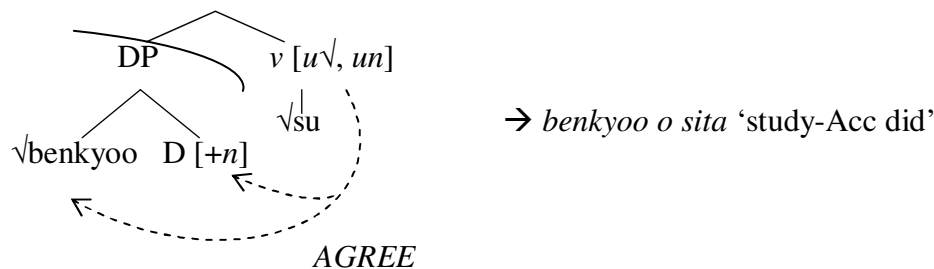
As a next step, the entire root-*n* complex moves up to *v* to check both [*u*√] and [*un*] features on *v*. This operation is *MOVE*, and it provides an NVI form:

(18) Incorporated Version: root-*n* movement to *v*:

```
        nP            v [+√, +n]
       /  \            |
      /    \          √su
 t√benkyoo  n[+√, +n]
           /    \
       √benkyoo   n
                MOVE
```
→ *benkyoo-sita* 'study-did'
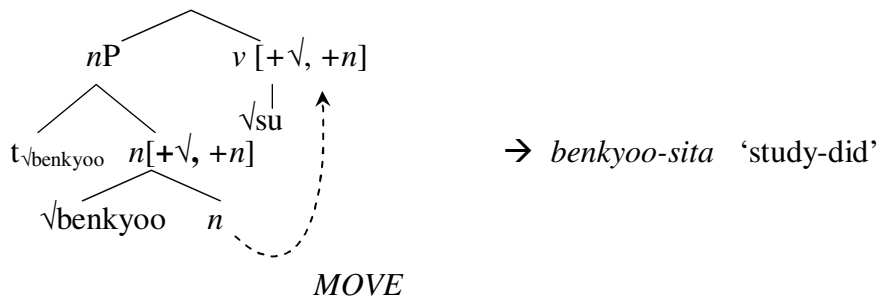
In the case of (16b), √*benkyoo* is inside the DP domain and the DP is a phase (14a).[3] Consequently, it cannot move to check the feature because it would have to cross a phase boundary, and *MOVE* is constrained by PIC (14b). Thus, *v* establishes *AGREE* with the root, getting its [*u*√, *un*] features to be checked. Since *AGREE* is not constrained by PIC (14b), it successfully yields an unincorporated form:

(19) Unincorporated Version:

```
        DP            v [u√, un]
       /  \            |
      /    \          √su
 √benkyoo   D [+n]
                AGREE
```
→ *benkyoo o sita* 'study-Acc did'

While √*benkyoo* has two options in its structural realization, √*syoosin* 'promotion' has only one option: it can only be realized as an *n*P:

---

[3] While the phasal status of DP is generally accepted, whether *n*P is a phase or not is controversial (see Marantz (2001), Marvin (2002) for the claim that *n*P is also a phase). In this paper, I take up a position that *n*P is not a phase.

(20) Configurations for √syoosin 'promotion':

```
        nP              v [u√, un]
      /    \               |
  √syoosin   n [u√, +n]    √su
```
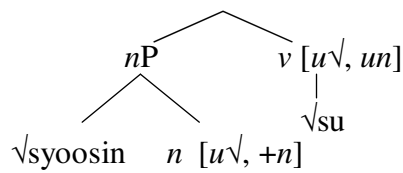
As a result, the structure for √*syoosin* only allows an incorporated form on a par with (18):

(21) Incorporated Version: root-*n* movement to *v*

```
        nP              v [+√, +n]
      /    \               |
  t√syoosin  n[+√, +n]     √su
           /    \
      √syoosin    n

                MOVE
```

→ *syoosin-sita* 'promotion-did'
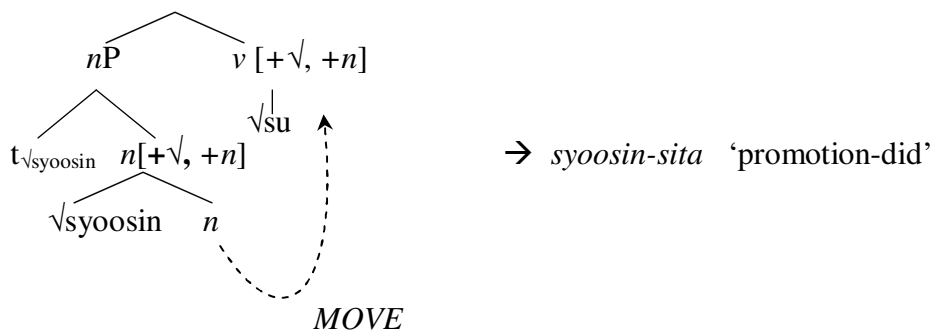
Since it cannot be realized as a DP due to the nature of D being incompatible with roots without an external argument, the unincorporated form cannot be obtained: [4]

(22) Illegitimate Configuration:

```
        DP              v [u√, +n]
      /    \               |
  √syoosin   D [+n]        √su

                AGREE
```

→ **syoosin o sita* 'promotion-Acc did'
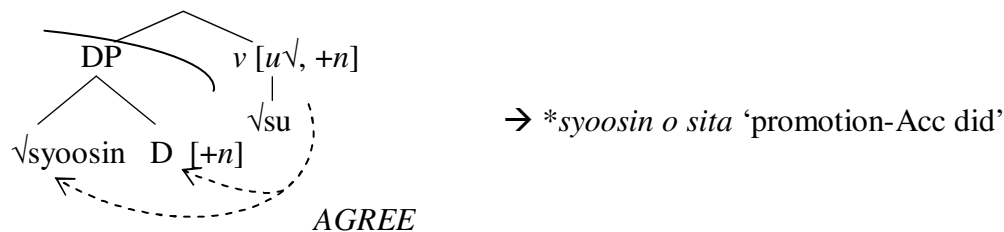
In summary, I claim that the (un)availability of DP structure makes the correct predictions for both *study-* and *promotion*-type nouns. I attributed the lack of choice for a root to be selected by D to the nature of the D: it can only select certain types of roots that take an external argument. Pushing this claim forward, I argue, contrary to Embick & Noyer (2005), that roots contain *some* grammatical features: that is, in our current system, roots must bear at least √ features so that they could enter into a feature-checking relation with *v*. Moreover, roots must contain grammatical information about their argument structure in order for them to be selected by a right head, namely, D or *n* (see Dobler (2007) for a similar claim with respect to roots and their selectors from independent evidence).

In the following section, I will discuss what implications and consequences the current analysis brings about.

---

[4] The validity of the assumption that D is incompatible with external argument-less roots is to be discussed later in the following section.

4. Implications

The immediate question to be raised about the optionality in structural realizations is how we deal with the option of √*syoosin* 'promotion' being eventually realized as a DP, but merged with an *n* first. Since our restriction on D is that it cannot *directly* select roots without external arguments, the configuration where D *eventually* combines with the *promotion*-type roots should be possible in principle:

(23)   Theoretically Possible Configuration for √syoosin 'promotion':
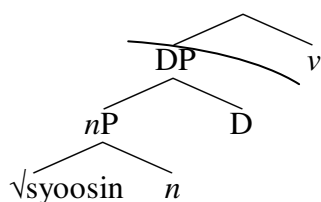
Note that none of our constraints are violated in (23): what D merges with is an *n*P, not the root itself. If this is the case, then the prediction is that √*syoosin* 'promotion' should be able to enter into an *AGREE* relation with *v* under the assumption that *AGREE* is not constrained by PIC, yielding an unincorporated version **syoosin-o sita* 'promotion-Acc did', contrary to fact. How do we then exclude this possibility?

The discussion above suggests that a locality constraint on *AGREE* is different from that on *MOVE*: namely, we need to state that while *MOVE* is strictly local, *AGREE* is *less but relatively* local. But what does this 'less but relatively local' mean?

In fact, the tolerance of long distance *AGREE* varies cross-linguistically. Consider the following cases of French wh-questions from Bošković (1998):

(24)   Marie a   vu   qui?
       Marie has seen whom
       'Who did Marie see?'

(25)   *Jean et   Pierre croient que Marie a   vu   qui?
        Jean and Pierre believe that Marie has seen whom?
        'Whom do Jean and Pierre believe that Marie saw?'

(26)   Qui   Jean et Pierre   croient-ils que Marie   a vu?
       Whom Jean and Pierre   believe   that Marie   saw?
       'Whom do Jean and Pierre believe that Marie saw?'

As shown in (24), French normally allows wh-in-situ in matrix questions. However, (25) shows that long-distance wh-in-situ is not allowed. By contrast, (26) shows that overt wh-movement in long-distant question is allowed. In a system where *AGREE* is less local than *MOVE*, how could we interpret this contrast between (25) and (26)?

Bošković (2007) analyzes this as a relativized minimality type of intervention effect. In (25) and (26), the matrix C, the embedded C, and the wh-phrase should all be specified for the

wh-feature. The specification of this feature may be different: suppose that the matrix C is specified for [+wh], and the embedded C for [–wh]. Suppose also that no matter what the feature specification is (i.e., + or -), either feature is qualified for causing the relativized minimality effect. Given that *AGREE* must be established with the closest element (i.e. *AGREE* closest), the matrix C cannot establish an *AGREE* relationship with the embedded clause wh-phrase, due to the intervening embedded C bearing [–wh] feature. This is why (25) is ungrammatical. Unlike (25), the intervention effect does not arise in (26) since the wh-phrase can cyclically move out of the embedded CP domain, obeying PIC. From this, we can conclude that *AGREE* is not subject to PIC as long as there are no other intervening factors.

From this observation, I assume that the same reasoning applies to our case in (23), repeated here as (27): namely, D acts as an intervener, causing the intervention effect:

(27) D as an intervener:
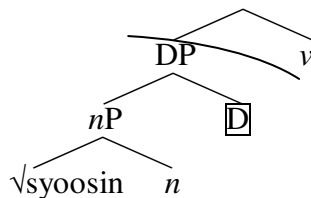
Now, the question to be asked is what makes D act as an intervener? Notice that once the relevant features are specified as shown in (28a) and (28b) below, the exact same type of intervention effect as the French wh-interrogative cases above can be obtained:

(28) Illegitimate configurations due to the intervention effect:
    (a)   Pre-movement of the root to *n*   (b)   Post-movement of the root to *n*
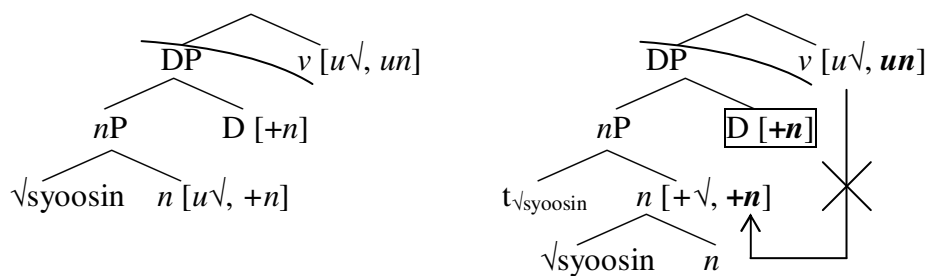
The configuration in (28a) shows the feature specification on each head. As has been assumed so far, *n* has both an uninterpretable root feature [$u\sqrt{}$] and an interpretable nominal feature [+*n*], whereas *v* has the same set of features but with a different value of the nominal feature (i.e., [*un*]). As for the feature specification on D, recall that unlike *n*, D only has an interpretable nominal feature [+*n*]. Since the $u\sqrt{}$ feature on *n* needs to be checked, a root √*syoosin* first moves to *n*, as shown in (28b). Now, in this very configuration, since the $u\sqrt{}$ feature on *n* gets checked by the root movement, the complex root-*n* constituent now has a feature bundle of [+√, +*n*]. In a later stage of the derivations, when *v* is about to establish an *AGREE* relationship with the root, D also bearing a [+*n*] feature causes the intervention effect. Note that the operation like the following is unavailable: *v* first targets D for having its [*un*] feature checked, and then searches for another goal *n* to get its $u\sqrt{}$ feature checked. This is due to the fact that feature-checking must be done in a "one fell swoop" fashion (Chomsky 2000).

Thus, *v* probes for the closest goal with the exact feature matching, namely, the root-*n* constituent with the $[+\sqrt{}, +n]$ feature bundle. [5] However, since *AGREE* does not hold due to the intervening D bearing $[+n]$, the derivation crashes. Note that the exact feature specification for the nominal feature does not matter. As we have seen in the French examples above, as long as the intervening head bears the same feature as the probe, it still acts as an intervener. Hence, the configuration in (28b) successfully excludes an unincorporated form for *promotion*-type nouns (i.e. *syoosin-o sita 'promotion-did'), the form we could only obtain via *AGREE* between the root and *v*.

The current system immediately brings about the following implication: the structure in (29) where there is no *v* bearing the $u\sqrt{}$ feature above the complex DP structure should be legitimate since there is no checking requirement between the root and the *v* which causes the intervention effect:

(29) Legitimate configuration:
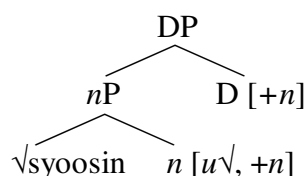
In fact, the prediction is borne out: the structure in (29) is allowed in the subject position, as shown in (30): [6]

(30) [$_{DP}$ John-no [$_{nP}$ syoosin]]-ga   Mary-to-no   kekkon-e   tunagatta.
        John-$_{GEN}$ promotion-$_{NOM}$ Mary-with-$_{GEN}$ marriage-to   led
        'John's promotion led to his marriage to Mary'

In (30), since the structure of the whole DP, [$_{DP}$ John-no [$_{nP}$ syoosin]], 'John's promotion', is in the subject position, there is no *v* carrying its $u\sqrt{}$ feature above it. Thus, the root does not need to *MOVE* nor *AGREE* to check off the $u\sqrt{}$ feature on *v*, rendering the sentence grammatical.

I now turn to the second implication of my analysis of the nature of D in the current system. If the assumption that D cannot be directly merged with a root without an external argument is on the right track, one possible extension of the analysis is nominalization in English.

---

[5] Another way of saying this is that the $[u\sqrt{}]$ feature on *v* is dependent on the $[un]$ feature: i.e. there is a hierarchical relationship between those two features like the following:
(i) $[un]$
        |
    $[u\sqrt{}]$

As Tobin Skinner (personal communication) has pointed out, this hierarchical organization is analogous to that of phonological features (e.g. [+anterior] is dependent on [CORONAL]). On this view, only the topmost feature functions as a probe, but whatever it targets will also have to satisfy the dependent $[u\sqrt{}]$ feature. Given this, if *v* were to target D bearing $[+n]$ feature, D cannot also check the dependent $[u\sqrt{}]$ feature, causing the derivation to crash. Consequently, *v* can only probe for the $[+\sqrt{}, +n]$ feature complex on *n*, where $[+\sqrt{}]$ is dependent on $[+n]$. However, *AGREE* between the *v* and *n* does not hold since the intervening D with $[+n]$ causes the intervention effect in the similar manner as (28b).

[6] The subject [$_{DP}$ John-no [$_{nP}$ syoosin]] must be realized as a DP in (30) since the genitive Case is assigned to the subject of *syoosin*, *John* (see Miyagawa 1993 and Ochi 2001, 2005 for the argument that genitive Case in Japanese is licensed by D head).

Consider the following nominalization examples:

(31)   a. John destroyed the city
       b. *The city destroyed
       c. John's destruction of the city.
       d. The city's destruction

(32)   a. John grows tomatoes
       b. The tomatoes grow
       c. *John's growth of tomatoes
   d. the tomatoes' growth

(Marantz 1997)

As you can see from the ungrammaticality of (31b) and (32c), it is obvious that deriving nominalizations from sentences (i.e. (31c) from (31a), (32d) from (32b)) is not what is happening here. If nominalized verbs are in fact carrying verbal features in the categorical component, then, they should share their distribution, and hence we would expect (31b) and (32c) to be grammatical.

Marantz's (1997) answer to this is that nominalizations like *destruction* and *growth* are never "verbs" at any stage in the derivation, and thus DPs (31c, 32d) are not transformationally related to sentences like (31a, or 32a,b). Thus, neither √DESTROY nor √GROW have the following configurations, where the roots are first merged with *v*:

(33)   the city's destruction, John's destruction of the city
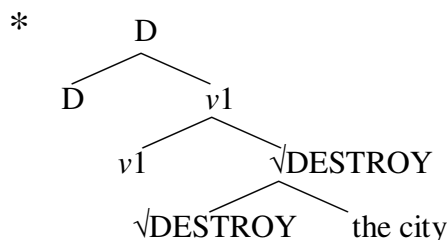
(34)   the tomatoes' growth
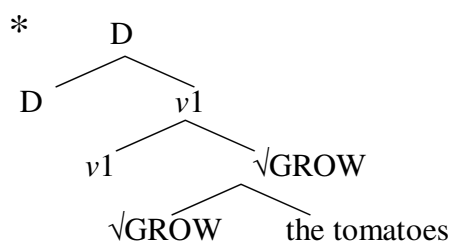
Note that the ban on these structures means that we cannot rely on *v* to introduce the agentive reading of the nominals. If the verbal head were involved in the agentive interpretation of '*John's destruction of the city*', then it automatically allows the possibility for the illegitimate configuration for √GROW in (34), wrongly predicting that *'*John's growth of tomatoes*' is grammatical. Thus, the trick here is to allow the agentive reading while both roots above only

have the D head, which puts them into a nominal context. The relevant configurations are as follows:

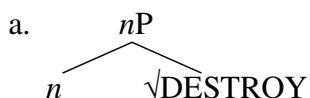(35) the city's destruction, John's destruction of the city

```
              D
            /   \
          D      √DESTROY
        /   \
  √DESTROY    the city
```

(36) the tomatoes' growth

```
              D
            /   \
          D      √GROW
               /    \
          √GROW      the tomatoes
```
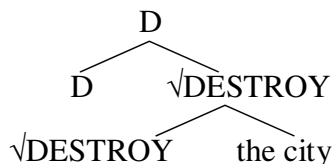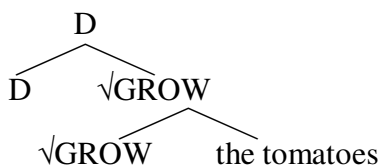
Now, the paradox here is that *destroy*, which is obligatorily transitive in its verbal domain, can be alternatively transitive or intransitive in its nominal counterpart *destruction*, while *grow*, which is optionally intransitive or transitive in its verbal domain, must be intransitive in *growth*. As Marantz notes, the only solution to this paradox is to say that this information is *somehow* implied by the root. In other words, the agentive reading is allowed for '*destroy*' in the nominal context while it is restricted in the verbal environment for *grow*. However, the obvious question for this argument is how we are able to distinguish the √GROW-type of nominals from the √DESTROY-type of nominals when they have the exact same structures?

   This dilemma can be solved if we apply our current analysis of root-dependent structural realization to the nominalization cases at hand. Recall that our system only allows D to select √DESTROY, since √GROW lacks an external argument. Thus, while √DESTROY has two options in its structural realization on a par with our *study*-type roots, √GROW only has an *n*P option like our *promotion*-type roots:
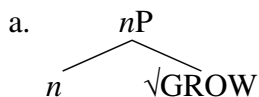
(37) Structures for √DESTROY:

```
   a.        nP                    b.        DP
           /    \                          /    \
          n      √DESTROY                  D      √DESTROY

     'the city's destruction'        'John's destruction of the city'
```

(38) Structure for √GROW:

```
   a.        nP                    b. *      DP
           /    \                          /    \
          n      √GROW                     D      √GROW

     'the tomatoes' growth'          '*John's growth of tomatoes'
```
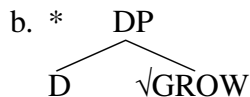
The different structural realizations now allow us to differentiate the agentive reading from non-agentive reading in a more straightforward manner. In (37) when √DESTROY is realized

as an *n*P, it does not yield the agentive reading: therefore, this is the case of '*the city's destruction*'. When it is realized as a DP, then, it yields an agentive interpretation, the case of '*John's destruction of the city*'. In contrast to √DESTROY, √GROW has only one option in its structural relation: that is, the *n*P structure in (38a). Therefore, it is incompatible with the agentive reading, disallowing nominalizations such as '**John's growth of tomatoes*'.

Now, if merging with D yields the agentive interpretation as shown in (38a), then how do we derive the agentive interpretation for *study*-type nouns when they are realized as *n*Ps? I claim that in both light verb and VN-*su* constructions in Japanese, it is the light verb *v* that plays the role of assigning theta-roles of the nominal. Notice that the gist of this claim is essentially the same as Grimshaw and Mester's Argument Transfer Theory, where the noun asks the light verb for 'help' with assigning theta-roles. In our present analysis, this implies that roots have theta-grids but do not have the ability to assign theta-roles. Thus, the roots need the light verb as a 'helper' for distributing their theta-roles.

Another possible extension of the analysis is to the third type of Japanese nominal that Miyagawa (1989) discovered. Miyagawa reported that there is a type of nominal, *nyuukai* 'membership', that is ambiguous between *study*-type nominals and *promotion*-type nominals. As shown in (39), this type of nominal usually allows both the incorporated and unincorporated version:

(39) a. Taroo-ga   (tenisubu-ni) nyuukai-sita.
        Taroo-$_{NOM}$ tennis club-to membership-did
     b. Taroo-ga   (tenisubu-ni) nyuukai-o   sita.
        Taroo-$_{NOM}$ tennis club-to membership-$_{ACC}$ did
        'Taroo joined the tennis club.'

(Miyagawa 1989)

Thus, at first sight, it appears that *nyuukai* 'membership' in (39) patterns with *study*-type nouns. However, these two types of nouns diverge when the NQ test is applied to, as shown in (40) and (41):

(40) *Gakusei-ga   suugaku-o 2-ri benkyoo-sita.
      students-$_{NOM}$ math-$_{ACC}$ 2-$_{CL}$ study-did.
      'Two students studied math'

(41) Tomodati-ga   tenisubu-ni 2-ri nyuukai-sita.
     Friends-$_{NOM}$ tennisbu-to 2-$_{CL}$ membership-did.
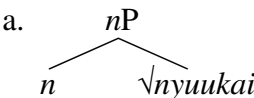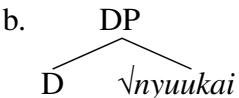   'Two friends joined the tennis club.'

(Miyagawa 1989)

From this observation, Miyagawa concludes that *membership*-type nouns are ambiguous as to whether they are unaccusative or unergative. According to him, when the relevant noun appears in an incorporated version like (39a), it is interpreted as unaccusative (i.e. *promotion*-type nouns). But if it appears in an incorporated version as in (39b), it is interpreted as unergative (i.e. *study*-type nouns). The unergativity of the incorporated version in (39b) is confirmed with the unacceptability of the stranded NQ, as shown in (42):

(42) *Tomodati-ga   tenisubu-ni 2-ri   nyuukai-o   sita.
     Friends-~NOM~   tennisbu-to 2-~CL~ membership-~ACC~ did.
     'Two friends joined the tennis club.'

                                                                              (Miyagawa 1989)

The problem of Miyagawa's analysis is that it is not clear that the same noun appears as unaccusative in one case and as unergative in the other when there is no other noticeable difference between (39a) and (39b). If there is such an unambiguous categorical noun classification, we should be able to see the structural difference between unaccusative *nyuukai* 'membership' and unergative *nyuukai*. Moreover, we need to differentiate the *membership*-type of nominals from the *study*-type nominals and *promotion*-type nominals.

Under our analysis, however, the structural differentiation of this nominal becomes possible. When √*nyuukai* is selected by D, it becomes unergative, and when it is selected by *n*, it becomes unaccusative, as shown in (43a) and (43b), respectively:

(43) Structures for √nyuukai 'membership':
     Unaccusative 'nyuukai'   Unergative 'nyuukai'

     a.   *n*P   b.   DP
           /   \   /   \
         n   √*nyuukai*   D   √*nyuukai*

Although we still need to clarify what the exact nature of such a *membership*-type noun is, the difference from the other two types of nouns *benkyoo* 'study' and *syoosin* 'promotion' is at least obtained. Although √*nyuukai* 'membership' has two choices in its structural realization, and √*benkyoo* 'study' does not, each structure corresponds to a different categorization. Likewise, although √*nyuukai* can be realized as an *n*P unlike √*syoosin* 'promotion', the structure as an unaccusative noun itself is exactly the same as √*syoosin*.

Summarizing this section, by applying our root-dependent categorization analysis, we provided a clear structural differentiation for paradoxical cases of nominalizations in English, and the categorical neutral nominals such as *nyuukai* 'membership'.

Moreover, I showed that allowing the possibility of DP merging *n*P (i.e. [~DP~ D [~nP~ *n* √]]) when there is no *v* above the structure indeed makes a correct prediction about the distribution of this DP phrase. When the relevant DP structure appears in the object position, it causes a crash of derivations, whereas if it occurs in the subject position, the derivations converge.

5. Conclusions

Turning attention to Miyagawa and Tsujimura's finding about the unaccusative nouns' behavior in the light verb and VN-*su* constructions, I have claimed that two types of nominals, *benkyoo* 'study' and *syoosin* 'promotion' are structurally different: a nominal structure of the former can either project to a DP or an *n*P, while the latter only projects to an *n*P. Together with this assumption, I argued that the obligatory or optional nature of incorporation comes from this structural difference: that is, an *n*P option yields an incorporated form via *MOVE*, and a DP option provides an unincorporated form via *AGREE*.

Although the focus of the investigation has been placed on the light verb and not on the heavy verb *su*, we can further push our analysis forward, and extend it to the heavy verb

constructions. I argue that what makes *su* 'light' or 'heavy' depends solely on the presence of the [*u*√] feature. That is, if *su* is realized as a [*u*√] feature-less *v*, then it functions as a heavy verb. In this case, *su* behaves as a semantically-content full verb, having its own theta-grid. This is why there is no NVI for sentences like (4), repeated here as (44) below:

(44) a. Émile-ga   shukudai-o   sita.
          Émile-_{NOM}   homework-_{ACC} did
      b. * Émile-ga   shukudai-sita.
          Émile-_{NOM}   homework-did
          'Émile did homework.'

The most significant implication of my analysis is that roots do contribute a computation to the grammar by containing a root feature [+√] and being associated with theta-grids. Bearing theta-grids enables them to be selected by a right head, namely, D or *n*, according to the presence or absence of the external arguments of the root.

   Thus, to the extent that my analysis is correct, what has been assumed about roots not containing any grammatical features (Embick & Noyer 2005) should be adjusted to that effect.

Acknowledgements

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