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Contents

Hedging verbs and nouns using an alternative semantics

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In this paper I provide a formal analysis of the English hedge *sorta*, concentrating on its use with verb phrases. I bring to light new data showing how *sorta* can hedge the direct object of creation verbs and some intensional verbs without combining with the direct object directly, and that the ability to hedge a direct object from a distance is conditioned by verb type and the type of determiner with the direct object. I build an analysis using Morzycki's (2011) alternative semantics implementation of the pragmatic halos of Lasersohn (1999).

1.   Introduction

Speech is rarely perfectly precise. Well-known from the work of Grice (1957) is that speakers are experts at implicated unsaid meanings — how something is said matters to the way it is interpreted. But the competence system allows for other avenues to express things that are not quite what was said; quantifiers can have restricted domains, and hedges such as *loosely speaking* and *sorta* mark words and expressions as being interpreted in a way that is outside the norm. This paper is an analysis of one such hedge, *sorta*.

The question pursued in this paper is about the representation behind hedging, and how *sorta* can grade over different meanings. I show that *sorta* is sensitive to noun phrase and verbal semantics, and that accounting for its behavior requires new assumptions about the denotations of lexical items. In doing this, I adopt a Hamblin semantics for imprecision from Morzycki (2011), who suggests modeling the denotations of lexical items as sets of alternatives, this being a reimplementation of Lasersohn (1999)'s pragmatic halos.

This paper starts by laying out the crucial data in section 2. From there, I move on to discussing the theoretical background of this paper, pragmatic halos and a Hamblin semantics for imprecision, in section 3. A first pass at an analysis is provided in section 4, with further discussion of the analysis in section 5. I discuss implications for the interface between semantics and the conceptual system in section 6, as well as a way forward in tackling the puzzles that confound my analysis.

2.   *The basic data*
2.1.   *Approximation and sorta*

The English modifier *sorta* is part of a family of modifiers often called *hedges*.[1] Like other hedges, *sorta* pragmatically serves to signal a mismatch between what a speaker is saying and what a speaker actually means. This may be done for the metalinguistic reason of not knowing the correct word or phrase to use at the time of utterance, or as a rhetorical strategy to soften the impact of what is said. In this respect, it behaves similar to *like* (Siegel 2002).

The mismatch *sorta* provides between what is said and meant is demonstrated in (1) below, where the natural interpretation is that the speaker does not mean to actually use the word *kick* in the sentence, but some other word. Denying the use of the word *kick* in a followup is perfectly acceptable (2), as the semantic content of *kick* is neutralized by *sorta* (Bolinger 1972).

(1)   [I was] running on concrete and accidentally sorta kicked the ground. (Google)

(2)   I was running on concrete and accidentally sorta kicked the ground — that is to say, I didn't really kick the ground, but it was like kicking the ground.

The approximative sense with *sorta* comes out clearly when considering the paraphrases available when *sorta* is used. The most natural paraphrases are those that express that *sorta V* (where V is the verb) is similar to but not V in some respect.

(3)   He sorta swam over to the boat.
         "He did something like swimming over to the boat."

(4)   The soccer player sorta kicked the ball.
         "The player did something close to but not quite kicking the ball."

Sorta is able to modify verb phrases headed by most types of verbs. For many verbs, the behavior of *sorta* mirrors the behavior in (1) above, where *sorta* hedges the verb. For some verbs, however, a second reading arises where *sorta* can hedge not just the verb but also its direct object. Verbs that *sorta* can do this for include some intensional transitive verbs (such as *look for*), as well as creation verbs (*build*), depiction verbs (*draw*, *paint*), and performance verbs (*sing*). To illustrate, in (5) below, the sentence is ambiguous between two readings: one reading where the verb is hedged, but also one reading where the direct object of the verb is hedged. (6) demonstrates the same phenomenon with a depiction verb, and (7) with *look for*.

(5)   The carpenter sorta built a barn.
         a. The carpenter did something that was like building a barn (e.g., putting together a prefabricated structure).

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[1] In this paper I am concerned with the adverbial *sorta* that can modify VPs and APs. The nominal *sort of*, i.e. *a sort of cat*, does not figure into this story. The adverbial *sorta* that can modify VPs and APs has a phonologically unreduced variant *sort of*, but to emphasize my treating adverbial *sort of* and *sorta* as a single lexical item separate from the nominal *sort of*, I write both as *sorta*, even when the unreduced variant is the preferred variant for speakers. *Kind of* (reduced: *kinda*) appears to be related to *sorta*, and for the purposes of this paper I assume that it has the same semantics and pragmatics. Some speakers report that judgements with *sorta* are odd while using *kinda* is better, but I assume that this is stylistic variation.

b. The carpenter built something like a barn (e.g., a shed).

(6)   The boy sorta drew a house.

a. The boy did something like drawing a house (e.g., connected the dots in a picture).

b. The boy drew something that was like a house.

(7)   I'm sorta looking for a horse.

a. I'm only half-heartedly looking for a horse.

b. I'm looking for something like a horse.

Looking at the examples above, we might think that this is simply an effect of the indefiniteness of the direct object. To some extent, it is; replacing the indefinite noun phrases with definite noun phrases in the sentences above makes the hedging effect on the direct object disappear. Both (8) and (9) below are unambiguous, showing that the determiner does have an effect.

(8)   The amateur carpenter sorta built the house.

a. The amateur carpenter did something that was akin to building that resulted in the house (e.g., he had help from more skilled carpenters).

b. *The amateur carpenter built something that was like the house (a shack, a hovel, . . .).

(9)   The men sorta sang the song.

a. The men did something that was like singing (mumbling, bellowing, . . .).

b. *The men sang something that was like the song (a poem, a verse, . . .).

When we look at more mundane verbs such as *kick* with indefinite direct objects, however, a different picture begins to emerge. (10) does not have the same sorts of readings that verbs such as *build* above do, and neither does *eat* in (11). Namely, the reading where the direct object is hedged is unavailable, even though the verb may still be hedged. Both of these verbs are outside of the verb classes delineated above, the creation verb and intensional verb classes.

(10)   The soccer player sorta kicked a ball.

a. The soccer player did something that was like kicking to a ball.

b. *The soccer player kicked something that was like a ball.

(11)   The woman sorta ate a cracker.

a. The woman did something that was like eating to a cracker.

b. *The woman ate something that was like a cracker.

What should be clear from this data is that there is a confluence of both indefinite noun phrase direct objects and verb class in getting this additional reading with *sorta*. First, only indefinite objects may be hedged — definite objects resist the hedging effects of *sorta*. Second, indefinite objects may only be hedged if they are selected for by one of a particular class of verbs, namely verbs of creation or intensional verbs.

A matter worth reflecting on for this puzzle is how *sorta* can affect a direct object at all. Given standard syntactic assumptions, *sorta* and the direct object never form a constituent, and in fact, *sorta* directly modifying a noun phrase is quite degraded (12, 13).[2]

(12)   *I saw sorta a bird.

(13)   *She ate sorta a cracker.

Under common assumptions about compositionality, it should be a bit of a mystery about how *sorta* can affect the interpretation of an NP when it does not form a syntactic constituent with it.

2.2.   *Summary*

When hedging verbs, some but not all verbs allow for their direct objects to be hedged by *sorta*. The relevant factor seems to be verb class. Complicating this generalization is that, for those verbs that allow their direct object to be hedged, it is only indefinite objects that are allowed to be hedged. Definite direct objects are never allowed to be hedged. This naturally leads to several questions about the nature of *sorta*. First, how can we represent the effect that *sorta* has on words, the so-called hedging effect? Second, what representation of *sorta* can derive the correct behavior of *sorta* with certain types of objects — why can indefinite objects but not definite objects be hedged? Finally, why is it that the indefinite objects of certain verbs are special? Why are only indefinite objects available for hedging with *sorta*?

3.   *Approximation*
3.1.   *Pragmatic halos*

Examining natural language expressions, Lasersohn (1999) notes that the pragmatics of many expressions allows them to be used even in situations where they would normally be considered false, strictly speaking. For example, consider the context and discourse in (14).

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[2]Assuming a syntax where a D(eterminer)P(hrase) takes an NP complement (Abney 1987), *sorta* can modify the NP in limited ways for some speakers. The adverbial *sorta* in this case contrasts with the noun *sort*, as demonstrated below. For instance, *a sort of fairytale* is a type of fairytale, but *a sorta fairytale* is something like a fairytale. Likewise, a Porsche is a sort of car, but not a sorta car, since it is definitely a car.

(1)   a. a sort of fairytale
               "a type of fairytale"
           b. a sorta fairytale
               "almost but not a fairytale"

(2)   a. A Porsche is a sort of car.
           b. #A Porsche is a sorta car.

My analysis seems consistent with these facts about noun phrases, but I do not pursue any further analysis of the DP-internal adverbial *sorta* in this paper.

(14) *Jen is discussing with Jim and Jill when various people arrived at their party the night before. Jack arrived at exactly 6:58pm.*
Jen: What time did Jack arrive?
Jim: He arrived at 7pm.

(15) #**Jill**: No, he arrived at 6:58pm.

In this discourse, we do not consider Jim to have said anything particularly pathological in terms of discourse structure. What Jim said was perfectly licit, given the standards of the conversation. In light of these standards, it is in fact odd for Jill to follow Jim's comment with the comment in (15). This is even more puzzling considering the facts of the matter: Jack did in fact arrive at 6:58pm. What Jim has said is absolutely false given this fact, and what Jill has said is absolutely true, but Jill's comment is illicit with respect to the conversation at hand while Jim's is perfectly acceptable.

Lasersohn argues that discourses allow for a certain amount of pragmatic slack or imprecision in interpreting expressions. Although certain things people say may in fact be absolutely false, discourses allows for an amount of leeway in what expressions count as good enough to be used. In casual speech, speakers typically allow each other quite a bit of pragmatic slack, as shown in the fictional discourse above. Jim's statement that Jack arrived at 7pm is good enough given the aims of the conversation, even though it is not truthful in the strictest sense. Jill's follow-up comment, although true, is regarded as odd because it is too precise given the imprecision allowed in this context. In fact, such utterances can be accommodated so long as we acknowledge we are entering a context where such pedantry is tolerated.

(16) **Jim**: Well, I guess that's true, Jill, but you're just being a pedant.

Lasersohn suggests that an appropriate way to model the effect of imprecision in discourse is to consider natural language expressions as projecting two types of meaning. One type of meaning is the ordinary truth conditional meaning of an expression, the other being a set of pragmatically ignorable differences given the context that he calls a pragmatic halo. Speakers are allowed imprecision in the meaning of their words and phrases so long as they fall within the pragmatic halo of an expression. For the discourse above, Jen and Jim will still interpret *7pm* as **7pm**, but implicitly acknowledge that *6:58pm* falls within the pragmatic halo of **7pm** and is hence an ignorable difference given the imprecision allowed to each other.

Not only do pragmatic halos shrink or expand implicitly with the context, but certain expressions that Lasersohn terms slack regulators can also affect the size of pragmatic halos. *Exactly* is argued to be a slack regulator, having the ability to shrink the size of a halo and hence allowing for less imprecision in how an expression may be evaluated. The effect of this can be seen in the discourse below, where Jen asks the exact time that Jack arrived.

(17) *Jen is discussing with Jim and Jill when various people arrived at their party the night before. Jack arrived at exactly 6:58pm.*
Jen: At exactly what time did Jack arrive?
*__**Jim**: He arrived at 7pm.
Jill: No, he arrived at 6:58pm.

In this discourse, Jim's statement is false as before, but it is now also pragmatically unacceptable, due to Jen's insistence on knowing the exact time that Jack arrived. The effect of *exactly* here was to shrink the pragmatic halo enough that *6:58pm* was excluded from the halo. Jill's follow-up that Jim is wrong is still true in this discourse, but now also pragmatically acceptable, given the fact that Jen has required more precision in the discourse by virtue of using *exactly*. And, Jim's response is now unacceptable, due to the increased amount of precision.

I suggest that *sorta* has some of the same flavor as a slack regulator. Namely, what *sorta* does is allow for normally ignorable expressions to be considered in place of the expression that *sorta* modifies. If *sorta* α is some expression, *sorta* allows for variants to α that would not otherwise be available given the discourse. This is essentially a slack regulating function, but with an important difference — although slack regulators like *exactly* shrink the size of the pragmatic halo, *sorta* does the opposite in increasing the size of the pragmatic halo.

3.2. *An alternative semantics for halos*

Morzycki (2011) analyzes metalinguistic comparatives (McCawley 1998; Giannakidou & Stavrou 2009; Giannakidou & Yoon 2011) as indirectly comparing the size of pragmatic halos. Morzycki assumes that the interpretation function $[\![.]\!]$ is parameterized to a degree of precision d (which I call the degree of precision or imprecision parameter), similar to how the interpretation function can be parameterized to a world in an intensional system. The degree of precision is directly related to the pragmatic halo for a given expression. A simplified denotation for (18) is given in (19).

(18)   George is more dumb than crazy.

(19) $[\![$*George is more dumb than crazy*$]\!]^{d'}$
          $= \mathbf{max}(\lambda d.[\![$*George is dumb*$]\!]^{d}) \succ \mathbf{max}(\lambda d.[\![$*George is crazy*$]\!]^{d})$

What the metalinguistic *more* does in this case is compare the degree to which George can be called dumb with the degree to which he can be called crazy.

Pragmatic halos in Morzycki's analysis are modeled as Hamblin alternatives (Hamblin 1973; Rooth 1985, 1992; Kratzer & Shimoyama 2002). These halos are functions that resemble the core predicate denoted by the lexical item to some degree. For instance, the halo for the adjective *dumb* might include not just the function **dumb**, which we might take *dumb* to standardly denote, but also the functions **dopey**, **foolish**, and so on, given an appropriate amount of pragmatic slack.

Halos are generated as sets of resembling functions. To accomplish this, Morzycki introduces a new relation, $\approx$ "resembles", which is true just in case two objects resemble each other to at least degree d (see 20). d is a degree in the real interval $[0, 1]$, and when $d = 1$, $\approx$ is formally equivalent to $=$.

(20) $\alpha \approx_{d,C} \beta$ iff, given the ordering imposed by the context C, α resembles β to (at least) the degree d and α and β are of the same type (Morzycki 2011).

Denotations are conceived of as their pragmatic halos, with the degree of precision parameter d on the interpretation function controlling the size of the set of alternatives. As the degree in-

creases towards the maximal degree, the halo contracts, while the halo expands as d approaches the minimum degree. Putting this together, *dumb* might be represented as in (21).

(21) $\quad\quad [\![dumb]\!]^d = \{f : f \approx_{d,C} \textbf{dumb}\}$

Morzycki provides a typeshift PREC which can be used to get access to the degree of precision parameter (22). The content of PREC is to simply abstract over the degree of precision. This has the effect of turning any expression type $\langle \tau \rangle$ into type $\langle d, \tau \rangle$.

(22) $\quad\quad [\![\text{PREC } \alpha]\!]^d = \lambda d'.[\![\alpha]\!]^{d'}$

(23) $\quad\quad [\![\text{PREC } dumb]\!]^d = \lambda d'.[\![dumb]\!]^{d'}$

In a Hamblinized system such as this, function application cannot proceed per the usual (e.g., Heim & Kratzer (1998)'s FUNCTION APPLICATION (FA)), due to denotations being sets rather than functions.[3] But, even though these are sets, we would like to think of denotations as having the same type as the objects in their sets of alternatives. For example, although $[\![dumb]\!]^d$ is the set of objects resembling **dumb** to degree d, we would still like to think of this as being type $\langle e, st \rangle$. Therefore, we need a new notion of what it means to apply one expression to another. The intuition is to apply all the objects from one set of alternatives to all the objects from another set of alternatives pointwise, creating another set of alternatives. This is formalized as HAMBLIN FUNCTION APPLICATION in (24) below.

(24) $\quad\quad$ HAMBLIN FUNCTIONAL APPLICATION (HFA)
$\quad\quad$ If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{d,C} \subseteq D_\sigma$ and $[\![\gamma]\!]^{d,C} \subseteq D_{\langle \sigma, \tau \rangle}$, then $[\![\alpha]\!]^{d,C} = \{c(b) : b \in [\![\beta]\!]^{d,C} \wedge c \in [\![\gamma]\!]^{d,C}\}$
$\quad\quad\quad\quad\quad\quad$ (Morzycki (2011), based on Kratzer & Shimoyama (2002))

To illustrate, suppose a function A, type $\langle e, st \rangle$ and a set B, type $\langle e \rangle$, as represented with the sets of alternatives in (25) below.

(25) $\quad A = \left\{ \begin{array}{l} \lambda x \lambda w.f(x)(w), \\ \lambda x \lambda w.g(x)(w), \\ \lambda x \lambda w.h(x)(w) \end{array} \right\}$

$\quad\quad B = \{a, b, c\}$

Since these are sets, $A(B)$ has to proceed via HFA and not FA. Each object in the set A is applied to each object in B, resulting in $C = A(B)$. This is illustrated in (26).

(26) $\quad C = A(B) = \left\{ \begin{array}{lll} [\lambda x \lambda w.f(x)(w)]\,(a), & [\lambda x \lambda w.f(x)(w)]\,(b), & [\lambda x \lambda w.f(x)(w)]\,(c), \\ [\lambda x \lambda w.g(x)(w)]\,(a), & [\lambda x \lambda w.g(x)(w)]\,(b), & [\lambda x \lambda w.g(x)(w)]\,(c), \\ [\lambda x \lambda w.h(x)(w)]\,(a), & [\lambda x \lambda w.h(x)(w)]\,(b), & [\lambda x \lambda w.h(x)(w)]\,(c) \end{array} \right\}$

$\quad\quad\quad = \left\{ \begin{array}{l} \lambda w.f(a)(w), \lambda w.f(b)(w), \lambda w.f(c)(w), \\ \lambda w.g(a)(w), \lambda w.g(b)(w), \lambda w.g(c)(w), \\ \lambda w.h(a)(w), \lambda w.h(b)(w), \lambda w.h(c)(w) \end{array} \right\}$

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[3] Morzycki's analysis allows for parts of the grammar to crucially *not* be Hamblinized, but the details are not important here.

C here is the result of the pointwise function application of the elements from set A to set B. This results in the alternatives from both A and B being represented in C.

To summarize, the interpretation function is parameterized to a degree of precision d. This controls the size of a pragmatic halo of alternatives, generated with the $\approx$ relation. The halo is a set of alternatives that resemble the core predicate to some degree. Being sets rather than functions, there also needs to be a new notion of function application: Hamblin Function Application. I assume a framework such as this in my analysis of *sorta*.

4. Analysis
4.1. Approximation with sorta

As discussed in section 2.1, *sorta* has the flavor of an approximator. Intuitively, the meaning of *sorta* represents some form of approximation. This is evident when we consider the paraphrases available for sentences that use *sorta*, as in (27) and (28). These paraphrases have in common the fact that they note some "closeness" to the predicate being modified.

(27)   He sorta swam over to the boat.
          "He did something like swimming."

(28)   The soccer player sorta kicked the ball.
          "The player did something close to but not quite kicking the ball."

How can we profitably think about closeness? The suggestion I make here is to think about *sorta* as allowing a speaker to get out of saying something that would be false. Consider the kinds of situations *sorta* is used in. Generally, when a speaker makes a *sorta V* assertion, it is in a situation where the verb cannot be used very felicitously. *Sorta* allows a speaker to expand the meaning of the verb to encompass situations that it otherwise could not describe. For concreteness, take example (1) from earlier in the paper, repeated as (29) below. The speaker here is using *sorta kicked the ground* to describe how she hurt her foot, but presumably *sorta kicked the ground* was used because *kicked the ground* did not accurately describe the situation. *Sorta* here is being used to expand the meaning of *kick the ground* in order to accurately describe the situation.

(29)   [I was] running on concrete and accidentally sorta kicked the ground.

The effect of *sorta* here should be compared with the behavior slack regulators such as *exactly*. Lasersohn's insight was that speakers allow each other an amount of pragmatic slack—false utterances can be pragmatically licit (and not uncooperative) if speakers allow each other to be imprecise. *Exactly* removes pragmatic slack, forcing speakers to be more precise. In other words, *exactly* allows for fewer expressions to count as "good enough" in a context. This is the opposite behavior of *sorta*. As Lasersohn notes, hedges like *sorta* expand the halo so that something in the halo is true.
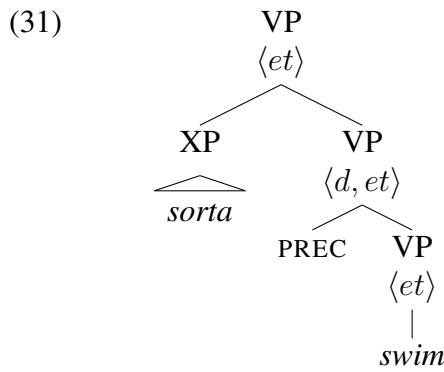
In the framework assumed, halos are regulated through the imprecision parameter d on $[\![.]\!]$. Therefore, *sorta* needs to affect the degree of precision by existentially quantifying over a degree and setting that degree as the value for the imprecision parameter on the object that *sorta*

combines with (denoted as α in (30) below). By using the PREC typeshift, *sorta* can have access to the imprecision parameter, as PREC turns non-gradable predicates into gradable predicates by binding the imprecision parameter with a lambda.

Naturally, there need to be some constraints on the degree *sorta* introduces; *Con* is a place-holder describing these constraints. As the expression *sorta* combines with a set of alternatives (the pragmatic halo), *sorta* will need to pick something from this set. This is accomplished in the second conjunct in (30) below, with existential quantification over functions $f \in [\![\text{PREC } \alpha]\!]^{d'}(d)$ (i.e., functions in the halo of α after the imprecision parameter has been set). I assume that VPs denote properties of individuals, and so the function picked from α's alternatives will need to be applied to an individual. These elements are put together in the denotation in (30).

(30)　　(Tentative)
　　　　$[\![sorta\ \alpha]\!]^{d'} = \lambda x \exists d \left[Con(d) \wedge \exists f \in \left[[\![\text{PREC } \alpha]\!]^{d'}(d) \right] [f(x)] \right]$
　　　　where $[\![\alpha]\!]$ is type $\langle d, et \rangle$

Syntactically, I assume *sorta* is a VP adjunct, as in (31). In the case of this example, α would be the VP PREC *swim*. I ignore the category of *sorta* and labeled it XP.

(31)

```
                    VP
                   ⟨et⟩
                 /      \
              XP          VP
             /‾‾\        ⟨d, et⟩
            sorta        /    \
                    PREC        VP
                               ⟨et⟩
                                |
                              swim
```

Superficially, $[\![sorta]\!]$ behaves a function of type $\langle \langle d, et \rangle, et \rangle$, as it combines with a gradable predicate and an individual. Strictly speaking, however, *sorta* does not have this type — the gradable predicate is not an argument of *sorta*, but is introduced syncategormatically. Writing *sorta* this way reflects how Morzycki (2011) and Kratzer & Shimoyama (2002) develop their semantics, but it also is a notational convenience. See Rawlins (2008) for thoughts on how to redevelop aspects of Kratzer & Shimoyama (2002) using functions rather than sets.

The degree introduced by *sorta* is used as the degree of precision for the expression *sorta* modifies. We need to return to the constraints on this degree, *Con*. The degree of precision controls the size of the pragmatic halo associated with some expression. As *sorta* is analyzed as expanding a pragmatic halo, the question here is how much the halo should be expanded. The halo should be expanded only a little amount; too much halo expansion, and an expression modified by *sorta* could come to mean anything. That *sorta* has an approximative meaning — *sorta kick* intuitively has a meaning close to *kick* — tells us that *sorta* expands the halo to only some small degree. To capture this, I introduce an operator $\prec$ that is true just in case one degree is less than but close to the value of a second degree. This is defined in (32).

(32)　　$\forall d \forall d', d \prec_C d'$ iff $d < d'$ and the value of d is close to d' as determined by the context C.

I assume that the new degree of precision is close to the standard degree of precision for the context — the degree of precision that the interlocutors have (usually implicitly) agreed to use when determining whether an utterance is true or false. This is comparable to the notion of a standard in the semantics of gradable adjectives. For instance, relative adjectives such as *tall* are often analyzed as being associated with standards that determine whether the adjective holds of some entity (Kennedy 2007; Kennedy & McNally 2005; Bierwisch 1989; Cresswell 1976). The degree of precision used in a discourse can shift, as slack regulators show, and standards associated with relative adjectives can also shift (the standard for whether a person is tall is not the same standard for whether a building is tall, for instance). The standards associated with verbs also change; what counts as a kick in one context might not necessarily count as a kick in a different context (an infant kicking a ball compared to a professional soccer player kicking a ball, perhaps).

Following Kennedy (2007), I assume a function **standard** that maps a gradable predicate (type $\langle d, et \rangle$) to the degree necessary for that predicate to hold true in the context. As the analysis pursued here crucially relies on a standard degree of precision, I assume that **standard** can return the standard degree of precision for a verbal predicate in addition to its typical duty with adjectives. This requires no change in the types that **standard** is defined over, since $[\![\text{PREC } \alpha]\!]$ (where α is a verb phrase) will be type $\langle d, et \rangle$.

The content of *Con*, then, is to compare the new degree of precision with the standard degree of precision using $\prec$. The denotation for *sorta* is updated in (33) to reflect this. (I have suppressed the context argument on $\prec$ for presentational clarity.)

(33)   (Final)
$$[\![sorta\ \alpha]\!]^{d',C} = \lambda x \exists d \left[d \prec \textbf{standard}([\![\alpha]\!]) \wedge \exists f \in \left[[\![\alpha]\!]^{d'}(d) \right] [f(x)] \right]$$

To demonstrate, *sorta swim* would be translated as (34) below. *sorta* has combined with the VP PREC *swim*.

(34) $[\![sorta\ \text{PREC } swim]\!]^{d',C}$
$$= \lambda x \exists d \left[\begin{array}{l} d \prec \textbf{standard}([\![\text{PREC } swim]\!]^{d',C}) \wedge \\ \exists f \in [[\![\text{PREC } swim]\!]^{d',C}(d)][f(x)] \end{array} \right]$$

The imprecision parameter on $[\![\text{PREC } swim]\!]^d$ is set to d. (35) is equivalent to (34), but PREC *swim* is rewritten using the $\approx$ notation.

(35) $[\![sorta\ \text{PREC } swim]\!]^{d',C}$
$$= \lambda x \exists d \left[\begin{array}{l} d \prec \textbf{standard}([\![\text{PREC } swim]\!]^{d',C}) \wedge \\ \exists f \in \{ f_{\langle e,t \rangle} : f \approx_{d,C} \textbf{swim} \}[f(x)] \end{array} \right]$$

Although the alternatives for any particular expression are context-dependent, for concreteness (34) might look as in (36), where the alternatives $\{ \textbf{swim}, \textbf{float}, \textbf{wade}, \ldots \}$ are represented.[4]

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[4] I simplify the alternatives here, but it should be assumed that, e.g., $\textbf{swim} = \lambda x.\textbf{swim}_w(x)$, with an open world variable.

(36) $[\![sorta \text{ PREC } swim]\!]^{d',C}$

$$= \lambda x \exists d \begin{bmatrix} d \lessdot \textbf{standard}([\![\text{PREC } swim]\!]^{d',C}) \wedge \\[2mm] \exists f \in \left\{ \begin{array}{c} \textbf{swim}, \\ \textbf{float}, \\ \textbf{wade}, \\ \ldots \end{array} \right\} [f(x)] \end{bmatrix}$$

Worth reflecting on at this point is *sorta*'s similarity to another well-known morpheme: POS. It has been argued that in English and other languages, a phonologically null morpheme POS takes a gradable adjective as its argument (Cresswell 1976; von Stechow 1984; Bierwisch 1989; Kennedy 1999, 2007). The role of POS is to saturate the degree argument of the adjective and assert that the degree to which the entity holds the property denoted by the adjective meets or exceeds a contextually supplied standard.[5] POS can be stated as in (37) below. The similarity to note here is that both *sorta* and POS involve comparing a degree to a standard. This makes *sorta* a cousin to POS; instead of asserting that the standard is met, however, it asserts closeness to the standard.

(37) $[\![\text{POS}]\!] = \lambda G \lambda x \exists d \, [d \geq \textbf{standard}(G) \wedge G(d)(x)]$

In summary, *sorta* expands the pragmatic halo of some linguistic expression and picks a function from the expanded halo. The halo is expanded by using a degree of precision less than but near the standard degree of precision. This was accomplished through a new operator, $\lessdot$, and by generalizing the **standard** function to be able to pick out standard degrees of precision.

4.2.   Hedging objects

In the previous section, I developed an analysis of how the verb may be hedged. The analysis depends on linguistic expressions having sets of alternatives available, alternatives that model Lasersohn's pragmatic halos. For instance, for a verb such as *swim*, each alternative is a function that resembles the core meaning of *swim*, the function **swim**, to some degree. The entire set of alternatives is a set of resembling alternatives that is ordered by their degree of resemblance to some function. What *sorta* does in this case is to lower the degree needed to be part of the set of resembling alternatives, by manipulating a degree of precision on the interpretation function.

But, as described earlier, *sorta* can also hedge the direct objects of some predicates. The question is how to get this kind of behavior with *sorta*, how *sorta* can hedge a direct object even when it does not merge with the direct object. The answer, I suggest, comes from the architecture of the Hamblin semantics assumed here.

In this system, denotations are represented as sets of alternatives that grow or shrink depending on the degree of precision. In the previous section, verbs (and verb phrases) were represented in this fashion, but we should expect that nouns (and noun phrases) are represented in this way as well, and this is precisely how Morzycki (2011) handles metalinguistic comparatives with

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[5]This is a description of POS on the assumption that adjectives denote relations between degrees and individuals. See Kennedy (1999) for a different analysis of POS where adjectives denote measure functions.

nominals rather than adjectives. The denotation for *house*, for instance, would be represented as in (38), a set of functions f such that each resembles **house** to degree d.

(38) $[\![house]\!]^d = \{f : f \approx_{d,C} \textbf{house}\}$

If nominals also have sets of resemblance alternatives, the problem of how *sorta* can hedge a direct object becomes the problem of how *sorta* has access to these alternatives. Put simply, the alternatives for the direct object have to "project" up to the VP level in order to be visible to *sorta*. The mechanism to do this is already available using an alternative semantics.

Since denotations are sets rather than functions, we required a new way of combining a predicate with its argument. This was Hamblin Function Application (HFA). The intuition formalized as HFA is to apply each function from one set of alternatives pointwise to its arguments in another set of alternatives. This creates a new set of alternatives with the alternatives of both the predicate and its argument. For concreteness, $[\![build\ a\ house]\!]^d$ would be represented as in (39), with the alternatives from $[\![build]\!]^d$ applying pointwise to the alternatives for $[\![house]\!]^d$.[6]

(39) $[\![build\ a\ house]\!]^d = \{b(h) : h \in [\![house]\!]^d \land b \in [\![build]\!]^d\}$

Since $[\![build\ a\ house]\!]^d$ will have the alternatives of both $[\![build]\!]^d$ and $[\![house]\!]^d$, this solves the issue of how *sorta* has access to the alternatives of *house*. Quite simply, the alternatives from *house* will continue to project upwards to the VP level. Through this compositional process, HFA, the alternatives at a lower node in the syntax can project to higher nodes in the syntax. Abstracting away from the precise translation of *build* and *house*, the alternatives for *build a house* might project as in (40).

(40)   VP: $\left\{ \begin{array}{ll} \lambda x[\textbf{build}(x)(\textbf{a--house})], & \lambda x[\textbf{build}(x)(\textbf{a--shack})] \\ \lambda x[\textbf{piece--together}(x)(\textbf{a--house})], & \lambda x[\textbf{piece--together}(x)(\textbf{a--shack})] \end{array} \right\}$

V: $\left\{ \begin{array}{l} \lambda f \lambda x[\textbf{build}(x)(f)], \\ \lambda f \lambda x[\textbf{piece--together}(x)(f)] \end{array} \right\}$ DP: $\left\{ \begin{array}{l} \textbf{a--house}, \\ \textbf{a--shack} \end{array} \right\}$

|
build   *a house*

To summarize, *sorta* can modify the direct objects of verbs even when it has not merged with the direct object due to the mechanics of a Hamblin semantics. The reason for this comes from the behavior of Hamblin Function Application. HFA applies predicates from one set pointwise to arguments in a second set, creating a third set. This set contains all the alternatives from the first and the second set; in essence, HFA allows the alternatives from the direct object to percolate upward throughout the course of the derivation. Worth reflecting on here is that this behavior comes for free, since HFA is independently necessary in this framework. All things being equal, if alternatives are grammatically represented and certain expressions are sensitive to alternatives, we should expect cases of apparent non-local relationships between some expressions and alternative sensitive elements. Finding that *sorta* exhibits this behavior (albeit in limited ways) is less surprising in light of the alternative semantics I have adopted.

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[6]I assume that the singular indefinite article *a* has no semantic contribution here, so that $[\![house]\!]^d = [\![a\ house]\!]^d$.

4.3. Summary and lingering issues

The previous two sections attempted a first pass at an analysis of the facts presented in section 2.1. This analysis relied on adopting the alternative semantics for imprecision proposed by Morzycki (2011). The behavior of *sorta* was to widen the pragmatic halo of an expression (modeled as a set of alternatives) and choose some function from this halo. This function resembled the predicate modified by *sorta* to some degree determined by a degree of precision parameter. By lowering the degree of precision, *sorta* could widen the halo. The fact that *sorta* could hedge the direct object of a verb and not simply the verb was a consequence of adopting an alternative semantics; Hamblin Function Application, necessary to make this sort of system compositional, allows for alternatives to project upwards throughout the course of a derivation. With the alternatives of both the verb and its object projecting up to the VP level, *sorta* was in a position to hedge both. But, there remain some issues with the analysis so far.

The first issue is accounting for the projection behavior of different sorts of noun phrases (indefinite versus definite). As repeated in the contrast in (41) and (42), *sorta* can hedge a singular indefinite direct object but not a definite direct object. Obviously, there must be some reason for this restriction.

(41)   The carpenter sorta built a barn.
   a. The carpenter did something that was like building (e.g., putting together a prefabricated structure).
   b. The carpenter built something like a barn (e.g., a shed).

(42)   The amateur carpenter sorta built the house.
   a. The amateur carpenter did something that was akin to building that resulted in the house (e.g., he had help from more skilled carpenters).
   b. *The amateur carpenter built something that was like the house (a shack, a hovel, . . .).

The second issue is related to the content of the verb itself. While only the alternatives for singular indefinites can project up to VP, most verbs seem to block the projection of the object's alternatives. However, some verbs, particularly verbs of creation and some intensional verbs, are holes with respect to the projection of alternatives. The account so far predicts that the alternatives of any indefinite singular direct object should project, which simply is not the case. In the next section, I develop explanations for these facts about the projection of resemblance alternatives.

5. *Constraints on* sorta
5.1. Determiner effects

As demonstrated earlier, the definite determiner blocks alternatives from projecting. The questions to pursue here are how alternatives are blocked, and why it should be the case that they are blocked.

The simplest way to block resemblance alternatives from projecting is by transforming the set of alternatives into a singleton set. HFA would proceed as before, but having only a single item in the set, that alternative would be the only alternative to project. There are two obvious possibilities for creating a singleton. One option is to simply specify maximum precision on the nominal, as in (43). This relies on $\approx$ being equivalent to $=$ when the degree parameter on $\approx$ is set to the maximal degree.

(43) $[\![house]\!]^{d=1} = \{f : f \approx_d \textbf{house}\} = \{\textbf{house}\}$

This option loses its appeal, however, when we consider the fact that in typical speech we allow some slack in word choice, even if it is not signaled with *sorta*. Enforcing maximum precision would make the incorrect prediction that definites are always interpreted maximally precise. I suggest another option: the use of a choice function, mapping the set of alternatives to a single alternative. I make this part of the meaning of the definite determiner, as in (44).

(44) $[\![the\ \alpha]\!]^d = \{\iota x.\textbf{choice}([\![\alpha]\!])(x)\}$

(45) $[\![the\ house]\!]^d = \{\iota x.\textbf{choice}([\![house]\!])(x)\}$

Speculating on why the definite might behave like this, one possible explanation is related to the fact that the definite presupposes the existence of individuals that satisfy the predicate. But, in the model, these individuals will already be true of the nominal predicate. Picking any alternatives besides the alternative the individual is true of would be false. This forces only a single alternative to project.

5.2.   *Verb class*

In section 4.2, I provided an analysis of *sorta* to account for not only how hedging can occur, but also why the object of some verbs can be hedged. The answer, I suggest, relies on *sorta* behaving like a Lasersohnian slack regulator, widening the halo around a verb in order to include in the denotation of the verb things that might not otherwise "count" as part of the denotation. This in turn occurs by lowering the degree of precision required for interpretation, by setting the imprecision parameter on the interpretation function lower than the contextually supplied standard. Doing this increases the amount of imprecision alternatives available. Objects can be hedged in this system because the alternatives of the object can project to the VP level by combining with the alternatives of the verb pointwise.

This account still severely overgenerates on the readings possible. Namely, the account so far predicts that all objects should be able to be hedged. This in fact is not the case; hedging is severely constrained. Only some verbs allow for their objects to be hedged, and among those objects that can be hedged, it is only indefinite noun phrases and not definite noun phrases. The goal here is to provide an account of this, and constrain the system to allow only the attested readings.

To pursue an explanation here, I want to start by asking the question of what makes the verbs that allow for hedging of their object special. Creation verbs and intensional transitive verbs such as *look for* allowed for hedging. Are these special in any way? The literature on verbs has suggested that they are in fact special with respect to their direct object position.

The relevant feature here is whether this is an opaque argument position or not. It is well-known that intensional verbs such as *seek* and *look for* have a referentially opaque direct object position (Van Geenhoven & McNally 2005; Zimmermann 1993; Montague 1974; Quine 1964; Moltmann 1997). There is no entailment that an entity instantiating the property denoted by the indefinite exists.

(46)   The man was looking for a horse.

      a.   Transparent reading: There is a horse than the man was looking for.

      b.   Opaque reading: The man is looking for a horse and it may or may not exist.

Creation verbs also exhibit this failure of existential quantification, as noted by von Stechow (2001). Holding the reference time constant, the argument in (47) does not hold. In comparison, a non-intensional, non-creation verb such as *push* allows this argument to go through (48). The reasoning for this plain; creation verbs only entail the existence of the created object at the end of the event.

(47)   John drew a circle.
      DOES NOT ENTAIL: There was a circle that John drew.

(48)   John pushed a cart.
      ENTAILS: There was a cart that John pushed.

Zimmermann (1993) and Van Geenhoven & McNally (2005) argue that intensional transitive verbs are special because of their argument structure. Intensional transitive verbs involve an attitude towards a property — they have a property-type argument — while non-intensional transitives have more mundane individual-type arguments. De Swart (2001) also argues that these verbs are special; intensional verbs allow for weak readings of indefinite noun phrases because these noun phrases have well-formed property-type denotations. These arguments are built on the referentiality of the noun phrase in object position; noticing the similarities between intensional transitive verbs and creation verbs with respect to their object position and existential exportation, we might extend this analysis to creation verbs and suggest that they also take property-type objects. What this amounts to, in the lexical semantics for these verbs, is local existential quantification over entities instantiating the property.

The data from *sorta* suggests that this is on the right track. Looking at intensional verbs, the natural reading for a noun phrase hedged by *sorta* as in (49) is one where existential exportation does not hold.

(49)   He was sorta looking for a horse.
      *'There is something like a horse that he is sorta looking for.'

I take the constraining factor here to be one of argument types. Verbs which allow for property-type arguments (type $\langle et, et \rangle$) allow for the alternatives of their direct object to project. Verbs which only allow for individual-type arguments ($\langle e, et \rangle$) do not allow the alternatives to project. This is a nod to claims that certain types of verbs are special with respect to the type of the arguments they combine with. Although I will not pursue a full formal analysis here, the hypothesis is that verbs that accept property-type complements allow for a sort of "escape hatch" through which the resemblance alternatives can project.

6.   Discussion
6.1.   Where resemblance alternatives come from

A relevant question to ask is where the alternatives for any particular expression come from. Formally, sets of alternatives were built using the $\approx$ relation, which was true just in case two functions resembled each other to some degree. But, this pushes back the explanation on where alternatives come from to the mechanics of $\approx$. A real explanation for why we see the alternatives we do would be ideal. Put more concretely, why should the alternatives to *swim* include *wade*, *float*, and so on?

A point to note here is that the alternatives available do not have to be represented by lexical items themselves. For instance, *sorta kick the ground* expresses something like a kicking action, but the purpose of the speaker using *sorta* here seems to be to show that the conceptual content of *kick* does not precisely match what happened in the event. This contrasts with a focus-sensitive adverb such as *only*; the alternatives *only* invokes, although they depend on the meaning of the focused element, are most naturally associated with other lexical items.

(50)   a.   Suzy sorta jogged.

             b.   Suzy only jogged$_F$. (not ran or sprinted)

(51)   a.   John sorta swam to the boat.

             b.   John only swam$_F$ to the boat. (but didn't climb in to the boat)

The alternatives *sorta* gets access to seem to be related in some way to the conceptual content of the lexical item that is being hedged. The alternatives invoked with *sorta swim*, for instance, although they might not be called swimming, intuitively are associated with swimming in some way: moving the arms and legs, floating in water, and so on.

Two points should be noted, then. First, $\approx$ has access to the conceptual content of the functions that it compares, in order to determine whether two functions resemble each other to the required degree. More work might be done on fleshing out $\approx$, perhaps in terms of prototypes (Kamp & Partee 1995), and that $\approx$ (in a pretheoretic sense) is a window into the interface between formal semantics and the conceptual system. Second, the alternatives that we see do not have to named by lexical items. This seems to requires that the functional domains in the semantic model have an infinite (and perhaps dense) space of functions, as the building of the set of alternatives requires comparison to any number of functions. Lexical items carve up this space in vague, context-dependent ways, depending on the precision required, but there are gaps not covered by particular lexical items in normal circumstances that *sorta* gives the speaker access to.

6.2.   Restriction and the projection of alternatives

I provide an analysis of why objects can be hedged in section 4.2 and attempt to explain the restrictions on this in section 5. However, I suggest here a second analytical option for why objects can be hedged and those constraints. This analysis is based on the work of Chung & Ladusaw (2004). Here, what I suggest is that intensional transitive verbs and creation verbs

combine with their objects differently than other verbs. Namely, these verbs will combine via Chung and Ladusaw's Restrict mode of composition, while other verbs combine via Specify. A difference in the mode of composition correlates with whether the alternatives for the direct object are visible to *sorta*.

Chung & Ladusaw (2004), based on data from Chamorro and Maori, argue for two new modes of semantic composition, what they call Restrict and Specify. Part of the problem they are trying to solve in introducing new modes of composition is the behavior of indefinites. Indefinites have a range of behaviors associated with them. Some authors have argued that this calls for a flexible type system where indefinites can be translated between quantificational, property, and individual types (Partee 1987). The approach Chung and Ladusaw argue for is that indefinites have uniformly property-type denotations, but that there exist different modes of semantic composition with different semantic effects.

They introduce modes of composition they call Restrict and Specify. Restrict contrasts with the familiar Function Application by being a non-saturating mode of composition, leaving a lambda untouched in the derivation; Function Application is a saturating mode of composition. The effect of this is illustrated in the hypothetical example in (52) (the derivation is impossible in English). Here, $[\![cat]\!]$ Restricts λy in the denotation of $[\![bit]\!]$. Conceptually, this is a form of intersection, intersecting cats with things that were bit.

(52)   The dog bit cat.
      a.   **Restrict**$(\lambda x[\mathbf{cat}(x)], \lambda y\lambda z[\mathbf{bit}(z)(y)])$
      b. $\lambda y\lambda z[\mathbf{bit}(z)(y) \wedge \mathbf{cat}(y)]$ (via Restrict)
      c. $\lambda z\exists y[\mathbf{bit}(z)(y) \wedge \mathbf{cat}(y)]$ (via Existential Closure)

Because Restrict is non-saturating, predicates still require some way of being saturated. Function Application with the open argument position is one way. Existential Closure is a second way (illustrated in (52c). They assume that all unsaturated predicates undergo existential closure of their open arguments at what they call the event level (roughly corresponding syntactically to *v*P). This has the effect of making it so that arguments composed via Restrict take obligatory narrow-scope with respect to negation and other operators.

The second mode of composition they introduce is Specify. Specify involves a local type-shift — a choice function. Choice functions map properties to entities, so the choice function can be an argument to a predicate that is looking for an entity-type argument. Choice functions introduce a semantic unfulfilledness — the choice function needs to be bound by an existential somewhere in the derivation — but the predicate can be saturated with a choice function. Existential closure over the choice function can happen at the event level or the clausal level (or both), depending on the parameters of the language. Specify therefore allows for both wide-scope and narrow-scope indefinites. I illustrate Specify in (53).

(53)   The dog bit a cat.
      a.   **Specify**$(f(\mathbf{cat}), \lambda x\lambda y[\mathbf{bit}(y)(x)]$
      b. $\lambda y[\mathbf{bit}(y)(f(\mathbf{cat}))]$ (via CF applied to **cat**, FA)
      c. $\lambda y\exists f[\mathbf{bit}(y)(f(\mathbf{cat}))]$ (via EC)

Indefinites in intensional transitive verbs and creation verbs take low-scope with respect to negation. For instance, *not build a house* does not have the inference that there exists a house that was not built. Rather, the inference that goes through is that no house was built. Under the system described, this could be interpreted as the indefinite combining with the verb via Restrict. The examples in (49) also suggest that this is the case. Taking a view of referential opacity as narrow-scope with respect to an intensional operator, these also suggest that the indefinite is taking narrow-scope. Again, this can be represented as the indefinite composing with the predicate via Restrict.

Indefinites in object position for other types of verbs, outside of the creation and intensional transitive verb classes discussed, do allow for both wide and narrow-scope readings. My interpretation of this fact is that indefinite objects for these verbs compose instead via Specify, with the existential closure over the choice function happening at either the event or the clausal level.

The picture that emerges here is that Restrict allows for the alternatives of indefinites to project, while Specify does not. The cases where I argued that Restrict was active are those cases where the alternatives of an indefinite object are accessible to *sorta*. I will suggest that the relevant difference between Specify and Restrict here is whether they are saturating modes of composition. Saturation closes off imprecision alternatives, while non-saturating modes of composition do not.

This conclusion is supported by the behavior of definites. By their nature, definites have individual-type denotations, and therefore do not need a special mode of composition; they can compose with predicates by Function Application. Function Application is a saturating mode of composition, which would predict that definites can never be hedged. This is in fact the case; the alternatives for definite noun phrases are never accessible to *sorta*.

To summarize the idea here, saturating modes of predication close off sets of imprecision alternatives, while non-saturating modes of predication do not. Creation verbs and intensional verbs combine with indefinite objects via Restrict, a non-saturating mode of composition, and so allow for their objects to be hedged by *sorta*. I will not pursue an explanation here for why saturation versus non-saturation matters for the projection of alternatives, but framing the problem in this way provides another point of entry into explaining the projection behavior of resemblance alternatives.

7. Conclusion

In this paper I have presented an account of *sorta*. My analysis depended on building up sets of resemblance alternatives, with *sorta* picking a single alternative from a set. This set of alternatives was meant to model pragmatic halos (Lasersohn 1999; Morzycki 2011). Much work remains to be done in expanding the range of the analysis, however. This was admitted as such in section 5, where I attempted to show how to constrain the readings available to *sorta* with certain verbs and indefinite objects, linking the projection of alternatives up to whether a verb accepts a property-type complement and whether the determiner on the DP direct object presupposes its domain. I discuss these facts, and provide the outline of an alternate solution using Chung & Ladusaw (2004)'s Restrict and Specify modes of composition. Finally, I discussed some consequences this work on *sorta* has for the semantics and conceptual system interface,

suggesting that the $\approx$ relation, which generates resemblance alternatives, has access to the conceptual content of a predicate, and that the alternatives generated do not need to be represented by any particular lexical item.

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What triggers the Hungarian objective paradigm?
A structural and feature-based account

András Bárány

I argue that neither purely structural (e.g. Bartos 1999) nor purely semantic approaches (e.g. Coppock 2013) to the distribution of Hungarian verb paradigms can account for the observed data. I propose, following Bartos (1999) that the structure of the direct object (DO) noun phrase is crucial, while certain semantic features of the DO also have to be taken into account. I claim that the role of [DEF] and the semantic effects observed by Coppock (2013) are mostly correct but that her analysis makes false predictions regarding possessive structures. Taking into account both structural and interpretative factors, I propose an approach covering a wider range of attested data.

1. Introduction

Hungarian transitive verbs have two distinct paradigms that are realised as distinct suffixes. These are often called *subjective* and *objective* paradigm or conjugation, respectively (cf. Bartos 1999, É. Kiss 2002, Coppock & Wechsler 2012, Coppock 2013).

The subjective paradigm appears when the verb is intransitive as well as with certain types of direct objects. The objective paradigm only appears when there is a direct object (DO) and is triggered by a mostly complementary set of DOs. Its triggers include pronouns (but see below for qualification), proper names, DOs including the definite determiner, demonstratives, certain quantifiers, as well as certain types of complement clauses. The following examples illustrate the distribution of each paradigm.[1]

(1) a. Mari újság-ot / egy / néhány / sok / minden / könyv-et olvas-∅.
       M. newspaper-ACC / one / some / many / every / book-ACC read-3SG.SUBJ
       'Mari is reading a newspaper / a / some / many / every book(s).'

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[1] I use the following abbreviations: SUBJ, OBJ — subjective and objective paradigm; 3SG, 1PL — third person singular, etc.; NOM, DAT, ACC, SUP — nominative, dative, accusative, superessive case; 3SG.POSS — third person singular possessive suffix; NEG — negation; COP/NEG.COP — copula and negated copula; PRF — verbal prefix.

b.   Mari téged   / titeket   / engem   / minket lát-∅.
     M.   you.SG.ACC / you.PL.ACC / me.ACC / us.ACC see-3SG.SUBJ
     'Mari sees you / me / us.'

(1a) illustrates that bare nouns, as well as nouns with the numeral or indefinite determiner *egy* 'one, a', and weak determiners like *sok* 'many', *néhány* 'some' require the subjective paradigm. Somewhat surprisingly, the quantifier *minden* 'every' also requires the subjective paradigm, even though it is a *strong* quantifier (cf. below). Finally, as (1b) shows, first and second person pronouns also co-occur with the subjective paradigm.

The objective paradigm, on the other hand, is triggered by DO noun phrases that roughly correlate with *definiteness*. Third person pronouns, proper names, the definite determiner *a(z)* 'the', demonstratives like *e, ez a* 'this', *az a* 'that', as well as certain (strong) quantifiers like *valamennyi, mindegyik* 'each' require the objective paradigm, cf. (2a). In addition, some complement clauses introduced by *hogy* 'that' and most possessed DO noun phrases co-occur with the objective paradigm, as shown in (1b).

(2)   a.   Csaba a   / ez-t a   / mindegyik könyv-et   olvas-sa.
            Cs.   the / this-ACC / each   book-ACC read-3SG.OBJ
            'Csaba is reading the newspaper / this / each book.'
       b.   Csaba ő-t   / Péter barátj-á-t   lát-ja.
            Cs.   him/her-ACC / P.   friend-3SG.POSS-ACC see-3SG.OBJ
            'Csaba sees him/her / Peter's friend.'

In the recent literature, different explanations have been given for why only certain types of noun phrases require the objective paradigm, while others do not. In this paper, I will provide a novel account based on existing analyses but extending them to account for a wider range of data. Specifically, I will focus on the structure of possessive structures, e.g. *Péter barátja* in (2b).

In Section 2, I illustrate the constructions in question in more detail, in particular focusing on possessed noun phrases in Hungarian. In Section 3, I review the relevant literature and I point out a few issues with these in Section 4. I propose a solution for these in Section 5. Section 6 concludes the paper.

2.   *Hungarian data: clause structure and possessive noun phrases*
2.1.   *Hungarian clause structure*

Hungarian word order is said to be free, but this is only true under specific interpretations. In particular, the order of *arguments* is basically free, i.e. the order of subject and object can vary. Post-verbally, there are few, if any, syntactic restrictions on the order of constituents (cf. É. Kiss 2002, É. Kiss 2008; Surányi 2006 for a different view). Pre-verbally, however, the Hungarian clause is restricted in various ways. While the order of arguments is still variable, Hungarian is usually analysed as a so called *discourse configurational* language, i.e. there are fixed positions for constituents interacting with information structure, among other things. Under standard assumptions, the order of topic and focus constituents is fixed, with (potentially several) topic

positions preceding a single focus position, which is closest to the verb (cf. É. Kiss 1994, 1998, 2002, 2008). The relevant parts of Hungarian clause structure are thus represented as follows:

(3)   [TopP [XP] [DistP [XP] [FP [XP] [AspP [XP] [VP [V XP XP]]]]]]

(cf. É. Kiss 2003:23)

In (3), TopP and DistP can appear more than once with several topics and distributive quantifiers, respectively. The focus projection FP appears only once and is the locus for exhaustive focus (cf. (4); discussion in É. Kiss 1998; Horvath 2007). AspP houses the so-called verbal prefix (cf. É. Kiss 2002:55ff.). It is pre-verbal when there is no XP in the pre-verbal focus position but post-verbal if there is. See the following examples to illustrate these properties (abstracting away from the exact position of the verb, irrelevant here).

(4)   a.   [TopP Péter [AspP meg-ev-ett   [egy egész csirké-t.   ]]]
               P.   PRF-eat-3SG.PAST.SUBJ   a   whole chicken-ACC
               'Peter ate a whole chicken.'
        b.   [FP Péter ev-ett   [AspP meg [egy egész csirké-t.   ]]
               P.   eat-3SG.PAST.SUBJ   PRF a   whole chicken-ACC
               'It was Peter who ate a whole chicken.'

The topic and focus positions come with their own respective restrictions about what types of noun phrases can appear. É. Kiss (2002) takes the topic position to house only referential and specific noun phrases. This can be tested with so called *definiteness effect* verbs, which require their arguments to be non-specific (cf. Szabolcsi 1986, É. Kiss 1995, Kálmán 1995, Maleczki 2001, Kálmán & Varasdi 2005 for discussion). The following pair illustrates this:

(5)   a.   Van elég   pénz.
               is   enough money
               'There is enough money.'   (É. Kiss 2002:14)
        b.   *Van minden pénz.
               is   every   money
               *'There is every money.'   (É. Kiss 2002:15, my translation)

The copula, similar to the English *there is*-construction, requires a non-specific argument, i.e. an argument that does not meet the requirements to appear in the topic position, which for É. Kiss (2002) requires a referential, specific argument. Thus, constructions like (5a) 'do not have a topicalizable constituent.' (É. Kiss 2002:15). This should rule out sentences with unambiguously non-specific topics, such as bare noun phrases, cf. (6).

(6)   a.   #Pénz   van.
               money   is
               intended: 'There is money.'

For present purposes, it is not necessary to go into further detail. In the remainder of this paper, definiteness effect contexts as well as the focus position will play a role while other properties of the Hungarian clause will not be relevant.

2.2.   *The Hungarian noun phrase and possessive constructions*

In this section, I will briefly sketch the structure of the Hungarian noun phrase, in particular with respect to possessed nouns, in section 2.2.2. First, I will illustrate the basic structure of the noun phrase with different kinds of determiners.

2.2.1.   *Determiners in the noun phrase*

Hungarian has what I will assume to be a definite determiner (though cf. Szabolcsi 1994 for a different view), *a(z)* 'the'.[2] It can be shown to be in a relatively high position in the noun phrase as it precedes other determiners such as certain quantifiers like *néhány* 'some' or *sok* 'many' as well as numerals. This is illustrated in the following examples.

(7)   a.   az egyetem
              the university
              'the university'
        b.   a   két egyetem
              the two university
              'the two universities'

The numeral *egy* 'one' can only be used as an indefinite determiner; as such, it follows the definite determiner just as in (7b) and can thus be argued to be hierarchically lower in the noun phrase. While most determiners can co-occur with the definite determiner *a(z)*, as in (8a), the universal quantifiers *minden* 'every', *valamennyi, mindegyik* 'each' can not, cf. (8b).

(8)   a.   a   sok   / kevés / négy / néhány / legtöbb level-ed
              the many / few   / four / some   / most   letter-2SG.POSS
              'your many / few / four / most of your letters'
        b.   (*a) minden / valamennyi / mindegyik level-ed
              the every   / each   / each   letter-2SG.POSS
              intended: 'your every letter / each of your letters'

Leaving the question of the exact position of the universal quantifiers aside for the moment, we arrive at the following rough structure of the Hungarian noun phrase and turn to the structures of possessive noun phrases.

(9)   [*definite determiner* [*quantifiers* [*adjectives* [*head noun*]]]]

2.2.2.   *Possessive constructions*

Hungarian has possessive suffixes which attach to nouns and agree with a possessor in person and number, cf. (10a). Possessors do not have to be spelled out, cf. (10a) again; in general, they can be nominative, (10b), or dative (10c).

---

[2]The presence or absence of the sibilant [z] is sensitive to whether the following word starts with a vowel or a consonant, cf. English *a(n)*.

(10) a. a   bicikli-nk
          the bicycle-1PL.POSS
          'our bicycle'
      b. Mari   bicikli-je
          M.NOM bicycle-3SG.POSS
          'Mari's bicycle'
      c. Mari-nak egy bicikli-je
          M.-DAT   a   bicycle-3SG.POSS
          'one of Mari's bicycles'

The most obvious difference between nominative and dative possessors is their syntactic distribution. Nominative possessors are usually argued to be lower than dative possessors (cf. Szabolcsi 1994; Bartos 1999; É. Kiss 2002). There are straightforward syntactic arguments for this, cf. (11) for illustration. While a nominative possessor cannot co-occur with the definite determiner *a(z)*, a dative possessor can.

(11) a. *Péter a   cucc-a
          P.NOM the stuff-3SG.POSS
          intended: 'Peter's stuff'
      b. Péter-nek a   cucc-a
          P.-DAT   the stuff-3SG.POSS
          'Peter's stuff'

Given (11) and the distribution of the definite determiner and other determiners reviewed above, we arrive at the following structure for the Hungarian noun phrase.

(12) DatPoss — D — NomPoss — Det — Num — Adj — N

Dat- and NomPoss refer to dative and nominative possessor respectively, D to the definite determiner *a(z)* and Det to other determiners and quantifiers. Note that dative and nominative possessors will not be present at the same time and that their overt presence is in general optional (obligatory possession marking is always present on the noun as suffixes).

In addition to these structural differences between nominative and dative possessors, there are interpretive differences. As the translations of the examples with nominative possessors show, these are always definite. This is shown with the following contrast, where there is a numeral between the possessor and the possessum. With a nominative possessor, the combination numeral+possessum is understood as a unique (plural) individual, while this uniqueness restriction does not hold for the noun phrase with the dative possessor.

(13) a. Mari   két fi-a
          M.NOM two son-3SG.POSS
          'Mari's two sons'
      b. Mari-nak két fi-a
          M.-DAT   two son-3SG.POSS
          'two of Mari's sons'

The two types of possessive constructions (nominative vs. dative possessor) also differ in their external distribution, not just in interpretation, though there is possibly a correlation. Recall the brief discussion above of the Hungarian construction similar to the English existential *there is*-construction, with the copula *van*, shown in (5a) and (5b). As argued there, only certain types of noun phrases are allowed in such contexts, see (14) for more examples:

(14) a. Van ∅ / egy / sok   alma.
          COP / a   / many apple
          'There's apples / an apple / many apples.'
      b. *Van az / minden / mindegyik alma.
          COP the / every   / each   apple
          intended: 'There is the / every / each apple.'

These structures are relevant for the present paper because possessive constructions are among the constructions restricted in these contexts. To express *x has y* in Hungarian, a construction with the copula is used, as shown in (15):

(15) Mari-nak van egy kocsi-ja.
      M.-DAT COP a   car-3SG.POSS
      'Mari has a car.'

The possessed argument, *egy kocsi* 'a car' in (15), is subject to the same restrictions as the nominal arguments in (14). As Szabolcsi (1994) argues, this is again similar to English, where sentences like *I have the sister* are ungrammatical (on the possessive reading). She identifies the arguments that are licit in such contexts as non-specific indefinites, as in the definiteness effect contexts discussed above. There is a further restriction on possessed noun phrases in this construction, however. The possessor has to bear dative case and be *extracted* from the noun phrase. Extraction, in this case, means that the dative possessor cannot be in a relation with the possessed noun that is too local, i.e. in the same constituent. Witness the following contrasts:

(16) a. *Van Mari   kocsi-ja.
          COP M.-NOM car-3SG.POSS
          intended: 'Mari has a car.'
      b. Csak Mari-nak van kocsi-ja.
          only M.-DAT   COP car-3SG.POSS
          'Only Mari has a car.'
      c. *Csak Mari-nak kocsi-ja   van.
          only M.-DAT   car-3SG.POSS COP
          intended: 'Only Mari has a car.'
      d. Csak Mari   kocsi-já-t   lát-t-am.
          only M.-NOM car-3SG.POSS-ACC see-PAST-1SG
          'I only saw Mari's car.'
      e. Van Mari-nak kocsi-ja.
          'Mari has a car.'

(16a) shows a nominative possessor in this type of possessive construction. This is strongly ungrammatical and contrasts with (15). That the dative possessor has to be *extracted*, i.e. non-local, can be shown using a test suggested in Szabolcsi (1994:225). The focus particle *csak* 'only' forces a single constituent into the pre-verbal focus position (cf. Section 2.1). The ungrammaticality of examples like (16c) shows, according to Szabolcsi (1994), that the dative possessor may not form a constituent with the possessum and thus must be extracted from that noun phrase. If the possessor is non-local, the structure is licit, cf. (16b). (16d) shows that a constituent with a local possessor is not generally ruled out with verbs that do not have definiteness restrictions on their arguments, while finally, (16e) shows that if the above reasoning is correct, string-adjacency between possessor and possessum need not determine constituency.

As mentioned above, both nominative and dative possessors can be covert. In those cases, it is not straightforwardly possible to tell whether the covert possessor is a nominative or dative possessor, but Szabolcsi (1994) argues that the coordinate structure constraint should hold even for phonologically null elements, i.e. it should be possible to test for extraction of dative possessors, covert or not. Szabolcsi (1994) shows that this is the case:

(17) *Van kalap-od   és sál.
       COP hat-2SG.POSS and scarf
       intended: 'There's your hat and a scarf.'

The reasoning behind this argument is that for the possessum *kalapod* 'your hat' to be licit its *pro* possessor has to be dative and extracted, which would force movement from one of the conjuncts and not the other (because there is nothing to extract from non-possessed *sál* 'scarf'). This kind of movement is straightforwardly ruled out by the coordinate structure constraint. In section 2.3.3, I will resume the present discussion.

2.2.3. NP or DP?

Having established the basic distribution of possessed noun phrases in Hungarian, I will turn now to the question of the category and the internal structure of the noun phrase. Szabolcsi (1994) assumes that all argumental noun phrases are DPs and that one of the roles of the determiner is similar to that of a subordinator or complementiser marking a clause as an argument.

Bartos (1999) and É. Kiss (2002), on the other hand, argue that not all noun phrases are of the same syntactic category. The category of the noun phrase depends on the elements that are actually present. Thus bare nouns are argued to be mere NPs, while numerals project NumP, and the definite determiner projects a DP. É. Kiss (2002:Ch. 7) provides some evidence for these claims; this evidence will be taken up later.

Bartos (1999) argues for the hypothesis that the syntactic category of the direct object noun phrase triggers the paradigms. The basic idea is that all and only those direct objects that project a DP layer trigger the objective paradigm. In his analysis of the Hungarian noun phrase, only those layers that are actually lexically present are projected. This view differs from Szabolcsi's in that non-DPs can be arguments of verbs too, a fairly standard assumption in the recent literature. On this view, then, the examples above would have the following structures:

(18)   a.   [$_\text{DP}$ az [$_\text{NP}$ egyetem]]
               the   university
               'the university'

        b.   [$_\text{DP}$ a [$_\text{NumP}$ két [$_\text{NP}$ egyetem]]]
               the   two   university
               'the two universities'

        c.   [$_\text{NumP}$ egy [$_\text{NP}$ egyetem]]
               a/one   university
               'a university'

(18a,b) and (18c) differ with respect to paradigm choice, the first two triggering the objective paradigm, (18c) requiring the subjective paradigm, as illustrated in (19). This analysis, adopted in É. Kiss (2002), predicts the correct paradigm choice for a wide range of cases, but there are some problems, to be raised in section 4.2.

(19)   a.   Meglátogat-om az egyetem-et.
               visit-1SG.OBJ   the university-ACC
               'I am visiting the university.'

        b.   Meglátogat-om a két egyetem-et.
               visit-1SG.OBJ   the two university-ACC
               'I am visiting the two universities.'

        c.   Meglátogat-ok egy egyetem-et.
               visit-1SG.SUBJ a   university-ACC
               'I am visiting a university.'

2.3.   Possessive structures and the verb paradigms

In this section, I will discuss why certain but not all possessed direct objects trigger the objective paradigm and what consequences the structure of these objects has for the analysis of paradigm choice in Hungarian.

2.3.1.   The syntax of possessed noun phrases

Szabolcsi (1994), Bartos (1999) and É. Kiss (2002) all make slightly different assumptions about the structure of possessed noun phrases. What they have in common is that they assume a projection PossP whose head introduces the possessive suffix and whose specifier arguably introduced the possessor (cf. É. Kiss 2002 for discussion and slight differences). The structure of (20a) can be represented as (20b), then, ignoring the issue of linearisation for present purposes.

(20)   a.   Mari   két bicikli-je
               M.-NOM two bicycle-3SG.POSS
               'Mari's two bicycles'

b.
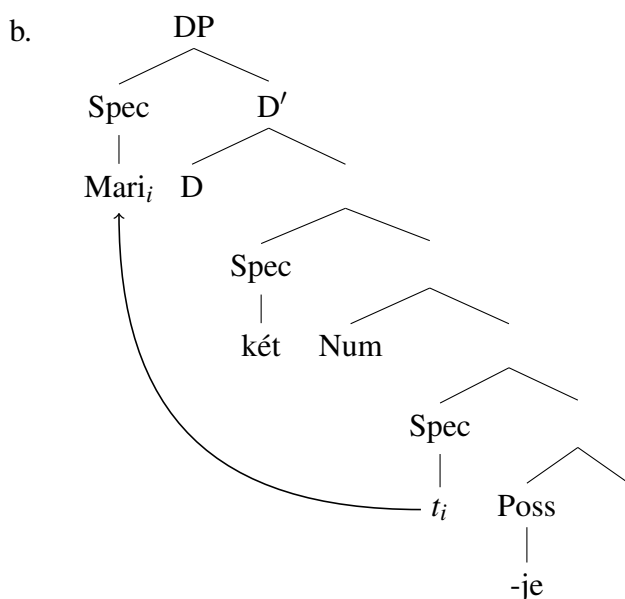
With a structure like in (20b), one can account for certain facts about the noun phrase. What is most important for present purposes is that nominative possessors are usually definite. I will assume that this is because the nominative possessor is in complementary distribution with the definite determiner by being in the same DP projection. Assuming the possessor to be in SpecDP rather than D deviates from assumptions in the literature (cf. É. Kiss 2002:168 for example), but the possibility of having full NPs and not only heads as nominative possessors is an argument for the possessor being in SpecDP, similarly to dative possessors.

The latter, as shown above, are not in complementary distribution with the definite determiner, which I argue is the case because of the different syntactic combination of the parts of the large possessive noun phrase. The following example illustrates a definite noun phrase with a dative possessor, cf. (21), and its structure in (22) according to É. Kiss (2002) (the base generation position of the possessor shall not concern us here). As É. Kiss (2002:168f.) argues, the dative possessor is adjoined to the lower DP, possibly due to its bearing case and being a KP (these details are not relevant for the present discussion). Crucially, then, the dative possessor is higher and less local with respect to the possessed DP.

(21)   Péter-nek a   diák-ja-i
       P.-DAT   the student-3SG.POSS-PL
       'Péter's students'

(22)   [DP Péter-nek [DP a [NumP -i] [PossP -ja- [NP [N diák- t_i]]]]]   (É. Kiss 2002:169)

Possessed NPs with dative possessors show a wider range of interpretations than those with nominative noun phrases. Given the argument above that the definiteness of possessed NPs with nominative possessors is induced by the locality of the nominative possessor, I will assume, following Szabolcsi (1994); Bartos (1999); É. Kiss (2002), that the syntactic freedom of the dative possessor is related to the fact that interpretations of such noun phrases vary.

That dative possessors are not in complementary distribution with the definite determiner provides good evidence that they are in a higher position than the nominative possessor. If D is filled, the possessed noun phrase is interpreted as definite; if it is not, possessed NPs with dative possessors can also be interpreted as indefinites, as shown in (16) above. The *mihi est-*construction provides a test for the indefiniteness of possessive noun phrases.

2.3.2. *Possessive structures and the objective paradigm*

The facts about the syntactic structure and interpretation of possessive structures in Hungarian just introduced allow us to now turn to their relation with the verb paradigms. Possessive structures with nominative possessors uncontroversially trigger the objective paradigm, just like definite determiners, demonstratives, determiners ending in *-ik* and the universal quantifiers *mindegyik*, *valamennyi* 'each'. The similarities between these types of noun phrases as direct objects will be addressed below.

The following examples illustrate a few possessed direct objects triggering the objective paradigm. They all have nominative possessors, but note that in each case the possessor could be covert as well, arguably nominative *pro*.

(23) a. Lát-ja   Péter lány-á-t.
    see-3SG.OBJ P.-NOM daughter-3SG.POSS-ACC
    'S/he sees Péter's daughter.'

  b. Olvas-t-a   Mari valamennyi / minden / öt könyv-é-t.
    read-PAST-3SG.OBJ M.-NOM each   / every / five book-3SG.POSS-ACC
    'S/he read each of Mari's books / every book of Mari's / Mari's five books.'

  c. Ismer-i   Péter egyik barát-já-t.
    know-3SG.OBJ P.-NOM one.of friend-3SG.POSS-ACC
    'S/he knows a certain friend of Péter's.'

  d. ?Nem ismer-i   Péter egyik barát-já-t.
    NEG know-3SG.OBJ P.-NOM one.of friend-3SG.POSS-ACC
    'S/he doesn't know a certain friend of Péter's.'

The direct object *Péter lánya* in (23a) gets a definite interpretation, the direct object being understood as unique and specific, also inducing an existential presupposition, as indicated by the translation.[3] With a nominative possessor, the (indefinite) numeral *öt* 'five' in (23b) also strongly favours a definite reading, viz. that Mari has authored five books, thus again having an interpretation as the unique set (or plural individual) of books such that Mari wrote them and implying that this is set is exhaustive, i.e. that she didn't write any others.

(23c,d) shows possessive structures including the phrase *egyik* 'a certain'. In these cases, the direct object again gets an interpretation as picking out a unique individual and the direct object scopes over the negation in (23d) (thus favouring a different word order where the direct object precedes the negation, arguably the reason for reduced acceptability).

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[3]An anonymous reviewer argues that the oddness of *Látja* pro *lányát* 's/he sees his/her daughter' in contrast with *Látja a* pro *lányát* 'id.' might make it necessary that "in the lack of an overt possessor definiteness/specificity must be explicitly marked." This is a valid point; the issue might be related to the marking of definiteness more generally, however, falling outside of the scope of the present paper.

Note that the above examples all trigger the objective paradigm; as far as I can tell, there is no variation with respect to paradigm choice with nominative possessors. There are certain structures which seem exceptional, cf. (24a,b), but these behave more like compounds than proper possessive structures (cf. Rácz for this data).

(24)   a.   Csirke comb-já-t   ev-ett   / *et-t-e.
                chicken leg-3SG.POSS-ACC eat-PAST.3SG.SUBJ / eat-PAST-3SG.OBJ
                'S/he ate a chicken leg.'
    b.   Petrezselyem zöld-jé-t   ve-tt   / *vet-t-e.
                parsley   green-3SG.POSS-ACC buy-PAST.3SG.SUBJ / buy-PAST-3SG.OBJ
                'S/he bought parsley.'

In both of these examples, the nominative possessor is a bare noun and not referential, giving rise to a different interpretation than in the examples in (23). I will not have anything further to say about structures as in (24).

2.3.3.   *Possessive structures and the subjective paradigm*

In addition to the compound-like noun phrase just discussed, there are further cases of the subjective paradigm co-occurring with possessed direct objects. While overt dative possessors provide more direct evidence for the nature of these constructions, I will discuss both overt and covert possessors.

As noted by Rácz, Szabolcsi (1994), Bartos (1999), Kiefer (2003) and Coppock (2013), among others, the *subjective* paradigm appears in certain varieties of Hungarian with some types of possessed direct objects. It is claimed in the literature that "certain varieties of the Hungarian language" (Bartos 1999:99, my translation) have a semantic distinction correlating the choice of verb paradigm and possessive noun phrase direct objects. As Szabolcsi (1994:227) states "there is a minority dialect in which object agreement is more semantic." Kiefer (2003) and Coppock (2013) also provide similar examples without noting which varieties are concerned. In brief, judgements on such examples are controversial and seem to vary but there are several sources of naturally occurring examples of the relevant sort.

The following examples provide a brief overview of the data in the literature. As mentioned above, Szabolcsi (1994) argues for syntactic restrictions on the interpretation of noun phrases:

(25)   For DP to be non-specific, it must have the possessor extracted (in addition to not containing any specific determiner, of course).

<div align="right">(Szabolcsi 1994:226, (120b))</div>

To set the stage for the dialectal data, she gives the following example from Standard Hungarian (her "majority dialect") said to have both a specific and a non-specific reading of the direct object *Chomskynak versét* 'a poem of Chomsky's' (*t* indicates the traces of the extracted dative possessor in (26), one from the nominative position, one from the internal dative position):

(26)   Chomsky-nak nem olvas-t-ad   *t t* vers-é-t.
        Ch.-DAT   NEG read-PAST-2SG.OBJ   poem-3SG.POSS-ACC

'You haven't read any poem of Chomsky's.'
?'You haven't read Chomsky's poem.'   (archaic)
(Szabolcsi 1994:226, (123), glosses adapted, her judgements)

The crucial example from the minority dialect is the following, a minimal pair to (26), differing only in the choice of verb paradigm, subjective in (27):

(27)   Chomsky-nak nem olvas-t-ál   vers-é-t.
        Ch.-DAT   NEG read-PAST-2SG.SUBJ poem-3SG.POSS-ACC
        'You haven't read any poem of Chomsky's.'
                                        (Szabolcsi 1994:227, (124), glosses adapted)

(27), according to Szabolcsi (1994) (and the received view in the literature), should only be acceptable for a minority of speakers. For those who do accept it, (27) has a non-specific interpretation, while (26) has a specific interpretation. Though not explicitly mentioned, the translation in Szabolcsi (1994) hints at the fact that this is an instance of scopal specificity, giving rise to an interpretation like the following:

(28) $\exists x[poem(x) \wedge Rel(c,x) \wedge \neg read(y,x)]$

In (28), $Rel(c,x)$ is the relation between the possessed noun *poem* and Chomsky, a relation of writing in this case. The specific reading can thus be illustrated by the existential quantifier outscoping negation. The non-specific reading would get roughly the interpretation in (29):

(29) $\neg\exists x[poem(x) \wedge Rel(c,x) \wedge read(y,x)]$

One crucial difference between (28) and (29) is that the latter but not the former is compatible with a situation where Chomsky has not written any poems. Szabolcsi's data are particularly interesting because they include overt possessors.

Bartos (1999) provides a further controversial example from his local dialect (Tolna county, cf. Bartos 1999:100, fn. 63) with a possessive structure and the subjective paradigm, even including a universal quantifier:

(30)   %Ismer-ek   minden titk-od-at.
        know-1SG.SUBJ every   secret-2SG.POSS-ACC
        'I know your every secret.'
                                        (Bartos 1999:100, my glosses and translation)

In addition, further examples with covert possessors with and without determiners are cited in the literature, cf. (31).

(31)   %Péter-nek olvas-t-unk   (néhány) vers-é-t.
        P.-DAT   read-PAST-1PL.SUBJ some   poem-3SG.POSS-ACC
        'We read some poems by Peter.'
                                        (Bartos 1999:105, my glosses and translation)

This concludes the overview of the relevant data of possessive structures and the subjective paradigm.

2.4. *The quantifiers* minden *'every' and* valamennyi *'each'*

As briefly shown in section 1, the universal quantifiers *minden* 'every' and *valamennyi* or *mindegyik* 'each' pattern differently with respect to the verb paradigms, with only the latter two triggering the objective paradigm. While not the main object of investigation, certain properties of the two types of determiners deserve mention.

First, these quantifiers have the same syntactic distribution. They precede numerals and adjectives (cf. Coppock & Wechsler 2012:726) in the noun phrase, i.e. they are possible located in a QP inside the DP. But interestingly, as discussed in detail by Szabolcsi (1994), they are incompatible with the definite determiner *a(z)* immediately preceding them. Szabolcsi (1994) argues that the determiner is deleted but actually present (cf. Coppock & Wechsler 2012:722 for discussion). Without further determiners, both strong quantifiers are in complementary distribution with *a(z)* 'the'. However, with additional material in the noun phrase both appear with non-adjacent *a(z)*, i.e. the sequence in (32a) is ruled out with *a* preceding the quantifiers, while (32b) is allowed, cf. Szabolcsi (1994:210f., (107)):

(32)   a.   (*a) minden veled   való találkozás
             the every   with.you being meeting
             'every meeting with you'
       b.   a veled   való minden találkozás
             the with.you being every   meeting
             'every meeting with you'

Second, neither quantifier is licit in definiteness effect contexts like the *van* construction, as shown in example (14) above. Here, the presence or absence of the definite determiner does not make any difference, patterning with the definite determiner and demonstratives, but not with indefinite quantifiers like *néhány* 'some' and possessives, as we have seen above. The presence of *a(z)* does, however, make a difference with respect to the objective paradigm. (32b) triggers the objective paradigm when used as a direct object, while (32a) does not, as shown in (33a,b).

(33)   a.   Élvez-ek   minden veled   való találkozás-t.
             enjoy-1SG.SUBJ every   with.you being meeting-ACC
             'I enjoy every meeting with you.'
       b.   Élvez-em   a veled   való minden találkozás-t.
             enjoy-1SG.OBJ the with.you being every   meeting-ACC
             'I enjoy every meeting with you.'

Given the morphosyntactic differences between the two quantifiers, É. Kiss (2002:156) assumes *minden* to be an 'inherently specific numeral', taking care of its ungrammaticality in definiteness effect contexts but allowing it to require the subjective paradigm. As far as I can tell, however, there is no syntactic evidence for this assumption.

Coppock & Wechsler (2012) take the alternation in (33) as an argument against the DP analysis for the objective paradigm. They argue that since *minden* is in principle compatible with the definite determiner as shown in (33b) (and given the idea proposed by Szabolcsi (1994) that in (33a) it is merely deleted, but present), the DP hypothesis proposed by Bartos (1999) cannot explain why *minden* does not trigger the objective paradigm. Instead, they propose an analysis based on the feature specification of *minden* 'every' and *valamennyi* 'each' also argued for by Coppock (2013), which I will illustrate in the following section.

2.5.   Interim summary

I have introduced data regarding two types of noun phrases and their correlation with the verb paradigms, possessive structures and universal quantifiers. While possessive structures provide arguments for the idea that the trigger of the objective paradigm is based on noun phrase structure, because of the extraction facts and different types of possessors, a purely syntactic approach runs into problems with universal quantifiers. In the following section, I will present an analysis based on two types of existing suggestions which attempts to cover a wider range of data than either one does, based on both structural reasoning and the feature specification of the noun phrase.

3.   Existing approaches to Hungarian verb paradigms
3.1.   DP or not? A syntactic approach

As mentioned above, Bartos (1999) suggests that all and only noun phrases that project DP trigger the objective paradigm. I will not go into all details in this paper, but rather focus on possessive structures and the universal quantifiers.

I have introduced the structure of possessed noun phrases above, having argued that those with nominative possessors always project DP. Syntactic evidence for this included the fact that these possessors are always close to the possessed noun. By assumption, this property is taken to hold for covert nominative possessors too. Thus these arguments are not problematic for the syntactic analysis proposed by Bartos (1999).

The structures assumed above for dative possessors fit this hypothesis as well, triggering the objective paradigm when the dative possessor is in a DP adjoined to the possessed noun phrase. What about the cases where possessed noun phrases correlate with the subjective paradigm, however?

On this syntactic view, in the varieties which allow both the subjective and the objective paradigm with possessed noun phrases, these have different structures, in accordance with the DP hypothesis. Thus, Bartos (1999:106) argues that the subjective paradigm appears with a possessive structure when the possessor is extracted directly from a position below DP, making its projection unnecessary, cf. (34) for illustration.

(34)   [$_{DP}$ Chomsky-nak]$_i$ nem olvas-t-ál   [$_{PossP}$ t$_i$ [$_{NP}$ vers-é-t   ]]
            Ch.-DAT   NEG read-PAST-2SG.SUBJ   poem-3SG.POSS-ACC
        'You haven't read any poem by Chomsky.'   (cf. (27) above)

By contrast, in the same varieties, the specific reading would be triggered by the following structure, according to Bartos (1999), with the possessor passing through SpecDP.

(35)   [$_{DP}$ Chomsky-nak]$_i$ nem olvas-t-ad   [$_{DP}$ t$_i$ [$_{PossP}$ t$_i$ [$_{NP}$
         Ch.-DAT   NEG read-PAST-2SG.OBJ

vers-é-t   ]]]
poem-3SG.POSS-ACC
'You haven't read Chomsky's poem.'   (cf. (26) above)

Given the purely syntactic view endorsed by Bartos (1999), these assumptions are somewhat speculative. I will defend this view by proposing a connection between the syntactic structure and the difference in interpretation in section 5.

3.2.   [DEF] *or not? A semantic approach*

Coppock & Wechsler (2012) and Coppock (2013) recently suggested a different approach to what triggers the objective paradigm in Hungarian. On their semantic view,[4] it is not the structure of the noun phrase that triggers the objective paradigm, but its formal feature specification. The idea is that certain determiners and lexical items are specified for a particular formal feature which triggers the objective paradigm.

In Coppock (2013), this feature is referred to as [+DEF]. She basically argues that lexical items triggering the objective paradigm are specified as [+DEF] and that this specification correlates with a certain interpretation, viz. familiarity. In her own words:

(36)   *Lexical Familiarity Hypothesis*
         If the referential argument of a phrase is *lexically specified* as familiar, then the phrase triggers the objective conjugation.

                                                                    (Coppock 2013:7)

She defines *referential argument* as follows:

(37)   *Referential argument*
         The referential argument of a phrase is the discourse referent *u* such that: when the phrase combines with an expression denoting property *P*, *P* is predicated of *u*.

                                                                    (Coppock 2013:8)

In addition to lexical items being [+DEF] there are lexical items specified as [−DEF]. An item counts as such if 'it lexically specifies its referential argument as new.' (Coppock 2013:9). Variation in paradigm choice, on this view, follows from the presence of both features on a noun phrase (the features percolate up in the structure).

On this approach, the difference between *minden* 'every' and *valamennyi* 'each' with respect to the paradigm is derived straightforwardly by the latter being [+DEF]. This correlates with the presuppositional nature of *each* (in both English and Hungarian; cf. Beghelli & Stowell 1997,

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[4]As Georg Höhn points out (p.c.), this approach is obviously not only semantic, but is based on the morphosyntactic properties of the items in question. Their relation to specific semantic effects and the way the authors, especially Coppock, refer to their work makes me adopt the label 'semantic approach' as well.

Bárány 2012:Ch. 4, Coppock 2013:16f. for discussion; the difference might lie in anaphoricity as well). As for possessive structures, Coppock (2013) assumes that it is the possessive suffix which is specified for [+DEF]. Its lexical entry looks as follows:

(38) $-ja_{\langle e,\langle e,t\rangle,\langle e,\langle e,t\rangle\rangle\rangle}$ 'POSS' $\leadsto$
        $\lambda R_{\langle e,\langle e,t\rangle\rangle}.\lambda x.\lambda y.[:>> [y:R(x,y)]]$ (Coppock 2013:20)

In the system of DRT Coppock (2013) uses, the possessive suffix is basically a presupposition trigger, and the $>>$ notation in (38) means that the first individual argument applied to the meaning in (38) is presupposed, 'so there is a familiarity requirement on the possessum' (Coppock 2013:20). A common noun with a possessive suffix gets the following meaning in this system:

(39)   macskája$_{\langle e,\langle e,t\rangle\rangle}$ 'cat of' $\leadsto$
        $\lambda x.\lambda y.[:>> y :CAT(y)\wedge$POSS$(x,y)]]$ (Coppock 2013:21)

(The higher type of the common noun results from type-shifting to make semantic composition with (38) possible.) Possessive structures are thus predicted to trigger the objective paradigm by virtue of being [+DEF] because of the possessive suffix. In the following section, I raise issues with this explanation and point to a solution.

4.   Issues with existing approaches
4.1.   Possessives in Coppock (2013)

The semantic approach suggested by Coppock (2013) runs into certain problems with possessive structures by predicting presuppositions in certain constructions where they do not actually arise as well as ruling out configurations in which the subjective paradigm appears. I will illustrate these issues in turn.

Viewing the possessive suffix as a presupposition trigger as in (38) and (39) predicts that presuppositions should also arise in negative *mihi est*-constructions (given that presuppositions are constant under negation), cf. the following example:

(40)   Mari-nak nincs   macská-ja.
        M.-DAT   NEG.COP cat-3SG.POSS
        'Mari doesn't have a cat.'

Given the lexical entry of *macskája* 'his/her cat' in (39), the presupposition in (41a) should arise, which is not the case. The meaning of (40) is rather as in (41b), *m* referring to *Mari*, expressing that *There is no x such that x is a cat and Mari owns x.*

(41)   a.   *y is a cat and Mari owns y.*
        b. $\neg\exists x[$CAT$(x)\wedge$POSS$(m,x)]$

In addition, the assumption that variation arises through the presence of both [+DEF] and [−DEF] turns out not to be correct. There are examples of possessive structures triggering the

objective paradigm that do not include any determiner specified for [−DEF], cf. the following example ((31) repeated from above) and a similar example from Coppock (2013).

(31)   %Péter-nek olvas-t-unk   (néhány) vers-é-t.
       P.-DAT   read-PAST-1PL.SUBJ some   poem-3SG.POSS-ACC
       'We read some poems by Peter.'

(42)   %Olvas-t-unk   Péter-nek (öt) vers-é-t.
       read-PAST-1PL.SUBJ P.-DAT   five poem-3SG.POSS-ACC
       'We read five poems by Peter.'

                                         (Coppock 2013:6, my glosses)

In both (41) and (42), the determiners which are possibly specified as [−DEF] are marked as optional, and they indeed are. The subjective paradigm is still possible with both cases if *néhány* 'some' and *öt* 'five', respectively, are missing. The proper name *Péter*, however, cannot be specified as [−DEF] because it is a canonical trigger of the objective paradigm.

    If (41) and (42) lack a source of [−DEF], however, there is no way for the subjective paradigm to arise on the view held by Coppock (2013).

    In addition, Coppock (2013:6) also states that in (42), 'the object phrase must be at least the size of a DP.' This is not quite true: given the arguments for the extraction of dative possessors and the analyses proposed by Bartos (1999), there *is* a possible, if speculative way of deriving a smaller structure.

    To summarise, the approach to possessive structures proposed by Coppock (2013) predicts presuppositions where there are none and is not successful in deriving the variation of paradigm choice for all cases.

4.2.   *Quantifiers on a purely syntactic approach*

For approaches which see the trigger of the objective paradigm as purely structural, the syntactic distribution of the universal quantifiers *minden* 'every' and *valamennyi* 'each' is problematic. Syntactically, these quantifiers behave very similarly, only differing in their morphosyntactic behaviour with respect to the verb paradigms.

    In section 2.4 I sketched the syntactic issues arising with these quantifiers. Coppock & Wechsler (2012) take the alternation in (32) to indicate that *minden* 'every' and *valamennyi* 'each' are both compatible with D, which is merely deleted.

    In the following section, I will argue that taking into account the theory of features proposed by Coppock (2013) and syntactic structure, these examples can possibly be explained analogously to possessive structures.

5.   *A solution: features in D*

In the previous section, I argued that claiming that the possessive suffix in Hungarian is a trigger of presuppositions (or familiarity) leads to wrong predictions and does not actually derive the distribution of the verb paradigms for those varieties which show an alternation.

While there is a semantic alternation correlating with paradigm choice, it cannot just be based on the presence of both [−DEF] and [+DEF]. The crucial factor that is lacking is the structure of the noun phrase, which I will argue below makes assuming both kinds of features unnecessary.

In this section, I will show that adopting a feature along the lines of what is proposed in Coppock (2013) accounts for the semantic properties of the noun phrases in question, but I will argue that its position is different from what Coppock (2013) assumes. To avoid confusion with Coppock's approach, I will refer to the relevant feature as [D], while retaining the semantics proposed in Coppock (2013).

The idea is that [D], i.e. familiarity, inducing a presupposition, is one of the features that make up *definiteness*. Other features would include uniqueness, for example. I will argue that it is possible to spell out only this feature, without spelling out other features leading to a fully definite noun phrase (cf. Szabolcsi 1994 for other assumptions of null D determiners in Hungarian).

Locating this feature [D] syntactically in the DP layer has several advantages: first, variation in paradigm choice can be accounted for without recourse to a negative version of that feature; second, possessive structures are (correctly) predicted to be non-specific in certain cases; third, noun phrase structure is taken into account and is linked to semantic interpretation, a conceptually preferable choice. I will now go through the data discussed above and demonstrate how an approach along these lines explains their morphosyntactic behaviour.

5.1.   Universal quantifiers

Recall the alternations in (32), repeated here:

(32)   a.   (*a) minden veled   való   találkozás
            the every   with.you being meeting
            'every meeting with you'
        b.   a   veled   való   minden találkozás
            the with.you being every   meeting
            'every meeting with you'

(32a) would not trigger the objective paradigm as a direct object, while (32b) would. Coppock & Wechsler (2012) illustrate this with the following examples (their (85) and (86)):

(43)   a.   a   Mari { valamennyi, minden } kalap-ja
            the M.   each   every   hat-3SG.POSS
            'each/every one of Marie's hats'
        b.   (*a) { valamennyi, minden } kalap-ja
            the   each   every   hat-3SG.POSS
            'each/every one of her/his hats'

                                                            (Coppock & Wechsler 2012:723)

(43) is actually less problematic for a structural analysis, because the determiner *a* 'the' in (43a) could modify the proper name and not the whole noun phrase (but see Szabolcsi 1994:200f.

for discussion). In (43a), we would not expect any variation with respect to paradigm choice, because of the nature of the nominative possessor. [5]

A different way to account for these data is to abandon the idea that *a(z)* is deleted in contexts like (42) and look for a different explanation. The reason Szabolcsi (1994) assumes a deletion rule is that she cannot locate the quantifiers in question in D. Neither can Bartos (1999) or É. Kiss (2002), because then their DP hypothesis fails. Yet syntactically, these quantifiers seem to be in complementary distribution with the definite determiner, possibly originating from a lower position (accounting for the alternation in (42)). In fact, É. Kiss (2002:154) argues that certain quantifiers like *valamennyi* 'each' do move to D because of a [+definite] feature. What about *minden* 'every'?

Now, assuming that what triggers the objective paradigm is not the syntactic presence of D but the presence of the feature [D], the [+definite] in É. Kiss (2002) and [+DEF] in Coppock & Wechsler (2012); Coppock (2013) could be seen as the same feature. Even *minden* 'every' can be spelled out in D to account for the complementary distribution with *a(z)*, but due to its lack of [D] (which does not have to be stipulated, given semantic evidence), it does not trigger the objective paradigm.[6]

5.2. Possessive structures

Better arguments for the connection of [D] to the DP layer come from possessive structures. As shown in section 4.1, possessive suffixes should not introduce presuppositions by themselves. And given the structural restrictions on nominative and dative possessors, it seems plausible that the syntactic structure of the noun phrase influences the presence or absence of [D] on D.

Given that nominative possessors, as argued in Section 2.3.1, are in complementary distribution, it is usually assumed that they are located in D. I will assume that their presence in D triggers the presence of the feature [D], which in turn triggers the objective paradigm. This is in line with the fact that nominative possessors never have a non-specific interpretation (apart from the compound-like forms discussed above). Thus, a referential expression in SpecDP is able to mark it as having [D].

The case of dative possessors is slightly more complex, given the nature of extraction. Let me briefly repeat the relevant facts: dative possessors allow for a wider range of interpretations (including non-specific indefinite readings of possessive structures). Following Szabolcsi (1994) I will assume that extraction of possessors is necessary for such readings to arise. Extracted possessors have been shown not to form a constituent with the possessed noun, cf. (16). What about those dative possessors that do trigger the objective paradigm?

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[5]The argument proposed by Coppock & Wechsler (2012) might be problematic for their own theory. They basically argue that since *a(z)* is deleted but projects DP, *minden* should trigger the objective paradigm. Accepting this theory, they have to assume that *a(z)* is deleted with all its features, i.e. not just phonologically; if it is not, its [+DEF] feature should trigger the objective paradigm as well, contrary to fact. But if, on their account, *a(z)* can be deleted completely, a syntactic explanation could be saved too. Haplology, as suggested by Szabolcsi (1994), might not be the right way to account for this.

[6]In fact, having both quantifiers in D could have other advantages. This could be an explanation for the fact that they do pattern together in definiteness effect contexts like the *van*-construction. Thus, their common syntactic distribution correlates with them being ruled out in such contexts, but the differences in semantics possibly lead to different morphosyntactic behaviour. This is possible, albeit speculative and counterintuitive.

In such cases, the possessor does form a constituent with the possessed noun, so is arguably more local. It is possible, then, to argue that [D] is spelled out only in those cases in which a dative possessor is in the specifier of a DP adjoined to the possessed noun phrase (taking D to be a null determiner). It is not spelled out, however, when the dative possessor is lacking, i.e. extracted from the noun phrase; in that case, the possessor is scrambled and adjoined to another node in the clause. A generalisation regarding the distribution of [D] can be stated as follows:

(44)   A noun phrase has [D] when a determiner with matching semantics is spelled out in D or when DP has a sufficiently local possessor in its specifiers.

5.3.   *A hybrid approach: noun phrase structure and features*

To summarise, I have argued for an approach that uses a feature like the one proposed by Coppock & Wechsler (2012) and Coppock (2013) to account for the interpretative correlates of the objective paradigm but I have argued that it is not introduced anywhere in the noun phrase, but related to the D position, spelling out part of the features that constitute the broader term definiteness. In the following section, I will argue that this analysis makes certain predictions which fit the data better than existing approaches.

5.4.   *Predictions and advantages*

As I have argued above, the present approach does not need to assume that there are both [−DEF] and [+DEF] features, because variation is not random, but a consequence of structural factors. Note that this is based on the assumption that covert possessors can be both overt and covert. This has been argued for by Szabolcsi (1994:231), as shown in (17) above. I have also assumed that [D] can be spelled out by a null determiner in D. If both assumptions are true, it follows that possessed noun phrases can have the following structures:

(45)   a.   [$_{DP}$ *pro$_i$* [$_{DP}$ D [$_{PossP}$ t$_i$ [$_{NumP}$ egy [$_{NP}$ bickli-d   ]]]]]
                                                        a   bicycle-2SG.POSS
            'a bicycle of yours'
       b.   [$_{DP}$ *pro$_i$*] … [$_{PossP}$ t$_i$ [$_{NumP}$ egy [$_{NP}$ bickli-d   ]]]
                                                        a   bicycle-2SG.POSS
            'a bicycle of yours'

(45a) would trigger the objective paradigm as a direct object, (45b) would not and is the structure that appears in the *mihi est*-construction *van egy biciklid* 'you have a bicycle'. While the structures in (45) seem stipulative, I have argued, first, that there is independent evidence for both silent elements and, second, that there are interpretive correlates. While covert possessors thus do not provide evidence as strong as overt possessors for extraction, their structures are not surprising.

Additional evidence for non-specific interpretations of certain possessive structures can be found in the literature and on the internet. Given the reasoning above, counterexamples to the current generalisation have to be non-specific possessive structures with nominative possessors.

I have not been able to find any clear example of such cases, while there are examples with dative possessors. (46) is from a Hungarian folk song, cited in Rácz, showing the subjective paradigm with a dative possessor. The possessed noun *két lányát* 'two daughters of his' is non-specific, not implying uniqueness.

(46) Az egri   kávés-nak   két lány-á-t   ismér-ek.
      the Eger-FROM coffee seller-DAT two girl-3SG.POSS-ACC know-1SG.SUBJ
      'I know two of the coffee seller's daughters.'

(folk song, cited in Rácz:279)

H. Varga (2010) cites the Hungarian author János Arany discussing examples like the (47a) and (47b), the latter paraphrased in (47c).

(47) a. Petőfi-nek három arckép-é-t   ismer-ek.
          P.-DAT   three portrait-3SG.POSS-ACC know-1SG.SUBJ
          'I know three portraits of Petőfi.'
      b. Fi-á-t   ismer-ek,   de lány-át   nem
          son-3SG.POSS-ACC know-1SG.SUBJ but daughter-3SG.POSS-ACC NEG
          ismer-ek.
          know-1SG.SUBJ
          'I know sons of his/hers, but no daughters.'
      c. 'I know one of his/her sons, s/he could have more than that, but I don't know them; I don't know whether s/he has daughters, I don't know any of them.'

(H. Varga 2010:49)[7]

I take the overt dative possessor in (47a) and (46) as evidence for the structural explanation above. The paraphrase of the meaning of (47b) in (47c) fits well with the absence of [D]. Note also that (47b) does not include any determiner that could possibly be specified for [−DEF], providing another example in which the presence of the subjective paradigm does not follow from the approach endorsed in Coppock (2013).

A final prediction of the current approach is that lacking the relevant structure, any combination of determiners not triggering the objective paradigm can co-occur with possessed noun phrases and the subjective paradigm, e.g. *minden* 'every'. Coppock (2013:22f.) argues that possessed noun phrases and *minden* trigger the objective paradigm obligatorily, given the [+DEF] feature on the possessive suffix and the lack of any feature on *minden* 'every'.

The present approach predicts that *minden* and possessives should be compatible with the subjective paradigm, as long as no local possessor introduces [D]. Such examples *are* available, although the following attested examples all lack an overt possessor.

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[7]Citing *Arany János 1860 — 1882. Prózai művek*. Németh, G. Béla (ed.), Arany János: Összes Művei XI. Akadémiai Kiadó, Budapest. 1968. 59.

(48)   a.   Minden problémá-já-t   megold-unk,   …
             every   problem-3SG.POSS-ACC solve-1PL.SUBJ
             'We solve all your [polite] problems …'[8]

       b.   Minden bánat-od-at   elereszt-esz,   …
             every   problem-2SG.POSS-ACC let go-2SG.SUBJ
             'You let go of all your problems.'[9]

       c.   Ezenkívül garantál-om,   hogy … elfeled-te-t   minden
             besides   guarantee-1SG.OBJ that   forget-CAUS-3SG.SUBJ every
             bánat-od-at.
             sorrow-2SG.POSS-ACC
             'Besides I guarantee that … it makes you forget all your sorrows.'[10]

In all cases above, the direct object consists of a possessed head noun with the determiner *minden* 'every' preceding it. On the approach endorsed here, if there is no local possessor, such constructions lack the feature [D] and thus do not require the objective paradigm.[11]

6.   *Conclusions*

The topic of this paper has been the distribution of the Hungarian objective paradigm with certain possessive constructions. I argued that the semantic analysis suggested in Coppock (2013) provides a good explanation of the interpretational correlates of the objective paradigm but that the distribution of the paradigm cannot be captured without taking the syntactic structure of the noun phrases into account.

     I proposed a hybrid approach, based on syntactic insights from Szabolcsi (1994); Bartos (1999); É. Kiss (2002) and the feature [D], adapted from [+DEF] in Coppock (2013). I showed that both the universal quantifiers *minden* 'every' and *valamennyi* 'each' and possessive constructions provide evidence for the semantic consequences of the presence of [D] and introduced

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[8]http://www.magyaronline.net/forum/viewtopic.php?topic=1811&forum=4,   accessed 28 May 2013.

[9]http://www.kerdesem.hu/valaszok/57432_mit_kialtasz_a_vegtelenbe_/2,   accessed 28 May 2013.

[10]http://lovegood.blog.hu/2009/03/18/cosmopolitan_5, accessed 18 May 2013.

[11]An anonymous reviewer points out that "[t]he grammaticality of the examples under (48…) are rather dubious. It is quite unlikely that a native speaker of Hungarian would utter a sentence like this on purpose." I used examples off the internet for the relevant data exactly because of the unexpected nature of these examples. A similar example is cited in Bartos (1999:100):

(i)   %Ismer-ek   minden titk-od-at.
       know-1SG.SUBJ every   secret-2SG.POSS-ACC
       'I know all your secrets.'

He mentions that this judgment is controversial, but claims that it is grammatical in his dialect (cf. Bartos 1999:100, fn. 63). Suffice it to say, such examples *are* controversial but they do appear in the wild. Sketching the geography or demography of these varieties is an important issue for future research.

additional attested data which are compatible with the present account but do not follow from other recent research on Hungarian verb paradigms.

Acknowledgements

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Acquisition of Russian comparison constructions
Semantics meets first language acquisition

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This paper brings together insights from cross-linguistic research on grammatical variation in comparison constructions (Beck et al. 2009), first language acquisition and the 'standard analysis' of comparison constructions based on von Stechow (1984), Heim (2001) and Beck (2011). The cross-linguistic parameters make predictions for the acquisition of Russian comparison constructions. I worked out the order of their acquisition based on predictions made by the theory and specific characteristics of Russian degree constructions. I tested the predictions against a longitudinal corpus of two bilingual children. An unexpected result is the late acquisition of all evaluative degree constructions but the positive.[1]

1. Introduction

'…the study of grammatical variation, like the study of grammatical universals is a "deep" domain of scientific inquiry, one where we can expect to discover richly explanatory principles. Child language provides a unique window into this aspect of human language' (Snyder 2007:3). Snyder shows that interdependent syntactic parameters can be traced back through first language acquisition. But we will see that the gain is mutual: the cross-linguistic parameters of degree constructions as proposed by Beck et al. (2009) provide guidelines as to how the child is going to acquire degree constructions. The parameter setting in Russian is different from that of German and English. This changes the evidence available to the child during the acquisition process and thus also the order in which comparison constructions are acquired. Acquisitional studies by Tiemann et al. (2012) and Hohaus et al. (to appear) have already shed light on how English and German speaking children acquire degree constructions. Russian has not yet been investigated from this perspective.

This paper is structured as follows: Section 2 provides the necessary theoretical background. In section 3, I will point out special features of Russian comparison constructions, provide analyses and finally, outline the predictions for the order of acquisition

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[1] This paper presents the results of the corpus study conducted within the frame of my Staatsexamen thesis: Acquisition of Russian comparison constructions by bilingual children: A corpus based study (2012).

of degree constructions in Russian. The corpus study and methodology are presented in section 4. In section 5, I will discuss the results and finish the paper with some concluding remarks in section 6.

2. Theoretical background

Two theoretical components that I used are the Beck et al. (2009) parameters and Snyder's (2007) parametric theory of language acquisition. I will now briefly present these two components before proceeding to the predictions.

2.1. Parameters of cross-linguistic variation in comparison constructions (Beck et al. 2009)

Beck et al. (2009) identified three dependent parameters of cross-linguistic variation based on data from 17 different languages from different language families. Data were collected for the constructions (1-7), among others.

(1)   **Difference Comparative (DiffC)**
        Naomi is 2cm taller than Sandra.

(2)   **Comparison with a Degree (CompDeg)**
        Naomi is taller than 1.50m.

(3)   **Degree Question (DegQ)**
        How tall is Naomi?

(4)   **Measure Phrase (MP)**
        Naomi is 1.70m tall.

(5)   **Subcomparative (SubC)**
        The shelf is wider than the drawer is deep.

(6)   **Negative Island Effect (NegIs):**
        *Mary bought a more expensive book than nobody did.

(7)   **Scope Interactions (Scope):**
        The draft is ten pages long. The paper is required to be exactly five pages longer than that.[2]

After examining the collected data, the following cluster patterns were found with the help of the Fisher Exact test and the method described in Maslova (2003) for the 17 languages: {DiffC, CompDeg} cluster together, {Scope, NegIs} also cluster together, where applicable, {DegQ, MP, SubC} also generally behave in a parallel way. The clusters were found to be dependent of one another, e.g. no language was found which had {DegQ, MP, SubC}, but

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[2] This example goes back to Heim (2001:224).

lacked {DiffC, CompDeg}. The parameters make clear predictions for the availability or non-availability of certain constructions in different languages.

Some of the core results of the study are summarized in Table 1.

Language example	CompDeg & DiffComp	Scope & NegIs	MP, DegQ & SubC
Motu	no	n.a[3]	no / n.a.
Chinese, Mooré	yes	no / n.a	no / n.a.
Russian, Guaraní	yes	yes	no
English, German, Thai	yes	yes	yes

Table 1: Some of the results of the cross-linguistic study by Beck et al. (2009)

Table 1 shows which constructions were taken to be diagnostics for a parameter setting, e.g. CompDeg constructions were taken to be indicators of degree ontology, while scope interactions between the comparative operator and a modal operator were applied as diagnostics for degree abstraction in a language. And finally, the availability of measure phrases, degree questions and subcomparatives indicated a positive setting of the so-called Degree Phrase Parameter.

The parameters are summarized and explained in (8-10).

(8) **Degree Semantics Parameter (DSP)** (Beck et al. 2009:19): A language {does/does not} have gradable predicates (type <d,<e,t>>) and related, i.e. lexical items that introduce degree arguments.

(9) **Degree Abstraction Parameter (DAP)** (Beck et al. 2004:325): A language {does/does not} have binding of degree variables in the syntax.

(10) **Degree Phrase Parameter (DegPP)** (Beck et al. 2009:24): The degree argument position of a gradable predicate {may/may not} be overtly filled.

Russian is a language with the parameter setting: [+DSP], [+DAP], [-DegPP]. Russian shares this parameter setting with Turkish, Romanian, Spanish and Guaraní. Except in the case of DegPP, Russian seems to pattern well with languages such as English and German which have the positive parameter setting of all the three parameters. However, the [DegPP] is set to negative. Neither MPs, nor DegQs or SubCs of the English type can be found in Russian. In order to express a Degree Question, for example, Russian uses a nominalization strategy as in (11) thus avoiding the English construction:.

(11) Kakogo   rosta   Oleg?
    Which-GEN   height-GEN   Oleg
    'How tall is Oleg?' (Lit. 'Of which height is Oleg?')

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[3] N.a stands for 'not applicable'. This can be due to different factors, for example the non-availability of clausal structures which, in turn, leads to non-availability of scope effects.

Why should this be the case? All three constructions, namely MPs, DegQs and SubCs require an adjective to combine with a syntactic element known as a Degree Phrase (DegP). In English, the Spec,AP position is filled in overt syntax in every construction, either by a trace as in (12a), by a *wh*-word as in (12b) or by a measure expression as in (12c).

(12) a. Helo's shoes are longer that the cupboard is deep.
          [than [how$_1$ [the cupboard is [**AP** t$_1$ [A deep]]]]]
      b. How deep is the cupboard?
          [**AP** how [A deep]]
      c. The cupboard is exactly 35 cm deep.
          [the cupboard is [**AP** [exactly 35 cm] [deep]]]

                                                                          (Beck et al. 2009:24)

In Russian, on the other hand, this position cannot be filled overtly. Therefore, none of those three constructions can be found in Russian.

   This parameter setting makes clear predictions for the order of acquisition, to be elaborated in section 3.4. of this paper.

2.2. Snyder's parametric approach to language acquisition

I will now briefly introduce the relevant parts of Snyder's theory in order to show the link between the parameters from 2.1. and first language acquisition.

   Snyder's central claim is that the time course of language acquisition is in itself a rich source of evidence about the nature of what and when the child is acquiring. For any parameter, he proposes the acquisitional predictions presented in (13) and (14).

(13) If the grammatical knowledge (including parameter setting and lexical information) required for construction A, in a given language, is **identical** to the knowledge required for construction B, then any child learning the language is predicted to **acquire A and B at the same time**.

(14) If the grammatical knowledge (including parameter settings and lexical information) required for construction A, in a given language, is a **proper subset** of the knowledge required for construction B, then the age of acquisition for A should always be **less than or equal to** the age of acquisition for B. (No child should acquire B significantly earlier than A.)

                                                                          (Snyder 2007:7)

The theoretical implication drawn from this is that the predictions in (13) and (14) can be directly applied to Beck et al.'s parameters to yield (15) and (16).

(15) **[+DSP] before [+DAP]:** No child should acquire constructions indicative of [+DAP] before [+DSP].

(16) **[+DAP] before [+DegPP]:** No child should acquire constructions indicative of [+DegPP] before [+DAP].

3. Specific characteristics of Russian comparison constructions and implications for acquisition

So far I have not addressed what else, besides the parameter setting, distinguishes Russian from languages such as English and German which dispose of a fully-fledged degree semantics. Composition in the *than*-clause, analytic and synthetic comparatives, and evaluativity are the three pertinent issues that will be addressed in the next subsections.

3.1. Comparatives with chem-*clauses vs. genitive-marked comparatives*

In Russian, the *chem*-clause is a *wh*-element in the instrumental case. The presence of the *wh*-element and the possibility of having an overt tensed verb (or copula) indicate that (17) involves a reduced clause. In (18), on the other hand, the standard of comparison is genitive-marked, and no reduced clause seems to be involved, cf. Pancheva (2006).

(17) Katya   byla   vyshe   **chem**   **Masha**
     Katya   was   tall-COMP   what-INSTR   Masha
     'Katya was taller than Masha.'

(18) Katya   byla   vyshe   **Mashi**
     Katya   was   tall-COMP   Masha-GEN
     'Katya was taller than Masha.'

The lexical entry for the comparative operator found in (18), where there seems to be no silent structure in the standard phrase is found in (19).[4]

(19) $[[\ er_{GEN}\ ]] = \lambda Adj_{<<d,<e,t>>}.\ \lambda y.\ \lambda x.\ max\ (\lambda d.\ Adj\ (d)(x)) > max\ (\lambda d'.\ Adj\ (d')(y))$

This is a comparative operator that compares two individuals along the dimension provided by the adjective. This operator is limited to predicative uses only, cf. Tiemann et al. (2012)[5].

    The Logical Form (LF) of (18) is in (18'a), the composition is illustrated in (18'b.- d.) and the truth conditions are spelt out in (18'e).

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[4] The discussion is presented in the general framework of the Heim & Kratzer (1998) textbook.
[5] There are adverbial cases of comparatives which can also take the genitive-marked standard of comparison:
     Masha   ljubit   Vanyu   bol'she   Ziny
     Masha   loves   Vanya-ACC   more   Zina-GEN
     'Masha loves Vanya more than Zina.'
This would not be expected under the assumption that genitive-marked Russian comparatives always employ the *er_{GEN}* in (19). I have not included these cases in the present paper. However, such adverbial uses should not be ignored in future work. I thank Roumyana Pancheva (p.c.) for bringing this point to my attention.

(18') a. [Katya [byla [[-*er* $_{<<d,<e,t>>,<e,<e,t>>>}$ vysokaya$_{<d,<e,t>>}$] Mashi]]]   (LF)

   b. [[vysokaya]] = λd. λx. x is d-tall

   c. [[er$_{GEN}$]] = λAdj$_{<<d,<e,t>>}$. λy. λx. max(λd. Adj (d)(x)) > max(λd'. Adj (d')(y))

   d. [[Mashi$_{GEN}$]] = Masha

   e. [[(18)]] = max (λd. Katya was d-tall) > max (λd'. Masha was d'-tall)

Note that here we do not need to move anything, rather we apply an *in situ* analysis.

   The Logical Form of the clausal counterpart from (17) illustrated in (20) looks similar to the analysis of English *than*-clauses, except that there is no overt preposition *than* in Russian and that we have an overt *wh*-phrase, namely *chem* under Spec,CP.

(20)
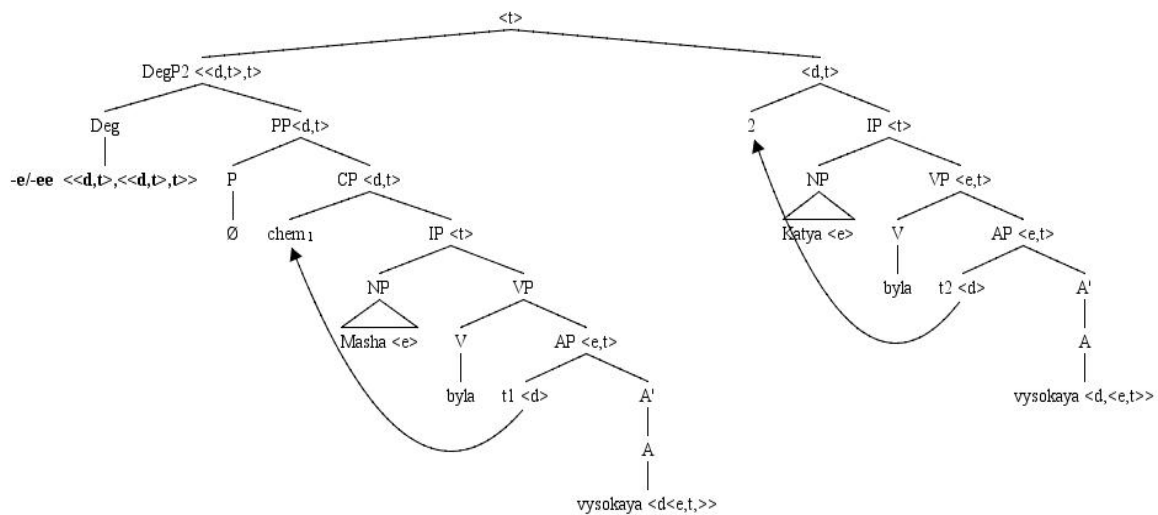
Truth conditions: 'The maximal degree of height that Katya reaches is larger than the maximal degree of height that Masha reaches.'

   The lexical entry for the clausal degree morpheme required here looks as in (21).

(21) [[er$_{CLAUSAL}$]] = λD$_1$ $_{<d,t>}$. λD$_2$ $_{<d,t>}$. max (D$_2$) > max (D$_1$)[6]

The composition of (20) works, as just mentioned, very much as it would for English clausal comparatives. We apply the clausal comparative operator in (21) and arrive at the semantic composition in (17').

(17') a. [[vysokaya]] = λd. λx. x is d-tall

   b. [[2 [Katya byla [t$_2$ vysokaya]]]]] = [λd. Katya was d-tall]

   c. [[chem$_1$ Masha byla t$_1$ vysokaya]] = [λd'. Masha was d'-tall]

   d. [[(20)]] = max (λd. Katya was d-tall) > max (λd'. Masha was d'-tall)

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[6] The specific morphological representation of this operator in Russian is **-e/-ee**, which is the same as in the genitive-marked case. In order to distinguish those two I resort to metalanguage and use *er$_{GEN}$* and *er$_{CLAUSAL}$*.

Note that the Degree Phrase Parameter is not violated in the *chem*-clause, because the Spec,AP position of the AP embedded under *chem* is taken care of by ellipsis. Importantly, degree abstraction (DA) is needed here. Since the semantics of the clausal case is more difficult than that of the non-clausal, genitive counterpart, I assume that the acquisition of the genitive-marked standard will precede the acquisition of the cases with the *chem*-clause.

3.2. Analytic and synthetic comparatives (AnC & SynC)

Another important property of Russian degree constructions is the synthetic-analytic distinction. Example (22) demonstrates a synthetic comparison (SynC). Here, the comparative morphology *-ee* is directly suffixed onto the gradable adjective *sil'nyj* ('strong'), as in English when *-er* is suffixed to the unmarked form of the adjective.

(22) Vanya sil'n**ee** chem Oleg
Vanya strong-COMP what-INSTR Oleg
'Vanya is stronger than Oleg.'

Example (23), on the other hand, is an instance of an analytic comparison (AnC).

(23) Vanya **bolee** sil'nyj chem Oleg
Vanya more strong what-INSTR Oleg
'Vanya is stronger than Oleg.' (Lit. 'Vanya is more strong than Oleg.')

In (23), the adjective is combined with the overt comparative operator *bolee* which consists of the morpheme *bol-* and comparative morphology expressed by the suffix *-ee*. I take *bolee* to be an overt degree operator which is morphologically detached from the gradable adjective. That means that (23) should work semantically like the LF in (20), but instead of the discontinuous morpheme *-ee/-e* the overt degree operator *bolee* should be found in the degree head position.

However, there is more to say about the analytic case in (23). A remarkable feature of analytic comparatives like (23) in Russian is that another meaning component, namely 'evaluativity' is involved[7]. That means that in addition to the fact that Vanya from (23) has to be stronger than Petya, both Vanya and Petya have to exceed the contextually salient standard for strength in order for the sentence to be true. I will distinguish SynC (synthetic comparatives) and AnC (analytic comparatives) in the course of acquisition, so far as SynC should precede AnC because of evaluativity. This will be explained in more detail in the next section.

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[7] I use the term 'evaluativity' from Rett's dissertation (2008) in the sense of Bierwisch (1989) who originally introduced the term 'norm-relatedness'. A construction is evaluative if it refers to a degree that exceeds a contextually salient standard, as in the positive.

3.3. Evaluativity in Russian degree constructions

Bierwisch (1989) introduced the term 'norm-relatedness' to refer to comparisons with a contextually determined standard of the relevant gradable property. Evaluativity is operative in the positive in English. I am providing an example of a positive construction in (24), since the positive is inherently evaluative.

(24)   a. Peter is tall.
       b. Peter is [$_{AP}$ POS$_S$ tall].
       c. [[POS$_s$]]= [λAdj. λx. max (λd. Adj (d)(x)) ≥s]   (Hohaus et al. (to appear):5)
       d. [[[$_{AP}$ POS$_s$ tall]]] = λx. max (λd.x is d-tall) ≥ s   (type <e,t>)

Example (24a) states that Peter's height lies above the given standard of tallness. As a result of composing the POS-operator defined in (24c) and the adjective I arrive at the meaning in (24d): the set of all x such that x's height reaches s, where the s-variable stands for a contextually salient threshold for tallness. Importantly, after the abstract POS operator has been inserted on top of the relational adjective, the degree argument slot is closed off, so that the adjective now has type <e,t>.

   Rett (2008) examines the connection between the polarity of the adjective and evaluativity. She shows that in the English equative, negative polar adjectives (A-), as in (25a), obligatorily trigger evaluative readings, whereas positive polar adjectives do not, as shown in (25b).

(25)   a. Gemma is as short as Judy.
       b. Tony is as tall as Pat.

In Russian this is different. The equative, as well as many other degree constructions including the AnC in (23) are evaluative regardless of the polarity of the adjective. Krasikova (2009) investigates the distribution of norm-related readings with dimensional adjectives across various degree constructions in Russian and English. She shows that in Russian the lack of degree morphology on the predicate triggers evaluative readings, while the comparative morpheme on a gradable predicate makes the norm-related reading disappear.

   How can evaluativity be encoded into the semantics? Rett (2008) proposes to encode evaluativity in the morpheme 'EVAL' in (26) which can occur freely and optionally in any degree construction.

(26)   [[EVAL$_i$]] = λD. λd. D(d) ∧d >s$_i$

EVAL is a function from a set of degrees to a subset of those degrees, namely the ones above the standard. The variable 's$_i$' is a pragmatic variable, which means that it is left unbound in the semantics. Each instance of EVAL introduces a possibly different pragmatic variable 's$_i$' which necessitates the indexing.

   The positive, the equative, the AnC, the superlative, as well as *enough/too*-comparatives in Russian are all evaluative as illustrated in Table 2.

Comp Deg	Diff Comp	SynC with *chem* clause	SynC with genitive	Positive	AnC	Equative	Superlative	Enough /too
-E	-E	-E	-E	+E	+E	+E	+E	+E

Table 2: Evaluative degree constructions in Russian

Using Rett's evaluativity operator in (26) in conjunction with Krasikova's morphological constraint I assign the LF in (27a) to the example of the AnC in (23). The semantic composition with the truth conditions is in (27b-e):

(27) a. $[[_{DegP}\, bolee_{<<d,t>,<<d,t>,t>>}\, [EVAL_{<<d,t>,<d,t>>}[chem_1\, Oleg\, t_1\, sil'nyj]]][2[Vanya\, t_2\, sil'nyj]]]$
     b. $[[\ [2\ [Vanya\ [\ t_2\ sil'nyj\ ]]]\ ]] = [\lambda d.\ Vanya\ is\ d\text{-}strong]$
     c. $[[\ [chem_1\, Oleg\, t_1\, sil'nyj]\ ]] = [\lambda d'.\ Oleg\ is\ d'\text{-}strong]$
     d. $[[\ EVAL\, [chem_1\, Oleg\, t_1\, sil'nyj]\ ]] = [\lambda d'.\ Oleg\ is\ d'\text{-}strong \wedge d' >s_{strong}]$
     e. $[[_{DegP}\, bolee_{<<d,t>,<<d,t>,t>>}\, [EVAL_{<<d,t>,<d,t>>}[chem_1\, Oleg\, t_1\, sil'nyj]]]\ [[Vanya\, t_2\, sil'nyj]]]$

       $= 1\,iff\ \ max\,(\lambda d.\ Vanya\ is\ d\text{-}strong) > max\,(\lambda d'.\ Oleg\ is\ d'\text{-}strong \wedge d' >s_{strong})$

Note that it suffices to insert the EVAL only once in the *chem*-clause, because it is entailed that if Oleg is above the standard for strength, Vanya also has to be above it, since he has to be taller than Oleg in order for the sentence to be true. The truth conditions, namely that Vanya's maximal degree of strength is larger than Oleg's maximal degree of strength and their degree of strength exceeds the height standard, are borne out.

This way of encoding evaluativity into the semantics has the consequence that evaluativity is understood as an extra component. It contributes to meaning by adding information about the context. The repercussion for L1 acquisition is that evaluative constructions are harder to acquire than non-evaluative ones because of this extra meaning component in the grammar.

3.4. Theoretical predictions of the order of acquisition

Based on Snyder's acquisitional predictions in (13) and (14) from section 2.2., I spell out the general predictions about the time course of acquisition of Russian comparison constructions in (28).

(28) **[+DSP] before [+DAP]:** No child should acquire constructions indicative of
     [+DAP] before [+DSP], specifically:
     a. No child acquires *chem*-clauses significantly before degree morphology.
     b. No child acquires *chem*-clauses significantly before genitive-marked
        comparison constructions.

Drawing on results from studies by Tiemann et al. (2012) and Hohaus et al. (to appear), I expect the following first steps in the acquisition of Russian degree constructions:

I. Unmarked adjective < contextual comparative[8]

First, there is the simple and uncomposed meaning of the adjectives, which only requires $\langle e,t \rangle$ type lexical entry in (29) (cf. Tiemann et al. 2012:136).

(29) $[[\text{vysokij}]]^c = \lambda x.\ x$ counts as tall in c   (type $\langle e,t \rangle$)

It is followed by a contextual comparative in (30) which still has type $\langle e,t \rangle$ (cf. Tiemann et al. 2012).

(30) $[[\text{vyshe}]] = \lambda x.\text{HEIGHT}(x) > d_c$ (type $\langle e,t \rangle$)

Here, the child has probably not learned yet that the meaning arises from the combination of a relational lexical entry for the adjective plus the comparative operator.

   Based on (28) and specific characteristics of Russian degree constructions, I expect the following further acquisitional steps:

II. Synthetic comparative (SynC) + genitive-marked standard (GEN) < SynC + *chem*-clause (acquiring degree abstraction (DA))

This is predicted by (28b). Since the synthetic comparative that uses er_{GEN} from (18'c) does not require degree quantification, no QR takes place. Everything can be interpreted *in situ*.

   By the time the child produces SynC with a genitive-marked standard, her adjective is no longer of type $\langle e,t \rangle$, but already of the relational type $\langle d,\langle e,t \rangle \rangle$ in (31).

(31) $[[\text{vysokij}]] = \lambda d_{\langle d \rangle}.\ \lambda x_{\langle e \rangle}.\ x$ is d-tall   (type $\langle d,\langle e,t \rangle \rangle$)

SynC with a *chem*-clause follows the SynC with a genitive-marked standard, because the child needs to acquire $er_{CLAUSAL}$ in (21) repeated in (32) for *chem*-clauses.

(32) $[[er_{CLAUSAL}]] = \lambda D1_{\langle d,t \rangle}.\ \lambda D2_{\langle d,t \rangle}.\ \max(D2) > \max(D1)$ (type $\langle\langle d,t \rangle,\langle\langle d,t \rangle,t \rangle \rangle$)

Note that the child needs to have assigned the value positive to the DAP-parameter by the time she uses *chem*-clauses.

III. SynC + *chem*-clause < Analytic Comparative (AnC) + *chem*-clause (acquiring evaluativity)

How does the child manage to acquire evaluativity? Here is a possible scenario: To be able to produce an AnC, a superlative or an equative, the Russian child needs to acquire not only degree abstraction, but also the EVAL operator. She first encodes evaluativity as part of the lexical entry of the comparison operator, as in (33).

(33) $[[\text{more}_{EVAL}]] = \lambda D_{\langle d,t \rangle}.\ \lambda D'_{\langle d,t \rangle}.\ \max(D') > \max(D)$ **& max (D)>s**

Evaluativity is expressed here in **'max (D)>s'**. This lexical entry is uncomposed with respect to evaluativity.

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[8] A minor notational remark: < means that construction A precedes another construction B, write A<B.

   The second thing that the child realizes is that the superlative also comes with an evaluative meaning in Russian. So the child also learns an uncomposed meaning of the superlative operator in (34).

(34) $[[C\ \text{-est}_{EVAL}]] = \lambda D_{<d,t>}.\forall D'[D' \neq D\ \&\ C(D') \rightarrow max(D) > max(D')$ **& max (D) > s**$]$[9]

In (34) evaluativity is again encoded as part of the lexical entry.

   The knowledge just sketched leads the child to evidence number one, namely that there is shared meaning component of the uncomposed *more$_{EVAL}$* with *C-est$_{EVAL}$*. With this knowledge the child can decompose (33) with respect to EVAL into (35).

(35) $[[more_{EVAL}]] = \lambda D_{<d,t>}.\ \lambda D'_{<d,t>}.\ max(D') > max(D)$

$$+$$

$[[EVAL_i]] = \lambda D.\ \lambda d.\ D(d)\ \&\ d > s_i +$ Licensing Condition (Krasikova 2009)

Now the child arrives at evidence number two, namely that *more$_{EVAL}$* in (33) also has the operator EVAL in it as a meaning component. Now, the child can decompose (34) into (36).

(36) $[[C\ \text{-est}_{EVAL}]] = \lambda D_{<d,t>}.\forall D'[D' \neq D\ \&\ C(D') \rightarrow max(D) > max(D')]$

$$+$$

$[[EVAL_i]] = \lambda D.\ \lambda d.\ D(d)\ \&\ d > s_i +$ Licensing Condition (Krasikova 2009)

This is one possible way of capturing how the child could arrive at an adult-like representation of the superlative and of AnC.

3.5. Interim Summary

In this section, I summarize the predictions discussed in 3.4. In Figure 1 the numbers 1-5 indicate the order in which the constructions are acquired (in bold), with the lexical entries indicated underneath as a reminder. I also indicate important transitions, namely the acquisition of degree abstraction and evaluativity by arrows.

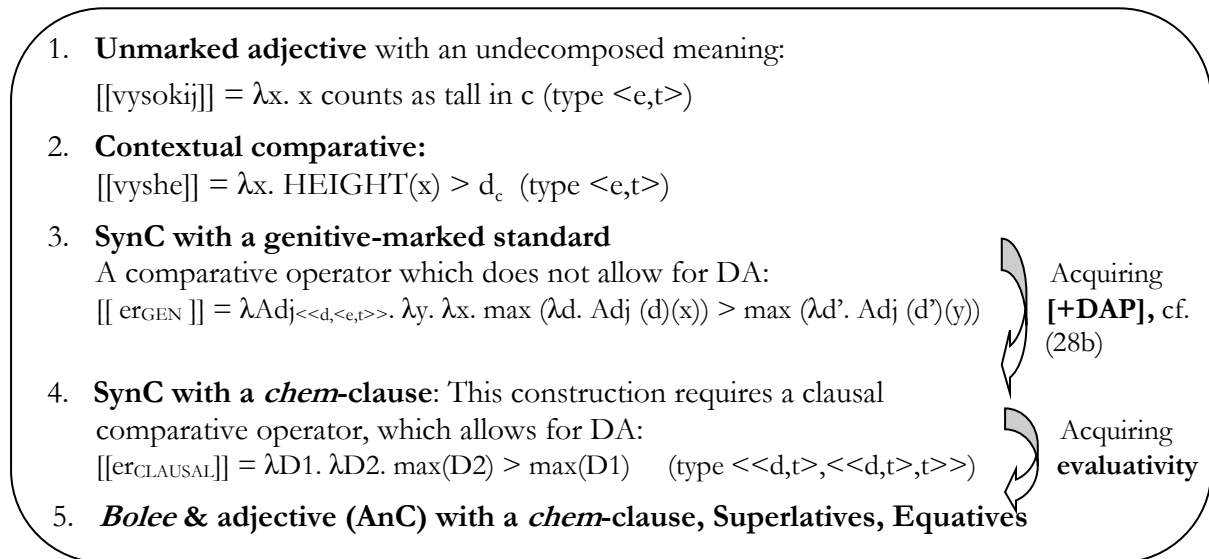[9] This is a lexical entry for the superlative morpheme adopted from Heim (1999:21).

1. **Unmarked adjective** with an undecomposed meaning:
   [[vysokij]] = λx. x counts as tall in c (type <e,t>)

2. **Contextual comparative:**
   [[vyshe]] = λx. HEIGHT(x) > d_c (type <e,t>)

3. **SynC with a genitive-marked standard**
   A comparative operator which does not allow for DA:
   [[er$_{GEN}$]] = λAdj$_{<<d,<e,t>>}$. λy. λx. max (λd. Adj (d)(x)) > max (λd'. Adj (d')(y))

   Acquiring **[+DAP],** cf. (28b)

4. **SynC with a *chem*-clause**: This construction requires a clausal comparative operator, which allows for DA:
   [[er$_{CLAUSAL}$]] = λD1. λD2. max(D2) > max(D1)   (type <<d,t>,<<d,t>,t>>)

   Acquiring **evaluativity**

5. ***Bolee* & adjective (AnC) with a *chem*-clause, Superlatives, Equatives**

Figure 1: Order of acquisition for Russian

For illustrative purposes, I also include the following graph to show the different stages of acquisition for Russian.

Stage 0	Stage 1	Stage 2	Stage 3	Stage 4
Unmarked	Contextual comparative	SynC + GEN	SynC + *chem*-clause	AnC Superlative Equative
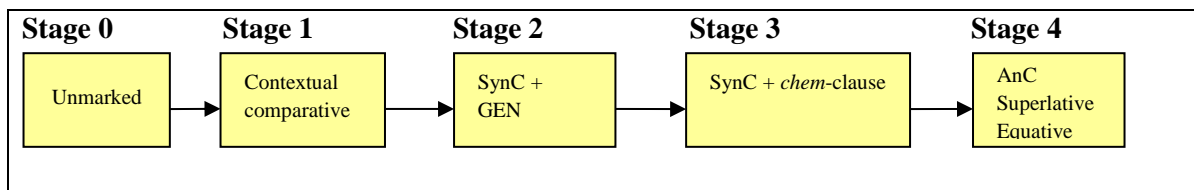
Figure 2: Stages of acquisition for Russian

Figures 1 and 2 illustrate that the unmarked form of the gradable adjective requires the least acquisitional effort. All types of comparatives start later, in stage 1 of Figure 2. The division between Stage 2 and 3 is necessary in Russian, because this is when the child acquires the ability to abstract over degrees, in other words, where she sets the [DAP] to positive. And finally, all the evaluative constructions should be acquired at the very end, at stage 4 in Figure 2 or at point 5 from Figure 1.

4. *Corpus and methodology*

In this section, I present the corpus and the methodology used in the study.

4.1.Corpus[10]

I tested the above predictions against a longitudinal corpus of spontaneous child speech. The corpus contains long-term recordings of two bilingual children: Max and David[11]. They were raised with Russian as their L1, but experienced German socialization early in their lives. Although I am aware of the fact that Max and David are bilingual children, I only look at the Russian part of the corpus and leave aside the German data.

The first child, Max, was recorded from age 2;3 (2 years, 3 months) to 6;1. In total 260 video recordings of approximately 60 minutes were made of him, but only parts of the recordings were put into corpus format. Unfortunately, the transcripts contain a considerable number of gaps. The total average number of utterances per transcript for Max is 187,6 (defined by the MLU-command from CLAN). An utterance is defined as exactly one line in the transcript, which can contain from just a word to a sentence. David's transcripts stretch from the age of 2;10 until 6;1. There are also some gaps at the ages of, for example 3;5, 3;7, 3;11, 4;0-4;3, 4;7, 4;8. The total average number of utterances per transcript for David is 447,8, so considerably higher than for Max.

4.2.Methodology

According to Snyder (2007), in order for results to be accurate it is important to exclude material that is mumbled, unclear or overlapping with another person's utterance in the transcript. Repeated material, e.g. utterances that contained the same words in the same order as produced by the respective adults in the same context was also excluded from the results. Memorized routine, such as poems, nursery rhymes, songs and fairy tale names was not taken into account. Novel utterances (Tiemann 2009:34) and finally, German words were excluded from the count, as well.

A suitable measure in determining the age of acquisition in longitudinal studies of spontaneous speech is the First of Repeated Uses (FRU). FRU goes back to Stromswold (1990). She argues that researchers who work with longitudinal corpora should credit the child with knowledge of a grammatical construction not immediately after its first clear use, but rather after one can determine that it is followed soon afterwards by regular use with a variety of different lexical items. Tiemann (2009) refined this formulation by establishing that 'soon afterwards' should be at least within the next two months after the first use (Tiemann 2009:35). The First of Repeated Uses has to be clearly distinguished from the very first use. The FRU is the crucial measure for determining the age of acquisition.

I used the program CLAN (Computerized Language Analysis) that is available on CHILDES[12] (MacWhinney, 2000), identifying relevant child utterances with the search command 'FREQ' which returns all of the child's utterances from one transcript in a separate

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[10] The corpora were kindly provided to me by Prof. Dr. Tilman Berger and his colleagues from the Slavic Department of the University of Tübingen. I especially thank Nathalie Mai-Deines who took the time to meet me on several occasions to exchange information on the corpus.

[11] These are pseudonyms which are used throughout. Information concerning the children is mainly drawn from Anstatt (2007).

[12] The CHILDES data base is freely accessible under the following web address: http://childes.psy.cmu.edu/

list. These lists were then searched 'manually' for the relevant constructions and checked against the original transcripts in order to exclude imitations, repetitions and formulaic expressions. Tables with the categories adjectives, comparatives (subdivided into different sub-categories: contextual comparatives, synthetic forms, analytic forms, *chem*-clauses), superlatives and equatives helped to order the different constructions counted in the list.

Going back to the transcripts for every single item proved indispensable during the search, because irregular occurrences of comparatives, as well as repetitions, memorized routine, etc. occurred very frequently and had to be excluded from the final results. For instance, irregular or totally lexicalized forms of comparatives, such as *dal'she* ('go on'), *bol'she* used with a negative element and meaning 'anymore', or *luchshe* 'better' meaning 'rather' had to be excluded. This could only be done by going back to the context for every single occurrence and by checking the use. I also excluded (as already mentioned in a previous footnote) adverbial uses of the comparatives. These special uses were, however, included for superlatives.

In Russian, as compared to English or German, it is much harder to use CLAN for systematic searches, for example in comparative forms of gradable adjectives: the typical endings of those are *-ee*, *-e*, or *–ey* in Russian. However there are too many words that possess these endings, so it would not be possible to control the output of the search command in the desired way.

Having considered all this, I developed the following method: First, I applied the CLAN command 'FREQ @ +t*CHI +f' to every single transcript that I had. This command operates only on the child tier (t*CHI) and yields all the words uttered by the child within one separate transcript file. Second, I went through the lists thus yielded and copied every relevant expression into an excel file, where I had different columns for the different kinds of degree constructions: gradable adjectives, comparatives, superlatives, equatives, etc. I also went back to the respective transcript every time, read up the context and copied the context next to the item in the excel file. Third, I determined the use of the construction in the context by categorizing it as 'adverbial', 'attributive', 'lexicalized' etc. An example for the third step taken out of my excel lists is given in Figure 3, where the first shaded area indicates a case of repetition which, of course, had to be excluded from the results and the second shaded area indicates a case of a contextual comparative.

Figure 3: Excerpt of a final excel file

5. Discussion of the results

Table 3 shows the very first use of the constructions of interest for both children.

First Use	Max (2;3-6;10)	David (2;10-6;01)
Unmarked Form	2;6	2;10
Comparatives:		
Contextual Comparative	4;3	2;11
SynC with genitive-marked standard	5;4	3;6
SynC with a *chem*-clause	5;4	4;6
AnC	none	none
Superlative	5;4	none
Equative	none	none

Table 3: Very first use, all constructions, Max and David

Remember that according to the definition of FRU the child can only be credited with the acquisition of a construction if she uses it regularly with a variety of different lexical items within the next two months after the very first use. Determining the FRU introduced by Stromswold (1990) and thereby the age of acquisition turned out to be impossible for most of the constructions in the corpus due to too few data points and too low absolute numbers of the constructions in question.[13] However, the data points in Table 3 and concrete examples from the corpus are also telling and can be used for a qualitative analysis of the data.

5.1. Results for Max

For Max, the contextual comparative follows the unmarked form of the adjective and precedes the SynC with a genitive-marked standard, just as predicted. Like the English and German children of Tiemann's et al.'s (2012) study, Max uses contextual comparatives as his first comparatives.

(37)   *MOT: nu, kakaja zmeja dlinnee?
         'Well, which of the snakes is longer?'
         *CHI: moja anakonda, moj [//] moja anakonda **dlinnee**.
         'My anaconda, my anaconda is **longer**.'

                                                    (Max, age: 4;3, file: Max_4_03_01_r_kod.cha)

Interestingly, the contextual comparative is the one construction Max uses quite regularly until the very end of the transcripts, namely at 5;4, 5;8, 5;9, 6;1, 6;6 and in the last transcript at 6;10. Because of this consistent use, I could at least tentatively conclude that Max acquires these forms, even without being able to determine the precise time of acquisition.

SynC with genitive-marked standards appears seemingly simultaneously with SynC plus *chem*-clauses for the very first and only time at 5;4. But there is a big gap of ten months (between the ages 4;6 and 5;4) before the first use of both constructions. This means that we can neither conclude that SynC plus genitive-marked standards was acquired before SynC plus *chem*-clauses nor that it was acquired after SynC plus *chem*-clauses. Remember that I hypothesized that SynC plus genitive-marked standards should be acquired before *chem*-clauses because of the different comparative operators, namely er_{GEN} and $er_{CLAUSAL}$. It should be mentioned at this point that *chem*-clauses are our only diagnostics for degree abstraction in a corpus of child language, as we cannot expect to find scope interactions, which are too complicated or negative island effects, which are ungrammatical. Max uses the comparative with a *chem*-clause ten times at age 5;4. This is a large number considering the fact that degree constructions are normally quite rare in the transcripts. That said, out of these ten occurrences, nine are of the kind found in (38).

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[13]   An anonymous reviewer points out that given the arguments by Stromswold (1990) and Tiemann et al. (2012), it is hard to interpret the very first ages relative to the acquisition predictions of what counts as an acquired constructions and what does not. The reviewer suggests that a larger corpus would not necessarily be the only way to test the predictions. As an alternative, a comprehension experiment could be conducted which would test whether the children have reliable knowledge of the relevant degree constructions, e.g. evaluative analytic comparatives at a certain age. It would be interesting to see how a child understands SynC *chem*-clauses compared to AnC, for instance. The reviewer also emphasizes that a comprehension experiment could provide an answer to the question of what the age of acquisition is for evaluative constructions. Importantly, this method would test for comprehension rather than production. It is a very interesting suggestion which, however, cannot be implemented in the scope of this paper and must be left to future research.

(38) *MOT: chto ty skazal, synochek?
      'What did you say, dear?'
      *CHI: dinozavr Reks sil'nee, **chem** mama shimpanze?
      'Is the dinosaur Reks stronger than the mum-chimpanzee?'

It becomes clear in the other eight examples that Max tries to order different animals according to their strength. But he is always using the same adjective *sil'nee* ('stronger'). As such, the FRU cannot be determined for Max's SynC+GEN construction, nor for his *chem*-clauses, since there is only one transcript in which they appear (at age 5;4); no subsequent uses can be found in the corpus. My predictions on this point can therefore neither be falsified nor verified.

Moving on to Max's superlatives and equatives, it can be said that the first superlative is used by Max at age 5;4.

(39) *MOT: a chto ljudi delali?
      'What did the people do?'
      *CHI: oni ja dumaju...
      'I think they...'
      *CHI: [...] vot odin chelovek govoril na [*] radio tam chto
      '[…] there was one person on the radio who said that...
      samyj sil'nyj chelovek dolzhen podnjat' takuju shtangu bol'shuju.
      ...the **strongest** (lit. most strong) **person** must pick up such a big barbell.'
                                                    (Max, age: 5;4, file: Max_5_04_05_r_kod.cha)

This is an attributive use of the superlative. Unfortunately, the FRU again cannot be determined for Max's superlatives, because there is always a gap of more than two months between all the occurrences of his superlatives.

In Table 3 'none' is recorded for instances of Max's equatives, because there are only three potential candidates, all of which had to be rejected due to the fact that the meaning the child is intending to convey is not clear in the context.

(40) *CHI: aga, xa+xa, ja budu sejchas <tozhe domik stroit'> [/] tozhe
       domik stroit', tol'ko malen'kij.
      After his mother told him that she is going to build a house, CHI says:
      'yes, hehe, I am also going to build a house [in the diminutive], but a small one.'
      *CHI: takoj dom, &gde [/] &gde [/] gde...
      'such a house, where, where...'
      *CHI: ja delaju **takoj domik bol'shoj**, **kak u tebja**.
      'I am making **such a big house, as you have**.'
                                                    (Max, age: 4;3, file: Max_4_03_01_r_kod.cha)

There is a contradiction in (40): Max wants to build a small house, at least smaller than his mother's. But he ends up using the adjective *bol'shoj* ('big') which results in the slightly strange 'I am building a house as big as yours'. This construction is evaluative in Russian and says that the house exceeds the standard for big houses. This erroneous use could be due to an interference with German, where the equative with positive polar adjectives like *groß* ('big')

is not evaluative, as was shown in (25b). It might also be the case that Max just has not mastered the evaluativity component of the Russian equative at this point of time and resorts to an equative-like construction.

Summing up Max's results, only his gradable adjectives and contextual comparatives come close to what appears to be actual acquisition of these constructions.

5.2. Results for David

As was the case with Max, the first comparative construction that appears in these data is a contextual comparative at age 2;11, just as predicted.

There is only one occurrence of a SynC with a genitive-marked standard and only two SynC with *chem*-clauses, which means that again there is insufficient data to draw any conclusions about the acquisition of these constructions. Nonetheless, they appear in the predicted order for the very first time (see Table 3).

There are two interesting instances of what seem special uses of superlatives. One of them is in (41).

(41)   *CHI: a naverx, **do samogo verxa,** e ego ne dostanesh'
        'To the top, to the very top, you cannot get it.'
        *LIZ: ja dostanu.
        Another child named Liza: 'I will get it.'

                                        (David, age: 3;2, file: David_3_02_r14_kod.cha)

But since these are not the instances that I am looking for, both for superlatives and equatives, I do not include them.

Note that neither of the children produced any analytic comparatives, i.e. evaluative constructions such as those in (23). Interestingly, there are several cases of analytic comparatives in the adult input yet still no such cases in the speech of the children.

Summarizing the results for David, it is not possible to draw any conclusions about the acquisition of anything but the gradable adjectives. The positive result that seems to verify my initial predictions is that the crucial comparative cases, i.e. the contextual comparative, SynC with a genitive-marked standard and SynC with a *chem*-clause first appear in the predicted order.

5.3. Interim Summary

It is worth underlining the point that adverbial cases of degree constructions might be good candidates for investigation in future acquisitional research. Including them might, on the one hand, yield more data points for the comparative cases and, on the other hand, provide valuable results for the analysis of adverbial comparatives in general.

A serious drawback of the corpora presented here is obviously the very small number of data points for the relevant constructions. That said, the results obtained do not falsify my predictions. Even without being able to determine the FRU, I can say that Max's and David's gradable adjectives, as well as Max's contextual comparative and SynC with a *chem*-clause come close to what looks like actual acquisition of these constructions.

A clear result for future studies is that the first uses of degree constructions happen after the age of 3;5. This is a solid finding, since the recordings are without gaps until the age of

3;5 and no comparison constructions are recorded until then. This result confirms the findings for English and German by Tiemann et al. (2012) and Hohaus et al. (to appear).

5.4. 'Surprising' result: late acquisition of evaluative constructions

A very clear result is that all the constructions that are evaluative in Russian, namely the analytic comparative, the equative and the superlative cannot be said to be acquired in the course of the recordings. In fact, except for Max's superlatives, none of the evaluative constructions even occur in the recordings. The superlative and equative cases that occur in the transcripts are different from the ones I am interested in. One could now object that maybe there are too few data altogether and that is why these rather complex evaluative constructions have not been encountered. How, then, can one explain the clear cases of synthetic comparatives with a *chem*-clause, for instance, which are also very complex constructions that require degree abstraction? It seems to be no coincidence after all. The prediction that the evaluative component of grammar is acquired late seems to be borne out.

An alternative view to the one I propose in this paper would be that children start out with the positive, which is inherently evaluative. The positive is clearly acquired early (see Table 3: 'unmarked form'). From this it could be assumed that children use a positive-based semantics for all comparative constructions. However, children do not first decompose the comparative constructions that they acquire, i.e. everything stays evaluative. Later, the children realize that they have to move away from their positive-based view, because many constructions, such as the SynC with a genitive-marked standard or with a *chem*-clause, are not evaluative. Under this view, all the non-evaluative constructions would be acquired late.[14] This is the other scenario under which the results of the present study would be suprising. But the absence of the evaluative degree constructions in the corpus has demonstrated that this is not the case. Evaluative constructions seem to be acquired late, probably even after the age of seven. More data would definitely be required in order to further test these predictions.

In my scenario, then, one question that remains is: What is the difference between the positive, which is inherently evaluative, and other evaluative constructions such as analytic comparatives and superlatives (cf. Table 2)? Why do they seem to be acquired so much later than the positive itself? There might be some fundamental difference between the positive and other evaluative constructions. This issue will have to remain an open question for the time being.

6. Concluding remarks

This paper combines insights from the formal semantics of degree constructions (cf. von Stechow 1984; Heim 2001; Beck 2011), cross-linguistic investigations of comparison constructions (cf. Beck et al. 2009) and a parametric approach to language acquisition (Snyder 2007). The acquisition data from Russian confirm the predictions made by the cross-linguistic parameters, namely that no child acquires *chem*-clauses before degree morphology and that no child acquires *chem*-clauses before genitive-marked comparisons. This study thus

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[14] I am thankful to Sigrid Beck (p.c.) for bringing this possible alternative view to my attention.

proves to be a good example of how formal semantic theory and research in child language acquisition can profit from each other. A theory of systematic cross-linguistic variation can make clear predictions for language acquisition and vice versa, insights from acquisition can refine semantic theory. Explicitly, a refinement of the parametric picture is certainly evaluativity in Russian, which I indicated to be an extra component in the children's grammar and encoded in Rett's EVAL-operator. According to my design of the semantics of the evaluative constructions, they were supposed to be acquired later than non-evaluative degree constructions. The absence of most of the evaluative constructions from the transcripts indeed points to a late acquisition of evaluativity.

New questions for future research have been opened up in the course of this study. An unresolved issue remains the early acquisition of the positive, which is in itself evaluative. Also, the acquisition of EVAL is logically possible, as sketched out in the prediction section, but one could question this way of encoding evaluativity by suggesting it be encoded in a presupposition, for instance.

What can be stated with certainty, however, is that much can be learned from a longitudinal study such as the present one and, methodologically, this kind of study is on the right track. Spontaneous speech production is captured here in the most natural way. The need for new corpora which are bigger and also longer becomes pressing if further testing of such semantic and acquisitional theories is to take place.

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Contrastive parallelism in European Portuguese
Prosodic features of a cohesion mechanism

Aida Cardoso

This paper focuses on the encoding of contrast in European Portuguese (EP), specifically by analysing contrastive parallelism structures, which seem to be crucial in the construction of the type of discourse that will be analysed: the argumentative discourse. Hence, my main goal is discussing how contrast is prosodically encoded in these structures and to relate the results with previous ones for other languages. The data show that contrastive parallelism has specific acoustic properties and that there is no one-to-one relation between pitch accents and these structures. Therefore, the results seem to indicate that the prosodic encoding of such structures is gradient.

1. Introduction

The study of the prosodic encoding of contrast entails two important theoretical issues that will guide this paper. On the one hand, literature has been discussing whether the prosodic encoding of contrast is gradient or categorical and, on the other hand, whether there are, or not, universals in the prosodic encoding of contrast. Furthermore, the fact that contrast studies are often centred on the analysis of focus and topic structures points out the relevance of interface studies involving prosody, syntax, semantics, and discourse in achieving a better understanding of contrast and its linguistic marking.

In this paper, I focus my attention on parallelism structures that convey contrast – or contrastive parallelism, as they will be named from now on. The reason for this choice is related to the type of discourse analysed in this work, i.e., argumentative discourse and, more specifically, a political debate. By analysing a political debate, it became clear that parallelism structures are widely used as a cohesion mechanism in such a type of discourse and, what is more, contrastive parallelism is associated with crucial moments of the argumentation and counter-argumentation of each debater.

Taking these aspects into account, the following sections will be centred on the analysis of contrastive parallelism structures, considering, first of all, the role of these structures as a cohesion mechanism and, secondly, the nature of the prosodic encoding of the semantic--discoursive value of contrast. The type of analysis conducted is, thus, guided by three main research questions:

(i) Which prosodic features are associated with structures of contrastive parallelism?

(ii) Is the prosodic encoding of contrastive parallelism gradient or categorical?

(iii) What is the role of contrastive parallelism in the syntax/prosody mapping? Does it have an effect on the melody and phrasing of utterances?

This paper is organized as follows: in section 2, previous studies on parallelism and on contrast are presented; in section 3, the corpus and the annotation criteria are explained; in section 4, the data are described; in section 5, the results are discussed in light of the initial research questions; and, finally, in section 6, a conclusion and some final remarks are made.

2. Theoretical background
2.1. Parallelism as a cohesion mechanism

Often taken as a rhetorical device, parallelism is also, and more importantly, referred to as a cohesion mechanism in early works on textual cohesion, such as Halliday & Hasan (1976). Taking this perspective into account, parallelism can be defined, from a discourse/syntax perspective, as a cohesion mechanism that entails the interface between different grammar components (e.g., syntax, semantics, morphology, phonology) and that involves shared grammatical features, similar word order, and similar syntactic structure, as proposed by Duarte (2003). Furthermore, the author emphasizes other important features of parallelism that evidence the interface of parallelism with other cohesion mechanisms in the construction of a textual unit. In this context, Duarte (2003) mentions, for instance, that lexical cohesion plays an important role in structural parallelism, since the latter can often be associated with strategies like word repetition or the presence of semantic relations.

From a prosodic point of view, parallelism is essentially described as a mechanism of tonal copy or, in other words, as intonational parallelism. Moreover, intonational parallelism is traditionally defined as tonal copy between consecutive intonational units. It is also worth noting that the study of intonational parallelism does not usually focus on constructions of structural parallelism. In fact, the studies of authors such as Palmer (1922), Crystal (1969), and Fox (1984) have in common the fact that the analysis of intonational parallelism is exclusively phonological and that, consequently, exploring the relations between syntactic structure and prosodic structure regarding parallelism is avoided. Nevertheless, it can be observed that, in works like Palmer (1922), Crystal (1969), or Fox (1984), tonal copy was generally analysed in structures of coordination, subordination, and parentheticals, for example. In this context, the main purpose of the prosodic analysis was to identify specific intonational contours that could be involved in intonational parallelism.

On the contrary, subsequent studies (Bolinger 1989; Wichmann 2000) show a new perspective by ascribing a cohesive function to intonational parallelism. Crucially, Bolinger (1989) points out that the repetition of intonational contours is what gives intonational parallelism (or "series intonation", in the author's words) its cohesive function and, for this reason, it is more relevant than the specific type of intonational contour that is copied.

> *What is probably more important as a general feature of series intonation is not the particular profile used on any one item (…) but the repetition of the same profile. This is a cohesive device in discourse (…).* (Bolinger 1989:207)

The type of intonational contour, along with its repetition, can be motivated by its discursive function or meaning, the author argues. On this matter, three main aspects should be mentioned: firstly, tonal copy can be seen as an insistent way of associating a specific communicative intention to an utterance; secondly, the repetition of an intonational contour

characterized by "an abrupt fall *in* or *from* the syllable that is made to stand out by the fall" (Bolinger 1989:3) can be associated with emphasis by giving a "dramatic or authorative effect" (Bolinger 1989:208) to a sequence, for instance; and, lastly, an emphatic realization of conjunctions (e.g., *and*, *or*), creates more tension (since conjunctions are elements not frequently accentuated in other contexts) and, consequently, draws the attention of the hearer.

More recently, Wichmann (2000) presented important findings on this matter. The author analysed data from the Spoken English Corpus (Knowles et al. 1996) and found intonational parallelisms involving consecutive nuclear pitch accents, as has been traditionally described, but also found two new contexts of tonal copy: (i) intonational parallelism involving different tones and (ii) intonational parallelism between non-consecutive tonal units. Regarding the first context, Wichmann (2000) argues that intonational parallelism can be perceived between different tones if we consider not their phonological categories, but their phonetic properties instead. As the author explains, the tones L* H and H* H, for instance, can be perceived as parallel because, phonetically, they are both realized with a final rising movement. On the other hand, the possibility of intonational parallelism between non-consecutive tonal units can be motivated by phrasing. As the author explains by taking a list as an example, if each list item does not correspond to a single tonal unit, we can still find tonal copy, although not between consecutive nuclear pitch accents.

2.2. Contrast encoding

Over the past few years, there has been a growing debate about the prosodic realization of contrast. On this matter, it is important to note, first of all, that contrast is often studied in relation to structures of topic and focus and that in this context it can have different meanings: contrast can be defined in the literature as a category, a subtype of focus or topic, or as a semantic-discoursive value associated with topic and focus structures, which is the view adopted in this paper.

Regarding the prosodic encoding of contrast, studies for different languages have been presenting data in favour of a gradient or categorical prosodic encoding of contrast. Thus, for authors as Steedman (2000) and Büring (2003), the realization of contrastive focus and topic corresponds obligatorily to a specific intonational contour. In fact, Büring (2003) argues that the definition of contrastive focus and of contrastive topic should be based on their prosodic realization. Hence the author, following Jackendoff (1972), defines the first one as a linguistic category realized in English by a falling pitch accent, the "A-accent", and the latter by a falling-rising pitch accent, the "B-accent" (Büring 2003:512).

On the contrary, Féry (2007) and Féry & Krifka (2008) propose that there is no one-to--one relation between intonation and contrast. Opposite to what is defended by Büring (2003), Féry (2007) claims that topic, focus, and contrast are not phonological concepts, rather their phonetic and phonologic properties can be cues to their interpretation. Nevertheless, the author claims that some specific intonational contours can be preferentially associated with structures that convey contrast, such as contrastive foci or contrastive topics. This preferential relation, the author notes, should not be associated with the information status of this type of structures, but with their syntactic distribution patterns.

Regarding the hypothesis of a gradient prosodic encoding of contrast, several recent studies for different languages have presented data supporting this claim. For German, Braun & Ladd (2003) and Braun (2006) compared the prosodic features of contrastive and non-contrastive topics in initial sentence position and found significant differences between

contrastive and non-contrastive contexts, especially regarding phonetic correlates. Hence, the authors conclude that contrastive topics show: (i) a longer duration of the stressed vowel; (ii) a higher and longer f_0 rise; (iii) higher values of f_0 range; (iv) higher values of f_0 peak height; and (v) later f_0 peak alignment. In addition, Braun & Ladd (2003) point out that there is some degree of variation in contrast marking, since speakers can use different strategies in order to mark contrast (e.g., their data reveal that some speakers use preferentially f_0 range, while others use f_0 peak alignment). Importantly, this variation within and across speakers is taken as another argument in favour of the gradient marking of contrastive topics.

Also for German, but regarding focus structures, Baumann et al. (2006) discuss the role of categorical and gradient features in contrast marking to conclude that speakers use both. According to the findings described in this study, broad focus and narrow focus (with contrastive focus being included in the latter) differ by the presence of the pitch accent !H* in over 50% of the cases of broad focus and, crucially, by the complete absence of the same pitch accent in contrastive focus. Moreover, similar phonetic properties as the ones highlighted by Braun & Ladd (2003) were also found as the focus domain narrows, namely a longer duration of the focalized elements, a higher f_0 peak associated with the nuclear accent, a greater pitch excursion to the peak of the nuclear accent, and, finally, a delay in the nuclear accent peak (Baumann et al. 2006:303).

For Italian, parallel results are described for contrastive foci by Torregrossa (2012). In this interface study between syntax and prosody, the author argues that contrast defines a set of alternatives of the same semantic type of the constituent it is associated with and, crucially, it is an autonomous informational notion with its own semantic content. Following this assumption and based on the results found for Italian, Torregrossa (2012) argues that contrast is not syntactically encoded as a specific functional projection. The prosodic results, on the other hand, exhibit a gradient marking of contrast, since they allow highlighting the role of longer duration and higher values of f_0 range measured in focalized elements, as opposed to the fact that contrast does not seem to have a direct effect neither on phrasing nor on intonational contours.

Finally, Borràs-Comes et al. (2010) propose an analysis of the prosodic features of statements, contrastive foci, and echo questions in Catalan. Since the nuclear pitch accent L+H* is associated with the three types of structures analysed in this study, the authors intend to find out whether f_0 differences are determinant in disambiguation, since it is assumed that increasingly higher values of f_0 are associated with each of the three semantic values. Crucially, the data lead the authors to conclude that f_0 range and f_0 peak height are determining features and, therefore, that there is a gradient distinction between statements and contrastive foci. Moreover, Borràs-Comes et al. (2010) also found variation across speakers in contrast marking and, in line with previous studies (e.g., Braun & Ladd 2003), take this finding as an argument in favour of the gradient nature of contrast.

Additionally, it is also important to mention, as Ladd (2008) has noted, that emphasis can play a relevant role in contrast marking as well. As the author puts it, emphasis can be seen as a "paralinguistic possibility of gradiently modifying the realization so as to single out individual words" (Ladd 2008:256). As for the phonetic features associated with emphasis, Ladd (2008) and Ladd & Morton (1997) point out that, in English, higher values of energy and of f_0 range are associated with emphasis. Furthermore, the authors claim that the perception of emphasis is gradient, being related to acoustic differences and, especially, to variation in f_0 range, but that the interpretation of emphasis is categorical, since an utterance is classified by hearers either as "normal" or "emphatic".

For European Portuguese (henceforth EP), although there are no studies specifically about contrastive parallelism, some literature has discussed the prosodic features related with contrast. Viana (1987), for instance, analysed foci structures and argues that focalized elements are realized by a "height accent" (Viana 1987:87) that affects the f_0 peak's height (aligned with the stressed vowel of the focalized word), which, in turn, affects the range of f_0 that precedes and follows the f_0 peak. Nevertheless, the author notes that within and across speaker variation and the distribution of the focalized element in the sentence may influence its prosodic realization.

In a more recent study, Frota (2000), on the other hand, argues in favour of a categorical realization of focus, which reflects on prominence and intonational patterns. Hence, the focalized element is the more prominent, regardless of its position in the sentence, and it is always associated with the pitch accents H*+L or ^H*+L. As far as the phonetic properties of focus are concerned, the author argues that the values of the f_0 peak's height and of the range of f_0 are related to emphasis, which is understood as a gradient and optional element that should not be taken into account in a phonological and categorical definition of focus.

Lastly, Viana et al. (2007), besides reaffirming that H*+L and ^H*+L are associated with focus, present data that allow the authors to say that the pitch accents H* and L+H* convey new information and are associated with emphasis as well. Finally, the pitch accent ^H* was found in contexts of emphasis and specification or correction of given information.

3. Methodology

The present study is based on a corpus built from a political debate aired by the public radio and television broadcaster of Portugal (RTP) on November 6th, 1975. This political debate was carried out by the two candidates to Prime Minister of Portugal at the time: Álvaro Cunhal (AC) and Mário Soares (MS). The main reason why this debate was chosen is related to its unique characteristics. First of all, it represents an historical moment, since it was decisive to the result of the first democratic elections after the end of a long period of dictatorship. Secondly, and perhaps more importantly, the quality of the debate has been acknowledged by previous studies on political science and media studies (e.g., Sena 2002). On this matter, Sena (2002) praises the quality of this debate by pointing out that both opponents' speech is characterized by a rational argumentation, aiming at enlightening the viewers, and by the absence of verbal attacks. What is more, these same characteristics can be seen as positive and, consequently, as vital in a quality argumentative speech, as argued in Dolz & Schneuwly (1998).

The debate lasted 3:31'07" and, besides the presence of the two political leaders, the debate was moderated by the journalists José Carlos Megre and Joaquim Letria, although only the speech of AC and MS was considered for analysis (3:18'10''). It is also important to note that the speech time of AC and MS was balanced: AC had a total of 1:38'01" speech time and MS a total of 1:40'09".

Regarding the transcription and alignment of the corpus, the debate was previously converted from video format (*Video OBject*) to audio format (*WAVEform audio format*) and the transcription (based on the transcription published in the newspaper *Diário de Lisboa* on November 8th, 1975 edition) was aligned with the acoustic signal using *Transcriber* (Barras et al. 1998).

Considering the target structures of this study, first of all it was necessary to make a survey of the relevance of parallelism in the corpus. In order to do so, all parallelisms were identified

and annotated according to a typology involving six categories (cf. Table 1).[1] As a result of this task, a total of 391 parallelism structures were identified in the corpus: 244 produced by AC and 147 produced by MS.

Typology of Parallelism Structures
Construction parallelism: refers to parallels in syntactic structures, such as clauses and phrases.
Lexical parallelism: refers to lexical repetition, which includes lexicon reiteration and lexical scales. The latter involves the use of lexical choices which lead to an increasing or decreasing strength effect, thus creating a scale.
Temporal parallelism: refers to verb forms that share verbal features such as tense, aspect, person, and number.
Semantic parallelism: refers to semantic relations like whole-to-part, hierarchies and similarities/oppositions.
Rhyme parallelism: refers to phonological phenomena, such as rhymes and alliterations.
Prosodic parallelism: Following Bolinger (1989) and Wichmann (2000), this refers to a cohesion mechanism associated mainly with tonal copy. It should be noted that there are various mechanisms that can ensure its perception (as discussed in section 2.1. of this paper).

Table 1: Typology of parallelism structures.

A closer observation of the data allowed identifying a subtype of construction parallelism that seems relevant in argumentative discourse, since it is found in crucial moments of the argumentation and counter-argumentation of both debaters. This specific type of construction parallelism is defined as a structure in which parallel grammatical structures express a proposition that denies or restricts the truth-value of another proposition in the same "contextual set" (Stalnaker 1978; Reinhart 1982). Hence, from now on, this specific type of structure will be called contrastive parallelism (cf. examples (1) and (2), realized by Mário Soares and Álvaro Cunhal, respectively. The contrastive parallelism structures are italicized).

(1) Ora, o Partido Socialista já escolheu o seu campo desde sempre. O Partido Socialista é um partido de esquerda, quer instaurar em Portugal uma sociedade socialista, portanto, uma sociedade sem classes, *mas em liberdade, mas respeitando os direitos do homem, mas através da democracia e do consenso popular majoritário, não fará uma revolução, nem irá para um socialismo que transforme este País numa ditadura.* (MS) 'Now, the Socialist Party has chosen which side is it on from the beginning. The Socialist Party is a left-wing party, it wants to establish a socialist society in Portugal, therefore, a society without classes, *but in freedom, but respecting the human rights, but through democracy and the majority popular consensus, it will not do a revolution, nor will it choose a socialism that turns this country into a dictatorship.*' (MS)[2]

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[1] In order for an utterance be considered a parallelism it had to have features of, at least, one of the six types of parallelism described in Table 1. Nevertheless, in most cases, the parallelism structures contained features from more than one type of parallelism, and were classified accordingly. For instance, example (1) shows marks of construction, lexical, and prosodic parallelism.

[2] The translations presented for each example from the corpus are intended to convey the general meaning of the utterance, i.e., they are not word by word translations. Nevertheless, the translation of the contrastive parallelism structures was made in such a way that all the parallelism features and the conjunctions or connectors with a contrastive meaning are preserved in the target language.

(2) Mas, dizia eu, que quanto a eleições*, nós queremos eleições e queremos sufrágio universal, mas queremos, em primeiro lugar, restabelecer as liberdades em todo o território nacional.* (AC)

'But, as I was saying, in what regards elections, *we want elections and we want universal suffrage, but we want, firstly, to re-establish freedom in all national territory.*' (AC)

A total of 47 cases of contrastive parallelism were found in the corpus (37 produced by AC and 10 by MS). In the analysis of each structure, the whole utterance (i.e., the contrastive parallelism structure itself and the context) was considered in order to ensure its correct interpretation. For this reason, the length of the analysed utterances varies between 3.2 seconds, for the shorter utterance, and 50.5 seconds, for the longest utterance.

After identifying the cases of contrastive parallelism, it was considered relevant to annotate the major and minor intonational phrases in all the 47 utterances with contrastive parallelism structures, since the intonational phrase would be the work unit from which several annotation parameters would be drawn from.[3] The result was a total of 1097 major and minor intonational phrases (789 of AC and 308 of MS). From this total, a sample was selected for prosodic analysis. In this selection process, the intonational phrases were classified according to their function in the utterance. Hence, two types of prosodic constituents were considered: the target constituents (T), which are intonational phrases that contain the contrastive parallelism structures, and the context constituents (C), which are intonational phrases that are found in the same utterance and are a part of the structure's "contextual set". Furthermore, a third type of constituent was retrieved from the corpus, namely intonational phrases extracted from neutral declarative sentences (simple or complex), without neither marked word order nor associated with an emphatic prosodic realization. These prosodic constituents were classified as control constituents (Ctrl) and were compared with the context constituents and, especially, with the target constituents.

Type of Constituent	Speaker		
	AC	MS	Total
T	115 (28.4%)	116 (28.6%)	231 (57%)
C	46 (11.4%)	53 (13.1%)	99 (24.4%)
Ctrl	38 (9.4%)	37 (9.1%)	75 (18.5%)
Total	199 (49.1%)	206 (50.9%)	405 (100%)

Table 2: Prosodic constituents selected for analysis.

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[3] On this matter, I follow works such as Frota (2000) and Viana et al. (2007) which consider that, in the case of EP, there are two levels of intonational phrasing, the minor and the major intonational phrase.

The prosodic and intonational literature on SEP has differentiated two levels of intonational phrasing and equated both of them to the IP (intonational phrase) type: the major IP (or compound IP) and the minor IP (Frota 2000, extending ideas from Ladd 1992, 1996). These two levels show boundaries of different strength: the major IP boundary (which is the outer boundary) shows a wider pitch range and bigger final lengthening than the minor IP boundary (which is the inner boundary within the compound IP phrase). (Viana et al. 2007).

Lastly, all of the 405 major and minor intonational phrases (cf. Table 2) was prosodically annotated in *Praat* (Boersma & Weenink 2009), following the conventions of *Towards a P_ToBI* (Viana et al. 2007). Each *Praat* file is composed of: (i) a word tier, with the orthographic transcription; (ii) a break index tier, with the annotation of break indices of levels 3 and 4, which correspond to minor and major intonational phrases, respectively; and (iii) a tone tier, where the pre-nuclear and nuclear pitch accents, as well as the boundary tones, were annotated. The annotation of each intonational phrase also included global and local phonetic measures. Concerning the local measures, the f_0 values (in semitones (ST)) of high and low targets of pre-nuclear and nuclear pitch accents and also of boundary tones were extracted. As for the global measures, duration (in seconds), number of syllables (phonological), maximum and minimum of energy (in decibels), and maximum, minimum, and range of f_0 (in ST) were extracted from each intonational phrase.

Regarding pitch accents and boundary tones, the annotation adopted the tonal inventory described for EP, in works such as Frota (2000, *in press*) and Viana et al. (2007), and took into account that the nuclear contours described for EP are, in general, equally found in minor and major intonational phrases (Viana et al. 2007). Particularly in the case of boundary tones, the notation "X" and "g" (preceding the tags H or L) was adopted, as proposed in Viana et al. (1999), where "X" indicates a major or minor intonational phrase boundary that corresponds to an oxytone word and "g" indicates a boundary that corresponds to post-tonic voicelessness or cases in which fundamental frequency is not detected.

Finally, it is worth mentioning that the data collected from the prosodic annotation were statistically analysed using SPSS (Statistical Package for the Social Sciences), version 18.0.0. Regarding acoustic measures, mean values were calculated and ANOVA (*F*) and t-Test (*t*) for independent samples were applied in the cases where the normality (and in the case of ANOVA also homogeneity) of variances was proven. In all other cases, Mann-Whitney (*U)* (for two independent samples) and Kruskal-Wallis (*H)* (for more than two independent samples) tests were performed. In the case of break indices and intonational contours, crosstabs and Chi-square (χ^2) tests were performed.

4. Data analysis[4]

The statistical analysis conducted on the data supports the existence of correlations between the type of structures and the prosodic parameters considered in this study and it also shows that there are differences between both speakers in several of the parameters. Over the next sections, the results obtained for acoustic measures and intonation are presented.

4.1. Acoustic measures

Regarding the acoustic measures taken into account in this study, the statistical analysis shows that there are significant differences between the two speakers in many of the parameters. Concerning global measures, this is true for duration ($U = 17865$, $p = .025$), number of syllables ($U = 13108$, $p < .001$), energy maximum ($U = 14509$, $p < .001$), f_0 maximum ($U = 17078$, $p = .004$), and f_0 minimum ($U = 15709$, $p < .001$). In the case of local measures, f_0 maximum of the pre-nuclear pitch accents ($U = 2314$, $p < .001$), f_0 minimum of

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[4] For a more detailed description of the data presented in this section, as well as for consulting tables and graphics concerning all the phonetic and phonological parameters discussed, see Cardoso (2012).

the pre-nuclear pitch accents ($U = 2484$, $p = .001$), and f_0 maximum of the nuclear pitch accents ($U = 17422$, $p = .009$) also present similar results.

Now, considering the possible correlation between phonetic features and the three types of constituents analysed – T, C, and Ctrl –, it was also found that, in many cases, there is in fact a correlation and, what is more, two patterns emerge from the statistical analysis.

Thus, the first pattern involves duration and number of syllables and the results obtained for these parameters reveal significant differences between constituents T and C (duration: ($U = 8957.5$, $p = .002$), number of syllables: ($U = 9388.5$, $p = .010$)) and also between C and Ctrl (duration: ($U = 2341$, $p < .001$), number of syllables: ($U = 2600$, $p = .001$)). These results point to the fact that duration and number of syllables have similar values for T and Ctrl (cf. Table 3).

Duration (seconds)			Number of Syllables		
Type of Constituent	Speaker		Type of Constituent	Speaker	
	AC	MS		AC	MS
T	0.894	0.751	T	7.28	4.70
C	0.985	0.963	C	8.46	6.13
Ctrl	0.707	0.737	Ctrl	5.53	4.81

Table 3: Mean values of duration and number of syllables.

The results obtained for the energy and f_0 parameters, on the other hand, show a different pattern from the one described for duration and number of syllables. Focussing firstly on the statistical results for global measures, significant differences exist between T and Ctrl and also between C and Ctrl in energy maximum (T and Ctrl ($U = 6386$, $p = .001$); C and Ctrl ($U = 2660$, $p = .001$)); in f_0 maximum (T and Ctrl ($U = 3149$, $p < .001$), C and Ctrl ($U = 1114$, $p < .001$)); and in f_0 minimum (T and Ctrl ($U = 4910$, $p < .001$), C and Ctrl ($U = 2478$, $p < .001$). Also relevant is the fact that f_0 range is the only parameter showing differences between all three types of constituents (T and Ctrl ($U = 6289$, $p < .001$), C and Ctrl ($U = 2012$, $p < .001$), and T and C ($U = 9420$, $p = .011$)).

As can be seen by the results described so far, the energy and f_0 parameters that show a correlation between types of constituent and prosodic features point to a pattern that opposes Ctrl to T and C (see an example in Figure 1).
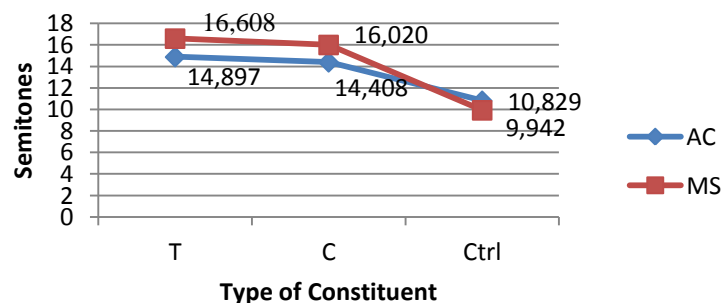

Figure 1: f_0 maximum – mean values.

Even in the case of f_0 range, the only parameter that presents significant differences between the three types of constituents, the values of T and C are closer, when compared with the values of Ctrl (as Figure 2 shows).
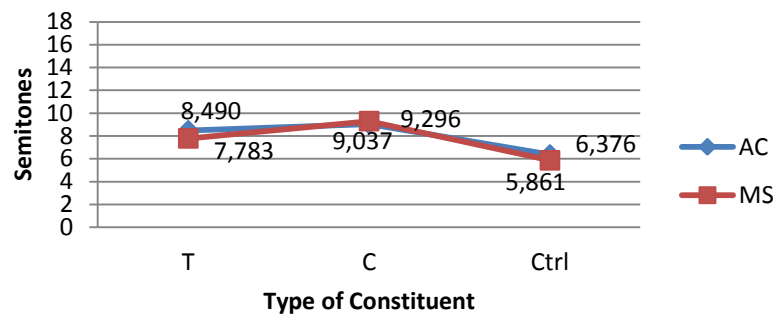

Figure 2: f_0 range – mean values.

The statistical data of the local measures seem to corroborate this (see examples in Figures 3, 4, and 5), since significant differences were found, once again, between constituents T and Ctrl in all the analysed parameters: f_0 maximum of the pre-nuclear pitch accents ($U = 208$, $p < .001$) and f_0 minimum of the pre-nuclear pitch accents ($U = 285$, $p = .004$); f_0 maximum of the nuclear pitch accents ($U = 4281$, $p < .001$) and f_0 minimum of the nuclear pitch accents ($U = 5113.5$, $p < .001$); and f_0 maximum of the boundary tones ($U = 720$, $p < .001$) and f_0 minimum of the boundary tones ($F (2, 160) = 4.985$, $p = .014$). Moreover, there are also significant differences between C and Ctrl in f_0 maximum $(U = 82$, $p < .001)$ of the pre-nuclear pitch accents and f_0 maximum ($U = 1385$, $p < .001$) and minimum ($U = 1876$, $p < .001$) of the nuclear pitch accents.
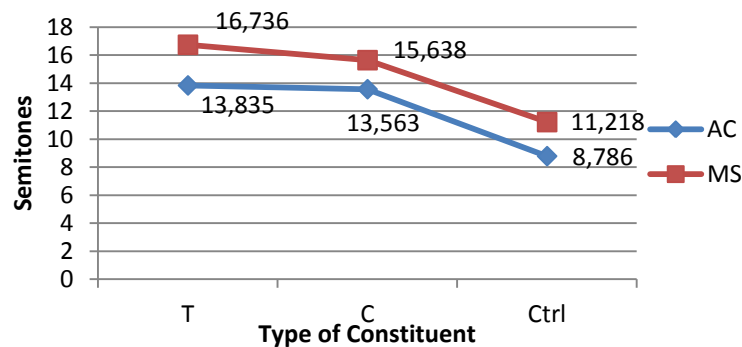

Figure 3: f_0 maximum of pre-nuclear pitch accent – mean values.

Furthermore, each of the local measures that were analysed replicate the exact same pattern: the constituents T have the higher values, followed by constituents C and, lastly, constituents Ctrl have the lowest values, even though in some cases (e.g., mean values of the f_0 maximum of the nuclear pitch accent) the values of T and C are quite close. This aspect is exemplified by Figure 3 and also by Figures 4 and 5.
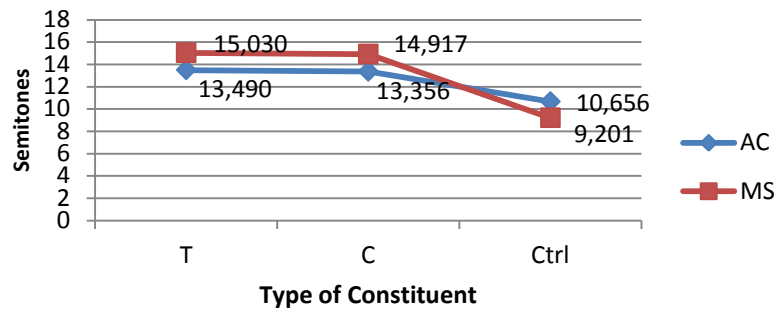
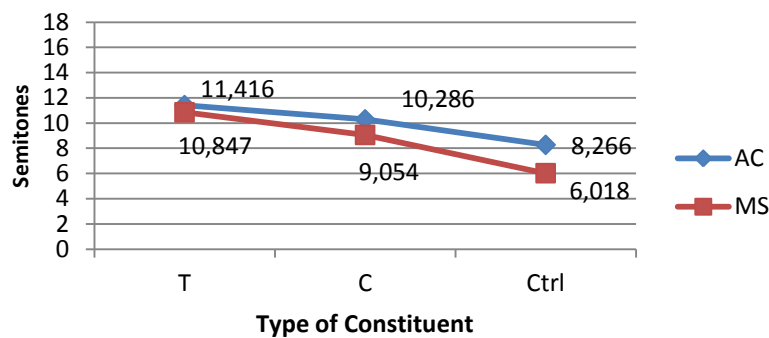*Figure 4: f₀ maximum of the nuclear pitch accent – mean values.*

Figure 5: f₀ maximum of the boundary tone – mean values.

Thus, the results obtained indicate a predominant pattern that distances C from Ctrl and, even more importantly, T from Ctrl. Nevertheless, it should also be taken into account that significant differences are not always found between C and Ctrl and especially that significant differences are seldom found between T and C. This observation, along with the fact that constituents C often show intermediate values (although closer to the ones found in T), points to the existence of a continuum in the values of the three types of constituents across the different phonetic measures analysed. Therefore, we can say that there is a dominant pattern that distances T and Ctrl and places C between the former two.

4.2. Intonation

Regarding pitch accents and boundary tones, significant differences between speakers were found in nuclear pitch accents ($\chi2$ (1) = 9.332, $p = .009$) and boundary tones ($\chi2$ (2) = 10.258, $p = .001$).

On the other hand, the comparison of the results by type of constituent reveals that only pre-nuclear pitch accents show a significant correlation between the distribution of pitch accents and the type of constituent. Remarkably, the results obtained for pre-nuclear pitch accents present the same pattern found in the f_0 and energy parameters. In other words, the pre-nuclear accents show significant differences between T and Ctrl ($\chi2$ (1) = 6.647, $p = .016$) and between C and Ctrl ($\chi2$ (1) = 6.025, $p = .029$).

	H*	^H*	L+H*	L+^H*	H*+L	^H*+L	H+L*	L*	N (%)
T	45	9	10	5	12	-	21	8	110 (64)
C	17	1	10	7	1	2	10	3	51 (29.7)
Ctrl	3	-	-	-	1	-	4	3	11 (6.3)
N (%)	65 (37.8)	10 (5.8)	20 (11.6)	12 (7)	14 (8.1)	2 (1.2)	35 (20.3)	14 (8.2)	172 (100)

Table 4: Pre-nuclear pitch accents' distribution by type of constituent.

Besides the statistical results, it should be highlighted that, crucially, pitch accents ^H*, L+H*, L+^H*, and ^H*+L do not occur in Ctrl (cf. Table 4). Nevertheless, we can say that there is no one-to-one relation between pitch accents and types of constituent, since seven different pitch accents were found associated with T constituents, for example. Thus, and more importantly, the data seem to show that there is no phonological category specifically associated with T, or, in other words, with the constituents that convey contrast.

As for nuclear accents and boundary tones, it is important to recall that only differences across speakers were found, and not across different types of constituent, which reinforces the previous observation of the absence of a one-to-one relation between pitch accents and types of constituent.

	H*	^H*	L+H*	L+^H*	H*+L	^H*+L	!H*	L*+H	H+L*	L*	N (%)
T	43	6	71	16	12	3	5	1	48	26	231 (57)
C	19	3	30	3	10	1	1	-	25	7	99 (24.4)
Ctrl	20	-	18	-	5	-	-	-	17	15	75 (18.6)
N (%)	82 (20.2)	9 (2.2)	119 (29.4)	19 (4.7)	27 (6.7)	4 (1)	6 (1.5)	1 (0.2)	90 (22.2)	48 (11.9)	405 (100)

Table 5: Nuclear pitch accents' distribution by type of constituent.

Furthermore, there is some degree of variety in pitch accents that were found in nuclear position in all three types of constituents (cf. Table 5). However, once again, we can see that some pitch accents do not occur specifically in Ctrl constituents in nuclear position. This is the case of ^H*, L+^H*, ^H*+L, and !H*. In light of these results, it can be said that the pitch accents that occur in T, but not in Ctrl, are pitch accents with high targets aligned with the stressed syllable. Moreover, we are talking, in many cases, of pitch accents that can be associated with higher levels of f_0 (e.g., ^H*, L+^H*, and ^H*+L).

Finally, the distribution of boundary tones shows that there is a higher frequency of low boundary tones in every type of constituent. Nevertheless, it should be noted that, in proportion, there is a higher frequency of high boundary tones in T (102 out of 231, which corresponds to 44.2%) (cf. Table 6).

	H- / H%	**L- / L%**	**HL- / HL%**	N (%)
T	102	119	10	231 (57)
C	34	57	8	99 (24.4)
Ctrl	25	49	1	75 (18.6)
N (%)	161 (39.7)	225 (55.6)	19 (4.7)	405 (100)

Table 6: Boundary tones distribution by type of constituent.

5. Discussion

Considering the results presented above, and focussing our attention firstly on duration and number of syllables, the results for these parameters do not seem to be conclusive. Nevertheless, it is worth trying to propose an explanation to the somewhat unexpected proximity of values between the constituents that form contrastive parallelism structures (T) and the ones retrieved from neutral statements (C). On this matter, lower values found in T may be related with a phrasing and prominence strategy aiming at emphasizing function words in contrastive parallelism structures, in line with what is argued by Bolinger (1989). In fact, throughout the cases of contrastive parallelism, there are many examples of conjunctions and connectors conveying negation and contrast (e.g., *mas* 'but', *pelo contrário* 'on the contrary', a.o.) that form an independent intonational phrase and that are realized with an emphatic intonation.

On the contrary, it seems that both global and local f_0 measures stand out in marking contrastive structures. Concerning f_0 measures, it is worth recalling that the data show that T, i.e., the constituents that contain the contrastive parallelism structures, has the highest values in almost all of the parameters analysed. What is more, and although there is an evident proximity between the values found in T and the ones found in C, the statistical analyses proves the existence of a significant difference between contrastive parallelism structures (T) and neutral statements (Ctrl) for each of the f_0 measures considered in this study. Hence, the prosodic encoding of contrast in contrastive parallelism structures shows a similarity to what has been stated for other languages (Braun & Ladd 2003; Baumann et al. 2006; Borràs-Comes et al. 2010; Torregrossa 2012). As previous studies showed, higher f_0 levels seem to be crucial in the prosodic marking of contrast and, as the results from the present analysis indicate, the data from contrastive parallelism in EP point to the same conclusion.

Following what has been described about emphasis in other languages (e.g., Ladd & Morton 1997) and looking at the present results, I propose that energy plays a secondary role in marking contrast in contrastive parallelism structures. Nevertheless, if we take into account the fact that the energy maximum levels show the same pattern as the f_0 levels in general, it can be considered that energy and f_0, together, contribute to the prosodic marking of these parallelism structures through emphasis. Hence, emphasis can be seen as a gradient element, as is argued by Ladd (2008) and Ladd & Morton (1997), that is an additional contribution to contrast marking.

Differently, phonological categories do not stand out in the same way as the phonetic parameters in the prosodic encoding of contrastive parallelism. In fact, only in the case of pre--nuclear accents significant differences were found in the distribution of pitch accents by type of constituent. Crucially, neither in (pre-nuclear and nuclear) pitch accents nor in boundary tones do we find a one-to-one relation between intonation and contrast. Nevertheless, the distribution of pitch accents does not seem random, since the data suggest the existence of a preferential relation between contrastive parallelism structures and their context and pitch accents with high targets aligned with stressed syllables. This aspect is showed by the higher frequency of high and rising pitch accents in T and C and, crucially, by the fact that some specific pitch accents were not found in Ctrl constituents (^H*, L+H*, and L+^H*, in pre--nuclear position, and ^H*, L+^H*, ^H*+L, and !H*, in nuclear position). On this matter, it is also worth noting the presence in both T and C of pitch accents that are related, in EP, to new information (H* and L+H*, Viana et al. 2007) focus (H*+L and ^H*+L, Frota 2000; Viana et al. 2007), and emphasis (H* and ^H*, Viana et al. 2007). In what regards boundary tones, the higher frequency of high boundary tones found in T (44.2%) can be related to the complexity of the utterances in which parallelism structures are present. Since the utterances can be composed of a variable number of complex sentences, with coordination, subordination, parentheticals, etc., and can be of variable length (cf. examples (1) and (2)), high boundary tones can be used to convey continuity.

Furthermore, a note should be made about the fact that T and C show more similar values throughout the analysed parameters. This can be explained by taking into account the concept of "contextual set" (Stalnaker 1978; Reinhart 1982). If it is assumed that the context of a contrastive parallelism structure plays a key-role in its interpretation, then it can be argued that the context can share many of the prosodic features with the target structures, in order to prepare a correct interpretation of the latter. Thus, f_0 and energy features, for example, show a gradient increase of values from context to contrastive parallelism structures, whereas for pitch accents distribution, context constituents have stronger (although not statistical significant) similarities with the ones belonging to contrastive parallelism structures.

Hence, the results discussed so far outline some properties that are distinctive of contrastive parallelism structures, especially in comparison to neutral statements. Moreover, the data indicate that a stronger relation is established between acoustic measures and contrast marking in contrastive parallelism structures than between intonation and the structures in question.

Additionally, it should be noted that many of the acoustic-phonetic parameters, as well as nuclear pitch accents and boundary tones, present significant differences between the two speakers. These results are also relevant, since they are in line with what has been described in previous studies about the variation across speakers found in the prosodic marking of contrast (e.g., Braun & Ladd 2003; Borràs-Comes et al. 2010). On this matter, it is worth recalling that, for these authors, such variation is taken as an additional argument in favour of the gradient nature of contrast.

Regarding the role played by contrastive parallelism structures in the cohesion of the discourse, it is relevant to discuss if and in what ways contrastive parallelism affects the phrasing and melody of the utterances in which occurs. In this context, different types of copy and contrast strategies used by both debaters can be described in order to support the hypothesis that, in fact, contrastive parallelism is a cohesion mechanism that involves an interface between syntax and prosody.

Starting with phrasing, I was able to identify a strategy in the corpus that is frequently used by both debaters and that consists on the association of the same phrasing to sequences

that are built as parallel (regardless of the fact that these structures can be similar or contrasting in meaning). Example (3) illustrates this relation between prosodic phrasing and syntactic parallelism.

(3) Nós pensamos / que, na verdade, // há que definir um estatuto, // mas que esse estatuto // é necessário defini-lo // com os próprios trabalhadores, / *que não é / por medidas administrativas, // não é / por medidas repressivas, // não é / por pequenos golpes de Estado* // (…). (AC)[5]
'We think / that, in fact, // a statute must be defined, // but that statute // has to be defined // with the workers themselves, / *it is not / by administrative measures, // it is not / by repressive measures, // it is not / by little coups d'état* // (...).' (AC)

As can be seen in (3), the three clauses that are built as parallels exhibit the exact same phrasing, since the prepositional phrases – *por medidas administrativas* 'by administrative measures', *por medidas repressivas* 'by repressive measures', *por pequenos golpes de Estado* 'by little coups d'état' – consistently form independent intonational phrases from the ones that are formed by the negation adverb *não* 'no' and the copulative verb form *é* 'it is'.

The regularity in phrasing that is represented in (3) can be, to some extent, related to the traditional approach to intonational parallelism that can be found in works such as Palmer (1922), Crystal (1969), or Fox (1984). In fact, the definition of intonational parallelism as a phenomenon that involves tonal copy between nuclear accents of contiguous tonal units presupposes the existence of a great degree of regularity in phrasing, as is shown in (3). However, the data reveal that assuming a direct relation between the regularities that can be found in phrasing and intonation ignores possibilities such as the ones proven by the data presented by Wichmann (2000). On this matter, it is important to recall that this author described cases of intonational parallelism between non-consecutive tonal units found in a British English corpus. Similar strategies were also found in my corpus, as shown by example (4).

(4) Se / *o Partido Comunista [H* H+L* gL%]* // vier um dia // rectificar as suas posições, // (…) se / *o Partido [H* !H-] / Comunista [H+L* gL%]* // renunciar, // portanto, à sua teoria / golpista / e vanguardista, // (…). (MS)
'If / *the Communist Party [H* H+L* gL%]* // someday // rectifies its positions, // (…) if / *the Communist [H* !H-] / Party [H+L* gL%]* // renounces, // therefore, to its theory / of coups / and of vanguard, // (…).' (MS)

In this case of parallelism it is notorious that the tonal copy is maintained across the parallel occurrences of the nominal phrase *o Partido Comunista* 'the Communist Party' even though the phrasing is not always exactly the same (cf. Figure 6). In other words, although the nominal phrase *o Partido Comunista* 'the Communist Party' forms a single intonational phrase in the first of the parallel clauses and two in the second, this fact does not change the tonal copy realized by MS, since the pre-nuclear pitch accent of the first occurrence of the nominal phrase (H*) is copied as the nuclear pitch accent of the intonational phrase composed of *o Partido* 'the Party' and, in the same way, the nuclear pitch accent and boundary tone of

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[5] Note that, in all the examples presented in this section of the paper, the simple bar (/) indicates a minor intonational phrase boundary and the double bar (//) indicates a major intonational phrase boundary.

the first occurrence of this nominal phrase (H+L* gL%) is copied as the nuclear pitch accent and boundary tone of the intonational phrase composed of *Comunista* 'Communist'.
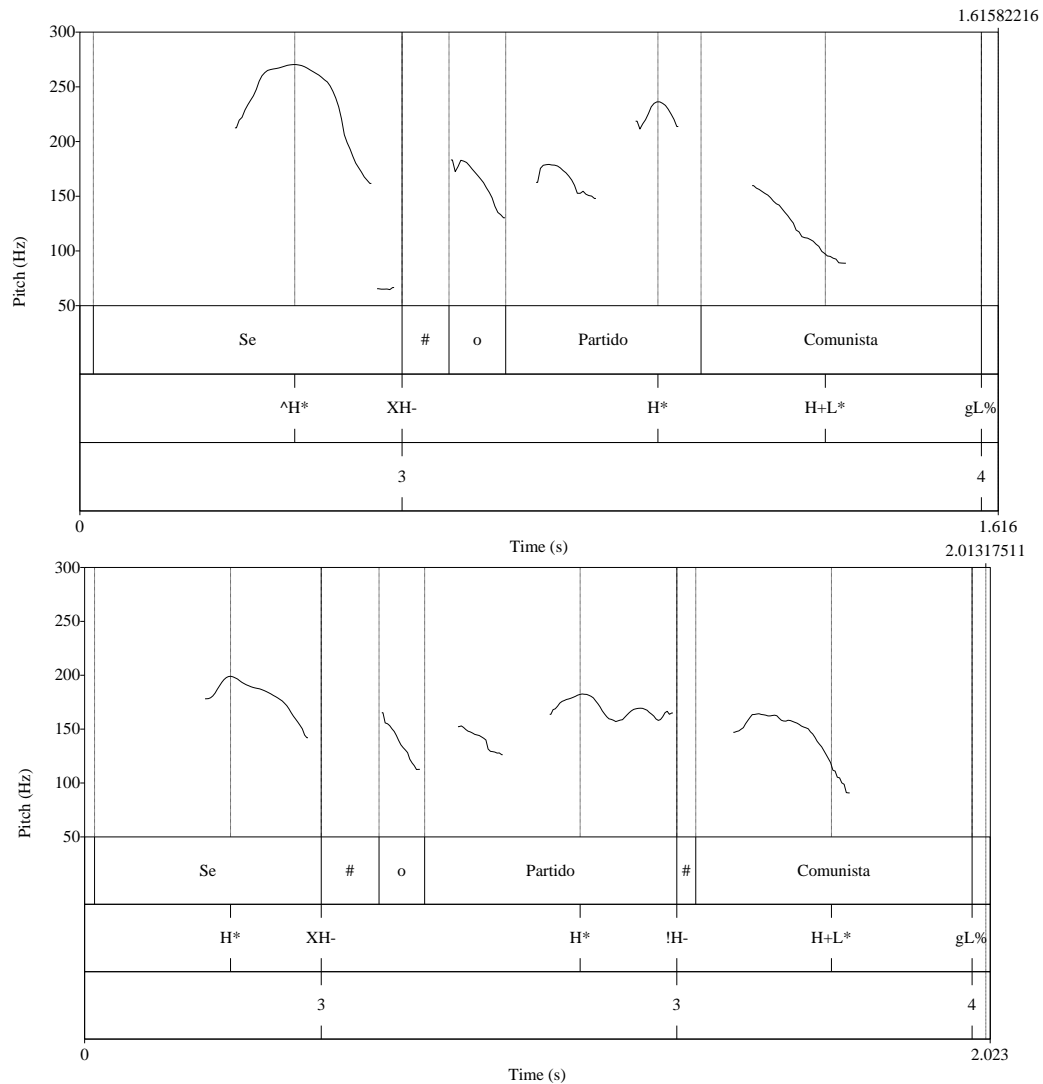

Figure 6: Intonational phrases of example (4) that evidence intonational parallelism in spite of differences in phrasing.

Besides phrasing, it is important to note that contrastive parallelism influences the melody of utterances as well and that this influence can be seen in strategies of copy and contrast used in the speech of both debaters. Considering the copy strategies, I can start by stating the presence in the corpus of tonal copy between contiguous intonational phrases (cf. example (5)), which is in line with what has previously been described in the literature about intonational parallelism (Palmer 1922; Crystal 1969; Fox 1984; Bolinger 1989; Wichmann 2000).

(5) *Nós [L+H* XH-] / somos pela unidade [L+H* gL-] / na base [L+H* gL-] / e sempre o dissemos [L* H* L%], // mas não pela unidade imposta pelo Estado, não os sindicatos transformados em correias de transmissão do Partido Comunista. (MS)*

'We [L+H XH-] / are in favour of the unity [L+H* gL-] / in the base [L+H* gL-] / and we have always said so [L* H* L%],* // but we are not in favour of a unity imposed by the State, we are not in favour of the unions turned into riggers of the Communist Party.' (MS)

In this example, the tonal copy concerns mostly the nuclear pitch accents and, crucially, there is a repetition of a rising f_0 movement across contiguous intonational phrases, as can be seen in Figure 7.
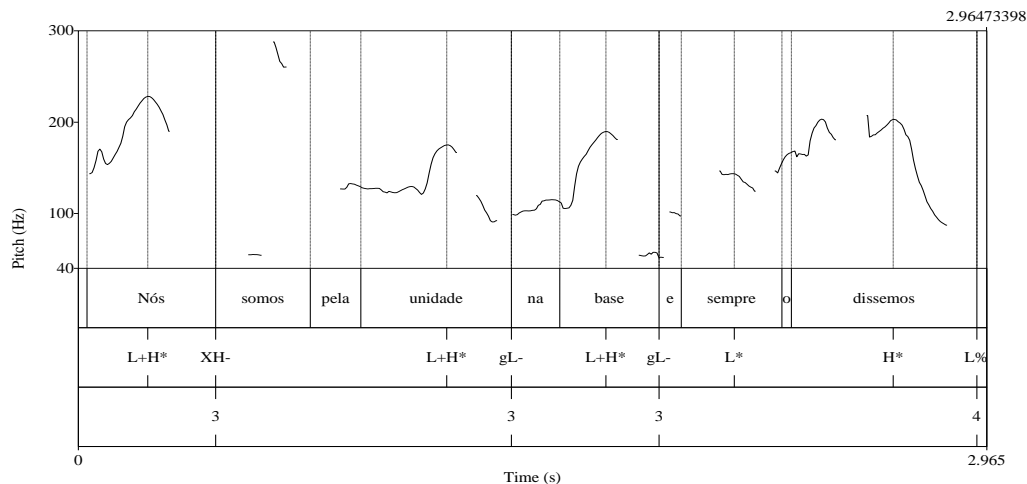

Figure 7: Intonational phrases of example (5) that evidence intonational parallelism between contiguous intonational phrases.

On the other hand, the data reveal that tonal copy can also reflect, in a more evident way, the interface between syntax and prosody. This aspect is evidenced by the finding that, in parallel structures, constituents with the same syntactic function can be associated to the same intonational contours or pitch accents (cf. example (6)).

(6) Portanto, não queremos [H+L* L+H* L-], / de forma nenhuma [H*+L L+H* H%], // pois nem temos [H*+L L-] / defendido, [L+H* gL-] / de forma nenhuma, [H*+L L+H* gH%] // a instauração dum regime [H* L+H* !H%] // unipartidário; [H* L+H* !H%] // não temos defendido, [H*+L L+H* H-] / de forma nenhuma, [H*+L L+H* H%] // a instauração dum regime [H* L+H* H-] / sem liberdade de imprensa, [H* L+H* H%] // pelo contrário, [L+H* H%] // temos defendido [H*+L L+H* H-] / a mais ampla [L+H* L-] / liberdade de imprensa [H* L+H* H%] // (…). (AC)
'Hence, we do not want [H+L* L+H* L-], / in any way [H*+L L+H* H%], // and we have not [H*+L L-] / defended [L+H* gL-] / in any way, [H*+L L+H* gH%] // the establishment of a one party [H* L+H* !H%] // regime; [H* L+H* !H%] // we have not defended, [H*+L L+H* H-] / in any way, [H*+L L+H* H%] // the establishment of a regime [H* L+H* H-] / with no free press, [H* L+H* H%] // on the contrary, [L+H* H%] // we have defended [H*+L L+H* H-] / the most broad [L+H* L-] / free press [H* L+H* H%] // (…).' (AC)

Regarding (6), it is worth noting that the intonational phrases in which the verb forms are realized – *Portanto, não queremos* 'Hence, we do not want', *pois nem temos defendido* 'and

we have not defended', *não temos defendido* 'we have not defended', *temos defendido* 'we have defended' – exhibit tonal copy and, what is more, similar f_0 contours. The same can be said for the intonational phrases composed of the prepositional modifier *de forma nenhuma* 'in any way' and prepositional connector *pelo contrário* 'on the contrary', on the one hand, and for the intonational phrases that correspond to the syntactic constituents with the direct object function in the clauses that are parallel, on the other hand. This means that, as exemplified by Figure 8, constituents with the same syntactic function are prosodically marked with similar intonation contours and similar f_0 movements.
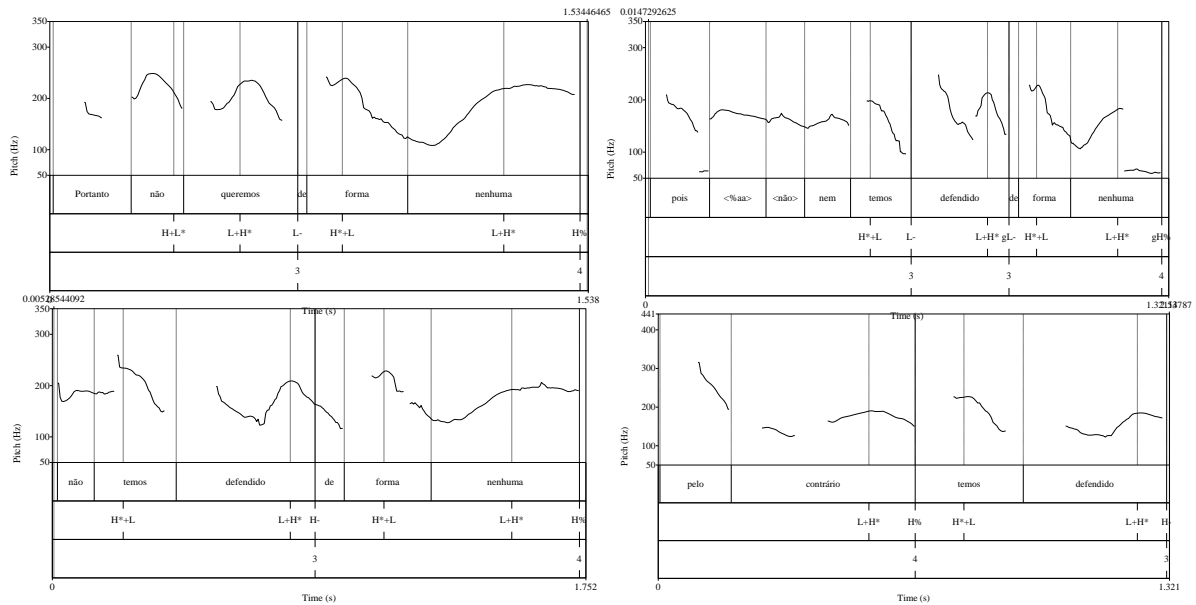

Figure 8: Intonational phrases of example (6) that evidence intonational parallelism involving constituents with the same syntactic function.

Lastly, it can be observed that both AC and MS use what can be called tonal contrast in order to prosodically mark contrastive parallelism. Crucially, in such cases, the relation between the prosodic structure, the syntactic structure, and the propositional structure of utterances is at play. Tonal contrast can thus be described as the association of different and, more specifically, opposing pitch accents or intonation contours to intonational phrases that convey propositions whose truth-value is contrasted in contrastive parallelism structures. This strategy of marking contrast, which is illustrated in (7), can translate in the realization of pitch accents characterized by distinct f_0 movements (e.g., rising movements versus falling movements), in changes in the alignment of the target (high or low) with the stressed syllable, or in differences in amplitude of the f_0 movement.

(7) O Governo / *constituiu-se, [L+H* gH%]* // o Governo / *tem condições [H* L+H* XH%]* // para marchar, // este Governo, // a meu ver, // *não tem [L+H* H+L* XL-]* / alternativa de esquerda, // *é [H*+L XL%]* // um governo / de esquerda // (…). (MS)
'The Government / has *formed [L+H* gH%]* // the Government / has *conditions [H* L+H* XH%]* // to follow through, // this Government, // as I see it, // *does not have [L+H* H+L* XL-]* / a left-wing alternative, // *it is [H*+L XL%]* // a left-wing / Government // (…).' (MS)

As can be seen in (7), the intonational phrases composed of *constituiu-se* 'has formed' and by *tem condições* 'has conditions' exhibit rising nuclear pitch accents, but the intonational phrases that semantically contrast with these, composed of *não tem* 'does not have' and *é* 'it is' present falling nuclear pitch accents. Moreover, the specific contrast between *não tem* 'does not have' and *é* 'it is' is also marked by differences in alignment of the target with the stressed syllable (cf. Figure 9).
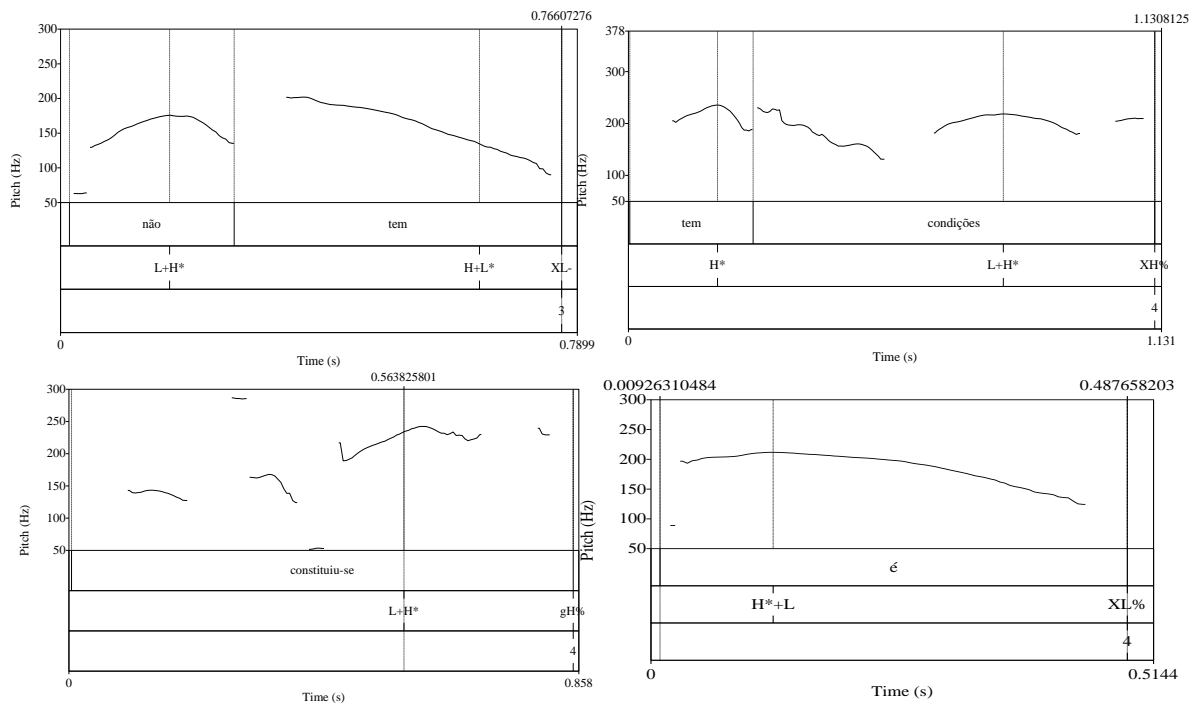

Figure 9: Intonational phrases of example (7) that illustrate the use of intonational contrast as a way to prosodically mark contrastive parallelism structures.

Hence, the data presented point out the importance of the relation between prosodic structure and syntactic structure in contrastive parallelism. A repetition structure, with the same word order and/or the same sentence structure (Duarte 2003), such as parallelism, is marked in the interface syntax / prosody. In contrastive parallelism structures, this interface shows itself in the presence of regularities and patterns of repetition and contrast in the intonation and phrasing that are related to the argumental structure of parallel clauses.

6. Conclusion

The main goal of this paper was to study the prosodic encoding of contrast in EP, focussing in a specific type of structures, namely contrastive parallelism structures. The choice of such structures was related to the corpus analysed – a political debate – in which parallelism structures and, more specifically, contrastive parallelism seem to play an important role in the cohesion of an argumentative discourse such as the one in question.

Hence, this study aimed at contributing to answer to three main questions:
(i) What prosodic features are associated with structures of contrastive parallelism?
(ii) Is the prosodic encoding of contrastive parallelism gradient or categorical?

(iii) What is the role of contrastive parallelism in the syntax/prosody mapping? Does it have an effect on the melody and phrasing of utterances?

Regarding the first question, the data from phonetic measures and from phonological parameters indicate that contrastive parallelism has specific acoustic properties, but, crucially, there is no one-to-one relation between pitch accents and this type of structures. These findings suggest that the answer to the second question should be that the prosodic encoding of contrastive parallelism is gradient. The fact that the acoustic and phonetic properties associated with contrastive parallelism structures seem to be the determining factor also points in that direction and, importantly, these findings are in line with what has been described for other languages (e.g., German, Italian, and Catalan) about the prosodic encoding of contrast (Braun & Ladd 2003; Baumann et al. 2006; Borràs-Comes et al. 2010; Torregrossa 2012). As discussed in the previous section of this work, notably, the energy and (most of all) the f_0 levels, both local and global, indicate a clear and significant difference between the target structures of this study and the control items, i.e., neutral declarative sentences. Furthermore, the data also suggest the existence of a continuum between the context preceding the contrastive parallelism structures and the actual contrastive parallelisms, since they have closer f_0 and energy values when compared with the control items. Thus, the acoustic and phonetic properties associated with contrastive parallelism structures seem to be crucial, which can indicate that the prosodic encoding of contrastive parallelism is gradient.

Concerning the third question, the data reveal that contrastive parallelism influences the temporal and melodic structure of the utterances in which it occurs. On this matter, some strategies used by the two debaters in their speech were presented that portray regularities in phrasing and the use of tonal copy and contrast in contrastive parallelism structures. These findings allow me to argue in favour of the crucial role of the interface between syntax and prosody in contrastive parallelism, here taken as a cohesion mechanism.

Acknowledgements

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Negation as a formal flexible feature in children's grammar
A case study investigating cross-linguistic transfer in a German-English bilingual child

Katharina Genske

Abstract

This paper investigates the occurrence and resolution of non-adult like negative utterances in a case study focussing on a German-English bilingual child. In line with the Interface Hypothesis (IH), the data show that initially word order properties of German interfere with the placement of the negative marker in English. In accordance with the Formal Flexible Feature Hypothesis (FFFH), I propose that children initially treat all negation as adverbial, before incorporating a head form of negation into their grammar. This entails that there is no *a priori* availability of a functional projection NegP in children's grammar, making negation a formal flexible feature.

1. Introduction

Within the field of bilingual first language acquisition it is widely accepted that children are able to differentiate between their languages from an early stage. However, this does not imply that they are immune to cross-linguistic influences in the form of transfer. One area of the language faculty that has been demonstrated to be involved in the occurrence and resolution of transfer is grammar (Serratrice 2013). Specifically, syntactic structures at an interface - an intersection of two modules of language - are assumed to be vulnerable to transfer. This observation is captured in the concept of the Interface Hypothesis (IH), which specifies conditions for the occurrence of transfer such as surface ambiguities or the lack of similarities within parallel syntactic structures (Sorace 2011). In that respect the IH resembles the 'subset principle' in first language acquisition, in that language-internal properties influence the directionality of transfer in bilingualism. However, the issue is far from settled as other studies have found transfer to be largely mediated by language external factors, such as working memory capacity (Serratrice 2013; Unsworth & Blom 2010). The longitudinal study presented here investigates the predictions of the IH in a German-English bilingual child from the age of 2;10 up to 5;0 years.

English and German both possess SVO as the canonical surface word order in simple sentences. This forms the majority of input to young children. However, the surface word order conceals underlying differences in the languages, which become evident in, *inter alia,* negative sentences, the focus of the current study. German is a Verb Second (V2) language, in which the main verb raises out of the VP through IP up to CP (Clahsen et al 1993; Haider 1993; Sorace 2011; Wenzlaff & Clahsen 2005). In negative sentences, the V2-property

requires the finite verb to move over negation, stranding the negative marker *nicht* in sentence-final position (Clahsen et al. 1993; Döpke 1999). This results in a V_NEG word order, as in *Die Ente schwimmt nicht* 'The duck swims not'. English, by contrast, is a language where main verbs remain in situ and do-support is required in sentences without a modal or auxiliary verb (Adger 2003). This results in NEG_V word order like *The duck doesn't swim*. In addition, English displays residual V2 in certain structures such as interrogatives, stylistic inversion and in the behavior of the lexical verbs *have* and *be* (Rankin 2012; Westergaard 2007a). This structural overlap, in addition to the surface overlap of word order in simple sentences, may encourage V2 transfer in bilinguals, which becomes visible in negative contexts (Müller 2008; Serratrice 2013).

A further complication for bilingual children is that English has two ways of expressing sentential negation – either with the negative adverb *not* or with its cliticized variant, the head form of negation *n't* (Pollock 1997), whereas German features only adverbial negation (Haegemann 1997; Hamann 2000). The IH predicts that German-English bilingual children could overextend the [German] adverbial use of negation as it demonstrates the more economical option. Use of adverbial negation in English (before do-support is acquired) can result in lowering of tense/agreement affixes over negation in negative sentences, as in **The duck not swims*. If early forms of the negative auxiliary verbs are unanalysed chunks (Bellugi 1967; Cameron-Faulkner et al. 2007; Thornton & Tesan 2012), forms such as **The duck can't/don't swims* are also predicted. However, lowering of the inflectional affix to the verb over a negative head *n't* violates the Head Movement Constraint (HMC) (Chomsky 1994) unless children analyse negation adverbially.

In the Formal Flexible Feature Hypothesis (FFFH), Zeijlstra (2007a) proposes that children initially treat all negation as adverbial because it is the simpler option. Later, children are able to incorporate a functional projection NegP into their syntax, if, and only if the adult grammar requires it. For negation to be incorporated into the child's grammar as a functional projection NegP, the language input requires instances of negative concord (NC) (Zeijlstra 2007b). In NC languages two negative elements do not cancel each other out, but rather yield one semantic negative reading, as demonstrated in (1).

(1)   We don't need no education.

While this might work in theory, children acquiring standard varieties of English are not exposed to NC in their input. Yet they still manage to add a negative head X^0 to their grammar and incorporate a NegP in the developmental progression towards the adult grammar (Thornton & Tesan 2012). The question remains: How do children converge to the adult grammar after initially adopting only adverbial negation at the onset of acquisition? Even more so, how can German-English bilingual children resolve this with the constant reinforcement of the syntactic analysis of adverbial negation from the German input? The main goal of this paper is to explain the occurrence and resolution of non-adult like utterances involving negation in a German-English bilingual child, as in examples (2a-c).

(2)   a.   *That's working not.   (*Kayla,* 3;00 years)
        b.   *It not swims.   (*Kayla*, 3;11 years)
        c.   *It's didn't works.   (*Kayla*, 3;08 years)

Section 2 will concentrate on the transfer of the German V2 word order to English in negative contexts and the acquisition of the correct English word order. Section 3 focuses on the second phase, that is the transition of using exclusively adverbial negation up to the

integration of head negation *n't* after the non-adult like word order of the first stage is abandoned. The study and the data gathered are reviewed in section 4. In section 5, I will argue there is no parameter-resetting involved in the integration of a functional projection NegP in the child's grammar. Instead I propose that children simply add the head negation *n't* to the already existing default adverbial negation. However, triggering mechanisms for the addition of head negation are argued to involve the acquisition of do-support, specifically the productive use of the decomposed negative auxiliary *doesn't* (with a negative head), not semantic doubling in the form of NC.

2. First stage: V2 transfer

The Interface Hypothesis (IH) (Sorace 2011) was originally proposed for adult bilingualism to explain remaining optionality in the output, even at levels of near native competence. Later its scope was widened to include language attrition and bilingual first language acquisition (Serratrice 2013). The IH claims ambiguity in the surface structures in the linguistic input to be a possible source for transfer in the grammars of bilingual children. More specifically the language with fewer sentence structures within the same syntactic context initiates transfer, but not vice versa (Sorace 2004, 2011). Thus language internal factors determine the directionality of transfer.

The canonical word order of simple main clauses in both English and German is SVO as highlighted in example (3). This word order constitutes the majority of the input to young children in both target languages. However, the surface word order hides underlying structural differences, which become visible in negative contexts involving third person singular (3PS).

(3)   Das Mädchen sieht   das   Schiff
        The girl   sees   the   ship
        'The girl sees the ship.'

When investigating matters pertaining to German negation one quickly notices the interplay between the placement of the sentential negative marker *nicht* and the verb, as German exhibits verb second (V2) properties. V2 is restricted to declarative main clauses in German, whereas in subordinate clauses the common unmarked structure is verb final (VE) (Wenzlaff & Clahsen 2005). The position of the negative particle in relation to the verb of the sentence has often been taken as evidence for the early existence of children's command of verb movement (Clahsen et al. 1993; Hamann 2000). In adult grammar, German negation is closely intertwined with finiteness. V2 in German is described as a property derived through head movement of the finite verb from a head-final position of the VP to a head-final position in T/IP and finally to a head-initial/specifier position in the CP (Clahsen 1983; Schwartz & Vikner 1996; Westergaard 2007b). This double raising is illustrated in Figure 1.
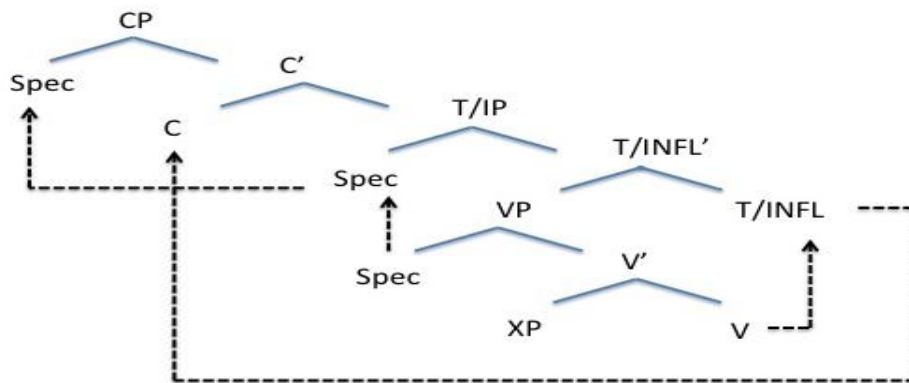
Figure 1: Derivation of V2 in German main clauses

Due to this verb raising, adverbs and modal particles surface post-verbally in sentences without auxiliaries or modals. Even though the status of the negative marker *nicht* as a head or specifier in adult German is still debated (Bayer 1990; Ouhalla 2005; Zanuttini 1997; Zwart 1997), I agree with recent analyses by Hamann (2000) and Haegemann (1997) in assuming *nicht* to be a negative adverb, mainly because it does not block verb movement. Classifying *nicht* as an adverb allows for continuity between child and adult grammar. Verb movements across the NegP with *nicht* in the specifier position avoid violating the head-movement-constraint and further the ECP. Therefore the double raising in German main clauses ensures the movement of the finite verb to the second position and leaves the negative adverb *nicht* stranded so that it surfaces in a post-verbal position. This yields the word order V-NEG as illustrated in example (4).

(4)   Das Mädchen sieht   das   Schiff nicht
       The girl   sees   the   ship   not.
       'The girl doesn't see the ship.'

In contrast to German, English is a non-raising language, where thematic verbs remain *in situ* in the VP. Negation therefore appears to the left of the main verb or sentence-medial adverb. This yields the word order NEG-V. Only in a restricted range of cases does English display residual V2 properties (Rankin 2012). These include auxiliary inversions in questions, stylistic inversions, the behavior of *be* and *have,* and negative inversions. Stylistic and negative inversions are expected to remain low in number in the input received by young children. However, the distribution of *be* and *have*, as well as auxiliary inversions in questions are quite common, as can be seen in example (5a, b). This overlap in surface structures creates further evidence for non-native V2 transfer from German to English in bilingual children.

(5)   a.   Wo   ist   der   Bahnhof?
                 Where is   the   station?
                 'Where is the station?'

b.　　　Wer　　liebt　　Eiscreme?
　　　　　Who　　loves　　ice-cream?
　　　　　'Who loves ice-cream?'

With this background knowledge of the underlying syntactic mechanisms and the proposals of the IH in mind, the following predictions concerning simultaneous acquisition of German and English can be made:

1. Word order transfer occurs unidirectionally from German to English, as German provides the more economical analysis with fewer choice restrictions for the learner;
2. Before children incorporate head negation in their syntax they may lower inflection over adverbial forms of negation;
3. If V2 is acquired and transferred to English in the early stages, a high percentage of inflected negative utterances are predicted (given that the verb has raised) in comparison to English monolingual children who frequently omit inflectional morphology.

3. Second stage: Negation as a formal flexible feature

The FFFH states that a particular feature can only be analyzed as a formal feature which projects if, and only if, there are substantial instances of doubling effects with respect to this feature in the input children receive during first language acquisition (L1). Within the FFFH, doubling effects are defined as multiple morphosyntactic manifestations of a single semantic operator. Further, only if the input provides evidence for the uninterpretable negative feature [uNeg] will the child be forced to instantiate a functional projection NegP to establish a feature-checking relation with the negative elements carrying [uNeg] (Zeijlstra 2004). In other words, if there is no [uNeg] in the input, which needs to be checked off and deleted before the derivation reaches the interface (Adger 2003), the child does not need to have a syntactic category negation. In this case the child would only use semantic, adverbial negation and assign to the negative operators an interpretable negative feature [iNeg]. This is the case for German negation with *nicht* 'not' and for English negation with *no*, *not* and developmental chunked forms of *don't+V/can't+V*. The clue for children to incorporate a NegP lies within semantic doubling in negative concord (NC). Before the learner comes across such doubling, Zeijlstra (2007a) proposes that there is no need in the child's grammar to form a functional category NegP. This lack of a functional projection would be manifested with negative markers being used adverbially instead of constituting a syntactic head and hence blocking movement. In his account the adverb is joined to little *v* and is thus an adjunct of the VP. The different syntactic representations are shown in Figure 2.

Figure 2: Syntactic representation of adverbial negation adjoined to little v versus head negation

However, children acquiring Standard English lack NC in the input and still incorporate a functional category NegP with a negative head X^0 in their grammar. Thornton and Tesan (2012) present a solution for this problem. They propose that children treat negation as adverbial before acquiring do-support, specifically before they acquire the negative auxiliary *doesn't*. In their study they observed that the inflected main verbs in negative utterances of monolingual English speaking children diminish once they are able to decompose *doesn't* into its components *do* plus 3rd person singular *–s* plus the negative clitic *n't*. The central claim is that even though negative auxiliaries are quite frequent in the children's input (they constitute up to 70% of the input children receive), they cannot easily be decomposed, as they bear little information about their morphological composition in regards to negation. Following Thornton and Tesan (2012) and the FFFH, a fourth prediction for the bilingual acquisition of German and English negation can be made:

4. Overgeneralization of adverbial negation in English diminishes once children have decomposed the negative auxiliary *doesn't*, indicating complete acquisition of do-support as a prerequisite to incorporate a negative head with the clitic *n't*.

In general a delayed acquisition of the syntax of negation in the English target language is expected. This delay is predicted through the constant reinforcement of one of the two possible syntactic analyses in the same context, here adverbial negation and verb-raising. In addition the developmental progress is expected to fluctuate, allowing variations throughout, as the subject moves from one stage to the next, trying different strategies to arrive at the target syntax. Nevertheless a clear difference between the first (transfer of V2) and the second stage (integration of head negation) should be visible in the data presented in section four.

4. The present study and data

The current study investigates the acquisition of negation in a German-English bilingual child named *Kayla*. Data were gathered through regular recordings of elicited productions and naturalistic play situations between the age of 2;10 and 5;06 years. Monthly English recordings at the Macquarie University child language laboratory complemented recordings in the home environment, where the child spoke German. Each recording lasted sixty minutes, yielding a total of 64 hours of material, of which 55 (28 in German and 27 in English) have been transcribed and analyzed to date. According to MLU$_w$ values *Kayla* is a balanced bilingual child (MLU$_{wen}$ range 2.16-4.11 versus MLU$_{wge}$ range 2.23-4.26), who grew up with the one language − one environment approach to bilingualism. While the family spoke German at home, *Kayla* attended English-speaking childcare in Australia starting at the age of eight months. This lead to an equal amount of exposure to the two target languages.

As sentential negation is used infrequently and with low numbers in the naturalistic speech of young children (Döpke 1999; Thornton 1996; Wexler & Harris 1996) elicitation games were designed to enhance the occurrence of the target structure and to ensure a reliable and dense data set. Games were designed to be highly felicitous for sentential negation in 3rd person singular contexts (3PS), as this is the most informative structure with regard to morphological decomposition, use of adverbial versus head negation and placement of the negator. This way the child was encouraged to try syntactic structures that she might have otherwise avoided in naturalistic speech. An example of an elicitation game is given in (6).

(6) Eliciting 3rd person singular negation requiring do-support from recording lab150410 (line 505-514), *Kayla* aged 3;00.11 years

Investigator: (testing old markers) And do you think this one works?
Kayla: Yes.
Investigator: You got the top off.
Investigator: You're strong, aren't you?
Kayla: Yeah. (tries the marker).
Kayla: That's working not.
Investigator: Oh, all the others were doing well.
Investigator: Let's try another one.

The games involved can be clustered in three different categories:
  a) Testing of different items (works versus doesn't work, swim, jump, makes noise, etc.)
  b) Role play situations to elicit negation and negative questions (doctor, waiter, teacher, etc.)
  c) Judging and possibly correcting utterances of a stuffed animal/puppet after hearing a story or conducting an experiment as under a).

Each recording session involved a similar structure. The first ten minutes were usually spent in free play leading up to the elicitation experiments that lasted up to forty minutes. Each recording session involved an experiment of one of the categories (a-c) described earlier. However, test items were altered each time, as were the role play situations and puppets. The remaining ten minutes were used for free play again. The same material was used in both target languages. This yielded about twenty minutes of naturalistic speech and forty minutes of elicited productions in each session, regardless of the language under investigation.

Data gathered were transcribed in CHAT format and analyzed in CLAN (MacWhinney 2000; MacWhinney & Snow 1990). The data were coded for main clauses versus embedded and truncated structures, yielding a total corpus of 410 English and 326 German utterances containing negation from naturalistic speech and elicitation tasks. Due to repetitions, direct imitations of previous sentences in the input or due to ambiguity, a number of multiword utterances had to be excluded. The remaining 334 English and 126 German utterances were used for further analysis.

Overall *Kayla* produced more correct negations than non-adult like utterances. Her German data showed no indication of cross-linguistic influence from English grammar. Typical V2 syntax is acquired at the beginning of the study at 2;10 years, resulting in V_Neg word order in 97% of her German negative utterances. In contrast her English data demonstrate great variability, mirroring the German syntax of negation. However, even in English *Kayla* produced more correct utterances than non-adult like forms, indicating a clear differentiation of the two target languages. The results obtained were clustered into developmental phases according to MLU$_w$ values in line with Clahsen et al. (1993). As this study concerns the placement of negation in relation to the verb only multiple word utterances were analyzed. This results in exclusion of MLU$_w$ values of less than 2.0, which is why *Kayla's* data start at developmental phase two. Table 1 shows *Kayla's* adult-like use of negation in 3PS contexts and the negators used. As can be observed, the forms of *can't+V* and *isn't/is not+V-ing* are present from the very beginning of data collection, starting at age 2;11 years. The latest form to appear (only in Phase IV from age 3;07 onwards), and remaining low in percentage (4.3%), is negation with *doesn't*, as predicted. In contrast the structure of *not+ present participle –ing*

is present from the onset of the study, presumably as an effective way of avoiding the form *doesn't*. This structure accounts for over 30% of all adult-like negations used by *Kayla*.

Phase	AUX not+V	Didn't+V	Doesn't+V	Can't+V	Isn't/Is not+V-ing
Phase II	0	0	0	4 (5.8%)	2 (2.9%)
Phase III	5 (7.2%)	1 (1.4%)	0	6 (8.7%)	1 (1.4%)
Phase IV	15 (21.7%)	5 (7.3%)	3 (4.3%)	9 (13%)	18 (26.1%)
Total	**20 (29%)**	**6 (8.7%)**	**3 (4.3%)**	**19 (27.5%)**	**21 (30.4%)**

Table 1: Kayla's adult-like use (69 tokens) of negation in third person singular contexts (3PS) according to developmental phases

The distribution of non-adult like negations in 3PS contexts over negators used is represented in Table 2. It is striking that nearly half of the negations in 3PS contexts were non-adult like occurring with V2 word order *V+not*. The data demonstrate a shift in word order preference in the transition from phase III to phase IV of *Kayla's* development. While the German *V+not* order dramatically decreases to just under 8%, the English target word order *not+V* increases steadily. This shift is also visible in the increased correct use of negative auxiliaries, as highlighted in Table 1. With greater use of these new structures comes an increased rate of non-adult like utterances, as can be seen in Table 2. While *don't+V* and *didn't+V* seem to be more difficult, accounting for nearly one third of all non-adult like negations at this developmental phase, the form *can't+V* remains low in the error count. The same can be observed for the negative auxiliary *doesn't*, which accounts for only 3% of non-adult like negations. However, as can be seen from Table 1 *doesn't+V* is still widely absent from the data, indicating that the child has not yet fully acquired do-support and thus all the requirements to acquire the syntax of English negation.

Phase	V+Not	Not+V	Don't+V	Doesn't+V	Didn't+V	Can't+V
Phase II	14 (13.6%)	7 (6.8%)	0	0	1 (1%)	1 (1%)
Phase III	24 (23.3%)	4 (3.9%)	0	1 (1%)	0	0
Phase IV	8 (7.8%)	10 (9.7%)	16 (15.5%)	2 (1.9%)	13 (12.6%)	2 (1.9%)
Total	**46 (44.7%)**	**21 (20.4%)**	**16 (15.5%)**	**3 (2.9%)**	**14 (13.6%)**	**3 (2.9%)**

Table 2: Kayla's non-adult like use (103 tokens) of negation in third person contexts (3PS) according to developmental phases

The shift in word order preference is also shown in Figure 3. During phase II and III *Kayla* clearly prefers the German post-verbal placement of the negator in her English utterances. This changes abruptly when she enters the fourth developmental phase at around the age of 3;07 years. Suddenly the use of preverbal negations in the English word order *Neg+V* increases to over 60%. Next the possibility of transfer of V2, as a cause for non-adult like negations in English, was investigated through the analysis of inflectional morphology of lexical verbs in negative 3PS contexts.
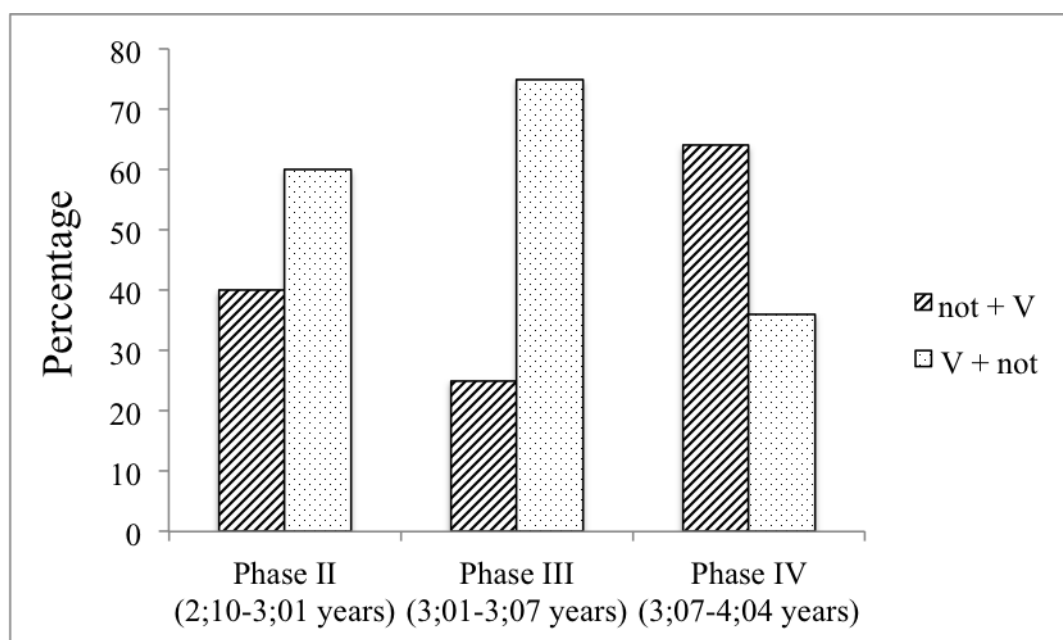
Figure 3: Shift in word order preference in Kayla's negation

During phases II and III the child strongly prefers the German word order in negative contexts (Figure 3). Whether or not it is transfer of German V2 syntax that causes the occurrence of these non-adult like utterances can be investigated through the use of inflection, as outlined in section 2. Figure 4 depicts the use of inflection in negative contexts according to the English *Neg+V* or German *V+Neg* word order within the three different developmental phases. It becomes evident that *Kayla* inflects main verbs in negative contexts at a very high rate from the very beginning of the study. While in phase II, when the German word order is still preferred, the English data show an almost equal amount of inflected and bare verbs with omitted inflectional morphology. The rate of inflected versus bare verbs clearly changes in phase III. Here the inflection rate rises to over 65% in the English word order *not+V*, while bare verbs decrease in occurrence. This rate becomes even higher in phase IV, where over 75% of lexical verbs in the English negative word order are inflected and the use of bare verb forms in 3PS negative contexts drops to just over 20%. The only unexpected observation is the increase in bare verb forms within the German word order, from 20% in phase II to nearly twice as much at 40%, during phase III. As German remains the preferred word order in negative contexts and the child still raises lexical verbs over negation to the V2 position the numbers of omissions of morphology should stay low. However, these data can easily be explained by fluctuation due to the child trying out different strategies in order to arrive at the target syntax. Such an approach is especially notable during this developmental phase of great transition, where many structures seem to change simultaneously, e.g. increased use of negative auxiliaries, shift in word order preference, increase in inflection in English word order and emerging use of do-support in the form of *doesn't*.
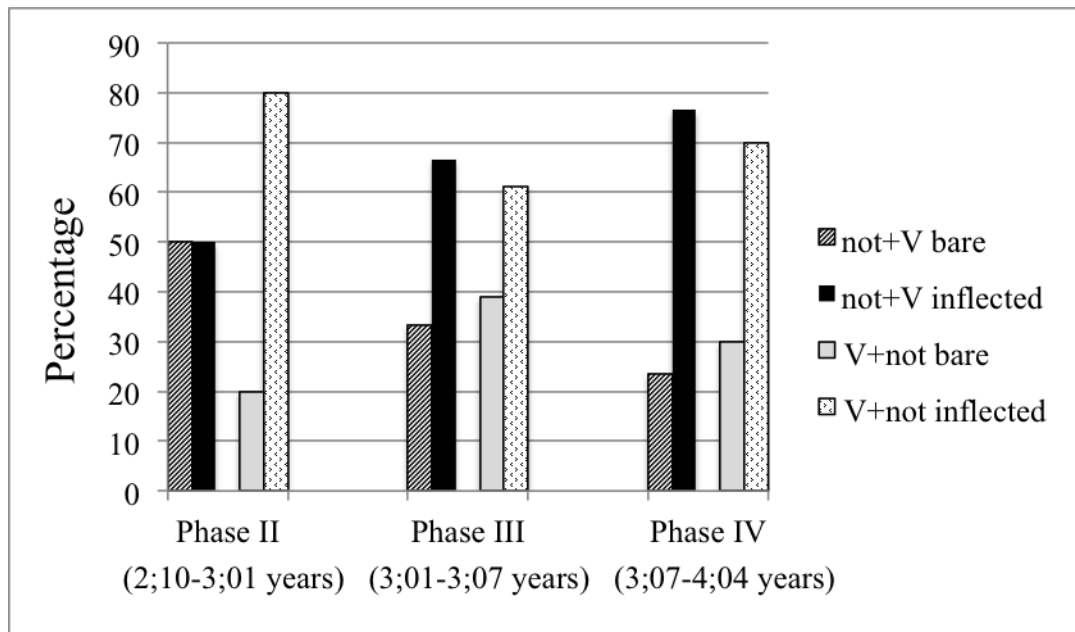
Figure 4: Kayla's use of inflection

The shift in word order preference also co-occurs with the emerging use of negative auxiliaries, as can be seen in Figure 5. At age 3;07 years the use of clitic *n't* overtakes negation with the negator *not*. While at the beginning of the study the child uses the negator *not* in 100% of all negations, this number slowly decreases to almost nothing at the end of the study. The opposite development can be observed for the use of negative auxiliaries with clitic *n't*. Usage rates seem to change rather suddenly at the transition from phase III to phase IV at age 3;07 years.
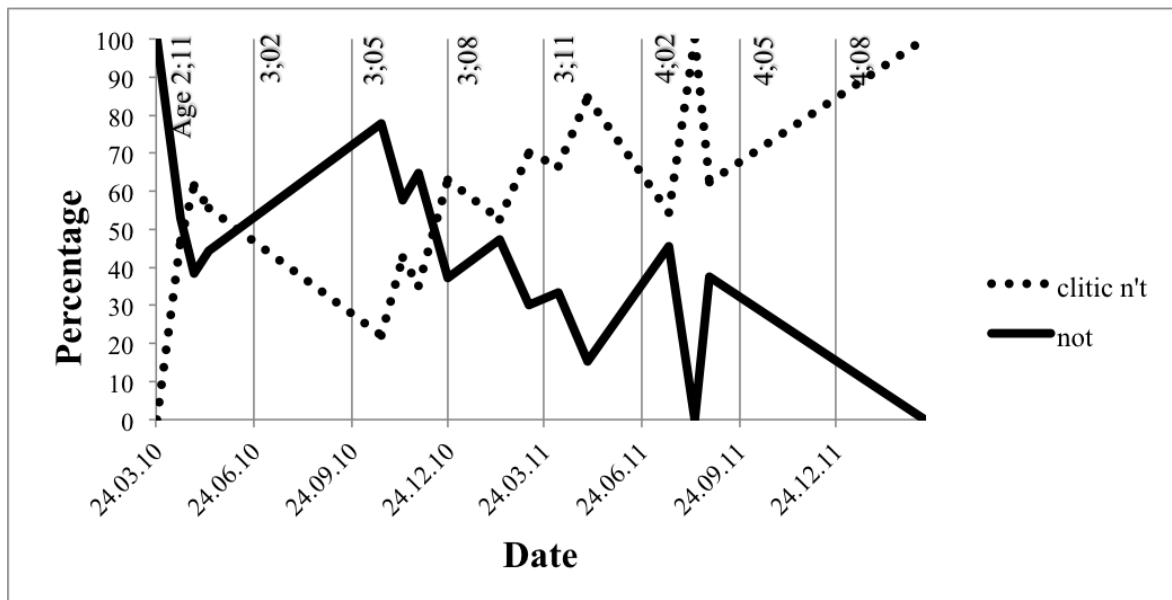
Figure 5: Kayla's use of the negator not versus clitic n't

Next the acquisition of do-support, specifically the form *doesn't,* was examined. As predicted, the negative auxiliary *doesn't* is acquired relatively late, only in phase IV from age 3;07 years onwards. Further, as soon as *doesn't* emerges, the non-adult like utterances with agreement

errors decrease in number. With productive use of *doesn't* at age 5;06 years non-adult like negations decrease and *Kayla* successfully establishes a maximal projection NegP with clitic negation occupying the head position, as highlighted in Figure 6.
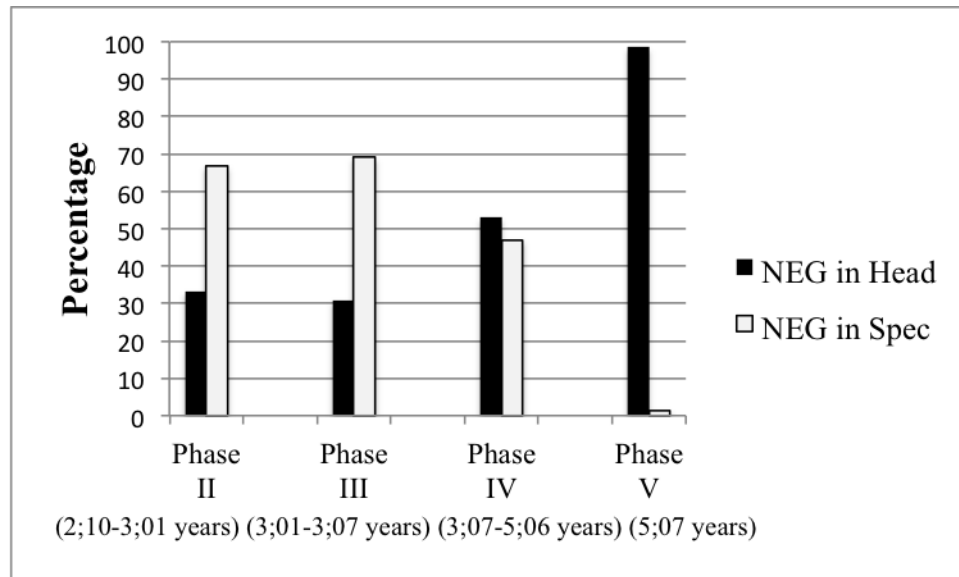
Figure 6: Distribution of negation in head or specifier position in Kayla's 3rd person negation

5. Discussion

The aim of this study was to investigate claims made by the Interface Hypothesis (IH) and the Formal Flexible Feature Hypothesis (FFFH) regarding the acquisition of negation of a German-English bilingual child. Four clear predictions were made:

1. Unidirectional transfer of word order from German to English;
2. Agreement errors due to doubling or lowering of inflection over negation before head negation are incorporated into the child's syntax;
3. High rate of inflection in early negations, where English monolingual children tend to omit inflectional morphology;
4. With the complete acquisition of do-support, specifically the form of *doesn't*, non-adult like English negation subsides.

The data presented here show that transfer occurs in the expected direction, exclusively from German to English, as predicted by the IH. Overall *Kayla* produced more target-like utterances than non-adult-like structures. Her German remained free of any English influence, while her English non-adult like negations in 3PS contexts showed word order transfer from German in 45% of the data. This highlights not only the difficulties this specific configuration causes in *Kayla's* early language development, but also that fusion as an explanation for the occurrence of non-adult like negations is not plausible. *Kayla* is able to differentiate her languages from early on and data analysis showed that V2 in German is acquired early and used effectively at the onset of the study at age 2;10 years. The structure of *V+not* in English negation has only been reported to occur with very low frequencies in previous studies investigating cross-linguistic influences in German-English bilingual children (Döpke, 2000; Schelletter, 2000). However, the current data demonstrate that transfer of V2, as predicted by

the IH, is a strong motivator for non-adult like negation in the bilingual child's English. Nevertheless, the data show a shift in preference from German word order *V+Neg* in phase II and III to the English target word order *Neg+V* in phase IV (Figure 3). Current findings contrast with previous studies, which found cross-linguistic influence to occur mainly in the opposite direction, i.e. from English to German (Döpke, 1999). This can be explained by differences in methodology. In the present study an elicitation method was used to elicit negation in 3PS contexts. This had the advantage of gathering a large data set of an otherwise infrequently occurring syntactic structure in naturalistic speech from just one individual. However, elicitation experiments are designed to be highly felicitous to one specific structure and encourage the child to produce utterances, which she might otherwise avoid in naturalistic speech until they are securely established.

With regard to the second prediction, the data illustrate that the shift in word order preference coincides with the increased usage of negative auxiliaries (Tables 1 and 2). While *can't+V* is present from the very beginning of the study and used correctly most of the time (see Table 1), it can be argued that the child uses it as a chunked form of negation, especially since other correctly used *auxiliary+n't* combinations are absent or remain low in number until phase IV. I also found that *Kayla* produced more non-adult like negations with negative auxiliaries once they are used productively in phase IV (Table 2). The highest number of non-adult like negations in 3PS contexts occurred with the negative auxiliaries *don't* and *didn't*. Here the data attested ungrammatical utterances such as *'It don't swim-s'* (3;08 years) and *'It-s didn't work-s'* (3;11 years), where inflection was either lowered over the negative clitic *n't* or even occurred doubled as a marker on the subject and the verb. These examples clearly illustrate that the child has not yet mastered do-support. Such use of negative auxiliaries displays agreement errors, which in turn demonstrate chunking in the form of *negative auxiliary+V* to be the underlying structure in the child's grammar (Cameron-Faulkner et al. 2007). *Kayla* has yet to realize that the clitic *n't* constitutes a head in the English grammar, and that lowering of the inflectional present tense *–s* marker violates the Head Movement Constraint (Chomsky 1994), unless an adverbial treatment of negation in early stages is assumed, as proposed by the FFFH (Zeijlstra 2007a; 2004). I will return to this point later, when revisiting the fourth prediction regarding the status of negation in early acquisition.

The data illustrated in Figure 4 clearly demonstrate a high preference for using inflected verbs in both word orders. While the inflection rate remains high in the word order *V+not* throughout the study ranging from 80% in phase II to 70% in phase IV, the number of omitted inflectional markers remains low. For the English target word order *not+V* a steady increase in inflection rates from 50% in phase II to nearly 80% in phase IV can be observed. These rates are unusually high compared to monolingual English speaking children. Phillips (2010) cites inflection rates of as little as 10% in early utterances, which slowly increase to around 50% at the age of 4 years. English monolingual children tend to omit inflection at early stages of development, which had previously been termed the Optional Infinitive Stage (Wexler & Harris 1996). I conclude that our subject clearly displays influence of her German grammar in her English inflection rates. *Kayla* moves the main verbs out of the VP through IP, where they receive inflectional markers, as German V2 gets transferred to English from early on (see Figure 3). English monolingual children do not display this kind of verb movement behavior, which accounts for the discrepancy in rates of omission of inflectional morphology in early stages. This difference diminishes in the last phase of acquisition. Another striking observation is the preference for structures with *not* plus *present progressive -ing*. Utterances such as *She is not sleeping* conform to the German syntax, representing a way to maintain V2 properties within English. They are also acceptable in adult English and an effective way of

avoiding the tricky operation of *do-support* in 3PS contexts. This use of negation allows the child to treat negation adverbially and retain the V2 grammar on the surface, without deviating from the two adult grammars. The high occurrence rate of 30% illustrates the importance of avoidance as a strategy in bilingual first language acquisition.

The fourth prediction is displayed in Figure 5. Again, as previously demonstrated for word order preference (prediction 1), agreement errors (prediction 2) and inflectional rates (prediction 3) a major shift can be seen at the age of 3;07 years, in the transition from phase III to phase IV. At this stage the use of clitic *n't* negation overtakes negation with the free negative marker *not*. While this change is not as abrupt as others it is still clearly observable; *Kayla* progresses from using *not* as a negative marker in 100% of negation in the beginning of the study to nearly exclusive usage of negative auxiliaries with the clitic *n't* at the later developmental stage. This development has also been attested in monolingual English speaking children (Thornton & Tesan 2012), although at a younger age of approximately 3 years. This age delay can be explained with the fact that *Kayla* has to work out two critical points in order to fully acquire the English syntax of negation compared with monolingual English children. First she has to resolve the fact that English is a non-raising language. Also, as described in the background section, English displays residual V2 in interrogatives and in the behavior of *be* and *have,* which could lead *Kayla* to a raising analysis for English. Secondly *Kayla*, just as her monolingual peers, has to figure out that adult English displays two forms of negation: a) negating adverbial with the negative marker *not* and b) head negation with the negative clitic *n't*. This is harder for *Kayla* than for monolingual English children, as the first option a) gets constantly reinforced by the German input, where negation is only adverbial. In addition English-speaking children produce agreement errors (as discussed under the second prediction), which could lead *Kayla* to hypothesize that English negative auxiliaries are also used adverbially. These two differences in both target languages delay the acquisition process for the subject by about 4 to 6 months.

The most critical observation is captured in Figure 6. It becomes evident that *Kayla* progresses from initially assigning negation the status of a specifier to using almost exclusively head negation by the end of the study. However, as proposed by the FFFH this change does not imply a parameter resetting as proposed by previous studies (Meisel 2011; Paradis & Genesee 1997; Schütze 2010; Tracy 1995). Rather the child is able to incorporate a head negation to the already existing adverbial negation at a later stage in her development (Thornton & Tesan 2012; Zeijlstra 2007a). Adverbial negation is already present in the early stage, as it is the default form of negation. German exhibits only this type of negation, where the adverbial use of negation does not block verb movement, thus it is able to coexist with the V2 requirement. This influence is visible in *Kayla's* use of inflection, as discussed within the third prediction (Figure 4). As long as utterances such as *'She fits not'* or *'It didn't swims'* are produced, the child has not incorporated a NegP with head negation into her English grammar and still uses negative auxiliaries as *v*P adjuncts. The use of an adverbial negative marker in German means that it can be interpreted within the semantics. In other words, there is no need to stipulate a maximal projection NegP in German. Contrary to Zeijlstra's theory, where negative concord (NC) triggers the progression from adverbial negation to head negation (Zeijlstra 2004), I prefer to agree with Thornton and Tesan (2012), who claim the acquisition of the negative auxiliary *doesn't* serves as proof that children have successfully mastered the syntax of English negation. The data confirm this hypothesis. As soon as *Kayla* uses *doesn't* productively, non-adult like negations in English vanish rapidly (Figure 6). Further data analysis is needed to confirm these primary observations, for example the development of negative questions of the type *'Why don't you like chocolate?'* or negative tags as *'He loves*

you, doesn't he?'. These would serve as natural test cases for Tesan and Thornton's (2012) hypothesis, as children in the stage of using only semantic negation are unable to move negative auxiliaries up to C. The head movement of a negative auxiliary only becomes available to the child after the establishment of head negation and a maximal projection NegP. However, this will have to be confirmed at a later stage, as data analysis of the acquisition of (negative) interrogatives is still ongoing. It will also be up to future work to investigate the role of the quality of the input the child receives, as both parents are non-native English speakers (with near-native competence due to multiple long-term stays in English speaking countries) with German as their L1. This could have altered the input the child receives and encouraged the child's preference for adverbial negation.

6. Conclusion

The study presented set out to explain the processes guiding the acquisition of sentential negation in a German-English bilingual child. A combination of predictions arising from the Interface Hypothesis (IH) and the Formal Flexible Feature Hypothesis (FFFH) were tested in an elicitation study. For now we can conclude that the acquisition of negation for the subject moves through two very distinct stages. The child comes to realize that 1) English is a non-raising language and transfer of the German V2 properties to English lead to word order violations resulting in ungrammatical utterances, and 2) that English features two types of negation: adverbial with the negative marker *not* and head negation with negative auxiliaries. In accordance with Thornton and Tesan's (2012) analysis I also found that the acquisition of do-support, specifically the productive use of the negative auxiliary *doesn't,* triggers the integration of a maximal projection NegP in the English target grammar. My data indicate that, as long as the child has not incorporated syntactic negation in the form of head negation with the clitic *n't* and a NegP, negation can continue to be used adverbially as a formal flexible feature in the child's syntax. This further strengthens the assumption that there is no *a priori* availability of a functional projection NegP in Universal Grammar.

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How do Hungarian preschoolers interpret number words?

Mátyás Gerőcs & Lilla Pintér

In addition to their 'exactly *n*' interpretation, numerals can receive non-exact readings, like 'at least *n*'. Since in Hungarian the interpretation of numerals is claimed to be determined by their syntactic position we carried out three experiments with Hungarian preschoolers to verify whether they can make use of structural information when interpreting numerals. We found that irrespective of syntactic structure, they strongly preferred the upper-bounded interpretation and the lower-bounded reading was not (or hardly) accessible to them. We conclude that the findings provide support for the view that the default meaning of numerals is in fact 'exactly *n*'.

1. Introduction

This paper reports on three experiments in which we investigated how Hungarian preschoolers interpret numerals in sentences such as (1a) and (1b).

(1) a. Kapjanak cukorkát   azok a   macik, akiknek   három málnája   van.
         Get-IMP candy-ACC those the bear-PL who-PL three raspberry-POSS have
         'Those bears shall get a candy who have THREE RASPBERRIES.'
      b. Kapjanak cukorkát   azok a   macik, akiknek   van   három málnája.
         Get-IMP candy-ACC those the bear-PL who-PL HAVE three raspberry-POSS
         'Those bears shall get a candy who have three raspberries.'

Under the standard generative analysis the sentences above have different meanings due to the different syntactic structure of the relative clauses. In (1a) the numeral appears in the position immediately preceding the verb (referred to as focus position in the Hungarian literature) and therefore it can only mean 'exactly three'. In contrast, in (1b) the numeral appears post-verbally and its meaning is 'at least three', though it can be supplemented with an upper-bounding implicature ('and not more'), as a result of which the 'exactly three' reading also becomes available. The underlying assumption behind this analysis is that numerals have a lower-bounded ('at least') semantics by default and the upper-bounded ('at most') reading emerges as a consequence of focusing, i.e. movement of the numeral into the pre-verbal slot. According to the most recent views (É. Kiss 2006a, 2010), the function of this designated focus position is to identify the maximal set of individuals to whom the predicate holds

excluding all other alternatives. Applying this operation to the number scale results in converting the lower-bounded ('at least') meaning of a numeral into the upper-bounded ('exactly') meaning. Thus, in Hungarian the distinction between the 'at least' and 'exactly' reading of numerals is claimed (É. Kiss 2006a, 2006b) to be grammaticalized.

Given this analysis, our first research question was whether Hungarian preschoolers can distinguish the meanings of sentences like (1a) and (1b), and if they can, whether they make use of the information structure of the sentence or if there are other cues they rely on.

It is, however, far from being obvious that the default meaning of numerals is 'at least *n*'. Many argue (Horn 1992, Geurts 2006, Breheny 2008) that the primary meaning of numerals is in fact 'exactly *n*' and all other readings can be derived from this meaning. Investigating the acquisition path of numerals can help settle this debate. Since children's pragmatic knowledge is considered to be more 'fragile' than that of adults (e.g. Crain & Thornton 1998), it is reasonable to assume that it is the default (literal) meaning that is more accessible to them. Related to this assumption, our second research question was how our results contribute to the semantic discussion on the default meaning of numerals.

2. On the meaning of numerals

It is a well attested fact (Horn 1972, 1989) that numerals give rise to three different interpretations, depending on the context in which they are used. Consider the following examples:

(2)   a. - How many mistakes did you make?
          - I made three mistakes.
       b. If you make three mistakes you will fail the test.
       c. If you make three mistakes you can still pass the test.

In (2a) the number word *three* is most naturally interpreted as 'exactly three'. In (2b), however, *three* means 'at least three', since one will also fail if one made more than three mistakes. Similarly, in (2c) *three* here means 'at most three', since one can also pass the test if one made fewer than three mistakes.

In any proper semantic analysis of numerals this meaning alternation must be accounted for. Though it would be possible to treat the different meanings as distinct lexical items, such a treatment would not conform to economy requirements. Therefore, it is more reasonable to assume that there is one default meaning from which all the other interpretations can be derived. Most semantic theories agree on this point (Horn 1972, Levinson 2000). However, on the question of which meaning is the default and how the other readings emerge, no consensus has yet been reached.

2.1. The neo-Gricean Approach

One of the mainstream approaches to the analysis of the meaning of numerals follows Gricean traditions (e.g. Levinson 2000). This approach claims that the default meaning of numerals is 'at least *n*' and that the 'exactly *n*' reading is a scalar implicature. In the Gricean framework scalar implicatures fall into the category of generalized conversational implicatures. They are triggered by scalar expressions, hence the term 'scalar'. Scalar expressions are expressions in

natural languages that can be ordered into scales according to their semantic strength. Typical examples can be seen in (3).

(3) <a, some, many, most, all>; <or, and>

In a scale, the stronger (more informative) expression entails the weaker one; for example if it is true that John ate all the cookies, then it is also true that John ate some of the cookies. This entailment, however, holds only in one direction, i.e. the weaker term does not entail the stronger one.

Scalar implicatures typically arise when the use of a weaker term implies that the use of the stronger term from the same scale would result in a false statement. This is illustrated in (4).

(4)   John: Are the cakes ready?
       Mary: Some of them are.

Mary's answer is most naturally interpreted as meaning that it is not true that all the cakes are ready, though Mary's statement would also be (logically) true in a situation where in fact all the cakes are ready. According to Gricean reasoning the listener assumes that Mary observes the Maxim of Quantity (i.e. she is sufficiently informative) and draws the conclusion that it is not true that all the cakes are ready, because if it were, Mary would have said so (Grice 1975).

It is important to note that scalar implicatures (and implicatures in general) do not necessarily follow from the literal meaning and they can be cancelled (5).

(5)   John ate some of the cakes – in fact, he ate all of them.

From a neo-Gricean viewpoint, the behaviour of numerals is similar to that of scalar expressions. The comparison is rather convenient considering the fact that number words also form a scale and exhibit the same entailment pattern as scalar expressions: if it is true that John ate five cookies, then it is also true that John ate four, three, etc. cookies. In other words, the sentence *John ate four cookies* is true in a situation as well, where in fact John ate five cookies. More formally stated: if a predicate P holds for a set of cardinality x, then the same P predicate holds for the set of cardinality x+n. Consequently, the default meaning of numerals must be 'at least n'.

In (6) the scalar expression *some* has been replaced with a numeral.

(6)   John: Are the cakes ready?
       Mary: Three of them are.

In this situation *three* is most naturally interpreted as 'exactly three', which is a scalar implicature. The reasoning here is the same as in the previous case: assuming that Mary is sufficiently informative, the listener concludes that it is not true that more than three cakes are ready, otherwise she would have said so.

Thus, advocates of neo-Gricean theory argue that numerals behave similarly to 'ordinary' scalar expressions. By default numerals have a lower-bounded ('at least n') semantics and the upper-bounded ('exactly n') interpretation is a scalar implicature arising as a result of inferential processes. If the implicature is cancelled, the default lower-bounded meaning returns.

2.2. Alternative analyses

The neo-Gricean approach has been subject to much criticism in recent years in the semantic and psycholinguistic literature (see Geurts 2006, Papafragou & Musolino 2003). The biggest concern of those disfavouring this approach is that numerals do not behave similarly to other scalar expressions. It has been observed that scalar implicatures triggered by scalar expressions consistently disappear in downward entailing contexts, e.g. in the scope of negation, as in (7).

(7)   a. Fred didn't read many of the books Wilma gave him.[1]
      b. Fred didn't read all the books Wilma gave him.

In (7a) the implicature ('but not all') triggered by *many* has been cancelled, i.e. the upper bound has been removed. It is indicated by the fact that (7a) entails (7b). If numerals behaved similarly to scalar expressions we would expect that (8a) also entails (8b). This is, however, not the case, as indicated in (8).

(8)   a. Fred didn't read two of the books Wilma gave him.
      b. Fred didn't read three of the books Wilma gave him.

In (8a) the implicature is not cancelled, i.e. the number word *two* still means 'exactly two'. The negation wide scope reading explains why (8a) does not entail (8b).

The examples cited above are intended to prove that no parallel can be drawn between the behaviour of scalar terms and numerals. In his later works even Horn reconsiders his earlier views on this topic; see Horn (1992). Furthermore, the fact that the downward entailing context has no effect on the interpretation of numerals raises the possibility that the default meaning of numerals is in fact 'exactly n'. Geurts (2006) and Breheny (2008) both argue for this latter assumption.

Geurts first points out that numerals have a quantifier (9a) and predicate (9b) meaning that should be treated separately.

(9)   a. Five cows mooed.
         $\exists x [\#x = 5 \ \& \ cow (x) \ \& \ moo (x)]$
      b. These are five cows.
         $\#these = 5 \ \& \ cow(these)$

While in (9a) the numeral appears in argument position and the proposition is bounded by an existential quantifier, in (9b) the numeral itself is the predicate. These two types of meaning can be converted into each other by type-shifting operations (namely Existential Closure and Quantifier Lowering). As regards the lower versus upper-bounded interpretation, Geurts (2006) simply proposes polisemy. He considers the upper-bounded quantifier meaning as default, and suggests that the different readings can be accessed via type-shifting.

Breheny's (2008) account has much in common with Geurt's (2006), although Breheny argues that the aforementioned type-shifting operations take place in the domain of pragmatics. Thus, the default meaning of numerals is 'exactly *n*' and the 'at least' reading emerges as a result of inferential processes. For example, the sentence *John ate three cookies*

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[1] Citing examples (9) and (10) of Geurts (2011: 54).

can be interpreted as *There are three cookies such that John ate them*, which is actually the lower-bounded meaning, given that it is true also in a situation where John in fact ate four cookies.

No theory proposes that the default meaning of numerals is 'at most *n*'. For this reason we do not discuss this interpretation in detail, although its acquisition is undoubtedly worth investigating.

To sum up so far, theories opposing the neo-Gricean approach argue that the interpretation of numerals is different from that of 'ordinary' scalar expressions and that their default meaning cannot be 'at least *n*' (as is claimed on the neo-Gricean view, see Horn 1972, 1989, Levinson 2000, among others). As an alternative it is becoming increasingly accepted that the default meaning is 'exactly *n*' and all other readings can be derived from it (as has been suggested by Geurt 2006 or Breheny 2008).

3. Hungarian data

Hungarian deserves special attention in this discussion because in Hungarian the distinction between the lower-bounded and upper-bounded meanings of numerals is claimed to be grammaticalized (É. Kiss 2006b, 2010). Thus, if the numeral is focussed, it can only mean 'exactly *n*', otherwise the meaning is 'at least *n*'. The following section provides a review of the basis for these claims.

Focus marking in Hungarian involves syntactic rearrangement, i.e. the focussed constituent moves to the position immediately preceding the tensed verb (focus position). This is illustrated in (10a), where the constituent *két doboz sört* 'two cans of beer' is focussed and appears pre-verbally. In (10b), however, the constituent *két doboz sört* is not focussed, consequently it does not move but appears in its argument position.

(10)   a. János [két doboz sört]$_{Foc}$ iszik   meg   minden   nap.
          John   two can beer-ACC   drinks   PRT   every   day
          'John drinks (exactly) two cans of beer every day.'
       b. János megiszik   [két doboz sört]$_{Foc}$ minden   nap.
          John   PRT-drinks   two can beer-ACC   every   day
          'John drinks (at least) two cans of beer every day.'

The widely accepted view in the Hungarian theoretic literature is that in (10a) *two cans* means 'exactly two cans' i.e. this sentence is not true if John drinks less or more beer every day. As opposed to this, in (10b) *two cans* means 'at least two cans', i.e. the sentence will be also true if John in fact drinks three or even more cans of beer every day. It is important to note that the 'exactly' reading can arise in (10b) as well, but in this case we are dealing with a scalar implicature that can be derived from Grice's maxims (see point 2.1). In other words, while in (10a) the 'exactly' reading is compulsory, in (10b) pragmatic factors decide whether the precise reading arises or not.

The analysis sketched above has two basic assumptions: (i) numerals have a lower-bounded semantics by default (following Horn 1972), and (ii) Hungarian pre-verbal focus expresses exhaustive identification. Assumption (i) can be easily supported by examples such as that in (11).

(11) Aki fel-nevelt két gyereket, az   15% nyugdíjemelésre jogosult.[2]
   who up brought two children (s)he 15% pension-raise-to entitled-is
   'Who(ever) has brought up (at least) two children is entitled to a 15% pension raise.'

It is obvious that in terms of (11), those having more than two children are also entitled to receiving a pension raise. It must be noted, however, that theories which cast doubt on the validity of (i) do not claim the opposite, either. Instead they suggest that (11) can be transformed into an existential statement ('if there are two children such that *y* raised them') whose truth conditions do not depend on whether *y* has *at least two* or *exactly two* children (see point 2.2).

    Assumption (ii) can be traced back to the work of Szabolcsi (1980, 1981). She claims that Hungarian pre-verbal focus bears a special semantic feature, namely, it expresses 'exhaustive listing'. This means that pre-verbal focus provides an exhaustive list of the referents for which the statement expressed by the sentence is true. The fact that the sentences in (12) contradict each other is a good indicator of this exhaustivity feature.

(12) a. [Péter]$_{Foc}$ aludt   a   padlón.
       Peter   sleep-PAST the floor-on
       'PETER was sleeping on the floor.'
    b. [Péter és Pál]$_{Foc}$ aludt   a   padlón.
       Peter and Paul   sleep-PAST the floor-on
       'PETER AND PAUL were sleeping on the floor.'

According to É. Kiss's (2006a) account in (12b) the conjoined NP appearing in the focus position exhaustively specifies the set denoted by the background ('who slept on the floor', namely Peter and Paul), thereby excluding any other possible alternatives. The same procedure takes place in (12a), although here Peter is the only element of the set. The contradiction stems from the fact that the elements of these sets are not identical. É. Kiss (2006a) analyses the pre-verbal element as a specificational predicate that takes the VP as its subject and claims that exhaustivity arises as a semantic consequence of the predicate referentially specifying the set determined by the subject. Other theories (e.g. Horváth 2005) presume that an abstract semantic operator (dubbed either an 'exhaustivity operator' or 'maximality operator') is responsible for the exhaustive interpretation associated with pre-verbal focus in Hungarian. Its function is to exhaustively identify the maximal subset of the set of alternatives for which the predicate holds. Thus according to this view, exhaustivity also arises as a result of identification.

    In the case of numerals, the alternatives to a number *n* are all the other numbers on the number scale not being equal to *n*. That is, numbers that are not equal to *n* form the set of alternatives on which the focus operates, thus identifying the maximal subset for which the statement expressed by the sentence holds. As a result of this identificational mechanism, numbers not being equal to the value denoted by focussed number are excluded, thereby narrowing down the lower-bounded meaning to the upper-bounded one. Consequently (13a) and (13b) cannot be true at the same time because in (13a) the alternatives to the number word *fifteen* (including the numbers greater than *15*) are excluded due to focussing.

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[2] Citing example (24) of É. Kiss (2010: 77).

(13) a. János [tizenöt palacsintát]_{Foc}   evett   meg.
      John   fifteen pancakes-ACC   eat-PAST PRT
      'John ate (exactly) fifteen pancakes.'
    b. János [tizenhat   palacsintát]_{Foc} evett   meg.
      John   sixteen   pancakes-ACC eat-PAST PRT
      'John ate (exactly) sixteen pancakes.'

By contrast, (14b) entails (14a) since the number word *fifteen* is not focussed and therefore the lower-bounded meaning is preserved.

(14) a. János meg-evett   tizenöt   palacsintát.
      John PRT-eat-PAST fifteen   pancakes-ACC.
      'John ate (at least) fifteen pancakes.'
    b. János meg-evett   tizenhat palacsintát.
      John PRT-eat-PAST sixteen   pancakes-ACC.
      'John ate (at least) sixteen pancakes.'

In sum, according to standard analyses (É. Kiss 2006b, 2010), in Hungarian it is the information structure of the sentence that determines how a numeral is interpreted. If it is focussed (which is also marked by its syntactic position), it is interpreted as 'exactly *n*', in all other cases as 'at least *n*'. The 'exactly' interpretation is a consequence of the function of focus, namely that it expresses that the denotation of the focussed constituent and the set denoted by the rest of the sentence are identical. Owing to this identificational mechanism the upward expanding 'at least' reading is blocked.

4. Developmental background

In order to have a comprehensive overview of how children interpret numerals it is important to briefly present the findings of related research in the fields of language acquisition and pragmatics. The following section discusses how children acquire the meaning of numbers, how they cope with scalar implicatures and finally, whether Hungarian children are sensitive to the exhaustive feature of identificational focus.

4.1 The acquisition of number words

The first step in the acquisition process of numerals is to learn what quantity each number word refers to. In order to do so, the logic of the number system must be understood, namely that each number word refers to a distinct quantity and that two successive numbers on the number scale have a difference of one. Wynn (1990, 1992) discerns four stages of this learning process: by the age of two and a half children are able to distinguish *one* and *many*. This means that in a task where they are supposed to pick the number of objects matching the number uttered by the experimenter they consequently pick one if they are asked for one, and more than one if they are asked for two, three or more (Give-N Task). By the age of three they learn the meaning of two and by the age of three and a half they have already learned the meaning of three. At the age of four they understand the relationship between counting and cardinality, i.e. they are able to form sets of four, five, six, etc. elements by counting.

Although there is no agreement in the literature on how exactly this learning process takes place (see Carey 2001), it is widely accepted that by the age of five the mapping between numerals and the quantities denoted by them is already solid and children use numbers in the lower range (up to six) quite confidently (see Wynn 1990, 1992). This is important, because it excludes the possibility that children might not access the 'exactly *n*' and 'at least *n*' meaning components of numerals because of their immature numerical knowledge.

4.2 The interpretation of scalar implicatures

In the last decade a large number of experiments has been carried out investigating how children interpret scalar implicatures (see Noveck 2001; Papafragou & Musolino 2003; Musolino 2004; Huang & Snedeker 2009; Huang et al. 2013). Most of these studies aimed specifically at comparing the interpretation of numerals and other scalar expressions and revealed the same tendency as Papafragou & Musolino (2003) did. They used a Truth Value Judgement Task in which participants were presented short scenes involving three horses jumping over a fence. After presenting the scene the experimenter asked the participant if the statement in (15) was true or false.

(15)   Some of the horses jumped over the fence.

While adults overwhelmingly rejected this sentence (92%) on the basis that all the horses jumped over the fence not just some of them, the majority of children (88%) accepted it willingly. These results indicates that in the case of children the implicature *but not all* has not been triggered. In a follow-up experiment Papafragou & Musolino (2003) modified the test sentence by replacing the scalar expression *some* with the numeral *two*, as in (16).

(16)   Two of the horses jumped over the fence.

When the sentence contained a numerical expression, children's judgements were much more similar to those of adults: only 35% of the children accepted (16), and the majority (65%) rejected it on the basis that all three horses jumped over the fence, not just two of them. Children therefore preferred the upper-bounded interpretation of the numeral, which in the neo-Gricean framework is considered to be a scalar implicature. If we were to accept this view, the previous results should lead us to conclude that while in the case of numerals they obviously can calculate scalar implicatures, in the case of other scalar expressions they clearly can not. This explanation would be rather hard to defend, so the authors cited above are of the opinion that the default meaning of numerals is actually 'exactly *n*'.

4.3 The interpetation of Hungarian identificational focus

Few experimental data have been provided so far regarding the interpretation of Hungarian pre-verbal identificational focus. In 2011 Pintér conducted an experiment with Hungarian preschoolers and adults using a Truth Value Judgement Task. Participants were shown pictures depicting two characters who were involved in the same activity, e.g. a bunny and a bear sitting on a chair. After presenting the picture the experimenter uttered a test sentence of representing one of the two types provided in (17).

(17) a. A maci felült   a   székre.
       the bear   up-seat-PAST the   chair-on
       'The bear sat on the chair.'

     b. [A maci]$_{Foc}$ ült   fel a   székre.
       the bear   seat-PAST up the   chair-on
       'THE BEAR sat on the chair.'

The information structure of the test sentence was varied: the subject (the bear) was either focussed (17b) or non-focussed (17a). In this instance focussing is marked by the inversion of the verbal particle *up* and the verb. Adults overwhelmingly rejected (17b) because the bunny was also sitting on the chair and therefore the exhaustivity requirement of focus has not been fulfilled. By contrast, children did not detect the semantic difference between the two sentences, and so judged (17b) to be true to the same extent as (17a). Kas & Lukács (2013) extended this investigation so as to also include object focus, obtaining similar results. It would appear, therefore, that Hungarian children are not sensitive to the exhaustive feature of identificational focus.

5. Experiments

The general purpose of the experiments we conducted was to investigate how children interpret number words in different syntactic positions. Previous research (Kas & Lukács 2013) has shown that children are not sensitive to the exhaustive feature of Hungarian identificational focus. If the default meaning of numerals is indeed 'at least *n*' and children's grammar also lacks the mechanism producing the upper-bounded ('exactly *n*') reading (namely exhaustive identification), then the logical consequence would be that children only have access to the 'at least' interpretation. In the first experiment we wanted to test whether this assumption proves to be borne out.

5. 1. Experiment 1
5.1.1. Participants

22 Hungarian speaking children participated in the experiment (10 girls and 12 boys) between the ages of 4;3 and 6;8 (mean age 5;6). Children were recruited at a public kindergarten in Budapest. None of them had received any mathematical training before. The results of two participants were removed from the final analysis owing to their poor performance on the filler trials testing numeric knowledge. The control group consisted of 17 adult native speakers of Hungarian.

5.1.2. Materials

In the experiment we had two independent variables: the syntactic position of the numeral and the type of the verb. Both variables had two values: in focus position or out of focus position and possessive verb or activity verb, respectively. Thus, the two variables gave rise to the following four conditions.

(i) non-focussed numeral, activity verb

Kapjanak cukorkát azok a macik, akik szedtek három málnát.
Get-IMP candy-ACC those the bear-PL who-PL pick-PAST three raspberry-ACC
'Those bears shall get a candy who picked three raspberries.'

(ii) focussed numeral, activity verb

Kapjanak cukorkát azok a macik, akik [három málnát]$_{Foc}$ szedtek.
Get-IMP candy-ACC those the bear-PL who-PL three raspberry-ACC pick-PAST
'Those bears shall get a candy who picked THREE RASPBERRIES.'

(iii) non-focussed numeral, possession verb

Kapjanak cukorkát azok a macik, akiknek van három málnája.
Get-IMP candy-ACC those the bear-PL who-PL is three raspberry-POSS
'Those bears shall get a candy who have three raspberries.'

(iv) focussed numeral, possession verb

Kapjanak cukorkát azok a macik, akiknek [három málnája]$_{Foc}$ van.
Get-IMP candy-ACC those the bear-PL who-PL three raspberry-POSS is
'Those bears shall get a candy who have THREE RASPBERRIES.'

The type of the verb was added as a variable because in Hungarian possession is expressed by an existential structure involving the verb *van* 'be'. In this case it is explicitly marked that the numeral is in the scope of an existential quantifier, which might facilitate the 'at least' reading (see point 2.2).

Each condition was represented by four items, which resulted in 16 critical trials. The test items were divided into three sections and presented in a pseudo-randomized order. At the beginning of each section there was a filler trial, whose purpose was to test the child's numerical knowledge.

5.1.3. Procedure

The experiment was conducted by two experimenters. One of them told the child short stories about a group of toy bears who had to perform different tasks, e.g. pick raspberries. The bears showed Hedgehog (a puppet acted by the other experimenter) how many raspberries they had picked. Each bear had a card in front of him depicting a set of raspberries ranging from 2 to 6. Hedgehog gave candy to the bears as a reward and she told the child which bears were able to receive a candy, i.e. she uttered the test sentence containing a number word, as in (18).

(18) Kapjanak cukorkát azok a macik, akik szedtek három málnát
Get-IMP candy-ACC those the bear-PL who-PL pick-PAST three raspberry-ACC
'Those bears shall get a candy who picked three raspberries.'

The child then had to give a candy to the bears who matched the puppet's description. (NB. The number of candies available was always more than the number of bears.) If the child gave a candy only to the bears who had exactly three raspberries, then it indicated that she

interpreted the numeral as 'exactly *n*' (see Figure 1). However, if she rewarded the bears who also had more than three raspberries, this indicated that she interpreted the numeral as 'at least *n*' (Figure 2).

Figure 1: Critical trial in Experiment 1 – 'exactly' interpretation

Figure 2: Critical trial in Experiment 1 – 'at least' interpretation

Adult participants were given test papers with illustrations of the settings presented in the children's test sentences (Figure 3). The experimenter read out the test sentences one by one and the participants had to mark the bears they would give a candy to. In the experiment we recorded how many times the participant interpreted the numeral as 'at least *n*' and how many times as 'exactly *n*'.
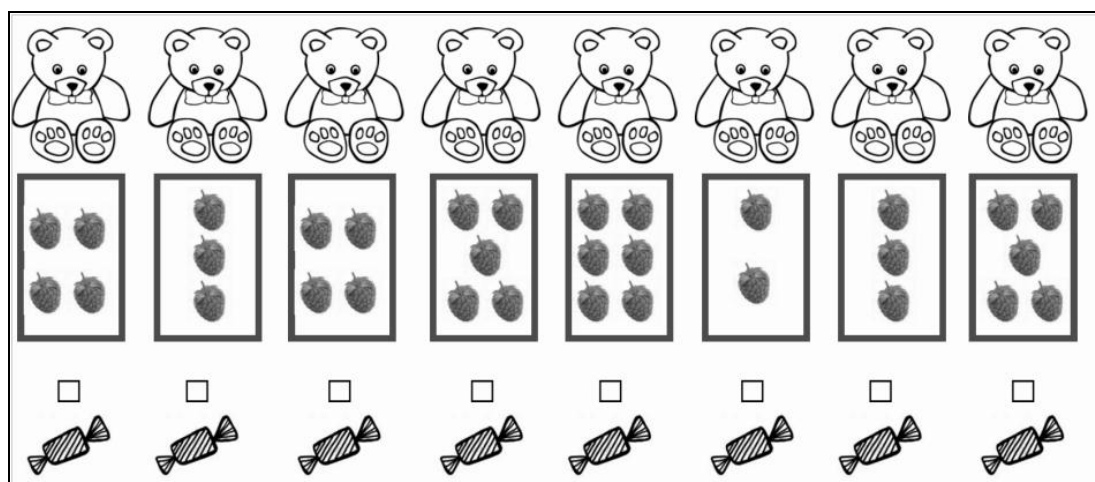
Figure 3: The test paper for adult participants

5.1.4. Results

Adults responded as predicted by the standard view (É. Kiss 2006b, 2010) which claims that the information structural role of numerals determine their interpretation. Performing a statistical analysis on the data has revealed that the rate of upper-bounded interpretations was significantly higher if the number word was focussed ($\chi^2 = 99.5$, df = 3, ***p = .0001***). In the case of the children, there was no difference in the interpretation of numerals appearing in and out of focus; they preferred the upper-bounded reading in every single trial. The type of the verb did not have a significant effect on interpretation in either age group.
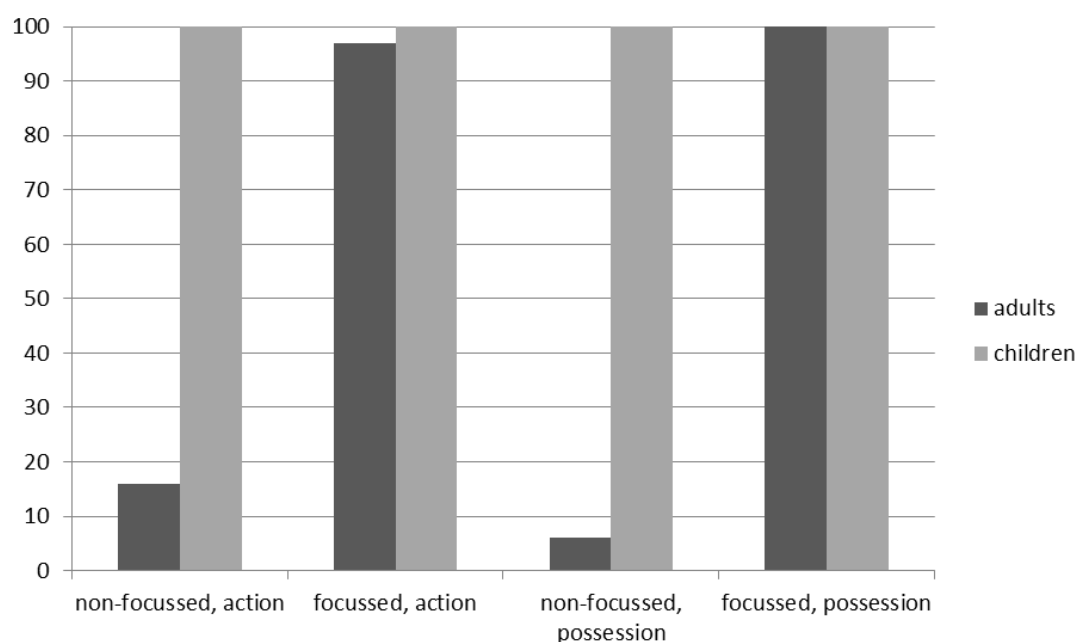
Figure 4: The rate of 'exactly n' interpretations in Experiment 1

One way of interpreting the result is that children's interpretation of numerals is unaffected by the information structure of the sentence, which is marked by syntactic means in Hungarian. Since they strongly prefer the upper-bounded reading of numerals, one could suggest that this is the default meaning. These findings also cast doubts on the claims that numerals receive an upper-bounded interpretation in focus position as a result of exhaustive identification, given that children have been shown not to be sensitive to exhaustivity. However, the question remains open as to whether the 'at least' reading is not available at all, or it is available but simply needs more pragmatic support. To test this latter assumption, we carried out two follow-up experiments. Our aim was to create a context that is biased toward the 'at least' interpretation in order to check whether this reading can be elicited by manipulating the pragmatic environment.

5. 2. Experiment 2
5.2.1. Participants

18 Hungarian speaking children participated in this experiment (9 girls and 9 boys, mean age 5;6 years). They were recruited from the same group tested in the first experiment. This time

we did not have an adult control group since the results of Experiment 1 confirmed that adults can assign both readings to numerically modified expressions.

5.2.2. Materials and Procedure

In addition to providing pragmatic support for the 'at least' reading of the numeral, we tried to make children more motivated by involving them in some sort of competition. We arranged a game that had two participants, the child and Hedgehog (a puppet acted by one of the experimenters). The children had a pile of cards in front of them depicting different objects, e.g. flowers and butterflies. Their task was to sort the cards, grouping together those that pictured the same object, i.e. all the cards with flowers or all the cards with butterflies. The number of cards of the two types was carefully arranged in advance, so after finishing sorting out the cards the child ended up having two more cards than the puppet (e.g. child: 6 cards, Hedgehog: 4 cards; *Figure 5*).
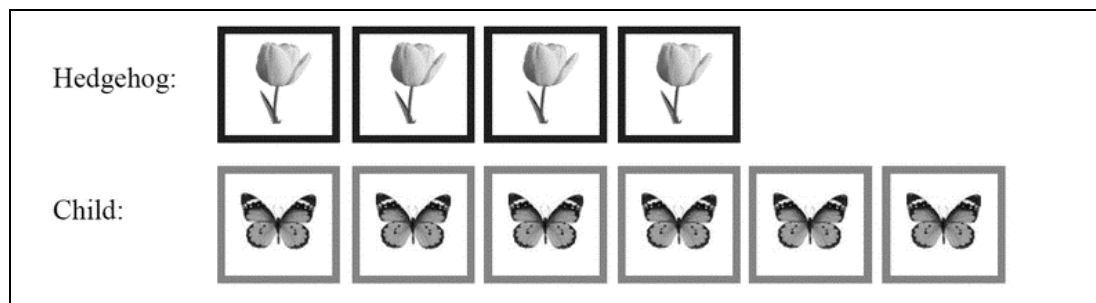
Figure 5: Critical trial in Experiment 2

The experimenter then put a number of balloons on the table and told the child the terms of getting one of them (19).

(19) Elvehet   egy lufit   az,   akinek   van   öt   kártyája.
     PRT.can get   a   balloon.ACC   that   who.DAT   is   five   card.POSS
     'If anybody has five cards, he or she can take a balloon.'

Crucially, in (19) – which was actually the test sentence – the numeral appears out of focus so it is compatible with both the 'at least' and 'exactly' readings. The test trials could have two outcomes: if the child interpreted the numeral as 'at least *n*', she took a balloon; if not, neither the child nor Hedgehog took a balloon. In the filler trials either the child or Hedgehog had exactly as many cards as mentioned in the test sentence (but not more); this meant that either the child or Hedgehog took a balloon. Both the test trials and the filler trials were repeated twice, with different cards and number settings. The winner of the game was the participant who had the most balloons in the end. However, owing to the equal number of test trials and filler trials the game ended either with the child winning or with a draw. During the experiment we recorded how many times the child took a balloon indicating that she interpreted the numeral as 'at least *n*'.

5.2.3. Results

Only 28% of the children took a balloon in the test trials (i.e. when they had more cards than mentioned in the test sentence) and out of them only 11% did consistently so, i.e. they took a balloon on both occasions. Most of them (72%) took a balloon only in the filler trials, i.e. when they had exactly as many cards as mentioned previously (see Figure 6).
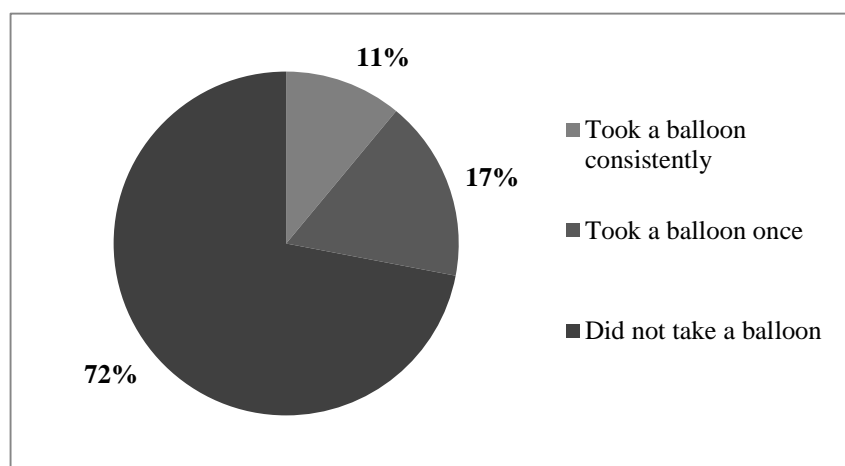
Figure 6: Results of Experiment 2

Children who refused to take the balloon gave the following explanations: *"I don't have five", "I have only* (!) *six", "If this one was not here, I could have a balloon"* (while he was covering one of his cards with his hand).

So it seems that the lower-bounded interpretation of numerals cannot be easily elicited even if the context clearly supports it. These results are in line with Musolino's (2004) findings in an experiment he carried out with English speaking children using the Truth Value Judgment paradigm.[3] It is important to mention, however, that in the same study Musolino (2004) reports on another experiment in which he managed to elicit the lower-bounded interpretation at a considerably high rate (about 80%). He developed stories in which one of the characters (Goofy) needed to borrow or obtain a specific number of items (i.e. two cookies) from another character (the Troll), who owned more than the required number. Musolino (2004: 22) suggests (referring to Kadmon 2001) that in situations such as this, the lower-bounded reading of the numeral is the most felicitous one since in terms of Goofy's needs it is irrelevant whether the Troll has exactly two or more than two cookies. In our third experiment we wanted to test if using a similar context would make the 'at least' reading more accessible to Hungarian children.

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[3] In this experiment Musolino used numerals to describe the performance of a character involved in a game or a competitive activity. For example the child was told that *the Troll had to put two hoops on the pole to win* and then she had to decide whether the Troll actually won the game in a situation where there were four hoops on the pole. The majority of the children (about 75%) answered 'no', highlighting the fact that the Troll did not put two hoops on the pole, he in fact put four on it.

5. 3. Experiment 3
5.3.1. Participants

This time 17 children (9 girls and 8 boys, mean age 5;7 years) participated in the experiment. They were recruited from the same group as in the first experiment. There was no adult control group.

5.3.2. Materials and Procedure

In the experiment children were told short stories about Hedgehog, who was involved in some kind of activity and needed a certain amount of items to do so, e.g. she was baking a pie and she needed four more apples to be able to finish it. Hedgehog's friends (three other puppets) were also present, and each of them had a certain number of the items Hedgehog needed in front of them. In the critical trials one of them had more relevant items than Hedgehog needed, e.g. 2 apples, 3 apples and 5 apples, respectively; see Figure 7.
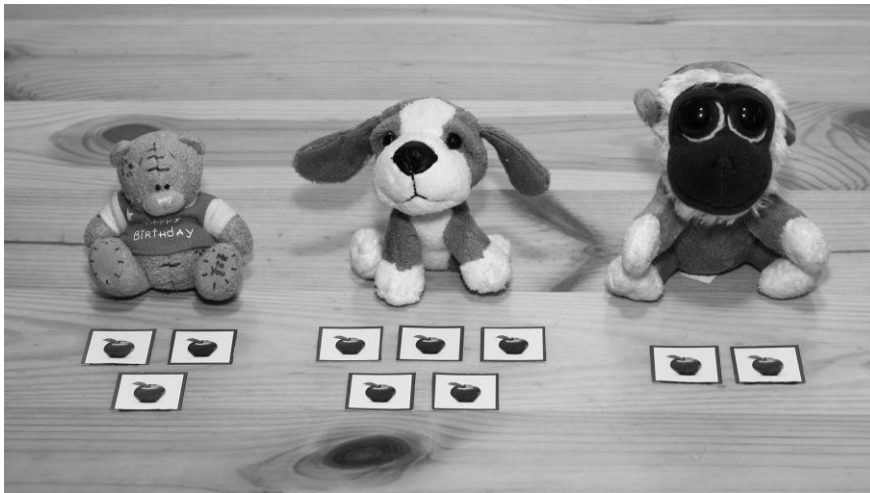
Figure 7: Critical trial in Experiment 3

The experimenter then asked the child whether there was anyone who had the number of items that Hedgehog needed (20).

(20) Van   valaki,   akinek   van   négy almája?
      is   someone   who-DAT has   four apple-POSS
      'Is there anyone, who has four apples?'

Again, in (20) – which was actually the test sentence – the numeral appeared out of focus so in theory it was compatible with both the upper-bounded and lower-bounded interpretation of the numeral. There were four critical trials and six filler trials presented in a pseudo-randomized order. In the filler trials either none of Hedgehog's friends had the required number of items or no numbers were involved at all (e.g. Hedgehog needed a bicycle, which her friends didn't possess). In the experiment we recorded the number of 'yes' responses in the critical trials, which indicated that the child interpreted the number word as 'at least *n*'.

5.3.3. Results

The results we obtained did not differ much from the results of Experiment 2. Only 23% of the participants answered 'yes' consistently to the experimenter's question, pointing at the puppet who had at least as many items as Hedgehog needed. The majority of the children (65%) did not think at all there was anyone who had as many items as Hedgehog needed (Figure 8). The 'no' answer was often justified by the explanation that "*I can see only three and five, not four*".
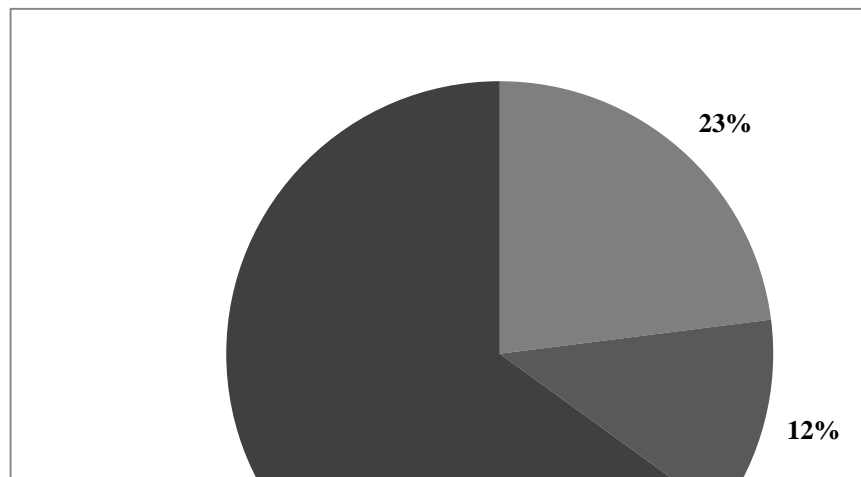
Figure 8: Results of Experiment 3

As the results show, the number of 'exactly n' interpretations has slightly increased compared to Experiment 2, but we did not manage to evoke such a robust effect as Musolino (2004) did. It is not clear whether this is due to the flaws of the experimental design or whether it is more closely connected to the fact that in Hungarian there is a very common competing structure, namely where the numeral appears in focus position (21).

(21) Van   valaki,   akinek   [négy almája]$_{Foc}$ van?
     is   someone   who-DAT   four apple-POSS   has
     'Is there anyone, who has FOUR APPLES?'

In (21) the numeral cannot be interpreted as *at least four* – either because of the exhaustivity feature of focus, as suggested by the standard analysis but disconfirmed in Experiment 1, or for other reasons. The presence of this alternative structure in children's grammar might create interferences that block the availability of the lower-bounded interpretation of numerals in other positions.

6. Discussion

Experiment 1 tested if Hungarian children can differentiate between the lower-bounded ('at least *n*') and upper-bounded ('exactly *n*') readings of numerals and, if they can, whether it is indeed the information structure of the sentence that determines the interpretation. We presumed that if the default meaning of numerals is 'at least *n*' and children are not sensitive to the exhaustive feature of Hungarian pre-verbal focus (which is claimed to be responsible

for the 'exactly' interpretation, as e.g. É. Kiss 2010 argues), then it must be the 'at least *n*' reading they can more easily access. The results we obtained, however, disproved this hypothesis: children always preferred the 'exactly *n*' interpretation, i.e. in both the situations corresponding to (1a) and (1b), they rewarded only those bears who had exactly *n* raspberries. This, in itself, does not exclude the possibility that the lower-bounded interpretation is also available to them; it might well be the case that it is elicited by pragmatic factors which simply did not occur in the first experiment. Nevertheless, it has been confirmed that information structure (indicated also by word order in Hungarian) has no effect on how children interpret numerals. While in the case of adults there was a significant difference between the interpretation of numerals appearing in and out of focus, in the case of children no such difference could be detected.

In experiment 1 we also tested if using a possession verb (*who has three strawberries*) instead of an activity (*who picked three strawberries*) has some effect on the interpretation. In Hungarian, possession is expressed by an existential structure involving the verb *van* 'be'. In this case it is explicitly marked that the numeral is in the scope of an existential quantifier and therefore the assertion concerns the existence of a set of *n* elements. Since the truth conditions of this existential statement are unaffected by whether there are exactly three or more than three strawberries, we presumed that in the case of non-focussed numerals the verb *van* 'be' would make the 'at least' reading more accessible. We found, however, that, irrespective of the type of the verb, children preferred the 'exactly' reading virtually without exception.

In experiments 2 and 3 we tested whether the lower-bounded reading of numerals can be elicited by manipulating the pragmatic environment. We tried to create a context that provides better support for the 'at least' interpretation and motivates children to make pragmatic inferences. We found, however, that making pragmatic cues more salient yielded no difference compared to the results of experiment 1: the majority of the children preferred the 'exactly' interpretation, suggesting that the lower-bounded reading is indeed not available to them.

When it comes to the question of how our findings contribute to the discussion concerning the default meaning of numerals, the answer is rather complex. On the one hand, the results we obtained are in favour of the view that the default meaning of numerals is 'exactly *n*'. As we saw, children interpret non-focussed numbers as 'exactly *n*' to the same extent as numbers appearing in focus position. If, however, the upper-bounded meaning is not a consequence of the identificational mechanism associated with Hungarian pre-verbal focus, then it is plausible to assume that this meaning is actually not derived, but is rather the default.

On the other hand, children's behaviour can be explained in several other ways. One possibility is that they misunderstood the task and thought that they were being tested on their counting. Therefore they simply looked for the sets that matched the number word uttered and once they found it, they did not bother considering the actual meaning of that number word. This might have been the case in experiment 1, but in experiment 2 it was clear that the goal of the game was to collect balloons and not to demonstrate how good they were at counting. So the fact that the majority of the children failed to interpret the numeral as 'at least five' strongly suggests that this reading is indeed not available to them at this age.

Another possibility is that at this age children are not able to decompose sets into smaller subsets, which is a prerequisite to the comprehension of the 'at least' meaning component. This means that they treat the set of, for example, three raspberries as an atomic unit and they do not access its elements through the set. This would be in line with Pica & Lecomte's (2008) claims based on their investigations of the Amazonian Munduruku tribe. It has been observed that the Munduruku lack consistent use of numbers beyond five and, perhaps as a

consequence, Munduruku speakers perform quite poorly on numerical tasks. For example, they have difficulty in precisely repeating more than three knocks, or to pick a number of nuts matching the number of nuts already present. In Pica's account these difficulties can be attributed to the fact that the Munduruku cannot decompose a set into subsets, which he claims to be an intermediate stage of numerical cognition. It is possible that children, similarly to the Munduruku, are at this stage and hence why they cannot assign non-exact interpretations to numerals.

The results raise some further questions. Assuming that the 'at least' reading of numerals is available to children as well, it is not clear why their behaviour is different from that of adults. In other words, what kind of changes occur in the course of language acquisition as a result of which the interpretation of numerals becomes a function of information structure? Furthermore, if the default meaning of numerals is 'exactly *n*', what consequences will this have for the analysis of Hungarian pre-verbal focus? If the default meaning were indeed 'exactly *n*', what we need to account for is not how the 'exactly' reading arises in focus position, but rather how the 'at least' reading can be derived in all other positions. If we accept the proposal of the alternative approach, namely that the upper-bounded reading arises as a result of existential closure, it remains to be explained why this transformation is not possible if the numeral is focussed. Answers to these questions can be hoped to be obtained in future research studies.

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(Backward) Control and Clitic Climbing
On the Deficiency of Non-finite Domains in Spanish and Catalan

Peter Herbeck

This paper investigates the interaction between two phenomena related to the transparency status of nonfinite complements in Spanish and Catalan: *Clitic Climbing*, which has been taken as a test for restructuring, and *Backward Control*, which has been interpreted as empirical evidence for the application of subject raising in control configurations. I will show (i) that the partial overlap between the two phenomena indicates that *Backward Control* is only apparent, being the side effect of verbal complex formation (Ordóñez 2009) and (ii) that there are basically three types of control infinitives with respect to transparency phenomena.

1.   Introduction

This work examines the interaction between two extraction phenomena in Spanish and Catalan, which pose challenges to the theoretical conception of non-finite complementation in current literature. Polinsky & Potsdam (2002, 2006) observe that DP subjects may appear inside complement control infinitives in some languages if the matrix controller remains empty – the so-called phenomenon of *Backward Control* (BC). Alexiadou *et al*. (2010) claim that this possibility also exists in Spanish:

(1)   (Juan) aprendió   a tocar   (Juan) guitarra (Juan).[1]
          Juan learn.PAST.3SG to play.INF Juan   guitar   Juan
          'John learned to play the guitar.'   (Alexiadou et al. 2010:114)

In a PRO-based analysis of control (Chomsky 1981; Landau 2000, 2004), the possibility of a DP subject inside a control infinitive is problematic given that the non-finite subject position should be obligatorily empty. In the *Movement Theory of Control* (Hornstein 1999; Boeckx et al. 2010), BC can be analyzed as DP raising and pronunciation of a lower copy:

(2)   ~~Juan~~ aprendió   [a tocar   **Juan** guitarra].
          Juan learn.PAST.3SG to play.INF Juan   guitar

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[1] Glossing in this paper is as follows: 1, 2, 3 – person; ACC – accusative; CL – clitic; DAT – dative; F – feminine gender; FUT – future; GER – gerund; IMP – imperfect; INF – infinitive; M – masculine gender; P – preposition; PRT – participle; PAST – past tense; PL – plural; PRES – present tense; SG – singular; SUBJ – subjunctive. The glossing and translation of several cited examples have been modified or added to make them fit the layout of this paper.

Building on Ordóñez (2009), I would like to show that two crucial arguments in favor of a movement analysis of BC are not valid in Spanish: first, according to Alexiadou et al. (2010), the possibility of objects (*guitarra* 'guitar' in (2)) and VP-modifiers following the subject shows that the latter is truly inside the embedded clause. Second, for Greek and Romanian, the authors claim that *all* obligatory control verbs exhibit BC. However, for some Spanish speakers, the verbs allowing BC correlate with those allowing restructuring to a wide extent:

(3)   (Lo)   aprendí   a   hacer   (lo).
         CL.3SG.ACC learn.PAST.1SG to make.INF CL.3SG.ACC
         'I learned to do *it*.'

The possibility of *Clitic Climbing* (CC) with *aprender* 'learn' shows that this verb is a restructuring predicate. Thus, as Ordóñez (2009) suggests, BC has an alternative derivation in terms of verbal complex formation (see also Gallego 2011):

(4)   a.   Non-restructured infinitive:
                 Ayer   quería   Juan [hacer   los deberes].
                 yesterday   want.IMP.3SG Juan make.INF the homework
         b.   Restructured infinitive:
                 Ayer   quería-hacer$_i$ Juan [hacer$_i$ los deberes].
                 yesterday   wanted-make   Juan   the homework
                 'Yesterday Juan wanted to do his homework.'

Verbal complex formation has been analyzed either as involving incorporation and head movement (Baker 1988; Kayne 1989; Grewendorf & Sabel 1994; Roberts 1997; among others) or XP remnant movement (Koopman & Szabolcsi 2000; Hinterhölzl 2006; Ordóñez 2009, 2011). Comparing the phenomena of *Backward Control* and *Clitic Climbing* in Spanish, I will show that these two theoretical proposals do not exclude each other but might exist as competing strategies of verbal complex formation: while incorporation yields a fully transparent configuration (allowing CC and BC), remnant movement applies when 'semi-transparent' effects arise (BC but not CC). The latter operation will crucially account for instances of *apparent* BC that exhibit non-restructuring properties. Since remnant movement necessitates prior application of scrambling, one prediction is that those languages that do not allow word order permutations by means of scrambling exhibit a lower degree of apparent BC phenomena. Interesting observations can be made here by comparing Spanish with Catalan.

   This paper is structured as follows: first, I will discuss the partial correlation between *Clitic Climbing* and *Backward Control* in Spanish, which yields the traditionally established dichotomy between restructuring and non-restructuring configurations. Thereafter, I will show that there seems to be a third class of control infinitives, which is non-restructuring but allows for certain degrees of transparency. Section 3 discusses locality conditions on CC and BC. It will be argued that different locality conditions on both phenomena reflect two strategies of verbal complex formation in terms of head and XP movement. In section 4, I turn to a comparison of the Spanish data with the closely related language Catalan. The last section discusses some problems and open issues regarding the interaction of CC and BC, given the existence of speaker variation with respect to the acceptability of both phenomena.

2. How diverse is non-finite complementation?
2.1. Two types of control complements? Evidence from Spanish

In Spanish, *Clitic Climbing* (CC) has been taken as a test for the application of restructuring (see Rizzi 1982; Aissen & Perlmutter 1983; for early analyses):[2]

(5)   a.   Juan quiere   hacer   los deberes.
            Juan want.PRES.3SG make.INF the homework
            'Juan wants to do his homework.'
    b.   Quiere   hacerlos.
            want.PRES.3SG make.INF-CL.3PL.ACC
    c.   Los   quiere   hacer.
            CL.3PL.ACC want.PRES.3SG make.INF
            '(He/she) wants to do it.'

As (5) shows, the direct object clitic of the embedded predicate can either appear inside the embedded clause or it can 'climb up' into the matrix clause. As has been frequently pointed out (see e.g. Luján 1980 for Spanish), not all matrix verbs license this alternation:

(6)   a.   Juan odia   hacer   los deberes.
            Juan hate.PRES.3SG   make.INF the homework
            'Juan hates to do his homework.'
    b.   Odia   hacerlos.
            hate.PRES.3SG   make.INF-CL.3PL.ACC
    c.   *?Los   odia   hacer.
            CL.3PL.ACC hate.PRES.3SG   make.INF
            '(He/she) hates to do it.'

A similar observation seems to hold for the possibility of apparent *Backward Control* (BC). While restructuring predicates like *deber* 'shall' or *querer* 'want' allow their subject to appear inside the matrix clause (*Forward Control* (FC)) or the embedded clause (BC), BC is degraded with the non-restructuring verb *odiar* 'hate' (see (8)) for several speakers:

(7)   Hoy (los estudiantes) no deben   leer   (los estudiantes) las novelas.
    today the students   not shall.PRES.3PL read.INF   the students   the novels
    'Today, the students shouldn't read the novels.'   (Ordóñez 2009:1)

(8)   (Pablo) odia   jugar   (*Pablo) a las cartas.   (Torrego 1998:210)
    Pablo   hate.PRES.3SG play.INF   Pablo   at the cards
    'Pablo hates playing cards.'

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[2] In finite matrix clauses, object clitics obligatorily climb to the preverbal position in Spanish:
(i)   (Los)   hago   (*los).
          CL.3PL.ACC make.PRES.1SG CL.3PL.ACC
Thus, in complementation structures involving *Clitic Climbing*, the apparently complex structure behaves like a monoclausal domain. Several authors (e.g. Picallo 1990; Cinque 2001; Wurmbrand 2003; Haider 2010) propose a base-generated monoclausal structure for restructuring configurations.

    Further tests diagnosing restructuring in Spanish include the possibility of long reflexive passive and object raising (see Aissen & Perlmutter 1983). Because of reasons of space, I limit my discussion to the interaction between *Clitic Climbing* and *Backward Control*.

These data indicate that there are two types of control complements with respect to transparency: restructuring verbs license CC as well as apparent BC while non-restructuring ones block both phenomena. Further evidence comes from verbs that take a prepositional complement (so-called *verbos de régimen*), which block CC as well as BC for most speakers (example (10) taken from Torrego 1998:210):[3]

(9)   a.   Juan { insistió   en / soñó   con} hacer   los deberes.
                Juan   insist.PAST.3SG on dream.PAST-3SG of   make.INF the homework

        b.   ?*Ayer   { insistió   en / soñó   con} hacer   Juan los
                yesterday insist.PAST.3SG on dream.PAST-3SG of   make.INF Juan the
                deberes.
                homework.
                'Yesterday, Juan insisted on / dreamt of doing his homework.'

        c.   {Insistió   en / soñó   con} hacerlos.
                insist.PAST.3SG on dream.PAST.3SGof   make.INF-CL.3PL.ACC

        d.   *?Los   { insistió   en / soñó   con} hacer.
                CL.3PL.ACC insist.PAST-3SG on dream.PAST-3SG of   make.INF
                '(He/she) insisted on / dreamt of doing it.'

(10)   a.   Se queja   de trabajar (*la familia) demasiado.[4]
                SE complain.PRES.3SG of work.INF the family too.much

        b.   Se (*lo)   queja   de hacer(lo).
                SE   CL.3SG.ACC complain.PRES.3SG of make.INF-CL.3SG.ACC
                '(He/she) complains about doing it.'

At first sight, these data suggest that both phenomena – CC as well as BC – are a side-effect of restructuring and, thus, BC is not necessarily tied to control as raising in Spanish:

(11)   BC-CC correlation:
         Apparent Backward Control is a side-effect of restructuring in Spanish.

As we have seen in (4), if BC is a side-effect of restructuring, the possibility arises that the DP subject appearing inside the embedded control infinitive is in fact a syntactic matrix subject, which remains *in situ*. As Contreras (1991), Zubizarreta (1998) and Ordóñez (1998) note, subjects may check/value nominative Case in their base position Spec,*v* and, hence, verbal

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[3] It has to be noted that most speakers generally prefer FC in direct comparison with BC. However, within the latter configuration, speakers seem to detect degrees of acceptability depending on the matrix verb. For example, out of 8 speakers that I consulted, BC with *insistir en* 'insist' and *soñar con* 'to dream' is only accepted by 2.5, with *deber* 'shall' by 8 and with *querer* 'want' by 6.5 speakers. BC with *odiar* 'hate' was accepted by 2 out of 8. Thus, the *-marking does not indicate absolute ungrammaticality, given that some speakers accept BC even with verbs like *insistir*. Although there is speaker variation, there seems to be a *tendency* towards rejecting BC with these non-restructuring verbs.

[4] Torrego (1998:210) gives the translation "S/he complains about (her family) working too much" for the ungrammatical sentence in (10a). According to a native speaker, the sentence is also degraded with a BC interpretation and sounds worse than a comparable sentence with a restructuring verb:

(i)   ? No quería   trabajar la familia demasiado.
           not want.IMP.3SG work.INF the family too.much
           'The family didn't want to work too much.'

complex formation has the consequence of leaving the syntactic matrix subject inside the infinitive in the linear order:[5]

(12) [$_{TP}$ Ayer T$_{[Nom]}$-[quería-hacer] [$_{vP}$ Juan [~~quería~~ ~~hacer~~] ... [~~hacer~~ los deberes]]]

If BC is the result of verbal complex formation, the question arises of whether it is a consequence of head movement (incorporation), as proposed with different implementations by Baker (1988); Kayne (1989); Grewendorf & Sabel (1994); Roberts (1997), among others, or of remnant movement (Koopman & Szabolcsi 2000; Hinterhölzl 2006; Ordóñez 2009, 2011).

In the next section, I will discuss some problematic data for the hypothesis in (11), namely, the existence of a group of verbs that does not allow CC and, hence, is non-restructuring but which nevertheless allows BC. I will take this as evidence that incorporation and vP remnant movement are competing processes to derive verbal complexes.

2.2. *A three-way transparency of control complements*

There is a class of verbs in Spanish that allows BC but is not of the typical restructuring class (i.e. modals and aspectuals). In (13) and (14), the verbs *decidir* 'decide' and *prometer* 'promise' allow BC for some speakers:[6]

(13) ?Ayer   decidió   hacer   Juan un viaje a Venecia.
        yesterday decide.PAST.3SG make.INF Juan a trip to Venice
        'Yesterday Juan decided to travel to Venice.'

(14) ?Ayer   prometió   limpiar Juan la casa.[7]
        yesterday promise.PAST.3SG clean.INF Juan the home
        'Yesterday Juan promised to clean the flat.'

The verbs in (13) and (14), however, are not typical restructuring verbs as can be observed in the ungrammaticality, or at least marginality, of CC:

(15) *?Te   lo   { decidí   / prometí}   dar.[8]
        CL.2SG.DAT   CL.3SG.ACC   decide.PAST.1SG/ promise.PAST.1SG give.INF
        'I decided/promised to give *it to you*.'

The discrepancy between CC and BC with certain control verbs indicates that we are not dealing with a pure dichotomy between 'triggering' and 'non-triggering' verbs (as in Aissen

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[5] See Ordóñez (2009) for a vast array of evidence in favor of a verbal complex analysis of BC.

[6] BC with *decidir* was accepted by 6,5 and with *prometer* by 6 out of 8 speakers that I consulted.

[7] In Ordóñez (2009), we can find the following BC structure with *prometer*:

(i) Prometió   darles   el jurado la libertad a los prisioneros.
      promise.PAST.3SG give.INF-CL.3PL.DAT the jury the liberty to the prisoners
      'The jury promised to give liberty to the prisoners.'

[8] Several speakers accept CC with an accusative clitic.

(i) Lo   prometí   hacer. (García Fernández (2006:15), attributed to Ignacio Bosque)
      CL.3SG.ACC promise.PAST.1SG make.INF
      'I promised to do it.'

However, adding a dative clitic seems to render the structure unacceptable.

& Perlmutter 1983). There is a class of semi-transparent infinitives which allow certain degrees of extraction but are not of the typical restructuring class:[9]

(16)   Three types of complement infinitives:

    'Triggering'   > **'Semi-triggering'**   > 'Non-triggering'

       ↓   ↓   ↓

   [+CC]/[+BC]   >   [-CC]/[+BC]   >   [-CC]/[-BC]
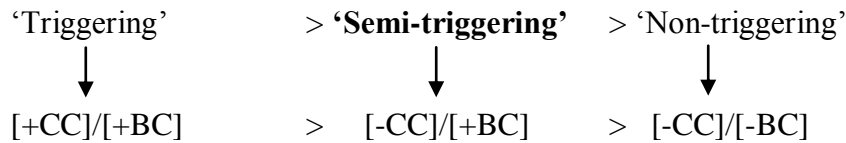
Independent evidence for such a three-way distinction can be found in Costa's (2004) work on European Portuguese (EP): in (17), it can be seen that CC is not possible with *decidir* in EP. Sentence (18), on the other hand, shows that this verb allows adverbs to climb:

(17)   Não   (*o)   decidi   convidá (-lo).   (Barbosa 2009:104)
          not   CL.3SG.ACC decide.PAST.1SG invite.INF-CL.3SG.ACC
          '(I) didn't decide to invite *him*.'

(18)   a.   Eu só   **lá** { quero   / posso}   ir   nesse dia.
              I   only there want.PRES.1SG can.PRES.1SG go.INF this   day
              'I want to/can go only *there* that day.'   (Costa 2004:47)
        b.   Eu só   **lá** { decidi   / prometi}   ir   nesse dia.
              I   only there decide.PAST.1SG promise.PAST.1SG go.INF this   day
              'I want to/can go only *there* that day.'   (*ibid*.)

Importantly, Costa (2004) shows that verbs of this class allow full DP subjects to appear inside the embedded infinitive in EP (sentence (19) from *ibid*. 44 and (19) from *ibid*. 47):

(19)   a.   {Querem   / decidiram}   ler   todos os alunos   esse livro.
              want.PRES.3PL decide.PAST.3PL read.INF all   the students this   book
              'All the students want/decided to read this book.'
        b.   *Recusaram   ler   todos os alunos   esse livro.
              refuse.PAST.3PL read.INF all   the students this   book
              'All the students refused to read this book.'

Note furthermore that the verbs belonging to the 'semi-triggering' class pattern quite similarly to raising verbs in blocking CC (see (20)) but allowing DPs to appear inside the infinitive in Spanish (see (21)):

(20)   *La   parecía   querer. (Bosque & Gutiérrez-Rexach 2009:680)
          CL.3SG.F.ACC   seem.IMP.3SG/1SG love.INF
          '(He/she/I) seemed to love *her*.'

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[9] See also Wurmbrand (2003) for German. Note that the exact classification of a particular verb as 'triggering', 'semi-triggering' or 'non-triggering' is subject to degrees of speaker variation. This point has been made in the context of *Clitic Climbing* by Aissen & Perlmutter (1983). In the case of apparent BC, there is similar speaker variation.

(21) ?Ayer   parecía   estar   haciendo Juan los deberes.[10]
      yesterday   seem.IMP.3SG   be.INF make.GER Juan the homework
      'Yesterday Juan seemed to be doing his homework.'

However, this parallel does not necessarily imply a raising analysis of apparent BC phenomena in Spanish. Szabolcsi (2009) claims that R-expressions inside control infinitives have different scope properties from those appearing inside raising configurations:

(22) No quiere   ir   sólo Juan a la   escuela.   (Szabolcsi 2009:32)
      not want.PRES.3SG go.INF only Juan to the school
      ✓ Reading 1: Only Juan doesn't want to go to school.
      * Reading 2: He$_i$ doesn't want it to be the case that only Juan$_i$ goes to school.

(23) No parece   cantar sólo Juan en este cassette.   (*ibid.* 33)
      not seem.PRES.3SG sing.INF only Juan in this tape
      ✓ Reading 2: It doesn't seem to be the case that only Juan is singing on this tape.

Out of the group of 'semi-triggering' verbs, *olvidar* 'forget' patterns with control and not with raising verbs with respect to scope relations:[11]

(24) Ayer   olvidó   hacer   sólo Juan los deberes.
      yesterday   forget.PAST.3SG make.INF only Juan the homework
      ✓ Reading 1: Only Juan forgot to do his homework.
      * Reading 2: He$_i$ forgot that only Juan$_i$ did/should do his homework.

If an R-expression inside the infinitive is associated with an operator, the nominal expression can only have matrix scope in control (reading 1) while, in raising, it can have an embedded scope interpretation (reading 2). This indicates that, although a DP subject may appear inside an embedded infinitive in the linear order, it is not necessarily a syntactic and semantic subject of the embedded event in all configurations. If this line of reasoning is on the right track, we have to account for why certain semi-triggering control verbs allow their thematic subject to appear inside their complement in the linear order although restructuring is blocked.

2.3. A short note: is there a four-way complementation?

Apart from the three types of verbs discussed until now, there even seems to be a fourth type, which allows restructuring but blocks apparent BC. This is the case with object control triggering verbs such as *permitir* 'allow':

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[10] Interestingly, some speakers report to me that the sentence sounds worse without the auxiliary inside the complement infinitive, which recalls Aux-to-Comp (Rizzi 1982) effects:
(i)   ??Ayer   parecía   hacer   Juan los deberes.
       yesterday   seem.IMP.3SG   make.INF Juan the   homework
       'Yesterday John seemed to do his homework.'
[11] Scope properties are less clear with constructions involving *decidir* and *prometer*, at least for the speakers that I consulted. Barbosa (2010:1) claims that configurations with *decidir* and an R-expression inside the infinitive (see (i.a)) do not allow the reading (i.b) in European Portuguese:
(i)   a. Decidiu   ir   o João   ao   mercado.
          decide.PAST.3SG go.INF the João to.the   market
       b. *'He$_i$ decided for it to be the case that João$_i$ goes to the market.'

(25) Le   permito   (a Juan) hacer   (*Juan) los deberes.
      CL.3SG.DAT permit.PRES.1SG to Juan make.INF Juan the homework
      'I allow Juan to do his homework.'

Although a nominative subject inside the infinitive is blocked in (25), the indirect object of *permitir* can appear inside the infinitive if it is introduced by a Case-marking preposition (see (26)[12]). Importantly, *permitir* also allows CC (see (27)).

(26) Le   permito   (a Juan) hacer   (a Juan) los deberes   (a Juan).
      CL.3SG.DAT permit.PRES.1SG to Juan make.INF to Juan the homework to Juan
      'I allow Juan to do his homework.'

(27) Me (la)   permitió   tocar(la).
      me CL-3SG.F.ACC permit.PAST.3SG touch.INF-CL.3SG.F.ACC
      '(He) allowed me to touch *it*.'   (Luján 1980: 386)

This shows that verbal complex formation has taken place; BC, however, is impossible (compare (28) with (4)):

(28) Le   permito-hacer a Juan [~~hacer~~, los deberes].
      CL.3SG.DAT permit-make to Juan make.INF the homework

The interaction between CC and BC thus yields the following four categories:

(29) a. 'triggering' subject → [+CC]; [+BC] (*deber* 'shall', *querer* 'want'…)
      b. 'triggering' object   → [+CC]; [-BC] (*permitir* 'allow' …)
      c. 'semi-triggering'   → [-CC]; [+BC] (*decidir* 'decide', *prometer* 'promise'…)
      d. 'non-triggering'   → [-CC]; [-BC] (*odiar* 'hate', *insistir* 'insist'…)

In the case of (29) and (29), the difference with respect to the possibility of BC seems to lie in Case: if the clitic and DP are initially merged in a big DP (e.g. Uriagereka 1995), they must match in Case, making apparent BC with a nominative subject impossible in (25).[13] What the existence of (26) reinforces is Ordóñez's (2009) idea that verbal complex formation is responsible for several configurations in which a DP appears inside an infinitive in the linear order.[14] However, the existence of 'semi-transparent' infinitives also indicates that the source of transparency might not be the same in all configurations. What I will argue is that transparency effects mainly derive from two different strategies of verbal complex formation: incorporation/head movement and remnant (XP) movement.

    In the next section, I will take a closer look at the encoding of locality constraints on CC and apparent BC.

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[12] Thanks to Adriana Fasanella.

[13] Note that the impossibility of BC with object control verbs is not self-evident as this phenomenon exists e.g. in Korean (see Polinsky & Potsdam 2006 for discussion).

[14] The following example from Ordóñez (2009), in which a matrix direct object appears inside the infinitive in the linear order, indicates that there are also 'semi-triggering object control' verbs:
(i)   Obligaron   a firmar   **a Bush** los acuerdos   de paz.   (Ordóñez 2009:5)
      Oblige.PAST.3PL to sign.INF to Bush the agreements of peace

3.   *Locality conditions on CC and apparent BC*

Let us assume that restructuring is tied to a process of verb incorporation (see e.g. Baker 1988; Grewendorf & Sabel 1994; Roberts 1997). While incorporation has been claimed to be covert in some languages (e.g. German; see Grewendorf & Sabel 1994; Sabel 1995), let us assume that it can have PF effects in Spanish:[15]

(30)   Quería-hacer Juan [hacer̶   los deberes].   ([V-V]SO in Spanish)
         wanted-make Juan make.INF the homework

If verbal complex formation is analyzed as triggered by a formal feature (e.g. [+R] as in Sabel 1995), giving rise to incorporation (in terms of head movement), the blocking effects of negation on CC in Spanish (see (31)) follow from *Relativized Minimality* (Rizzi 1990) in that intervening Neg heads block head movement (see also Moore 1994 for discussion):[16]

(31)   a.   *Te   quisiera   <u>no</u> ver   más.
             CL.2SG want.SUBJ.IMP.1SG not see.INF more
        b.   Quisiera   <u>no</u> verte   más.
             want.SUBJ.IMP.1SG not see.INF-CL.2SG more
             'I would like not to see *you* again.'   (Luján 1980:384)

Furthermore, the ungrammaticality of CC (see Kayne 1989, Terzi 1996) with an intervening *si*-complementizer (see (32)) can be derived in a similar way. Ordóñez (2009: 4) observes comparable blocking effects for BC in Spanish (see (33), taken from Torrego 1996:115):

(32)   a.   (Lo)   sé   hacer(lo).
             CL.3SG.ACC know.PRES.1SG make.INF-CL
        b.   No (*lo)   sé   <u>si</u>   hacer(lo).
             not CL.3SG.ACC know.PRES.1SG whether make.INF-CL.3SG.ACC

(33)   No sabía   <u>si</u>   firmar (* el profesor) la   carta
        not know.IMP.3SG whether sign.INF   the professor the letter
        'He_i did not know whether the professor_i should sign the letter.'

Further blocking effects such as intervening adverbs follow from the adjacency requirement on incorporation. The following example from Luján (1980) shows that adverbs block CC in Spanish:

(34)   a.   *La   deseaba   <u>mucho</u> ver.
             CL.3SG.F.ACC wish.IMP.3SG much   see.INF
        b.   Deseaba   mucho   verla.
             wish.IMP.3SG   much   see.INF-CL.3SG.F.ACC
             'He very much wished to see *her*.'   (*ibid*. 385)

If verb incorporation can have PF effects in Spanish, we predict adjacency to hold between the finite and non-finite verbs so that intervening material causes ungrammaticality. In fact, as

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[15] See also Guasti (1997) for a discussion of overt verb incorporation in Romance causatives.
[16] See Matushansky (2006) for further discussion of locality constraints on head movement.

Luján (1980:396) observes, no material may intervene between the two verbs in a restructuring configuration, with the exception of a (prepositional) non-finite complementizer:

(35)   Lo   aprendí   a hacer.
       CL.3SG.ACC learn.PAST.1SG to make.INF
       'I learned to do it.'

At first sight, the possibility of prepositional complementizers is problematic. However, given that they are inseparable from the matrix verb if restructuring takes place (see (36)) but independent elements in the non-restructuring version (see (36)), it seems to be the case that they are ambiguous between a 'particle'-like element, which itself incorporates into the matrix verb, and a non-finite complementizer:

(36)   a.   Ha   aprendido **Juan** a hacer**lo**.
            have.3SG learn.PRT   Juan P make.INF-CL.3SG.ACC
       b. *?**Lo**   ha   aprendido **Juan** a hacer.[17]
            CL.3SG.ACC have.3SG learn.PRT   Juan P make.INF
            'Juan has learned to do it.'

(37)   a.   Aprendí [$_{FinP}$ a [$_{TP}$ T-hacerlo ...]].   (non-restructuring)
       b.   Lo aprendí-a-hacer [$_{FinP}$ a-hacer [$_{TP}$ T-hacer...]].   (restructuring)

To sum up, dealing with 'triggering' configurations in terms of verb incorporation allows us to formulate locality in terms of two factors: first, *Relativized Minimality* prohibits the intervention of heads and, second, adjacency requirements on verbal complexes prohibit the intervention of any element that does not itself incorporate into the matrix verb. In the next section, I will turn to another potential locality factor for restructuring: the phasehood status of the non-finite complement.

3.1.   When are non-finite complements phases?

If verbal complex formation is a narrow syntactic operation, we predict phasehood to be a relevant factor for the possibility of restructuring. In this section, I take a look at some factors that might lead to the phasehood status of non-finite complements.

It has been observed by Cinque (2001) that there is a considerable overlap between the restructuring vs. non-restructuring distinction, on the one hand, and the exhaustive/strict (EC) vs. partial/imperfect control (PC) distinction (Landau 2000; Wurmbrand 2003), on the other. What differentiates Landau's (2000) two classes of Obligatory Control complements is the specification for or lack of semantic [tense]: while EC complements are untensed (i.e. they are specified for anaphoric tense), PC complements are internally, semantically tensed. Consider in this context Chomsky's (2004) definition of a phase: "[...] at SEM, vP and CP (but not TP) are propositional constructions: vP has full argument structure and *CP is the minimal*

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[17] Judgment based on two informants. Note also the following examples from Ordóñez (2009):

(i)   *?Te   lo   quiere   Juan   comprar.   (Clitic Climbing)
          CL.2SG.DAT CL.3SG.ACC want.PRES.3SG Juan buy.INF
(ii)   Quiere   Juan   comprár**telo**.   (No clitic climbing)
          want.PRES.3SG Juan buy.INF-CL.2SG.DAT-CL.3SG.ACC
          'Juan wants to buy it for you.'

construction that includes tense and event structure and (at the matrix, at least) force." (Chomsky 2004:124; [my emphasis]) According to this definition, tense is a crucial factor for determining whether CP is a strong phase boundary or not. It could thus be argued that the [+tense] nature of PC infinitives renders the infinitival complement a strong phase while [-tense] EC complements are non-phasal (or weak phases). That the presence of semantic tense in the complement might be a relevant factor for the blocking of restructuring can be found in the following Italian sentences from Landau (2000:80):

(38)   a.   Gianni ha   detto   a Maria che *si* preferiva   lavare
              John   have.3SG tell.PRT to Mary that SI prefer.IMP.3SG wash.INF
              di   mattina.
              in.the   morning
              'John told Mary that he preferred to wash in the morning.'
        b.   Gianni ha   detto   a Maria che preferiva   incontrar*si*
              John   have.3SG tell.PRT to Mary that prefer.IMP.3SG meet.INF-SI
              di   mattina.
              in.the   morning
        c. * Gianni ha   detto   a Maria che *si* preferiva   incontrare
              John   have.3SG tell.PRT to Mary that SI prefer.IMP.3SG meet.INF
              di   mattina.
              in.the   morning
              'John told Mary that he preferred to meet in the morning.'

Sentence (38) shows that the verb *preferire* allows CC for some Italian speakers. The contrast between (38) and (38), however, shows that CC is not possible if *preferire* takes a PC complement.

    Wurmbrand (2003) argues that strict OC configurations are VPs while non-strict OC complements are CPs.[18] However, both assumptions are problematic: on the one hand, a full CP analysis implies that control complements have a full left peripheral activity (i.e. ForcePs should project a Focus and a Topic phrase in the sense of Rizzi 1997). In Spanish, however, Clitic Left-dislocation and Focus Fronting are blocked in OC infinitives:

(39)   ??Luis quiere,   los libros$_i$, leerlos$_i$.
          Luis want.PRES.3SG the books read.INF-CL.3PL.ACC
          'Luis wants the books to read them.'   (Gallego 2010a:147)

(40)   *Luis quiere   CERVEZA beber   (y no sidra).
         Luis want.PRES.3SG BEER   drink.INF and not cider
         'Luis wants BEER to drink (and not cider).'   (*ibid.*)

On the other hand, a reduced VP analysis of (exhaustive) control complements is problematic in the light of the existence of prepositional complementizers with several EC verbs (e.g. Catalan *provar de* 'try', etc.). If these are low complementizers, located in Fin (cf. Rizzi

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[18] Wurmbrand's (2003) classification of controlled complements is in fact more complex: she differentiates functional restructuring from lexical restructuring verbs, the latter selecting either for a VP (= restructuring) or a vP/TP (= reduced non-restructuring). Verbs selecting for a CP are non-restructuring verbs. The Spanish data discussed here support such a fine-grained subclassification, although they do not necessarily prove a correlation with truncation of functional layers.

1997), several EC complements should project at least a FinP layer (see also Haegeman 2004). The fact that these complements are [-tense], however, implies that they are not strong phases. Let us then assume the following structure for EC and PC complements:

(41)   [$_{FinP}$ Fin$_{[-tense]}$ [$_{TP}$ T$_{[-tense]}$ [$_{vP}$ PRO v [$_{VP}$ V]]]].   (EC → weak phase)

(42)   [$_{FinP}$ Fin$_{[+tense]}$ [$_{TP}$ T$_{[+tense]}$ [$_{vP}$ PRO v [$_{VP}$ V]]]].   (PC → strong phase)[19]

If verbal complex formation is triggered by a formal feature of the selecting predicate (e.g. Sabel's (1995) [+R]), the configuration in (42) blocks restructuring given that the FinP phase boundary makes a triggering relation between the matrix and the embedded V impossible.

However, apart from the [±tense] distinction of non-finite complements, there are further factors that might be responsible for blocking CC and BC: for example, in the case of verbs like *insistir*, the preposition introducing the complement is not a complementizer but a *lexical* preposition (see e.g. Luján 1980). Evidence can be found if we pronominalize the respective complement in Catalan, where the adverbial pronouns *hi* and *en* substitute PPs while accusative *ho* pronominalizes DPs or CPs/FinPs:

(43)   a.   Hi   vaig   insistir,   a fer   els deures.
              HI   PAST.1SG insist.INF, to make.INF the homework
              'I insisted on it…on doing one's homework.'
        b.   No ho   provessis   pas, d' aturar-me.   (Villalba 2002:2269)
              not it.ACC try.SUBJ.IMP.2SG NEG   of stop.INF-me
              'Don't try it…to stop me.'

Thus, in the case of *verbos de régimen*, the complement is in fact not a FinP but a PP.

A similar line of reasoning can be pursued for factive verbs. Kiparsky & Kiparsky (1971) have claimed that the complement of factive verbs is introduced by an abstract nominal expression (= *the fact*). Luján (1980: 400) shows that this group of verbs also allows their complements to be nominalized in Spanish:

(44)   Lamenta   (*el   hecho de* / *el*) conocerte.
        regret.PRES.1SG   the   fact   of the   know.INF-you
        'He regrets knowing you.'

A typical restructuring predicate like *want*, on the other hand, blocks the introduction of its complement by *el hecho de* or the determiner *el* (see Luján 1980:434):

(45)   Quería   (*el / *el hecho de) que se fueran   sin   verlo.
        want.IMP.3SG   the   the fact   of that SE go.SUB.IMP.3PL   without see.INF-him
        'He wanted the/the fact that they leave without seeing him.'

It follows from Lujan's (1980) observations that the transparency status of a non-finite complement does not necessarily depend exclusively on the [±tense] nature of Fin. However, the apparent diversity of factors leading to transparency/opacity effects can be subsumed under one factor: the phasal status of the respective non-finite complement.

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[19] Note that López (2009) assumes that FinPs can be strong phases.

(46) *'Non-triggering'*: ($\rightarrow$ phasal complements)
    a. V [$_{PP}$ P [$_{FinP}$ Fin$_{[\pm tense]}$ [$_{TP}$ T$_{[\pm tense]}$ [$_{vP}$ ...
    b. V [$_{DP}$ D [$_{FinP}$ Fin$_{[\pm tense]}$ [$_{TP}$ T$_{[\pm tense]}$ [$_{vP}$ ...
    c. V [$_{FinP}$ Fin$_{[+tense]}$ [$_{TP}$ T$_{[+tense]}$ [$_{vP}$ ...

(47) *'Triggering'*: ($\rightarrow$ non-phasal complements)
    a. V [$_{FinP}$ Fin$_{[-tense]}$ [$_{TP}$ T$_{[-tense]}$ [$_{vP}$ ...

In recent literature, DPs (see Svenonius 2004; Chomsky 2008:143) and PPs (see e.g. Gallego 2010b) have been considered to be possible phase boundaries beside the traditional vP and CP phases. Consequently, it could be assumed that nominalization (DP) or a lexical preposition (PP) turns a deficient FinP into a strong phase, blocking restructuring.

3.2. On the nature of 'semi-triggering'

In this section, I investigate the nature of 'semi-triggering' verbs which are located between the clear restructuring and non-restructuring classes with respect to transparency. I have argued, following proposals by Grewendorf & Sabel (1994) and others, that restructuring depends on verb incorporation, which optionally applies in the syntax in Spanish. This way, the observed blocking effects and the locality constraints in terms of phasehood follow from restrictions on (head) movement and the adjacency requirement on verbal complexes.

However, as we have seen, there is a group of non-restructuring verbs (which I have termed 'semi-triggering'), which allows apparent BC (see (13) and (14)). This leads us to a problem originally noted by Alexiadou et al. (2010): namely, that BC is apparently possible out of non-restructuring (biclausal) environments. However, this is not necessarily evidence in favor of the application of raising in control. Rather, it is evidence for the view that verbal complex formation can recourse to an *alternative* strategy of XP movement.

3.2.1. Verbal complex formation in terms of scrambling and remnant movement

Verbal complex formation has been argued to be the result of (remnant) phrasal movement in Hungarian and Dutch by Koopman & Szabolcsi (2000) (see also Hinterhölzl 2006 for West Germanic). In this vein, Ordóñez (2009) argues that apparent BC in Spanish is the result of XP-remnant-movement of the embedded infinitive (see also Ortega-Santos 2013). The author's analysis, however, crucially relies on the assumption that Spanish (in contrast to Catalan) has an additional position for subjects between vP and TP. According to Chomsky (1995), only functional heads that are interpretable at the C-I interface are licit during the syntactic derivation, given the *Principle of Full Interpretation*. Ordóñez's (2009) analysis leaves open the semantic import of the additional projection hosting postverbal subjects.

I would like to propose an alternative derivation[20] which maintains the merits of Ordóñez's (2009) remnant movement analysis but which makes crucial use of Contreras' (1991), Zubizarreta's (1998), and Ordóñez's (1998) hypotheses that subjects may remain *in situ* to check nominative Case in Spanish. Building on the work of Ordóñez (1998, 2000), Gallego (2010a, 2013) shows that the availability of VSO in Spanish correlates with the availability of

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[20] I refer the reader to Gallego (2011) for an alternative derivation in terms of A'-movement of the infinitive (without prior application of scrambling out of TP). Following Ordóñez (2007, 2009), also Gallego's (2011) analysis argues for an additional position for subjects in Spanish, which is absent in Catalan.

deriving VOS by means of object shift. Evidence comes from scope and binding properties which indicate that the object c-commands the subject in the VOS order:

(48)   Aquí presentó   (a) [cada niño]$_i$ su$_i$ madre.
         here introduce.PAST.3SG to   each boy(DO) his mother(S)
         'Here, his$_i$ mother introduced each boy$_i$.'   (Ordóñez 1998:319)

As (48) shows, an object quantifier can bind the subject in the VOS order. In the VSO order, however, the bound interpretation is not available:

(49)   *Aquí presentó   su$_i$ madre   (a) [cada niño]$_i$.
         here introduce. PAST.3SG his mother(S) to   each boy(DO)   (*ibid*. 318)

The difference between (48) and (49) indicates that the object c-commands the subject in the VOS, but not in the VSO, order. Thus, scrambling the object above the subject creates new binding possibilities (cf. Ordóñez 1998:320).
      If Spanish has the operation of scrambling/object shift[21] as part of its grammar, this means *a priori* that this operation can scramble objects in finite as well as non-finite clauses. For a non-finite complement, the following stage of a derivation should be licit in Spanish:

(50)   [$_{FinP}$ Fin [$_{TP}$ PRO T [$_{vP}$ los deberes$_i$ [$_{vP}$ PRO v-hacer$_j$ [$_{VP}$ ~~hacer$_j$ los deberes$_i$~~]]]]

The application of scrambling/object shift in (50) allows the remnant vP, relieved of its internal argument, to undergo verbal complex formation (see Koopman & Szabolcsi 2000; Hinterhölzl 2006; Ordóñez 2009), moving to a higher Spec of the matrix vP:

(51)   [$_{vP}$ [$_{vP}$ PRO hacer$_j$ [$_{VP}$ t$_i$ t$_j$]]$_x$ [$_{vP}$ Juan decide [$_{FinP}$ Fin [$_{TP}$ PRO T [$_{vP}$ los deberes$_i$ t$_x$]]]]]]
         → vP remnant movement

After the application of verbal complex formation, matrix T and C are merged. Finite T forces overt head movement of v-V to T (cf. Alexiadou & Anagnostopoulou 1998):

(52)   [$_{CP}$ C [$_{TP}$ Ayer T-decidió [$_{vP}$ [$_{vP}$ PRO hacer [$_{VP}$ t$_i$ ~~hacer~~]]$_x$ [$_{vP}$ Juan ~~decidió~~ [$_{FinP}$ Fin [$_{TP}$ T [$_{vP}$ los deberes$_i$ t$_x$]]]]]]]

The crucial step underlying *apparent* BC phenomena in non-restructuring contexts is, as in the case of restructuring, the formation of a verbal complex in Spanish. However, in contrast to 'pure' triggering environments, it is not verb incorporation that is at stake, but vP remnant movement, which is possible because Spanish can apply scrambling to the internal argument of the embedded predicate, leaving the remnant infinitive without its direct object. Hence, the less strict locality conditions on BC, in comparison with CC, follow from the assumption that restructuring requires lexically triggered verb incorporation while 'semi-triggering' verbs allow an *alternative* strategy of syntactically triggered vP remnant movement.

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[21] For our purposes, the classification of this operation as object shift (Gallego 2013) or scrambling (Ordóñez 1998, 2000) is not crucial.

3.3. Raising as 'semi-triggering'?

One question that arises is where raising fits into the three-way classification of 'triggering', 'semi-triggering' and 'non-triggering' verbs. This question is important given that raising verbs have been classified as being independent from control (Chomsky 1981; Landau 2000), collapsed with control (Hornstein 1999), or collapsed with restructuring (Cinque 2001).

Given their similar behavior with respect to Clitic Climbing and apparent Backward Control, it might be tempting to classify raising verbs together with 'semi-triggering' verbs in Spanish. However, as has been pointed out, Szabolcsi's (2009) scope data are evidence for the assumption that in (backward) control, we are dealing with a syntactic matrix subject while in raising, we are dealing with a subject of an embedded infinitive, even though the two configurations appear to be identical on the surface:

(53)   a.   Ayer   [quería-hacer] Juan los deberes.
            yesterday wanted-make   Juan the homework
       b.   Ayer   parecía   [estar   haciendo   Juan los deberes].
            yesterday seem.IMP.3SG   be.INF make.GER Juan the homework

I would like to argue that it is exactly this difference that holds in Spanish. In raising, the subject is merged in its thematic position inside the infinitive and undergoes long-distance nominative Case checking with finite matrix T (cf. Alexiadou et al. 2012). This derivation is not blocked by any mechanism of grammar: theta-theory is respected because matrix *parecer* does not assign a theta-role, Case theory is respected because, in Spanish, nominative can be valued *in situ*, and locality is respected since the clausal layer is truncated, raising infinitives lacking the CP layer (see e.g. Chomsky 1995). Thus, raising verbs are of the semi-triggering type with respect to the deficiency of their non-finite complement. However, differently from semi-triggering control verbs, they block derivation (53) because of the thematic properties of the configuration (cf. Chomsky's (2008) *Dual Semantics*).

The last question that has to be answered is why Clitic Climbing is blocked by raising verbs in Spanish. If raising infinitives are non-phasal complements, it is expected that restructuring should be possible.[22] However, as I have pointed out, Luján (1980) and Bosque & Gutiérrez-Rexach (2009) consider CC to be impossible with Spanish raising verbs. Thus, they cannot be analyzed as restructuring predicates in this language – an assumption that is problematic given the defective nature of the infinitival complement.

If verbal complex formation in terms of incorporation is a narrow syntactic process, it is expected to be triggered by a formal feature. Sabel (1995) assumes that it is triggered by a feature of the selecting matrix predicate (i.e. [+R]). Suñer (1980) emphasized the importance of lexical selectional restrictions for the possibility of CC. However, an approach in purely lexical semantic terms cannot account for the importance of general locality constraints (blocking effects) that affect the possibility of restructuring and apparent BC. Thus, a full picture of transparency phenomena related to non-finite complementation needs to take into account both factors:

(54)   a.   *Triggering*: $V_{[+R]}$ [non-phasal XP]
       b.   *Semi-triggering*:   V [non-phasal XP]
       c.   *Non-triggering*:   V [phasal XP]

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[22] In Italian, restructuring is possible with the raising verb *sembrare* 'seem' according to Cinque (2001).

This approach assumes that the transparency status of a non-finite complement is not exclusively a result of the truncation of functional layers (CP vs. TP vs. vP) – it is a product of the interaction between lexical selectional restrictions, phasehood properties and constraints on movement operations.

4. A view from apparent BC in Catalan

The preceding sections have argued that verbal complex formation can be of two types in languages such as Spanish: verb incorporation and vP remnant movement. The latter process requires prior application of scrambling inside the embedded infinitive, leaving the remnant vP without its internal argument. One prediction of this approach is that languages without scrambling cannot recourse to vP remnant movement to derive apparent BC phenomena.

In this context, a look at Catalan can be interesting, given that this language has been claimed to derive the VOS order not by means of scrambling/object shift (see discussions in Ordóñez 2000, 2007, 2009; López 2009; Gallego 2010, 2013) but by means of [VO]-topicalization (see Gallego 2013) or an alternative linearization strategy (see López 2009), similarly to Italian (see Belletti 2004; Zubizarreta 1998). Evidence can be found in that a bound reading between an object quantifier and the subject is not available in the VOS order in Catalan (cf. Solà 1992; Gallego 2013; cf. also Belletti 2004 for Italian; compare with (48)):

(55)   [What's up with these children? Who's going to take them home?]
        Demà   acompanyarà   cada noi la seva mare.
        tomorrow accompany.FUT.3sg every boy the his   mother
        'Tomorrow his mother will accompany every boy.'
                                                        (*bound reading; López 2009:143)

Since the object does not seem to c-command the subject in the Catalan VOS order, object scrambling has not taken place.

In fact, Ordóñez (2007, 2009) notes that Catalan allows *apparent* BC configurations to a lower extent than Spanish. Thus, the VVSO order is not possible:

(56)   *?V-VSO:
        Avui no deuen   llegir (*?els estudiants) les novel.les (els estudiants)
        today not shall.3PL read.INF the students   the novels   the students
        'Today the students shall not read the novels.'   (Ordóñez 2009: 1)

However, concluding that apparent BC is fully blocked in Catalan would be too hasty. Having a look at Solà's (2002) work on CC, we can find the following examples of subject-verb inversion where a lexical subject appears inside the embedded infinitive in the linear order:

(57)   a. Volen   venir   els cosins <u>a dinar</u>.
            want.PRES.3PL come.INF the cousins to have.lunch.INF
            'Our cousins want to come and have lunch.'   (Solà 2002:233)
        b. Hi   ha   aconseguit parlar en Joan <u>per telèfon</u>.
            with.him have.3SG manage.PRT talk.INF the John by phone
            'John managed to talk to him by phone.'   (*ibid.* 235)

    c.   Han   provat   d' entrar   lladres   <u>a la casa</u>.
         have.3PL   try.PRT   P   enter.INF   thieves   to the house
         'Thieves have tried get into the house.'   (*ibid*.)

For Catalan, as for Spanish, we could assume that verbal complex formation, rather than raising, is responsible for the surface VVSPP orders:

(58)   a.   [Volen - venir]   els cosins   a   dinar.   (✔ [V-V]SPP)
           want.3PL   come.INF the cousins   to   have.lunch.INF
      b. *? [Vol   - fer]   en Joan els deures.   (*? [V-V]SO)
           want.3SG   make.INF   the John   the homework

This way, it can be explained why the VVSO order is ruled out: Given that the VSO order has been observed to be impossible in Catalan (see Bonet 1989; Solà 1992; Vallduví 2002), in contrast to adjuncts which do not block subject verb inversion (see Solà 1992), the impossibility of apparent BC in the VVSO order but its possibility in the VVSPP order is expected if verbal complex formation is at stake:[23] in (58), the subject is syntactically inside the matrix clause during all stages of the derivation and, hence, is expected to obey the same constrains as matrix subjects:

(59) ??? Avui   farà   en Joan el   dinar.   (*?VSO; Solà 1992:11)
       today   make.FUT.3SG   the John   the lunch
       'Today John will cook the lunch.'

(60)   Ho escriurà   en Joan amb l'   ordinador .   (✔VSPP; *ibid*. 14)
       it   write.FUT.3SG the John   with   the   computer
       'John will write it with the computer.'

Further interesting evidence for a verbal complex analysis of apparent BC in Catalan comes from Solà's (2002) observation that the same opacity inducing factors that block CC also render BC unacceptable:

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[23] It is difficult to say whether the VVSPP order is grammatical with unaccusative verbs and definite DPs followed by a non-adjunct PP. Most speakers that I consulted do not accept a sentence like (i):
(i)   Vol   anar   (?? en Joan) a   Barcelona   (en Joan).
       want.PRES.3SG   go.INF   the John   to Barcelona   the John
Furthermore, the sentence improves if the PP is right-dislocated and doubled by a clitic:
(ii)   Hi vol   anar en   Joan, a   Barcelona.
       HI want.PRES.3SG go.INF the   John   to Barcelona
       'John wants to go, to Barcelona.'
In simple matrix clauses, Bonet (1989:18) claims that VSPP with a definite DP and an unaccusative verb is degraded:
(iii) ??Aquesta tarda   ha   anat   en Pep a   Reus.
       this   afternoon have.PRES.3SG go.PRT   the   Pep   to Reus
       'This afternoon, Pep has gone to Reus.'
If this reasoning is on the right track, it is *Definiteness Effects* (see Belletti 1988 for Italian) that arise in apparent BC configurations with unaccusative verbs in Catalan. However, given variation among speakers, it is difficult to make a conclusive judgment.

(61)   a.   <u>Negation</u>: (*ibid*. 234)[24]
              Voldrien   <u>no</u> haver   de venir   (* els nens) a dinar.
              want.COND.3PL not have.INF of come.INF   the kids to have.lunch.INF
              'Our children would like not to have to come and have lunch.'

        b.   <u>*'only'*-focusing</u>: (*ibid*. 236)
              Han   après   <u>només</u> a engegar-lo   (*els nens) amb
              have.3PL learn.PRT   only   to turn.on.INF-CL.3SG.ACC the kids with
              la   maneta.
              the handle
              'The children have learned only to turn it on with the handle.'

        c.   <u>Adverbial intervention</u>: (*ibid*.)
              Han   après   <u>de seguida</u> a caçar-les   (* els nens)   amb
              have.3PL learn.PRT   right away to catch.INF-CL.3PL.F.ACC   the kids   with
              una xarxa.
              a   net
              'The children have learned right away to catch them with a net.'

Furthermore, Solà (2002) shows that even in the licit BC word orders, the matrix verb must be a restructuring one in Catalan (examples from *ibid.* 233):

(62)   *Es proposen   venir   els cosins a dinar.
         SE determine.PRES.3PL come.INF the cousins to lunch.INF
         'Our cousins are determined to come and have lunch.'

(63)   *S'han   decidit   a entrar   lladres a la casa.
         SE-have.3PL decide.PRT to enter.INF thieves to the house
         'Some thieves have made their minds up to get into the house.'

Taken together, the possibility of apparent BC in Catalan seems to depend on (i) the nature of the matrix verb (restructuring vs. non-restructuring) and (ii) the nature of the constituent following the subject inside the infinitive. This state of affairs can be straightforwardly explained if restructuring involves verbal complex formation, with the consequence that the matrix *in situ* subject appears inside the infinitive in the linear order.

    The remaining question is why Catalan cannot recourse to an alternative XP movement strategy (vP remnant movement) to 'rescue' the VVSO order. The answer must lie in the absence of object scrambling to derive VOS: If remnant vP movement depends on prior application of scrambling, this derivation should be impossible in Catalan:

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[24] A reviewer raises the question of whether these blocking effects also hold in structures without the modal 'haver'. The following sentences from Solà (2002:235) demonstrate that also non-periphrastic tense/aspect exhibits blocking effects with negation (see *ibid.* for further examples):

(i)   a.   No ho gosa   dir   (ningú) al   director.
              not it dare.PRES.3SG say.INF nobody to.the director
              'Nobody dares to tell the director.'

        b.   No gosa   <u>no</u> dir-ho   (*ningú) al   director.
              not dare.PRES.3SG not say.INF-it nobody to.the director
              'Nobody dares not to tell the director.'

(64)   [$_{TP}$ T-Vol$_j$ [$_{vP}$ [$_{vP}$ PRO fer$_k$ [$_{vP}$ els deures t$_k$]]$_x$ [$_{vP}$ en Joan t$_j$ [$_{vP}$ t$_x$]]]]]
        want.PRES.3SG   make.INF the homework   the John
        → vP-movement (no remnant) → VVOS order / *VVSO order

If Catalan cannot derive VOS by means of scrambling, it is predicted that vP remnant movement is not possible, given that the vP cannot be relieved of its internal argument. Hence, *if* Catalan can recur to an alternative XP movement strategy to derive verbal complexes, the prediction would be that only full vP movement can take place. Hence neither verb incorporation nor vP remnant movement can generate apparent BC phenomena in the VVSO order. This state of affairs can be explained without any recourse to an additional position for subjects if we assume that the availability of scrambling might be a relevant parametric difference between Spanish and Catalan.[25]
    In fact, all Catalan speakers that I consulted accept the VVOS order:

(65)   Volia   fer   els deures   en Joan.
        want.IMP.3SG   make.INF the homework the John
        'John wanted to do his homework.'

However, also in this order, an embedded scope reading seems to be unavailable, indicating that the subject is not truly inside the embedded clause:

(66)   No volia   fer   els deures   només en Joan.
        not want.IMP.3SG make.INF the homework only   the John
        ✓ Reading 1:   Only John didn't want to do his homework (others wanted to do it).
        * Reading 2:   He$_i$ didn't want it to be the case that only John$_i$ does his homework. (He wants others to do it too).

These data thus reinforce the conclusion that DP subjects that appear inside infinitives in the linear order are not necessarily the syntactic and semantic subject of the embedded event, but may appear in this position as a side effect of restructuring and verbal complex formation.

5.   Notes on variation and some open issues

The discussion points to a division between Spanish and Catalan with respect to the degrees of availability of apparent BC phenomena: Spanish allows DP subjects to appear inside complement infinitives of 'triggering' and 'semi-triggering' predicates in the VVSO order, while Catalan blocks this order in both configurations, reflecting restrictions on word order in finite matrix clauses. I have argued that this might be due to the availability of scrambling-like operations in the former language, building on ideas of Ordóñez (1998, 2000, 2007, 2009), López (2009), and Gallego (2010, 2013). Thus, if Catalan allows apparent BC to a lesser extent than Spanish, the general (un-)availability of BC phenomena cannot exclusively be related to the *pro-drop* property, but has to take into account restrictions on the derivation of the VSO and VOS orders and subject-verb inversion in general (see also Alexiadou et al. 2010 and Ordóñez 2009 for relevant discussion).

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[25] Differences between Spanish and Catalan in the availability of scrambling-like operations have been discussed in the context of P-movement (López 2009), object shift (Gallego 2013), and scrambling (Ordóñez 2000, 2009).

Bonet (1989) argues that subjects can only be licensed by *in situ* nominative Case assignment in Catalan if the subject also receives focus, which might be responsible for the stricter licensing conditions on postverbal subjects in this language, given that, apart from a purely morpho-syntactic licensing mechanism by means of Case, there is an additional discourse-sensitive requirement. That conditions on the derivation of the VSO and VOS orders play a role in the licensing of apparent BC phenomena is confirmed by the existence of sentences such as (19) in European Portuguese, a language which, similarly to Spanish, licenses VSO and has been argued to derive VOS by means of scrambling (see Costa 1997).

However, a definite conclusion with respect to a *clear-cut* (parametric) division in the area of apparent BC phenomena in Romance is difficult for the following reasons: first, as has already been observed, there is considerable variation among native speakers, both of Spanish and of Catalan, with respect to which verbs and which word orders allow apparent BC phenomena. The data discussed here are based on introspective intuitions from a limited set of speakers and in order to confirm a genuine parametric divide, a wider comparative study would be needed. Furthermore, many relevant factors such as intonation and discourse context could only restrictedly be taken into account. Given the crucial importance of information structure for word order patterns in the studied languages, more investigation is needed into whether different contexts and intonation contours change acceptability of the studied constructions in both languages. For example, in Ortega-Santos' (2013) investigation of corrective focus in Spanish non-finite configurations, we find the following sentence with a non-restructuring verb (example (67) from *ibid.* 118 and (67) from *ibid.* 115):

(67) a.   Todos los días lamenta   comprar Cefe el pan.
           all   the days regret.PRES.3SG buy.INF   Cefe the bread
           'Cefe regrets buying bread every day.'
      b.   Pedro (*lo)   lamentó   haber(lo)   comprado.
           Pedro   CL.3SG.ACC regret.PAST.3SG have.INF-CL.3SG.ACC   buy.PRT
           'Pedro regretted having bought it.'

However, Ortega-Santos (2013: fn. 14) notes that the (XP)-VVSO order in (67) cannot be used in an out-of-the blue context:

(68) A: Qué pasó ayer?
           What happened yesterday?
      B: Ayer   lamentó   (Juan) haber   ganado   (*? Juan) la lotería.
           yesterday regret.PAST.3SG Juan   have.INF win.PRT   Juan the lottery
           'Yesterday, Juan regretted having won the lottery.'   (*ibid.* 118)

If this reasoning is on the right track, some apparent BC configurations, which are judged as unacceptable by native speakers in a neutral context, might improve given a change in discourse context. However, it is striking that certain BC configurations need, while others do not seem to need, embedding into a special context to be judged as acceptable.

A related question is how speaker variation could be integrated into the analysis outlined here. That is, why do some speakers accept apparent BC and CC with a wider range of matrix verbs and word orders than others? It could tentatively be assumed that, for some speakers, verbal complex formation in terms of vP remnant movement cannot use the Spec of a FinP (or PP/DP) phase as an escape hatch, given that the result would be Improper Movement (A-A'-A) while others can recourse to A'-movement and, hence, allow apparent BC even out of

phasal domains. The former speakers would allow apparent BC only out of triggering and semi-triggering contexts while the latter would allow it even out of certain non-triggering ones. Another possibility would be that speakers are insecure with respect to the exact (lexical) classification of verbs as 'triggering', 'semi-triggering' or 'non-triggering'.

Given the limited scope of this study, I cannot fully resolve these issues and so leave them for future research. The preliminary conclusion to be drawn here is that it does not merely seem to be the *pro-drop* property that is responsible for the possibility of a DP subject to surface inside a complement infinitive, but that further factors include *degrees* of word order freedom and strategies of information structure encoding[26], such as scrambling (see Ordóñez 2000, 2009), [VO]-topicalization, and right-dislocation. The importance of these factors for the possibility of apparent BC phenomena is certainly evidence in favor of dealing with this configuration in terms of degrees of restructuring, different strategies of verbal complex formation, and the availability of scrambling-like operations.

6. Conclusion

In this paper, I have discussed data which indicates that the restructuring vs. non-restructuring classification of verbs is not a clear-cut dichotomy in Spanish but that there are various intermediate cases, allowing for *degrees* of transparency, supporting conclusions reached by Wurmbrand (2003) on the basis of German. This has lead me to add to Aissen & Perlmutter's (1983) two-way classification of 'triggering' vs. 'non-triggering' a third group of 'semi-triggering' verbs in Spanish which select for deficient (non-phasal) complements but are not lexically specified for triggering restructuring in terms of incorporation. I have followed Ordóñez (2009) in assuming that Spanish can recourse to an XP remnant movement strategy to form verbal complexes. This possibility is crucially conditioned by the availability of scrambling-like operations, which allows remnant vP movement to take place. As has been suggested by Ordóñez (2009), Catalan, which lacks these operations, is predicted to exhibit a lower degree of apparent BC phenomena. The strict correlation of BC with restructuring and sensitivity to opacity-inducing factors provide evidence in favor of such a view.

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[26] See also Alboiu (2007) for a discussion of BC and information structure in Romanian.

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Contextually conditioned allomorphy and the Basque locative
Spelling out the Basque extended nominal projection

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This paper proposes a non-paradigmatic analysis of the Basque case system that facilitates a unified analysis of two anomalies in the distribution of the locative in Basque, namely the unexpected lack of exponence of the definite singular locative throughout the directional cases and in the scope of the adnominal linker *-ko*. These anomalies are analysed as effects of contextually conditioned zero spell-out of the locative morpheme and the singular determiner. Based on Embick's (2010) theory of cyclic spell-out, the present analysis predicts two cross-linguistic restrictions on morpheme interactions in the nominal domain.

1.   Introduction

The present paper deals with the interactions of nominal structure and the locality conditions governing context sensitive allomorphy. It proposes a non-paradigmatic analysis of the Basque case system based on an articulated structure of the extended nominal projection. Certain effects sometimes treated in terms of a split between a basic and a local case paradigm are analysed in terms of contextually conditioned null exponence of functional morphemes. I suggest that the relevant locality conditions are captured in Embick's (2010) $\mathbb{C}_1$-LIN theory under the assumption that K is a cyclic head and that this approach predicts two cross-linguistic restrictions on the possibility of morpheme interactions in the nominal domain that could be further tested.

In particular, I propose a unified treatment of two special properties concerning the exponence of the definite singular locative *-an*, which seems to remain unexpressed under certain conditions. The empirical phenomenon forming the basis of my argument is illustrated by the contrast in (1) between the predicative locative phrase and its adnominal counterpart. While (1b) retains the locative meaning, the locative singular ending *-an* cannot be realised in the presence of the attributive linker *-ko*, cf. (1c). Note that other adverbial case endings appear without problems in the context of *-ko*, as shown in (1d).

(1) a. Zuhaitz-a etxe aurre-an   dago.
         tree-DET house front-LOC.SG 3SG.is.located
         'The tree is in front of the house.'[1]

     b. [DP etxe   aurre-ko zuhaitz-a]
             house front-KO tree-DET
         'the tree in front of the house'

     c. *etxe aurre-an-ko   zuhaitz-a
         house front-LOC.SG-KO tree-DET

     d. [DP Thessaloniki-ra-ko   hegaldi-a]
             Thessaloniki-ALL-KO flight-*det*
         'the flight to Thessaloniki'

Another instance of morphologically special behaviour of the locative concerns the distribution of the marker *-ta* that is attested throughout the local cases apart from the definite singular forms. I suggest that this marker represents the unmarked realisation of the locative morpheme, and that the singular allomorph receives overt spell-out only if it is at the edge of the spell-out domain.

The discussion will proceed as follows. I am going to discuss the two locative anomalies as well as the challenges facing a paradigmatic treatment in the next section. A reanalysis of the morphology of Basque noun phrases is presented in section 3. Section 4 gives a short overview of Distributed Morphology and presents the proposal for deriving the case paradigm of Basque from the structure of the extended nominal projection (xnP). Section 5 shows the generalisations unifying the locative anomalies that emerge under this analysis. In section 6, I show how these generalisations can be derived in Embick's (2010) framework of contextually conditioned allomorphy. Crucially, I also present two predictions that the locality conditions imposed by the current analysis make regarding the cross-linguistic possibility of interactions between morphemes instantiating D and K. The final section wraps up and points out some further questions raised by the discussion.

2.   *The locative anomalies*

In this section I will present the two morphological puzzles involving the locative morpheme which will form the basis of my argument. The first anomaly concerns the interaction between the locative and the attributive linker *-ko*, the second concerns the distribution of locative markers in the so-called local case paradigm. I will also briefly discuss the shape of the locative singular morpheme. Finally, I will show that a paradigmatic approach to the Basque case system does not provide us with a satisfactory answer regarding the relationship between these anomalies.

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[1]Unless indicated, the examples were elicited from consultants from the Gipuzkoa province, speaking standard Basque. Glossing is as follows: 1,2,3 – person; ABL – ablative; ABS – absolutive; ALL – allative; AUX – auxiliary; BEN – benefactive; COM – comitative; DAT – dative; DET – determiner; DIR – directional; ERG – ergative; GEN – genitive; INSTR – instrumental; LOC – locative; PART – partitive; PL – plural; SG - singular; TERM – terminative

2.1. The locative-linker anomaly

In contrast to most other 'adverbial case' markers, the inessive/locative[2] *-an* cannot appear in the context of the linker *-ko*, as indicated in the introduction. Similarly, the PP in (2a) has no overt exponent for either the locative singular morpheme (usually *-an*) or the definite article (usually *-a*).

Interestingly, the plural and indefinite versions of the inessive do not show the same behaviour. It is only the final *-n* of the definite plural *-etan* and the indefinite *-tan* that is missing in (2b) and (2c) compared to their use in non-adnominal contexts (in effect their citation forms).

(2)   a.   lantegi-∅-ko   tximini-a
              factory-LOC.SG-KO chimney-DET
              'the chimney in the factory'
       b.   lantegi-eta-ko   tximini-a-k
              factory-LOC.PL-KO chimney-DET-PL
              'the chimneys in the factories'
       c.   hainbat lantegi-ta-ko   tximini-a-k
              many   factory-LOC.INDEF-KO chimney-DET-PL
              'the chimneys in many factories'

I assume that the determiner and the locative morpheme are syntactically present in cases like (1b) and (2a) in spite of the lack of morphological exponence.

As we will see in the next section, the lack of exponence of the determiner is common to all locational cases. As for the locative morpheme, the correspondence in meaning to the unanimously locative-marked phrases – *etxe aurre-an* 'in front of the house' for (1b) and *lantegi-an* 'in the factory' for (2a) – as well as the parallel in meaning between the singular and the plural and indefinite locatives in connection with *-ko* indicate the presence of a locative in all those phrases.

Moreover, the absence of a locative meaning in the combination of *-ko* with other complements, cf. the instrumental marker *-z* in *harri-z-ko eliza* 'the church made of stone', shows that, contrary to the traditional description of *-ko* as *locative genitive*, it is something other than *-ko* that contributes the locative meaning (Höhn 2011, 2012).

These two observations show that the locative morpheme is present for interpretation at LF. By hypothesis, the Inclusiveness Condition 'bars introduction of new elements (features) in the course of computation' (Chomsky 2001:2). I take this to imply that the locative is present in the output of syntax even when it has no exponent.[3]

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[2] I will mostly use the term *locative*, but will occasionally make use of the alternative term *inessive* to avoid confusion with the more general *locational cases* that involve the stative locative as well as the dynamic directional cases.

[3] A reviewer notes a complication for the argument that everything that is interpreted at LF has to be present in narrow syntax from arbitrary arguments, which are usually argued to be absent in syntax (Rizzi 1986). While this is an important limitation of the present kind of argument, the presence of overt exponents in indefinite and definite plural contexts makes an analysis of the missing definite singular forms in purely interpretive terms seem improbable.

Finally, while the absence of the configuration LOC+KO seems to hold across most dialects of Basque, the Souletin dialect in France seems to allow or have allowed forms like *etxenko* 'who is at home' (de Rijk 2008:103) with locative *-n*.[4] This again indicates that *-ko* is not itself a locative marker.

The above observations lead me to the conclusion that a locative morpheme is present in the relevant *-ko*-phrases even when not overtly expressed. The first locative anomaly thus concerns the lack of phonological realisation of the definite locative singular in the context of the linker morpheme.

2.2.   *The local case paradigm anomaly*

The second locative anomaly concerns what de Rijk (2008) characterises as the local case paradigm, given in (3). The morpheme *-ta* that shows up throughout the locative and directional endings in all but the definite singular forms sets the local cases apart from the rest of the case paradigm, as shown in (4).[5]

(3)   Local cases (cf. Hualde & Ortiz de Urbina 2003:173, Table 59)

	INDEFINITE	DEFINITE			Translation
		SG	PL		
			GENERAL	PROX	
LOC	leku**ta**n	leku*an*	lekue**ta**n	lekuo**ta**n	at a place
ABL	leku**ta**tik	leku*tik*	lekue**ta**tik	lekuo**ta**tik	from a place
ALL	leku**ta**ra	leku*ra*	lekue**ta**ra	lekuo**ta**ra	to a place
DIR	leku**ta**rantz	leku*rantz*	lekue**ta**rantz	lekuo**ta**rantz	towards a place
TERM	leku**ta**raino	leku*raino*	lekue**ta**raino	lekuo**ta**raino	up to a place

(4)   Grammatical and non-local adverbial cases (cf. Hualde & Ortiz de Urbina 2003:173, Table 59)

	INDEFINITE	DEFINITE			Translation
		SG	PL		
			GENERAL	PROX	
ABS	leku	leku**a**	lekuak	lekuok	-
ERG	lekuk	leku**a**k	lekuek	lekuok	-
DAT	lekuri	leku**a**ri	lekuei	lekuoi	-
GEN	lekuren	leku**a**ren	lekuen	lekuon	of a place
BEN	lekurentzat	leku**a**rentzat	lekuentzat	lekuontzat	for a place
COM	lekurekin	leku**a**rekin	lekuekin	lekuokin	with a place
INST	lekuz	leku**a**z	lekuez	lekuoz	with a place

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[4]I leave open the question of why the locative is not realised as *-an* here, which I argue in section 3.1 to be its definite singular form. In Standard Basque the vowel is preserved in hiatus contexts, cf. *leku-an* 'at the place' and the discussion in section 3.1. It may be that the locative exponent in Souletin has been reanalysed as a simple *-n*.

[5]I disregard the partitive and the prolative here, which only have an indefinite form. Also note that I use the term paradigm in a purely descriptive way, as I will argue that they do not represent grammatical primitives.

Crucially, in the definite singular local forms the bare postpositions (*-an, -tik. . .*) attach directly to the stem. In contrast to the grammatical cases and the non-local postpositions, there is no exponent of the definite article *-a*. Likewise, the definite singular forms do not show any marker paralleling the *-ta* morpheme found in the other definiteness-number combinations of the local cases. This peculiarity of the locative singular has already been noted by Jacobsen (1977).

A further effect specific to all the local cases is their incompatibility with animate arguments. The use of a proxy morpheme is mandatory in order to connect them with any of the local endings. This can be either the suffix *-gan* (Table (5)) or the free morpheme *baita* as in *mutilaren baitan* 'on/in the boy' (Hualde & Ortiz de Urbina 2003:176f.; cf. also de Rijk 2008:ch. 3.6). In both cases the ground argument or *relatum* is in the genitive case, if only optionally in the case of the definite singular. Note that in these cases the definite singular forms do not lack the definite article. However, the genitive marker *-ren* can optionally be dropped.

(5)   Local markings of mutil 'boy' (Hualde & Ortiz de Urbina 2003:176, Table 64)

	INDEFINITE	DEFINITE		
		SG	PL	
			GENERAL	PROX
LOC	mutilengan	mutila(ren)gan	mutilengan	mutilongan
ABL	mutilengandik	mutila(ren)gandik	mutilengandik	mutilongandik
ALL	mutilengana	mutila(ren)gana	mutilengana	mutilongana
DIR	mutilenganantz	mutila(ren)ganantz	mutilenganantz	mutilonganantz
TERM	mutilenganaino	mutila(ren)ganaino	mutilenganaino	mutilonganaino

To conclude, this set of data raises the question of what the systematic distinction between the local and the basic cases results from, i.e. what the status of the *-ta* morpheme is and how the special local forms for animate nouns can be explained. The local case paradigm anomaly consists in the special behaviour of the definite singular locative as compared to the parallel definite plural and indefinite forms, in particular its lack of an exponent marking definiteness/number and of a marker corresponding to *-ta*.

2.3.   Challenges to a paradigmatic approach

De Rijk (2008:ch. 2 and 3) assumes a split of the case system into a 'basic system of case endings' and a locative case system with the three distinctive properties introduced above. This is suggested to result from the fact that the local case system is historically older than the basic one, preceding the development of the definite article.

According to de Rijk (2008:54), the morpheme *-ta* noted above represents an indefinite marker. Elsewhere (*ibid.*: 97), he identifies both *-ta* and *-eta* as number indicators in the locative system. It is not quite clear whether these two claims are mutually compatible, but both options regardless raise further questions.

If *-ta/-eta* are number markers, it is puzzling why indefinites should carry number marking, while the definite singular forms remain unmarked. This would be the mirror image of the non-local cases, where definites show a form of number marking via the article *-a* and indefinite

forms lack any marking. On the other hand, if -*ta* is an indefinite marker, its obvious similarity to the definite plural marker -*eta(n)* remains mysterious. While answers to these questions may be conceivable, an issue common to both analyses is that the historical account for the paradigmatic split does not explain why the split between the paradigms is where it is. That is to say, one might wonder why it should be the local system that did not undergo the relevant changes and whether this would indicate some special connection or interaction between number marking and locatives. It is not clear how such a connection would be motivated. I will suggest in section 3.2.3 that -*ta(n)* is the unmarked exponent of the locative morpheme and -*e* the plural allomorph of the definite article.

Let me now turn to the locative-linker anomaly. Contrary to the identification of the linker -*ko* as 'locative genitive' in traditional treatments and its inclusion as a 'relational' in the description of the system of nominal inflections by Hualde & Ortiz de Urbina (2003:173ff.), it has been widely argued that the linker should not be treated as a case marker in Basque (Wilbur 1979; Eguzkitza 1993; Trask 1997:102; de Rijk 1988, 1993, 2008:ch. 5.3; Höhn 2011, 2012). Hence the locative anomaly with the linker morpheme does not lend itself to an explanation in terms of the split in the case paradigm. De Rijk (1988, 1993) suggests a rule of postposition deletion instead that can apply in the context of -*ko*. He argues that what has been described as bare noun complements to -*ko* involves the same mechanism as the locative-linker anomaly and proposes five separate deletion rules (locative, elative, allative, sociative, instrumental). I will not deal with the other cases here because only the locative cannot appear alongside the linker at all (except in the Souletin variety, cf. section 2.1), while the other four forms can in principle be used with the linker (Höhn 2011, 2012). If they are the result of some deletion rule, then that would have to be significantly more constrained than in the case of the locative, pointing to a distinction between the locative-linker anomaly and whatever governs the bare NP complements of -*ko*.

Finally, if we assume that the linker is indeed not part of the case paradigm, there is no reason to assume common behaviour. Hence, the similarities between the local case paradigm anomaly and the locative-linker anomaly have to be treated as coincidental. The fact, however, that both involve the same morphological effect on the realisation of the locative singular seems to me to suggest some kind of connection after all. I believe that an alternative analysis of the apparent case paradigms will open up the possibility for a unified analysis of the locative anomalies and allow a less idiosyncratic perspective on the case system of Basque.

3.   Rethinking case paradigms
3.1.   The shape of the locative singular morpheme

Before turning to a reassessment of the Basque case paradigms, a discussion of the composition of the locative singular suffix -*an* may be helpful. I will argue here that of the following three potential analyses the first one is the most probable.

1. determiner ∅ + locative allomorph -*an*

2. determiner -*a* + locative allomorph -*an* with a-reduction as in /-a/ final nouns, cf. (7a)

    3. determiner *-a* + locative allomorph *-n*

Historically, the *-an* morpheme is probably derived from a consonant initial form /-Xan/.[6] This implies that the locative ending includes an /a/, hence favouring the first or second analysis.

    Furthermore, one of the central synchronic effects providing evidence for that diachronic hypothesis supports the first option. If the locative singular follows a consonant-final noun, a process of *e*-epenthesis takes place between the stem and the locative singular ending (Hualde & Ortiz de Urbina 2003:179, de Rijk 2008:50). Crucially, this preserves the form *-an*. Since there is no *e*-epenthesis in the absolute singular between the stem and the definite article *-a*, it seems plausible that the preserved /a/ in (6a) is not an exponent of the definite article, but belongs to the locative ending.

(6)   a.   *azal-ean* vs. **azal-an* 'in/on the skin' (loc. sg.)
        b.   *azal-a* vs. **azal-ea* 'the skin' (abs. sg.)

Finally, Karlos Arregi (p.c.) points out to me the following observations regarding Bizkaian variants of Basque, which lend strong support to the first option (silent determiner + *-an*). In Bizkaian, stem-final /a/ is raised to /e/ (or /i/ in Lekeitio Basque) before the singular determiner, cf. (7), and deleted in the plural (Jacobsen 1977; Hualde et al. 1994:87f.). The schema in (8) shows this effect for the absolute and the dative (with raising to /e/ instead of /i/).

(7)   *neska* 'girl' + def. article

        a.   standard Basque (Batua): *neska-a → neska*
        b.   Lekeitio (Bizkaian): *neska-a → neski-a*

(8)   *arbola* 'tree'

*arbol**e**-a*	abs.sg
arbol∅-ak	abs.pl
*arbol**e**-a-ri*	dat.sg
arbol∅-a-ri	dat.pl

The presence of the definite article *-a* in the locative singular under the second and third hypothesis would predict raising of stem-final /a/, hence a form like **arbolean*. The observed form *arbolan* 'in the tree' does not show vowel raising though. The fact that vowel raising does not apply with the *a*-initial plural determiner shows that it is not a purely phonological rule, but sensitive to morphological features. Consequently, no vowel raising is expected under the first hypothesis because the /a/ following the stem is not part of the singular determiner. If we plausibly assume a phonological rule shortening the /a/+/a/ sequence as found in other standard varieties of Basque, the first hypothesis makes the correct prediction as illustrated in (9).

(9)   a.   Hypothesis 1: ✓ arbol(a)-∅-an → *arbolan*
        b.   Hypothesis 2:   arbole-a-an → **arboleaan → *arbolean*
        c.   Hypothesis 3:   arbole-a-n → **arbolean*

---

[6]Cf. Jacobsen 1977:164, Hualde & Ortiz de Urbina 2003:179 and de Rijk 2008:50.

On these grounds I will assume here that the definite locative singular contains a silent definite article and a locative morpheme *-an*.[7]

3.2. *A reanalysis of the paradigms*

While de Rijk's (2008) division of the 'case system' of Basque into a basic and a locative system captures valid observations and may be well justified from a diachronic perspective, the theoretical status and basis of this distinction for a synchronic analysis is not clear. I will propose here that there is no need to refer to paradigms, but that the peculiarities noted above are rooted in properties of the locative/inessive morpheme.[8]

3.2.1. *Cases and postpositions*

Before explicating this point, I should point out that I make a distinction between the grammatical cases, i.e. ABS, ERG, DAT, GEN, and the 'adverbial case' markers (analysed as a type of postposition), that is, the rest of the paradigm in (4) as indicated by the horizontal line. Apart from the observation that the meaning of the adverbial cases corresponds to adpositions in many other languages, they also differ from the grammatical cases in various respects (Eguzkitza 1993, Höhn 2012:120ff.). While the postpositions 'have their own referential content' (Eguzkitza 1993:166), the grammatical cases seem to be more dependent on external elements like a case-assigning verb or a head noun for what Eguzkitza calls their 'referential content'. On a morphosyntactic note, the grammatical cases trigger agreement markers on the finite auxiliary (Arregi & Nevins 2012), while postpositions do not.[9] Furthermore, postpositions can trigger overt case marking on the noun as seen in (10), hence they are not in complementary distribution with grammatical case markers. Finally, the examples in (11) illustrate that case marked nouns are not compatible with the linker *-ko*, while those marked by postpositions are.

(10)   ama-ren-tzat
            mother.DET-GEN-BEN
            'for (the) mother'

(11)   a. *etxe-(a)-ri-ko-a
               house-DET-DAT-KO-DET

---

[7]Note, however, that with proper names the locative is just plain *-n* as in (ia), with *e*-epenthesis after noun-final consonants, cf. (ib). This seems to support the third analysis under the assumption that the lack of /a/ in these cases stems from the absence of the definite article with proper names.

(i)   a.   Bilbo-n
              Bilbao-LOC
       b.   Irun-en   *e*-epenthesis
              Irun-LOC

[8]Wilbur (1979:93) also strongly argues against paradigmatic analyses of Basque: 'If, on the other hand, we treat these strings of nominal affixes as a sequence of elements that are systematically added in the course of the generation of Basque sentences, we destroy the inflexional illusion and dismiss the offense of superdeclension.'

[9]This argument does not bear on the genitive, which is restricted to the nominal domain.

    b.   harri-z-ko-a
         stone-INST-KO-DET
         'the one made of stone'

    c.   diru-rik   gabe-ko   gizon-a
         money-PART without-KO man-DET
         'the man without money'

3.2.2.   *Free and bound postpositions*

The term postposition calls for clarification, since it enjoys a somewhat wider acceptance for a different class of morphemes comprising, e.g., *gabe* 'without', *kontra* 'against' and *buruz* 'about'; for clarity I will refer to these by the term 'free postpositions'. They take a nominal complement and seem to assign case to it. Like the 'adverbial cases', henceforth bound postpositions, they follow their complement and can be used with the linker *-ko* as shown above in (11c), but have a larger degree of syntactic freedom than those (Hualde 2002 and de Rijk 2008:34f.). Free postpositions can be coordinated directly as in (13). In order to coordinate bound postpositions, the head noun needs to be repeated or another appropriate host, e.g. a personal pronoun, has to be used, see (12). In the following, the term postposition will be used in reference to the bound postpositions unless stated otherwise, and they will be symbolised by little p.[10] The class of bound postpositions consists at least of the adverbial cases introduced above, and probably some more postpositions whose status has been disputed, e.g. *-gatik* 'because of', the distinctive property being their morphophonological dependence on a preceding word.

(12)   bound postpositions (after de Rijk 1993:157)

    a.   Sorgin-a-ren-tzat   eta *(sorgin-a-ren)-gatik   egin zen hau.
         witch-DET-GEN-BEN and witch-DET-GEN-because.of do   AUX this
         'this was done for the witch and because of the witch'

    b.   Sorgin-a-ren-tzat   eta *(ha-ren)-gatik   egin zen hau.
         witch-DET-GEN-BEN and 3SG.DEM-GEN-because.of do   AUX this
         'this was done for the witch and because of her'

(13)   free postpositions

    a.   zu-re   kontra ala alde
         2SG-GEN against or for
         'for or against you'   (Hualde 2002:333)

    b.   etxe-a-ren   aurre-an   eta atze-an
         house-DET-GEN front-LOC.SG and back-LOC.SG
         'in front of and behind the house'

Note that while the words *aurrea* and *atzea* in (13b) are sometimes described as free postpositions, they can probably be more accurately characterised as members of a class of location nouns (cf. Hualde 2002; de Rijk 2008:ch. 4) spelling out Svenonius's (2008) AxPart, similar to English *in **front** of*. As far as the local case markings are concerned, like their English counter-

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[10]Not to be confused with the categorising node p sometimes used in the DM framework.

parts they are restricted to the singular. Otherwise they seem to behave just like regular nouns, reducing the number of instances of clear free postpositions to a few ones like those in (13a).

3.2.3. *Morphological reanalyses*

Recent analyses of the structure of spatial PPs suggest that dynamic/directional PPs contain a lower static locative element (e.g. Svenonius 2008; Koopman 2010; den Dikken 2010; Terzi 2010). This allows for a reevaluation of the locative patterns.

As outlined in section 2.3, analysing the morpheme *-ta* as a number or indefiniteness marker is problematic. I suggest instead that *-ta(n)* is simply an exponent of the locative morpheme, with the final /n/ subject to deletion. This explains the commonality between the indefinite and the definite plural forms of the 'local case paradigm', as well as the restriction of this morpheme to forms involving the locative without the necessity of stipulating a separate locative paradigm. Furthermore, I analyse the morpheme *-e* found in almost all definite plural forms and the corresponding *-o* throughout the proximal plural as counterparts of the definite singular article *-a*, cf. the tables in (3) and (4). Consequently, the apparent definite plural locative morpheme *-etan* actually consists of at least two morphemes, *-e + -tan*. This approach also makes it clear that we are not dealing with two but only one locative anomaly in both phenomena described above, namely the lack of the definite article with the local postpositions and of a counterpart to *-tan* with all local postpositions except the locative.

Finally, this view permits a clearer treatment of the interaction of animacy and the local postpositions as well. Instead of ascribing the incompatibility with animate nouns to a whole paradigmatic case system, it becomes possible to localise that property in the locative morpheme. The purpose of the proxy morphemes *-gan* and *baita* might then be to intervene between a [+animate] feature on a noun phrase and the locative so as to circumvent this incompatibility.

The following section will outline an analysis of the structure of the nominal domain in Basque to provide a basis for a proper description of the nature of the locative anomaly.

4. *The structure of the Basque nominal domain*
4.1. *Distributed Morphology*

My analysis is grounded in the framework of Distributed Morphology (DM; Halle & Marantz 1993 and subsequent work). A basic tenet of DM is that there is only one generative component in grammar, namely syntax. Therefore, the assembly of complex 'words' is a result of regular syntactic structure building and post-syntactic, morphological (and eventually phonological) operations on these structures. Accordingly, the building blocks of syntax are not complex 'words', but functional morphemes and Roots.

The latter are open-class items corresponding to 'lexical' categories or 'content words' in other theories. These category-neutral Roots have their categorial behaviour determined by categorial functional heads *n, v* and *a* (Marantz 1996, 1997; Embick & Marantz 2008; Embick 2010). Functional morphemes only consist of (sets of) features and get their phonological content post-syntactically through the process of Vocabulary Insertion.[11] This draws on a list of

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[11] As the question is tangential to the main issue, I remain agnostic here as to whether Roots enter the derivation

Vocabulary Items (VIs) with potentially underspecified, context-sensitive rules for the realisation of functional morphemes. Under this view, inflectional paradigms are mere artefacts of structure building and subsequent spell-out effects (Bobaljik 2001, 2008; Embick & Marantz 2008).

One might wonder whether Grimshaw's (2005) notion of extended projections of *lexical* categories is compatible with a framework involving category-neutral Roots. Obviously, such an object cannot project a *category-specific*, e.g. nominal, extended projection. I assume that instead it is the category-defining functional heads *n, v, a* that form the basis of an extended projection.[12]

4.2. *The extended nominal projection of Basque*

My analysis of the extended nominal projection (xnP) in Basque is represented in (14).

(14)
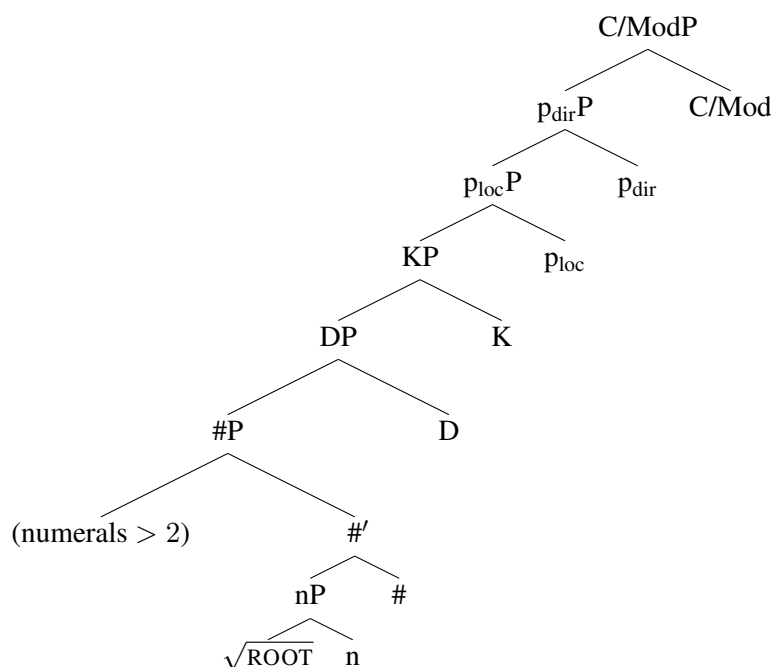
Basque is an OV language, so by the tendency for harmonic word orders within languages one would expect Basque to be right headed in the nominal domain as well. In harmony with the assumptions made before, a nominalising functional head n takes a category-free Root as its complement, yielding a syntactic object with nominal properties.[13]

The head # is the location of number features, the numeral *bat* 'one' and certain quantifiers, and it accommodates quantificational phrases in its specifier, particularly also numerals > 2.

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with phonological content or are subject to late insertion (cf. e.g. Embick 2010:ch.2, fn. 1 for the former view; see Marantz 1995 and Haugen & Siddiqi to appear for the latter one).

[12]The view taken here that Merge(n, Root) forms an nP raises the question of where nominal complements would be merged. These questions will not be addressed in the present work, but cf. e.g. Cinque (2005:327, fn. 34) and the references there, as well as Adger (2013) for the hypothesis that nouns do not have complements at all.

[13]In principle, the structure is compatible with NP instead of nP as well.

Several arguments for this projection (alternatively identified as Q(uantifier)P) have been adduced by Artiagoitia (2002, 2006, 2012). In line with Etxeberria (2007) and contra Artiagoitia (2002), I take the article *-a* to indiscriminately originate in the head D.[14] I adopt the view that the grammatical cases (including the genitive) are instantiations of a K(ase) head (cf. among others Eguzkitza 1993), and that absolutive case is marked by the absence of KP (cf. Nichols 1986; Bittner & Hale 1996; Neeleman & Weerman 1999; Neeleman & Szendrői 2007:679, fn. 5; Arregi & Nevins 2012:ch. 2).

As discussed in section 3.2.3, I assume that the so called adverbial case markers realise a p head in the *x*nP. Note the split into a locative and a directional p head following current assumptions in the literature (Svenonius 2008; Koopman 2010; den Dikken 2010 among others) and the discussion in section 3.2.3. In a plain locative, p_{dir} will be absent; non-local postpositions will also involve only one projection of the p type. I will not address the question of whether other projections that have been proposed for spatial Ps are present in the *x*nP. If p is indeed a part of the *x*nP instead of starting its own extended projection, it should be a functional head. In the next section I will argue that this is indeed the case.

I have suggested elsewhere (Höhn 2011, 2012) that the linking morpheme *-ko* represents a functional head C or Mod that facilitates nominal modification. For example, PPs can be used adnominally only in the presence of the linker, cf. (1d) above. To accommodate the analysis of bound postpositions as functional heads, I have to modify that proposal in one respect. Instead of locating the linker in the extended projection of PP, I assume that at least in the context of bound postpositions it is the highest functional head in *x*nP.[15]

Before going on to substantiate my claim about the functional nature of Basque bound postpositions, a few general words on the structure sketched in (14) are in order. The reader should be aware that the structure given in (14) above is not meant as a template of the extended noun phrase as an independent theoretical object. It is rather intended to be an illustration of the sort of structures I will be concerned with in the further discussion. Moreover, it is not meant to be exhaustive, nor is it the case that all the heads included in (14) need to be always present — in fact, the assumption that K is absent in the absolutive will be crucial to the argument. Finally, I assume that syntactic structure is defined purely in terms of hierarchical relations without reference to linear order. Consequently, the tree in (14) is right-headed for illustrative purposes only, since linearisation takes place post-syntactically (but before Vocabulary Insertion).

4.3.   *Functional postpositions*

In the remainder of this section let us consider whether the bound postpositions (i.e. the adverbial case endings) do indeed show characteristics of functional elements. Abney (1987:43f.) proposes the following prototypical properties of functional heads:

(15)   a.   Functional elements constitute closed lexical classes.
        b.   Functional elements are generally phonologically and morphologically depen-

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[14]The head # may have some import on the realisation of D though, e.g. by the process of Fusion, cf. section 6.

[15]As implicitly assumed in the work cited, I believe that *-ko* may turn out not to be very restrictive regarding the category of its complement. That question is orthogonal to the problem of locatives though.

dent. They are generally stressless, often clitics or affixes, and sometimes even phonologically null.

c.   Functional elements permit only one complement, which is in general not an argument. The arguments are CP, PP, and (I claim) DP. Functional elements select IP, VP, NP.

d.   Functional elements are usually inseparable from their complement.

e.   Functional elements lack what I will call "descriptive content". Their semantic contribution is second-order, regulating or contributing to the interpretation of their complement. They mark grammatical or relational features, rather than picking out a class of objects.

Bound postpositions clearly meet the first and second criteria. They are not productive and, as defined in section 3.2.2, they cliticise or affix to a preceding element. The variety of complements they take seems to be restricted to DP/KP (or p_{loc} in the case of p_{dir}). The bound postpositions are not separable from their complement as shown in section 3.2.2 above. Finally, while one of the arguments in section 3.2.1 for a distinction between the bound postpositions and the grammatical cases was that the former have a somewhat more specific meaning, it seems equally plausible to say that postpositions 'mark [. . .] relational features'. They certainly do not pick out a class of objects, not even in the abstract sense in which verbs may refer to events. Hence, four and possibly even all five of the characteristics of functional morphemes apply to the bound postpositions.

Another argument comes from the observation that certain phonological processes in Basque seem to be sensitive to the distinction between lexical Roots and affixes. Final /n/ in affixes is deleted under certain conditions, e.g. if preceding a velar stop in the onset of a following affix — voice assimilation or e-epenthesis are no option (16). Similarly, adjacent heterorganic stops in coda and onset of two affixes do not lead to epenthesis, but to deletion of the final consonant in the preceding morpheme (17).

(16)   a.   emakume-e-kin
              woman-PL-COM

        b.   emakume-e-ki-ko   diskriminazio-a
              woman-DET.PL-COM-KO discrimination-DET
              'discrimination against women'

        c.   *emakume-e-kin-ko

        d.   *emakume-e-kin-go

        e.   *emakume-e-kin-eko

(17)   a.   ama-ren-tzat
              mother.DET-GEN-BEN

        b.   ama-ren-tza-ko   opari-a
              mother.DET-GEN-BEN-KO present-DET
              'the present for (the) mother'

        c.   *ama-ren-tzat-ko

        d.   *ama-ren-tzat-eko

Proper names ending in consonants (18), on the other hand, resolve these kinds of clashes either by e-epenthesis or, alternatively, by voice assimilation (a,b) or deletion of the onset of the second segment (c,d). With respect to the linker *-ko* at least, the contrast in (19) implies that for adverbs voice assmilation seems to be the standard strategy, while it is bled by epenthesis with common nouns (cf. Hualde & Ortiz de Urbina 2003:43f.).

(18)   *Proper names*   (Hualde & Ortiz de Urbina 2003:177f.)

      a.   Irun-go/ Irun-e-ko
             Irun-KO Irun-EPENTHESIS-KO

      b.   Irun-dik/ Irun-e-tik
             Irun-ABL Irun-EPENTHESIS-ABL

      c.   Irun-a/   Irun-e-ra
             Irun-ALL Irun-EPENTHESIS-ALL

      d.   Paris-a/   Paris-e-ra
             Paris-ALL Paris-EPENTHESIS-ALL

(19)   *Common nouns and adverbs*   (Hualde & Ortiz de Urbina 2003:175)

      a.   egun-e-ko
             day-EPENTHESIS-KO
             'of the day'

      b.   egun-go
             today-KO
             'of today'

Pending further inquiry, it seems a plausible working hypothesis that the choice of resolution strategy correlates with the class of the morphemes involved in the way specified in (20).

(20)   a.   When two adjacent functional morphemes produce an illicit consonant cluster, the preceding morpheme undergoes adjustment.

        b.   Lexical morphemes (or, possibly, Roots) tend to remain unaffected by any phonological readjustment processes.

Hence, if the coda and onset of two functional morphemes produce an illicit consonant cluster, it is the preceding morpheme that is subject to adjustment (usually deletion of the coda). If the first one is a content word, then either epenthesis takes place or the following functional morpheme undergoes appropriate modification (elision or voice assimilation of the onset) in order to rectify the problem. A possible reason for that may be that the "content words" are actually Roots, subject to early insertion, which could make phonologically conditioned allomorphy of late-inserted following functional morphemes preferable to adjustments of the phonological matrix of the Root.

     To the extent that the general spirit of the above generalisation is valid, it provides us with further evidence that the morpheme *-ta* in the directional forms discussed in section 2.2 does indeed correspond to the locative marker *-tan*. If p_{loc} is a functional morpheme generally realised as *-tan*, then according to the generalisation, deletion of the final nasal is expected whenever it is followed by another functional morpheme (in the same phonological domain). The morpheme

-ta in examples like (21) is therefore simply the realisation of p$_{loc}$ after the application of a standard phonological adaptive process to avoid an /nk/ cluster.

(21) mendi-e-ta-ko   haitzulo-ak
      mountain-DET.PL-LOC-KO cave-DET.PL
      'the caves in the mountains'   (Hualde & Ortiz de Urbina 2003:145)

Interestingly, the above observations about the sensitivity of phonological processes to certain types of morphemes lend strong support to the notion that there is a substantial difference between the locative ending and the proxy morpheme *-gan* found with animate nouns in connection with the local postpositions, cf. table (5) in section 2.2.

In contrast to the locative, the morpheme-final /n/ is not subject to ellision. Instead, the onset of a following functional morpheme undergoes voice assimilation if it is a stop (ablative: *mutilarengan-dik* 'from the boy') or is deleted in the case of a rhotic (allative: *mutilarengan-a* 'to the boy'). While the linker is not used with *-gan* in Modern Basque (instead the alternative proxy morpheme *baita* is used, yielding *baitako*), the form *-gango* is attested in older stages of the language (de Rijk 2008:97). So with respect to its phonological integrity, the morpheme does not behave like a regular functional morpheme at all. Hence an analysis where *-gan* is an alternative realisation of the locative in an animate context seems problematic. Rather, the pattern resembles the one found with proper names, common nouns and adverbs in its tendency to keep the phonological matrix intact. In view of the tentative explanation given above, this might be a result of early insertion, which, by hypothesis, is a property of Roots.

The fact that complements of the proxy morphemes *-gan* and *baita* are marked with the genitive case hints at their nominal character.[16] This looks similar to locational nominals like *aurre* 'front' — introduced as a free pronoun in (13b) in section 3.2.2 — which also assign genitive to their complements. However, while both allow the genitive marker on their complement to be absent, this is restricted to singular definite complements, which moreover retain their definite article, with the proxy morphemes, cf. the table in (5). With locational nouns, on the other hand, deletion of the whole determiner-case-cluster is licensed in the plural too (*lagun(en) artean* 'among friends', Hualde & Ortiz de Urbina 2003:187). Also, the strategy of avoiding illicit consonant clusters with the proxies is not e-epenthesis as with common nouns, but rather corresponds to the strategies used with proper names (18) and adverbs (19).

While the question of the categorisation of the proxy morphemes remains unsolved at the moment, the discussion strongly implies that they are not of the same type as the bound postpositions. Pending further inquiry, I will assume that they are nominal either as complement or even as a realisation of an n head that takes a [+animate] complement. Either way they start a new xnP, which may account for the fact that the proxies are obligatory for locatives of animate nouns. If the locative morpheme is incompatible with a [+animate] xnP, the proxies could provide a [-animate] host for p$_{loc}$.

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[16]In the light of the present discussion it seems plausible to assume that the root of *baita* is actually something like $\sqrt{\text{BAI}}$, which is treated as a regular indefinite noun, whence the locative morpheme *-ta(n)*, cf. *mutila baitan* 'in the boy'. The homophony of the proposed Root to *bai* 'yes' is probably accidental. The other proxy *-gan* might be historically related to the noun *gai* 'thing', which Hualde (2002:333) takes to be the source of the postposition *-gaitik* 'because of.'

5. Descriptive conditions on locative realisation

In this section, I will exemplify how some forms of the case paradigms are analysed under present assumptions. More importantly, I will propose two descriptive generalisations that unify the locative-linker and the local case paradigm anomalies. The relevant components will turn out to be D and p_{loc} in interaction with their environment.

Let us first look at the structure and spell-out of an unspectacular locative plural form with the linker morpheme, such as (22).[17] Since p_{loc} has an absolutive complement, KP is absent, cf. section 4.2.

(22)   *lantegietarako (bidea)* '(the road) towards the factories'
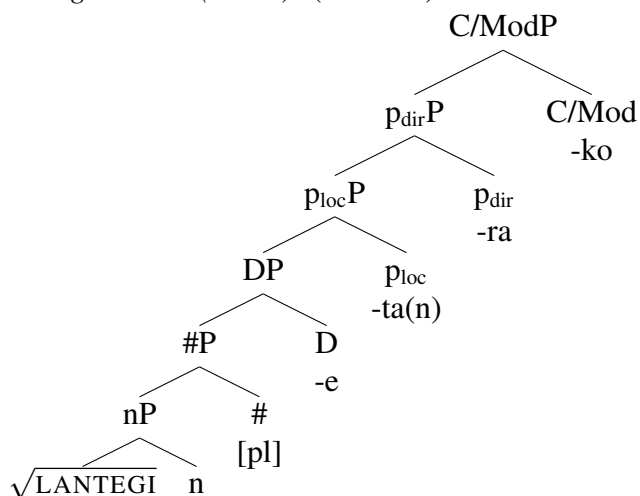
Compare this to the definite singular locative in (23), which I have argued in section 3.1 to involve null spell-out of D.

(23)   *lantegian* 'in the factory'
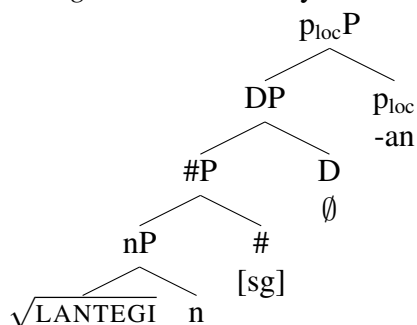
With an additional p_{dir} projection, as in the allative for instance, both D and p_{loc} receive zero spell-out. The structure in (24) thus corresponds to the local case paradigm anomaly.

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[17]Note that the phonological realisations of the individual heads are included for illustration only.

(24)   *lantegira* 'towards the factory'

```
                          p_dir P
                       ┌────────┴─────┐
                     p_loc P        p_dir
                   ┌────┴────┐       -ra
                  DP       p_loc
                ┌──┴──┐      ∅
               #P    D
             ┌──┴──┐  ∅
            nP    #
          ┌──┴──┐ [sg]
       √LANTEGI  n
```
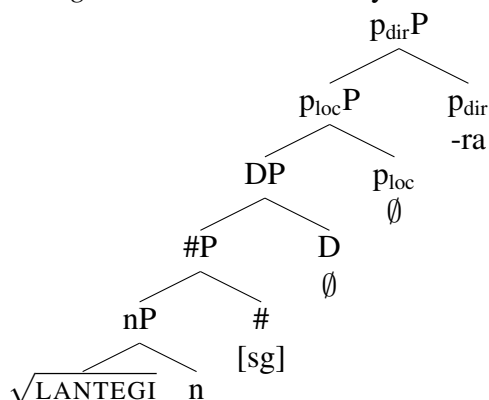
Strikingly, the same effect can be observed if the linker is added instead of p_{dir}. Again, we yield null spell-out of both D and p_{loc} as shown in (25), the case of the locative-linker anomaly.

(25)   *lantegiko (tximiniak)* '(the chimneys) in the factory'

```
                          C/ModP
                       ┌────────┴─────┐
                     p_loc P        C/Mod
                   ┌────┴────┐       -ko
                  DP       p_loc
                ┌──┴──┐      ∅
               #P    D
             ┌──┴──┐  ∅
            nP    #
          ┌──┴──┐ [sg]
       √LANTEGI  n
```
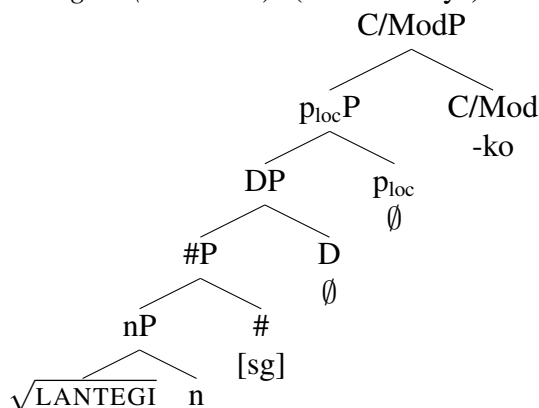
These observations can be captured by the following generalisations:

(26)   a.   The singular determiner is silent in the context of p_{loc}.
        b.   Basque p_{loc} is overtly realised iff a) its complement does not bear a singular feature
              or b) it is the highest head in the extended nominal projection.

As the zero variants of those morphemes do not seem to differ in interpretation from their overt counterparts, it seems reasonable to view these as morphophonologically conditioned effects. The next section will flesh out that hypothesis.

6.   *Locality conditions for the locative anomalies*

In this section, I will propose that the generalisations in (26) result from zero spell-out rules for D and p_{loc} which apply under locality conditions consistent with the predictions of Embick's (2010) $\mathbb{C}_1$-LIN theory of context-sensitive allomorphy. The necessary assumptions about domain formation also predict two cross-linguistic limitations of possible morpheme interactions.

<center>*6.1. The $\mathbb{C}_1$-LIN theory and two predictions*</center>

Embick proposes that context-sensitive allomorphy is subject to a linear adjacency condition restricted to locality domains determined by cyclic spell-out. Spell-out of a cycle is triggered by the category-defining heads and presumably also the phase heads of syntactic theory (Chomsky 2001). Spell-out and hence domain formation is governed by the principles stated in (27), deriving in turn to the two corollaries in (28) and (29).

(27) $\mathbb{C}_1$-LIN theory   (Embick 2010:51-54)

    a.   SO1: When cyclic head x is merged, cyclic domains in the complement of x are spelled out.

    b.   SO2: Merge of cyclic y triggers Spell-Out of cyclic domains in the complement of y, by (SO1). For a cyclic domain headed by cyclic x in the complement of y, this means that the complement of x, the head x itself and any edge$^+$ material attached to x's domain undergoes Vocabulary Insertion.[18]

    c.   SO3: Material in the complement of a phase head that has been spelled out is not active in subsequent PF cycles. That is, the complement of a cyclic head x is not present in the PF cycle in which the next higher cyclic head y is spelled out.

(28)   Domain Corollary   (Embick 2010:56)
Cyclic head x is not present in the PF cycle of computation that is triggered by Merge of x. Thus, x is *not* subjected to Vocabulary Insertion (and thus cannot undergo any phonological processing) until the next cycle of Spell-Out, when it is in the *domain* of another cyclic head.

(29)   Activity Corollary   (Embick 2010:56)
In $[[\ldots x]y]$, x, y both cyclic, material in the complement of x is not *active* in the PF cycle in which y is spelled out.

The pruning operation in (30) renders phonologically empty morphemes transparent for the purpose of the linear adjacency condition on allomorph selection.

(30)   Pruning schema   (Embick 2010:59)
$\sqrt{\text{ROOT}}\frown [x, \text{-}\emptyset],[x, \text{-}\emptyset] \frown Y \rightarrow \sqrt{\text{ROOT}} \frown Y$

I stipulate here that a complete xnP always forms a PF domain. Crucially, I furthermore assume that n and K are cyclic heads, but not D or any of the p heads. While these assumptions are made with reference to the present case study, they yield two predictions that may be further tested cross-linguistically.[19]

(31)   a.   D-type morphemes cannot be sensitive to K morphemes (or anything structurally higher). While K triggers the spell-out of the next lower cyclic domain (Root, n and its edge$^+$ domain) and therefore also D, it is not itself inserted until the

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[18]Edge$^+$ refers to all contiguous non-cyclic heads between two cyclic heads.

[19]Thanks to David Embick for pointing out the significance of this issue. Notice also that these predictions hold to the extent that KP is syntactically projected. If there is cross-linguistic variation to the effect that some languages encode case as a non-projecting feature, e.g. on D, the present predictions naturally do not carry over directly.

next cycle, cf. the Domain Corollary (28). D may however be sensitive to p-type morphemes provided that cyclic K is not present.

b. K(ase) morphemes should not show Root-conditioned allomorphy, since according to the Activity Corollary (29) in a configuration [$_{KP}$ K ... [$_{nP}$ n Root]] upon spell-out of K the Root is no longer active.[20]

The prediction in (31a) is what is at issue in the case of the locative anomalies.

6.2. A sample derivation

To illustrate the spell-out process, assume the following toy list of Vocabulary Items. Brackets indicate sensitivity to phonologically conditioned allophony of the bracketed phoneme, the symbol ⌢ in X⌢Y indicate that X is linearised directly adjacent to Y. Note that as hinted in section 4.2, I assume that (post-syntactic) Fusion of # and D (possibly preceded by head movement) results in a single node containing the features of both heads to account for the alternation between the singular (*-a*) and plural (*-e*) articles.

(32)   #+D[def, pl] ↔ -ak / __]$_{PF\ domain}$
         #+D[def, pl] ↔ -e
         #+D[def, sg] ↔ -∅ / __⌢ [loc]
         #+D[def, sg] ↔ -a

(33)   p$_{loc}$ ↔ -an / [sg] ⌢__]$_{PF\ domain}$
         p$_{loc}$ ↔ ∅ / [sg] ⌢__
         p$_{loc}$ ↔ -tan

The zero allomorph of the definite determiner in (32) is inserted iff it linearly precedes the locative, capturing the first generalisation in (26). This VI cannot apply to plural determiners, for which more specific rules are available.

The second generalisation is captured by (33). The traditional *-an* allomorph is inserted for p$_{loc}$ iff it the preceding morpheme has a [sg] feature and p$_{loc}$ is not followed by anything else in its PF domain.[21] This captures the strongly restricted distribution of that allomorph. If the second condition is not met, the zero allomorph is triggered. This is the situation observed in the locative-linker anomaly as well as the local case paradigm anomaly. Finally, *-tan* represents the elsewhere case.

The stepwise derivation in (34) of the allative singular form *lantegira* 'to the factory' illustrates how both generalisations result in the sketched theory.

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[20]Depending on the analysis of suppletion, root-allomorphy/suppletion sensitive to K would be ruled out as well. While this prediction seems to be largely valid cross-linguistically, it has recently come to my attention that there seem to be some cases of case-sensitive suppletion for some singular-only nouns, e.g. in Lezgian (Moskal 2013), representing a challenge to the strong claim made here.

[21]Notice that sensitivity to the domain edge is also assumed to account for the limited distribution of the *-ak* allomorph of the plural determiner, cf. (32).

(34)   *Fusion of # and D:* $\sqrt{\text{LANTEGI}}\frown(\text{n})\frown(\#+\text{D[def, sg]})\frown(\text{p[loc]})\frown(\text{p[all]})$
      Insertion: $\sqrt{\text{LANTEGI}}\frown(\text{n}, \emptyset)\frown(\#+\text{D[def, sg]}, \emptyset)\frown(\text{p[loc]}, \emptyset)\frown(\text{p[all]}, \text{-ra})$
      pruning: $\sqrt{\text{LANTEGI}}\frown(\text{p[all]}, \text{-ra})$
      spell-out: lantegira

Notice how this approach predicts that the absence of KP in the absolutive is crucial for this effect. Thanks to this, all the heads in the xnP are spelled out at once, placing #+D and p_{loc} adjacent to each other and in the same PF cycle. These are the necessary conditions to allow them to trigger each other's null spell-out. In contrast, the presence of a zero K head intervening between D and p_{loc} would predict the unattested output *lantegi-a-ra*.[22]

Remember that we have predicted in (31a) above that spell-out interactions of the type observed in the locative anomaly should be impossible if K intervenes between D and p. For example, zero spell-out of D should not be triggered in a string of the form $\text{D}\frown\text{K}\frown\text{p}$. And indeed bound postpositions triggering genitive marking, like the benefactive in (35), do not allow a zero D when they are definite.

(35)   mutil-*(a)-re-ki-ko   maitasun-a
      boy-DET.SG-GEN-COM-KO love-DET.SG
      'the love for/towards the boy'

While this observation involves negative evidence, the animate locative forms from the table in (5) might present a more direct test case. They generally involve a genitive complement, but the genitive marker is optional in the definite singular. It seems plausible to assume that K is still syntactically present then. In principle, D and the locative marker[23] are adjacent after pruning of K. However, as in the hypothetical scenario with a null absolutive K, they are located in separate PF cycles. Consequently, D should not receive null spell-out—which, in this case, is actually what we find as illustrated in (36).

(36)   a.   mutil-a]$_{\text{PF}}$-(ren)-gan-dik
          boy-DET.SG-GEN-LOC-ABL
          'from the boy'

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[22] Merger of K would trigger spell-out of n and its edge$^+$ domain up to D, cf. (ia). K and p_{loc} would be inserted in the next cycle. Pruning silent K would place p_{loc} adjacent to D as in (ib), so p_{loc} could receive zero spell-out. For D, though, only phonological adjustments would be allowed, as it has undergone insertion in the previous cycle.

(i)   a.   *Fusion of # and D:* $\sqrt{\text{LANTEGI}}\frown(\text{n})\frown(\#+\text{D[def,sg]})\frown\text{K[abs]}$
          insertion: $\sqrt{\text{LANTEGI}}\frown(\text{n}, \emptyset)\frown(\#+\text{D[def,sg]}, \text{-a})\frown\text{K[abs]}$
          pruning: $\sqrt{\text{LANTEGI}}\frown(\#+\text{D[def,sg]}, \text{-a})\frown\text{K[abs]}$
          spell-out: lantegia
      b.   *insertion:* $\{(\#+\text{D[def,sg]}, \text{-a})\}\frown(\text{K[abs]}, \emptyset)\frown(\text{p[loc]}, \text{-tan})\frown(\text{p[all]}, \text{-ra})$
          pruning: $\{(\#+\text{D[def,sg]}, \text{-a})\}\frown(\text{p[loc]}, \text{-tan})\frown(\text{p[all]}, \text{-ra})$
          adaptation: $\{(\#+\text{D[def,sg]}, \text{-a})\}\frown(\text{p[loc]}, \emptyset)\frown(\text{p[all]}, \text{-ra})$
          pruning: $\{(\#+\text{D[def,sg]}, \text{-a})\}\frown(\text{p[all]}, \text{-ra})$
          spell-out: * lantegiara

[23]Notice that this argument might lose force if the speculations in section 4.3 regarding the nominal nature of the proxies are true. Unfortunately, I am not aware of any other test case that could provide positive evidence.

b.   *mutil-∅-gan-dik

So under the assumption that K is cyclic but that the absolutive is marked by the absence of K, the generalisations in (26) can be successfully analysed as results of contextually conditioned zero spell-out of D and p_{loc}, with the $\mathbb{C}_1$-LIN theory correctly predicting the relevant locality conditions.

6.3.   *Alternatives to null spell-out*

To conclude this section, I will briefly sketch potential alternatives to the account above. The two relevant variables seem to me to be the mechanism leading to null exponence and the nature of the domain in which the relevant mechanism applies.

With respect to the first issue, a reasonable alternative might involve deletion of the locative and the determiner instead of a null allomorph. Regarding the second question, I have stated earlier that a syntactic deletion mechanism seems unlikely as that would lead to different structures and prevent interpretation of the D and p_{loc} at LF for the singular local cases, which is not what we observe. There are, however, alternatives relying on post-syntactic domains. Instead of restricting the domain for the relevant rules by means of cyclic spell-out augmented by a linear adjacency condition, one could imagine reference to prosodic domains (Ackema & Neeleman 2003, Nevins 2012) or the M(orphological)-Word level (Nevins 2012).

For the first option, a deletion rule in the spirit of Ackema & Neeleman (2003) could apply whenever the feature clusters [def,sg] and [loc] are contained in the same prosodic domain, cf. (37). In departure from Ackema & Neeleman (2003), the prosodic word rather than the phonological phrase would seem the more natural domain in the present case.

(37) $\{\dots Y\dots [def,sg]\dots [loc]\dots X\dots\} \rightarrow \{\dots Y\dots X\dots\}$[24]

In Nevins's (2012) conception, rules at the prosodic level are subject to a strict adjacency restriction, hence one might also consider the stricter formulation in (38).

(38) $\{\dots Y^{\frown}[def,sg]^{\frown}[loc]^{\frown}X\dots\} \rightarrow \{\dots Y^{\frown}X\dots\}$

An alternative domain to consider is the M-Word level, where an M-Word is a '(potentially complex) head not dominated by another head projection' (Embick 2010:37, (15a)). Non-adjacent nodes can interact on this level (Nevins 2012), so a rule like (39) follows almost directly from the generalisations in (26).

(39) $[\,[\,[\dots Y\{sg\}\,]_{YP}\, p_{loc}\,]_{p_{loc}P}\, X\,]_{XP} \rightarrow [\,[\,[\dots \cancel{Y\{sg\}}\,]_{YP}\, \cancel{p_{loc}}\,]_{p_{loc}P}\, X\,]_{XP}$
       If p_{loc} dominates a head with a singular feature and is dominated by any other head in the M-Word, both p_{loc} and the node carrying the singular feature are deleted.

The $\mathbb{C}_1$-LIN theory seems preferable to all these hypothetical alternatives insofar as the locality conditions it poses on whatever mechanism leads to the non-realisation of D and p_{loc} are more restrictive. The alternative theories seem prone to allowing more unattested interactions

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[24]Curly brackets indicate prosodic domains.

between D and the locative marker than Embick's account. In particular, they may run into problems with the animate locative cases discussed at the end of the previous section. To the extent that the proxy morpheme *-gan* does not form a separate prosodic domain, nor presumably a separate M-Word, the interaction between D and the locative marker should lead to the unattested **mutil-∅-∅-gan-dik*, cf. the previous section.

It is, however, feasible that deletion may account for the absence of overt exponence of D and p_{loc} instead of null allomorphy, provided that the application of the relevant rule is subject to the locality conditions of the $\mathbb{C}_1$-LIN theory. I will only provide two tentative arguments that lead me to prefer a treatment in terms of allomorphy for the time being. Usually, deletion rules like the ones suggested above have some independent motivation (e.g. in terms of haplology, cf. Nevins 2012). At the moment, I am not aware of what such a motivation might look like in these cases. The phonological matrix of Vocabulary Items, on the other hand, is expected to be basically arbitrary, so contextually conditioned zero-allomorphs for the definite article and the locative morpheme are not all that extraordinary. Theresa Biberauer (p.c.) also points out to me that deletion most commonly occurs at domain edges, while according to the present analysis null exponence of p_{loc} is crucially triggered exactly when it is not at the edge of the xnP.

7. *Conclusion and outlook*

The present paper has proposed a unified treatment of different cases of lack of exponence of the Basque locative. I have argued for a reanalysis of the Basque case paradigms, deriving from the structure of the extended nominal projection and post-syntactic effects of the spell-out of that structure. In particular, I have proposed that there is a distinction between the grammatical cases and the so called adverbial cases, which should be analysed as postpositions realising some higher functional head in the xnP; furthermore, that the morpheme *-tan* represents the default realisation of the locative; and finally that the morpheme *-e* is the default allomorph of the definite determiner *-a* in the plural. The observation that special locative forms are found with animate nouns has been taken to indicate that animacy is a grammatically active feature in Basque, which the locative morpheme is incompatible with and which can be blocked in some way by the proxy morphemes *-gan* and *baita*.

Based on these assumptions, I have traced the common origin of both locative anomalies to the interaction of the definite singular determiner and the locative morpheme, which seem to have contextually conditioned null allomorphs. I have argued that these kinds of interactions are best restricted by the locality conditions arising from Embick's (2010) $\mathbb{C}_1$-LIN theory, while leaving open the possibility that sufficiently restricted deletion rules rather than null allomorphs might account for the silence of D and the locative morpheme in the locative anomalies.

The assumption that n and K are cyclic nodes has lead to two predictions restricting the possible interactions between case and determiner-like morphemes which should hold cross-linguistically. In the presence of a KP, D should not be sensitive to K or higher material in the xnP. The realisation of K morphemes, on the other hand, should not be sensitive to the identity of the Root. There are challenges at least to the inverse of the second prediction, whether there is a general lack of sensitivity of the realisation of Roots to K, cf. Moskal (2013) and fn. 20, that call for further investigation.

To conclude, I am going to list some further questions arising from the present discussion. De Rijk (1988, 1993) has claimed that the ablative, the allative and the comitative endings can be optionally deleted under the linker as well, in parallel to the locative-linker anomaly. If these structures (treated as 'bare NP' complements to *-ko* in Hualde & Ortiz de Urbina (2003:147f.)) are really cases of optional deletion, one might wonder whether they yield to a similar treatment as the one proposed here for the obligatorily silenced locative morpheme.

Another non-trivial issue concerns e-epenthesis before locative /-an/ with consonant-final stems, cf. (6a). I would speculate that this phenomenon could be treated as a form of stem allomorphy, or *readjustment* in DM-terms.

A further question is how certain nominal elements can be restricted from occuring with certain features in higher functional heads, *viz.* how local nouns lik *aurre* 'front' can be restricted to definite singular features on #+D. If the animacy-blocking proxy morphemes are indeed nominal, that also raises the issue of why *-gan* shows definite behaviour, whereas *baita* seems to pattern as a non-definite noun. A very tentative hypothesis may be that these are actually functional nouns, special instances of n rather than regular Roots merged with n. If xnP is indeed projected by n, the idea that n could impose restrictions on xnP may not be completely outlandish.

Finally, on a crosslinguistic note, silent locative adpositions have been observed elsewhere, for example in Modern Greek and some Italian dialects (cf. Terzi 2010 and references given there). The conditions on the appearance of silent locative prepositions identified by Terzi (2010) for Modern Greek differ rather significantly from what has been proposed here for Basque. There, it seems that properties of the preposition, the ground argument and the verb interact in licensing P-drop, which is, moreover, generally optional. In Basque, in contrast, we have seen strong indications that the silence of the locative is obligatory and structurally triggered, independent of the ground argument (save for the apparent sensitivity to animacy). In spite of these differences, the question whether there are any properties that could unify these and other cases of non-realisation of — particularly locative — adpositions seems an interesting subject for future investigation.

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Context shift (im)possible
Indexicals in German Sign Language

Annika Hübl

Role shift is a sign language specific mode of quotation, combining properties of direct and indirect discourse. By using non-manual markers, sign languages offer the possibility to shift into the role of the person whose utterances or thoughts are reported. There is consensus that personal indexicals are shiftable in sign languages. This means that signers shift their reference to the context of the reported utterance in the scope of role shift. However, relatively little is known about the interpretation of local and temporal indexicals in role shift. This paper presents an analysis of elicited examples in German Sign Language and ascribes their inhomogeneous behaviour to modality-specific phonological properties of the particular signs. To describe the meaning of the indexicals, I build on basic assumptions and formal approaches that have been developed for the analysis of free indirect discourse.

1. The background
1.1. Introduction to role shift

Sign languages (SLs) have grammaticalised non-manual markers indicating reported discourse.[1]

- Change of eye gaze (towards the locus of the addressee of the reported utterance)
- Change of head position (towards the locus of the addressee of the reported utterance)
- Body lean
    - Sideward movement of the upper part of the body (towards the locus of the signer of the reported utterance)
    - Midsagittal body shift (towards the locus of the addressee of the reported utterance)
- Facial expression (associated with the signer of the reported utterance)

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[1] For more detailed information about role shift and related phenomena such as constructed action, see Lillo-Martin (2012), Herrmann & Steinbach (2007, 2012), and Quer (2005, 2011).

These markers can be summarised under the term *role shift* (RS). In order to understand how RS works, it is important to know some facts about the grammar of sign languages. The signing space (see numbers in Figure 1), in which these visual-manual languages are articulated, is relevant for the introduction and the resumption of discourse referents and for the expression of agreement between subject and object.

Figure 1: Signing space and referential loci

Discourse referents are associated with loci in signing space, they are generally established by a pointing sign, using IX_1 for the signer, IX_2 for the addressee, and IX_3 for absent discourse referents (cf. Figure 1). These referential loci also serve for agreement. The sign HELP, for example, is a so-called agreement verb in DGS that has to inflect. This means that the starting and the end point of the sign's movement are not fully lexically specified but have to be adjusted to the loci of the subject and the object (see example (1-a)).[2] That is, in case of $_1HELP_2$, basically meaning 'I help you', the movement starts at the subject location ('I') and ends at the object location ('you').[3]

The above-mentioned non-manuals shift the signing space and allow to open a "new" signing space, namely the one necessary for the reported utterance.[4] The following examples in German Sign Language (DGS $\Rightarrow$ *Deutsche Gebärdensprache*) illustrate how this works in detail.

(1)   a.   TOMORROW $_1HELP_2$
               'I will help you tomorrow.'

        b.   PAST A-N-N-A IX_{3a} M-A-R-I-A IX_{3b} SAY : $\overline{\text{TOMORROW } _1HELP_2}^{\text{rs}}$
               'Anna said to Maria: "I will help you tomorrow."'

The manual articulation $_1HELP_2$ is the same in (1-a) and (1-b) but the interpretation is different. Although the verb movement is adjusted to the referential loci of first and second person, in the

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[2] Note that the term *movement* is used in a fundamentally different way than in generative syntax. Signs are constituted by four basic phonological parameters: handshape, orientation, location, and movement. A change of one parameter can cause a change in meaning. For an overview of sign language phonology, see Brentari (2012).

[3] Note that it is convention to gloss signs with small caps. Hyphens between the caps illustrate that this word has been fingerspelled. Horizontal lines above the glosses indicate the scope of non-manual features, 'rs' stands for the non-manuals used for RS (there are other non-manual markings for various grammatical functions, such as 'topicalization' and 'negation').

[4] Herrmann & Steinbach (2012:217-219) state that the non-manuals establishing RS are not obligatory to the same extent. A change of eye gaze is more frequent and less marked than a change of head position and a change of head position is more frequent and less marked than a body lean. They attribute this to the physical interdependency between the articulators.

scope of the non-manual markers, it does not make reference to the actual signer and addressee of the matrix context but to the interlocutors of the internal context, Anna and Maria.[5]

1.2.   *Local and temporal indexicals in the scope of RS*

Whereas sign language linguists agree in general that personal indexicals in the scope of RS shift their reference to the context of the reported utterance,[6] relatively little is known concerning the interpretation of local and temporal indexicals in RS. This issue was raised by Quer (2005) first. He discussed the following example and argued that in Catalan Sign Language (LSC) the interpretation given below is the only one that is accessible.

(2)   [uttered in Barcelona] $\overline{\text{IX-L MADRID MOMENT JOAN}_{3a}}^{\text{topic}}$ $\overline{\text{THINK IX}_1 \text{ STUDY FINISH HERE}}^{\text{rs}}$

'When he was in Madrid, Joan thought he would finish his studies in **Barcelona**.'

According to Quer, signers of LSC have clear intuitions that HERE can only be interpreted relative to the context of the matrix utterance and thus refer to Barcelona. This is particularly remarkable because the whole reported thought is accompanied by the non-manual markers typical of RS. In addition, the first person IX_1 unambiguously shifts its reference and refers to Joan and cannot refer to the signer of the actual context.[7] This is contradictory to the predictions of the Shift-together Constraint of Anand & Nevins (2004:21), claimg that indexicals in a shifted context have to shift together.

However, the option to interpret HERE in LSC with respect to the reported context is not ruled out. Quer (2005:141) argues that if HERE is further specified, e.g. by adding the sign MADRID in this particular example, it can easily refer to the reported context. Although Kaplan's (1977/1989) definition of indexicals already had to be modified to account for languages as Amharic (Schlenker 2003) or Slave and Zazaki (Anand & Nevins 2004), it is obvious that

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[5] I will only consider standard instances of RS in this paper in which the interlocutors of the original utterance do not participate in the reporting event in the actual context. There are complex constellations that cannot be expressed making use of RS, e.g. those where the person about whom something is said in the original utterance is the signer in the actual context *C* but was not present in the reported context *c* (*Anna said to Maria that she would help me.*). In this case, signers use an indirect report. Furthermore, more data are required to allow stronger claims concerning the factors constraining the use of RS. For a more detailed discussion of this aspect, see Herrmann & Steinbach (2007:166-167).

[6] Though, unshifted or *backshifted* pronouns have also been reported for sign languages (Engberg-Pedersen 1995). For a signer, this can be a plausible strategy in terms of efficiency in case one of the participants of the reported utterance is present in the actual utterance situation. Note that this strong influence of the utterance context on the use of pointing in signing space is likely modality-specific and provides further evidence against analysing RS as an equivalent of direct discourse in SLs.

[7] Note that in example (2), which is directly taken from Quer (2005), the non-manuals have scope over the verbum dicendi, too. This is also common in DGS. It is not yet clear if this spreading of the non-manual markers is triggered by particular factors, e.g. properties of the utterance itself or of the context of utterance. However, this observation underlines the fact that the existing categories of direct vs. indirect discourse fall short of accounting for the modality-specific properties of RS in SLs.

analyses of indexicals are faced with new challenges when taking data from SLs into account.[8]

In my study, I focus on the interpretation of temporal and local indexicals in the scope of RS. The relevant data are described in the next section. I will explain the results with the phonological parameters of the signs that determine their context-sensitivity. Hence, I assume that this context-sensitivity (or the lack of it) is a lexical property of indexicals in SLs. In order to sketch a semantics for the indexicals investigated in this paper in section 3.3, I first summarise Eckardt's (2012) analysis of free indirect discourse in section 3.2 as it provides an appropriate basis for my own analysis.

2. *The data*

A first analysis of the data below was proposed in Hübl (2013). The data I present in this section are instances of RS in DGS that I have elicited in the Sign Language Lab at the University of Göttingen. My hypotheses are based on the introspective judgements of a near-native signer who has acquired DGS since the age of 4.

I elicited examples containing the following local and temporal indexicals: HERE, TODAY, NOW, YESTERDAY, and TOMORROW. All examples had the same structure: The first sentence introduced two discourse referents, A and B, the second sentence was an utterance of A addressing B which was reported by making use of RS. This second sentence contained the critical indexical expression.

Example (3-a) including HERE is basically analogous to the one of Quer in (2).

(3)   a.   [uttered in Göttingen] PAST M-A-R-I-A HANNOVER IX-L SAY : $\overline{\text{HERE IX}_1 \text{ LIKE LIVE}}^{\text{rs}}$

'When Maria was in Hannover, she said that she wanted to live in **Göttingen**.'

       b.   [uttered in Göttingen] PAST M-A-R-I-A HANNOVER IX-L SAY :
$\overline{\text{HANNOVER AREA HERE IX}_1 \text{ LIKE LIVE}}^{\text{rs}}$

'When Maria was in Hannover, she said that she wanted to live in **Hannover**.'

Interestingly, the interpretation of the DGS example in (3-a) follows the same pattern as its counterpart in LSC: IX_1 gets shifted and refers to the signer of the reported utterance, Maria, but HERE cannot shift and refer to Hannover but has to refer to Göttingen. Furthermore, as in LSC, HERE can easily be specified and consequently get interpreted relative to the context of the reported utterance (see (3-b)). Moreover, in DGS, the same holds in principle for TODAY: An unshifted interpretation is preferred (cf. (4)) but a shifted interpretation is accessible when TODAY is specified by an additional temporal information.

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[8] One can conclude from Kaplan (1977/1989) that the semantic value of an indexical is always and exclusively fixed by the context of the actual speech act. Consequently, they cannot be affected by a logical operator. Schlenker (2003:29) summarises this claim under the term *Fixity Thesis*.

(4)   [uttered on Thursday] PAST WEDNESDAY M-A-R-I-A$_{3a}$ T-I-M$_{3b}$ BOTH EAT IX$_L$ TELL :

$\overline{\text{IX}_1 \text{ LIKE TODAY DANCE GO}}^{\text{rs}}$

'On Wednesday, Maria and Tim ate there together and she told him that she would like to go dancing on **Thursday**.'

However, the interpretation of the other elicited indexical expressions is different from the interpretation of HERE and TODAY. This is not too surprising as Quer (2011:293) also states for LSC that not all temporal and local indexicals show the pattern outlined above. NOW does not seem to allow to be interpreted relative to the reported context for at least some of his informants, whereas YEAR THIS seems to be ambiguous in LSC and can refer either to the matrix context or to the reported context.

The latter pattern of interpretation can be found in my DGS data, too. TOMORROW and YESTERDAY are ambiguous between a shifted and a non-shifted interpretation: without any further specification, there seems to be no clear preference for neither the external nor the internal context (which can be deduced from (5-a)). But again, both TOMORROW and YESTERDAY can be lexically specified so that a signer can easily unambiguously encode the favoured meaning (cf. (5-b) and (5-c)).

(5)   a.   [uttered on Saturday] PAST THURSDAY M-A-R-I-A$_{3a}$ T-I-M$_{3b}$ MEET TELL :

$\overline{\text{IX}_1 \text{ LIKE TOMORROW MOVIES GO}}^{\text{rs}}$

'On Thursday, Maria and Tim met and she told him that she would like to go to the movies on **Friday/Sunday**.'

b.   [uttered on Saturday] PAST THURSDAY M-A-R-I-A$_{3a}$ T-I-M$_{3b}$ MEET TELL :

$\overline{\text{IX}_1 \text{ LIKE TOMORROW FRIDAY MOVIES GO}}^{\text{rs}}$

'On Thursday, Maria and Tim met and she told him that she would like to go to the movies on **Friday**.'

c.   [uttered on Saturday] PAST THURSDAY M-A-R-I-A$_{3a}$ T-I-M$_{3b}$ MEET TELL :

$\overline{\text{IX}_1 \text{ LIKE TOMORROW SUNDAY MOVIES GO}}^{\text{rs}}$

'On Thursday, Maria and Tim met and she told him that she would like to go to the movies on **Sunday**.'

Concerning NOW, the data suggest that its "shiftability" lies in between HERE/TODAY on the one hand and TOMORROW/YESTERDAY on the other hand, as NOW shows a weak preference for the reported context and is not totally neutral. Again, NOW can be lexically specified, e.g. by disambiguating temporal information, to support the accessibility of a shifted or a non-shifted reading.

Summing up, this first analysis reveals a complex pattern of interpretation for local and temporal indexicals. Opposed to personal indexicals that have to shift in general, this does not hold for local and temporal indexicals. Moreover, the latter do constitute an inhomogeneous group. These findings are similar to those of Quer (2005) proposed for LSC. In the next section, I attribute the results I have found in DGS to modality-specific properties of the signs themselves.

3. The analysis
3.1. Modality-specific properties of indexicals in DGS

I argue that HERE and TODAY have a strong preference not to shift to the reported context because of specific phonological properties of the signs. For this reason, one has to be aware of the fact that signs are not holistic linguistic symbols. Instead, each sign consists of smallest distinctive units that can be analysed as phonlogical parameters (Brentari 2012:22):

1. Handshape
2. Place of articulation
3. Movement
4. Orientation
5. Non-manual behaviour

In the following, I will analyse the articulation of the indexicals discussed in the previous section and will infer from the results how the phonological parameters of an indexical sign influence its interpretation. The articulation of HERE and TODAY is very similar in DGS as can be seen in Figure 2:
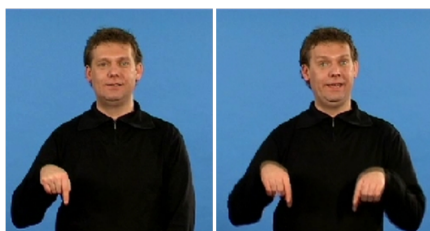
Figure 2: The signs TODAY and HERE in DGS (Kestner 2009)

HERE and TODAY show a strong preference not to shift reference in the scope of RS because three of the five phonological parameters are determined in a way that the signs establish a strong preference for the place (and metaphorically for the time) of the actual utterance context.[9]

- Handshape: index finger
- Movement: downward movement
- Orientation: index finger directed downward

In contrast, TOMORROW and YESTERDAY are ambiguous between a shifted and a non-shifted interpretation when being coarticulated with the non-manual markers of RS. Regarding the features of the signs' parameters, this appears to be a logical consequence: No parameter is fixed in a way that could establish a preference for the actual context. Both signs are produced with an extended thumb relative to a metaphorical horizontal timeline (see Figure 3 for TOMORROW).

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[9] Due to various linguistic and extralinguistic factors, SLs are not standardised to the same extent as most of the spoken languages that we are familiar with. Hence, I am aware of variants of HERE as a one-handed sign and of TODAY as a two-handed sign. Crucial to distinguish the two meanings is the different mouthing, visually indicating the production of the German words *hier* 'here' and *heute* 'today'. However, this has no influence on my analysis because the crucial properties of the signs occur in all the variants.
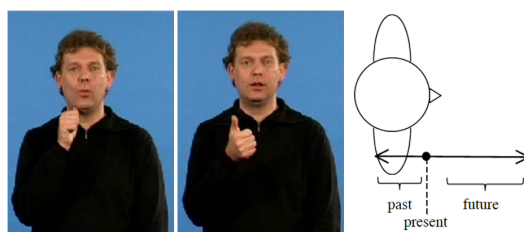
Figure 3: The sign TOMORROW in DGS (Kestner 2009), relative to a horizontal timeline

Moreover, the behaviour of NOW matches the assumptions proposed so far. Recall that NOW shows a weak preference for being interpreted with respect to the context of the actual utterance. Compared to the strong preference of HERE and TODAY and the corresponding analysis, at least one parameter of the sign NOW can be seen as a trigger of the weak preference: NOW is articulated with a clear downward movement but does not feature a handshape and orientation with the potential to create a stronger relation to the matrix context (see the Y-handshape in Figure 4). The fact that only a weak preference can be discovered for NOW is surprising to some extent since TODAY represents a more abstract concept than NOW. From this point of view, one would expect that NOW is more predestined to prohibit a shifted interpretation.[10] This supports my assumption that the nature of the phonological parameters is the crucial factor and not (only) the deictic semantics alone – pending future research on a reliable empirical data basis confirms these findings.

Figure 4: The sign NOW in DGS (Kestner 2009)

At this point, a first step forward is taken towards an appropriate description of how local and temporal indexicals are interpreted in RS. The next step is to formulate a precise semantics for these indexicals based on this description. For this purpose, I want to make use of insights gained in the study of free indirect discourse (FID). Although FID and RS seem hardly comparable at first sight, I argue that crucial questions arising in the semantic analysis of the two are so similar that in principle, the same approaches can be applied successfully to both phenomena. Hence, the following section deals with FID and its relevant linguistic analyses. Building on this, I sketch a semantics for local and temporal indexicals in DGS in section 3.3.

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[10] Thanks to Georg Höhn who made me aware of this interesting aspect.

3.2.   Shiftable and non-shiftable indexicals in FID

FID is a mode of reported discourse typical of literary narratives. It has always been a prominent topic in literary studies and has also gained increasing attention in formal semantics in recent years, e.g. in the works of Schlenker (2004), Sharvit (2008), and Eckardt (2012) among others. This is due to the fact that utterances in FID simultaneously exhibit features of direct and indirect discourse.

Eckardt (2012) assumes that utterances in FID are evaluated relative to two utterance contexts <C,c> with C representing the context of the narrator as external context and c representing the context of the protagonist as internal context.

Crucial to the interpretation of FID is a specific behaviour of indexicals. Eckardt's analysis is based on the assumption that context-dependent expressions systematically divide up in shifting and non-shifting indexicals. Hence, there are two distinct groups of indexicals: those that can be interpreted relative to an internal context (if available) and those that cannot. Eckardt (2012) defines these groups as follows:[11]

- Pronoun and tense interpretation is always relative to the external context C.

- The interpretation of temporal adverbs, speaker-related adverbs and particles and addressee-related predicates can be relative to the internal context c.

Example (6) illustrates how this works in detail .

(6)   Emma was cracking up. *Tomorrow was her 30th birthday and where the hell was the man of her life?*

In contrast to the first sentence, which is read as a description of the narrator, the passage in italics is told from the perspective of the protagonist Emma and reports her thoughts. This is due to a very specific combination of grammatical features: On the one hand, the narrator as the speaker of (6) is responsible for the use of past tense and the third person pronoun. In doing so, it is linguistically excluded to interpret the protagonist Emma, the referent of *her*, as speaker of the utterance in italics. On the other hand, *tomorrow* is obviously interpreted as the next day from Emma's perspective and not as the *tomorrow* of an abstract narrator. Moreover, the interrogative that can only be interpreted coherently as a question Emma addresses to herself and the expressive *what the hell* are typical ingredients of direct discourse. Hence, they are reliable linguistic indicators of the protagonist's perspective.

As mentioned above, the fact that utterances in FID are neither ungrammatical nor contradictory, is preferably analysed in terms of context shift, e.g. by Schlenker (2004) and Eckardt (2012).[12] As Eckardt distinguishes shiftable and non-shiftable indexicals, I adopt her style of defining the semantics of indexicals in FID and adjust it to the pattern of indexicals in RS.

In order to account for the interpretation of both shiftable and non-shiftable indexicals,

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[11] I do not want to claim that sign languages show the same pattern concerning the distribution of indexical expressions. However, the concept of assuming different groups of lexical items that differ in their ability to shift reference to an internal context is useful for the analysis of role shift.

[12] But see Maier (2012) for an alternative analysis based on mixed quotation.

Eckardt introduces two sets of context variables and the external and the internal context as two different assignment functions taking care of the indexical variables in the following way:

- An external context *C* is an assignment function that is defined on {*SP, sp, AD, ad, NOW, now, HERE, here, WORLD, world*}. *C* is consistent in the sense that *SP* and *sp*, *AD* and *ad*, etc. are mapped to identical values: *C(SP) = C(sp), C(AD) = C(ad), C(NOW) = C(now), C(HERE) = C(here), C(WORLD) = C(world)*.

- An internal context c is an assignment function that is defined on {*sp, ad, here, now, world*}.

Note that variables in capital letters are used for non-shifting indexicals whereas the small letters indicate that the indexical in question can shift from an external to an internal context. In a standard utterance situation in which only one context, the actual context of utterance *C*, is available, there is no difference between the two groups of indexicals. Although the meaning of *I* is based on *C(SP)* (cf. (7)) and the semantics of *tomorrow* is based on *c(now)* (cf. (8)), in the end, the reference of both is fixed with respect to *C* because this is the only context available $[\![\phi]\!]^{M,g,C}$.[13]

(7) a. $\|I\| = SP$
     b. $[\![SP]\!]^{M,g,C} = C(SP)$

(8) a. $\|tomorrow\| = \lambda e.\tau(e) \subset \iota t.\text{DAY-AFTER}(t, now)$
     b. $[\![\lambda e.\tau(e) \subset \iota t.\text{DAY-AFTER}(t, now)]\!]^{M,g,C}$ = the set of events that are located in the unique interval that counts as the day after *C(NOW)*

The difference between the two groups of indexicals is crucial if two utterance contexts are available, e.g. in FID. Strings in FID are interpreted in the following way $[\![\phi]\!]^{M,g,<C,c>}$. As can be deduced from (9), this does not influence the reference of *I* as a non-shifting indexical which is defined on *C(SP)*. Hence, *I* always has to refer to the speaker of the actual context and cannot refer to the speaker of the internal context (which is the context of the protagonist in FID). In contrast, the reference of *tomorrow* which is based on *c(now)* and therefore is sensitive to an internal context does shift to *c*, which is shown in (10).[14]

(9) a. $\|I\| = SP$
     b. $[\![SP]\!]^{M,g,<C,c>} = C(SP)$

(10) a. $\|tomorrow\| = \lambda e.\tau(e) \subset \iota t.\text{DAY-AFTER}(t, now)$
      b. $[\![\lambda e.\tau(e) \subset \iota t.\text{DAY-AFTER}(t, now)]\!]^{M,g,<C,c>}$ = the set of events that are located in the unique interval that counts as the day after *c(now)*

To sum up, Eckardt (2012) accounts for the interpretation of FID by assuming an external and an internal context and two assignment functions defined on different sets of variables. Moreover,

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[13] The examples in section 3.2 are taken from Eckardt (2012) and are partly modified to meet the requirements of the issue raised here.

[14] Note that Eckardt (2012) argues that her formalism predicts that all shiftable indexicals in a shifted context have to shift together which is generally comparable to the assumptions of Anand & Nevins (2004) and their Shift-together Constraint.

she implements the potential to shift into the semantics of the indexicals as she argues that indexicals differ with respect to which of the sets of variables they rely on. In the next section, I sketch how to adapt this approach to deal with the sign language data introduced in section 2 and 3.1.

3.3.   Shiftable and non-shiftable indexicals in DGS

Accounting for the complex pattern of indexicals in DGS poses a challenge because one has to deal with more or less preferred interpretations instead of clearly accessible or inaccessible interpretations. In addition, semantics has to take care of modality-specific phonological features that influence the interpretation procedure in a deictic-iconic way. Future research will have to define more precisely the phonology-semantics interface with respect to SLs. The findings of this paper suggest that a direct phonology-semantics interaction might be a plausible solution – at least for SLs – although a phonology driven or influenced interpretation is dispreferred in most current models.[15] For an overview of the behaviour of the indexicals discussed so far, see Table 1:

have to shift if c is available	**strong preference not to shift** although c is available	**weak preference not to shift** although c is available	**ambiguous** between a shifted and a non-shifted interpretation
IX_1	HERE	NOW	YESTERDAY
IX_2	TODAY	—	TOMORROW
deictic-iconic relation to signer and addressee	strong deictic-iconic relation to C	weak deictic-iconic relation to C	no deictic-iconic relation to neither C nor c

Table 1: Overview of indexicals and their preferred interpretation in RS

The analysis of IX_1 and IX_2 is rather straightforward. Unlike English *I* in (7), for example, which is a non-shifting indexical, IX_1 and IX_2 have to be interpreted relative to an internal context *c* if available. Hence, the semantics of these indexicals rests on the "small" speaker or more precisely *signer* variable, which is shown in (11). However, if only *C* is available, IX_1 will refer to the signer of the actual context.

(11)   a. $\|IX_1\| = si(gner)$
          b. $\|IX_2\| = ad(dressee)$

The analysis of HERE and the temporal indexicals is more complicated. My preliminary solution how to account for the preferences of the different indexicals is to integrate them into the indexicals' semantics. Regarding HERE and TODAY, this is a strong deictic-iconic preference (SDP), see (12). Regarding NOW, this is a weak deictic-iconic preference (WDP), see (13).

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[15] I thank Georg Höhn for pointing this out to me.

- SDP: Even though an internal context c is available, there is a strong deictic-iconic preference for HERE and TODAY to be interpreted relative to the external context C.

- WDP: Even though an internal context c is available, there is a weak deictic-iconic preference for NOW to be interpreted relative to the external context C.

(12)   a. $\|\text{HERE}\| = \lambda e.\tau(e) \subset \iota l.\text{PLACE-UTTERANCE}(l, x)$ & $x \in \{HERE, here\}$ & *HERE* $>_{SDP}$ *here*

        b. $\|\text{TODAY}\| = \lambda e.\tau(e) \subset \iota t.\text{DAY-UTTERANCE}(t, x)$ & $x \in \{NOW, now\}$ & *NOW* $>_{SDP}$ *now*

(13) $\|\text{NOW}\| = \lambda e.\tau(e) \text{ o } x$ & $x \in \{NOW, now\}$ & *NOW* $>_{WDP}$ *now*

That TOMORROW and YESTERDAY are ambiguous between a shifted and a non-shifted interpretation is reflected in their semantics in the following way:

(14)   a. $\|\text{YESTERDAY}\| = \lambda e.\tau(e) \subset \iota t.\text{DAY-BEFORE}(t, x)$ & $x \in \{NOW, now\}$

        b. $\|\text{TOMORROW}\| = \lambda e.\tau(e) \subset \iota t.\text{DAY-AFTER}(t, x)$ & $x \in \{NOW, now\}$

Although this analysis is very useful in revealing the characteristics of indexicals in sign languages, it is to be seen as a first attempt. The adaption of Eckardt's approach to RS should be redefined to ensure that the assignment function can provide for the interpretation.[16] Moreover, future research has to spell out if indexicals in SLs differ fundamentally from indexicals in spoken languages. If so, it will have to be analysed if this is to due to phonological properties of the signs as is suggested here or if more general pragmatic principles are at work.[17]

4.   *Summary and outlook*

In this paper, I presented recently elicited data from DGS and addressed the question of how local and temporal indexicals are interpreted when being articulated in the scope of RS. The results suggest an inhomogeneous pattern because in contrast to personal indexicals that generally have to shift, temporal and local indexicals need not to be shifted and show different preferences

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[16] Schlenker et al. (2012) introduce the concept of *Formal Iconicity*. The basic idea is that specific geometric properties of signs have to be preserved by the interpretation function. The following example illustrates this. The observation is that high loci in signing space have to refer to tall or important entities, low loci have to refer to small entities or metaphorically to entities with a low social status (Schlenker et al. 2012:9). Schlenker et al. analyse this inference as a presupposition by analogy with the gender features of pronouns in spoken languages. An advancement of the analysis presented in this paper could be to test if the concept of presupposition is also useful in order to account for the interpretation of local and temporal indexicals in RS.

[17] Emar Maier (personal communication) argues that RS, like FID, is a form of "flexible" quotation. He assumes that indexicals can be used unshifted in SLs easily because it is a very effective linguistic strategy to use indexical pointing to entities that are salient in the actual context *C* (more or less independent of the referring expression used in the orginal utterance). Note that indexical pointing is part of the grammar of sign languages and therefore has a different status than the identically looking co-speech gesture in spoken languages. Hence, the economic use of pointing in the signing space could be a strong linguistic constraint in sign languages that can override contraints requiring a report as literal as possible. If Emar Maier is right, the modality-specific behaviour of indexicals in SLs is caused by two factors: (1) the status of indexical pointing in the grammar of SLs and (2) the condition that referents of the original utterance are also highly salient in the actual context *C*.

for either *C* as the external context or *c* as the internal (or reported) context. These findings fit in with those of Quer for LSC and indicate that the Shift-together Constraint that Anand & Nevins (2004) propose has to be relativised when taking SLs into account.

In section 3, I ascribed the inhomogeneous behaviour of local and temporal indexicals to modality-specific phonological properties of the parameters used in the articulation of the particular signs. Subsequently, I described the meaning of the indexicals by building on formal approaches developed for the analysis of FID. I focused on the analysis of Eckardt (2012) because she systematically distinguishes between shifting and non-shifting indexicals, which provides a good starting point to be applied to indexicals in RS. Finally, I outlined a semantics for the personal indexicals IX_1, IX_2 as well as for the local and temporal indexicals HERE, TODAY, NOW, TOMORROW, and YESTERDAY. I integrated the different preferences as a direct semantic reflex.

Further research is needed to provide an empirical basis for the study of SLs, especially when addressing subtle questions such as the interpretation of RS. Despite the parallels in Quer's work on LSC, it is not yet clear if all SLs show similar patterns. However, this would only be expected if indexicals in other SLs show phonological properties as described in this paper for HERE and TODAY in DGS. In addition, more attention should be paid to the fact that RS cannot be reduced to a marker of reported discourse. Quer (2011) discusses so-called non-quotational instances of RS in detail. In principle, it is conceivable that indexicals do not behave alike in quotational and non-quotational RS.

Moreover, it is not yet clear if RS necessarily has to be analysed in terms of context shift. Alternative approaches, e.g. based on the concept of mixed quotation (Maier 2012), should also be considered. Finally, RS should be systematically investigated in order to gain deeper insights into fundamental lingustic similarities *and* differences between spoken and sign languages.

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Deriving De Re/De Dicto Interpretations in Online Sentence Processing

Alanah McKillen

This paper reports the results of an experiment designed to adjudicate between two theoretical accounts of de re/de dicto ambiguity: the scope account (Montague 1973; Russell 1905) and the world variable binding account (Percus 2000; von Fintel & Heim 2011).The results are partly compatible with the scope account and completely incompatible with the world variable account, thus seeming to favour the former. This conclusion is not without complications, and I suggest there are two potential sources for the problematic results: a learning effect or a lexical surprisal effect. Once we take these factors into consideration, the observed incompatibility may not be as problematic as first thought.

1. Introduction

This paper presents results from a self-paced reading study which sets out to provide experimental evidence that could distinguish between two theoretical accounts for deriving de re/de dicto ambiguities: the traditional scope account and the world variable binding account. One major difference between these two accounts is the presence of covert movement in the former, and the absence of covert movement in the latter, in deriving a de re interpretation. Using the ACD (Antecedent Contained Deletion) paradigm of Hackl et al. (2012) to assess whether covert movement occurs in online sentence comprehension, the experiment presented here compares the processing cost of ACD under a de re biased context to the processing cost of ACD with a non-biased context, in order to see whether contextual bias for a de re reading has any effect on the processing time of ACD. If covert movement occurs in online structure building, then ACD processing will be facilitated, thus providing evidence for the scope account, and if ACD is not affected, this would then indicate that covert movement has not taken place, thus providing evidence for the world variable binding account. The results presented here appear to be completely incompatible with the world variable account, and only partially compatible with the scope account. I suggest that what complicates the compatibility of the results with the scope account could be due to one of two factors, namely, a potential learning effect or a surprisal effect, both of which, when controlled for in further research, may lead to results which are in

fact compatible with the scope account.

2.   *De Re/De Dicto Ambiguity*

It is a well known property of intensional predicates (e.g. modals, propositional attitudes) that they give rise to an ambiguity regarding the DP embedded in their clausal complements (Chierchia & McConnell-Ginet 2000; McKay & Nelson 2010; Gamut 1991; von Fintel & Heim 2011; Quine 1956), known as the de re/de dicto distinction.[1] For illustration, take the example sentence in (1) which could be uttered in two different contexts ((1a) and (1c)) and give rise to two distinct interpretations for the same surface string of words.

(1)   John **was willing** [$_{TP}$ to read [$_{DP}$ **every** [$_{NP}$ **book that Mary bought**]]]

    a.   **Context**: John knows that Mary has good taste in literature and that she recently bought some books for her collection. John doesn't know which books she bought but he was willing to read whichever ones she did buy.

    b.   De Dicto: All the books that John was willing to read are whichever ones Mary bought.

    c.   **Context**: John is a big fan of H.G. Wells and was therefore willing to read *The Time Machine, War of the Worlds*, and *The Invisible Man*. Unbeknownst to John, Mary likes collecting late 19th century science fiction and bought those same books.

    d.   De Re: All the books that John was willing to read just happen to be the same ones that Mary bought.

We see here that the DP *every book that Mary bought* is embedded under the propositional attitude predicate *was willing* and gives rise to two interpretations of the sentence. Under the de dicto interpretation (1b), the books that John was willing to read seem to depend on whatever books Mary bought. The description *every book that Mary read* is integral to what John's willingness is about. So, if Mary bought *Dune, Solaris,* and *Neuromancer*, then John was willing to read those books. If on the other hand Mary bought *The Time Machine, War of the Worlds*, and *The Invisible Man* then those are the books that John was willing to read. Under the de re interpretation (1d), John's willingness is about a particular set of books, in this case, *The Time Machine, War of the Worlds*, and *The Invisible Man*, and it just so happens that this set of books is the same as the set of books Mary bought. If asked what books he was willing to read, John would not use the description *every book that Mary bought* since he is unaware of the books she bought and thus this description is not integral to what John's willingness is about.

One way of typically distinguishing a de re reading from a de dicto reading semantically is to look at the preservation of truth under substitution of a co-designating term as in (2).

(2)   Semantically de re/de dicto (McKay & Nelson 2010):
    A sentence is semantically de re just in case it permits substitution of co-designating terms salva veritate. Otherwise, it is semantically de dicto.

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[1]More specifically, the ambiguity arises with regard to the restrictor of the DP, as we will see in Section 2.1. For introductory explanatory purposes in this section I will just make reference to the DP.

For the context in (1a), if we tried to substitute the DP *every book that Mary bought* in (1) with another DP that denoted the same set of books, e.g. *the books by H.G. Wells* assuming that the set of books Mary bought was *The Time Machine, War of the Worlds*, and *The Invisible Man*, the reading in this context would no longer be true, since the description *every book that Mary bought* is integral to what John was willing to read, thus indicating a de dicto reading. On the other hand, for the context in (1c), we can substitute the DP *every book that Mary read* in (1) with another DP denoting the same set of books. For example, if the speaker instead uttered: *John was willing to read [$_{DP}$ the books by H.G. Wells]* in this context then the sentence would still be true, thereby indicating a de re reading.

2.1.   Theoretical Approaches: Possible Worlds

This section addresses two main theoretical approaches for deriving the distinction between de re and de dicto interpretations, assuming that the distinction between the two readings is one of a difference in the world of evaluation of the DP restrictor, and that propositional attitude predicates are analyzed as intentional/modal operators. The de re interpretation would arise when the DP restrictor is evaluated in the actual world, whereas the de dicto reading would arise when it is evaluated in every possible world made accessible by the intensional operator. If we were to represent the paraphrases in (1b) and (1d) in terms of their truth conditions with regard to possible worlds, the distinction would be as in (3).

(3)   a.   De dicto: Every possible world in which John's willingness is realized[2] is a world in which he reads every book that Mary bought, in that world.

        b. $\forall w \in$ Acc $\forall x [$ book(x) in $w \land$ bought(m,x) in $w \rightarrow$ read(j,x) in $w]$

        c.   De re: Every book Mary bought in the actual world is such that in every world where John's willingness is realized, he read them.

        d. $\forall x [$ book(x) in $w_o \land$ bought(m,x) $w_o \rightarrow \forall w \in$ Acc $[$ read(j,x) in $w]]$

For the de dicto reading we obtain a scenario where every book John was willing to read can vary depending on each possible willingness world of John's, and for the de re reading the situation is one where every book John was willing to read does not vary depending on each of John's willingness worlds, it is the same set of books in all of them, i.e. those Mary bought in the actual world.

2.1.1.   Scope Account

How can this distinction between evaluation worlds be captured? One account determines the relevant evaluation world by the LF position of the DP. This is the scope account of Russell (1905) and Montague (1973) where de re/de dicto ambiguity is an instance of scope ambiguity. In order for the restrictor/NP to be evaluated in the actual world (and derive a de re reading) it must be outside the scope of the intensional operator, since all predicates that occur within the scope of an intensional operator must be evaluated in the same possible worlds made accessible

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[2]I.e. for every possible world which is an element of the set of accessible worlds (Acc).

by that operator. Thus, the only way to be evaluated in the actual world is to not be in the scope of the intensional operator. To do this, the whole DP is assumed to move covertly to adjoin to the nearest position where it is outside the scope of the intensional operator. To derive the de dicto reading the DP remains in situ[3]. Schematically, following Keshet (2008, 2010), the resulting LFs for each reading would be as in (4).

(4)   For an intensional operator α:
    a. $[\dots \alpha [\dots [_{DP} \text{ D NP }]]]$
    b. $[[_{DP} \text{ D NP }]_1 \dots \alpha [\dots t_1]]$

2.1.2.   World Variable Account

In the world variable account of Percus (2000); von Fintel & Heim (2011), the relevant evaluation world is determined by the introduction of overt world variables associated with the DP restrictor in the LF syntax and the operators which bind them. As we can see in the LFs in (5), there are overt world variables[4] and λ-operators which bind these variables to determine the world where each predicate is evaluated.

(5)   For an intensional operator α:
    a. $[\lambda w_o \dots \alpha [\lambda w_1 \dots [_{DP} \text{ D NP} w_1]]]$
    b. $[\lambda w_o \dots \alpha [\lambda w_1 \dots [_{DP} \text{ D NP} w_o]]]$

The de dicto reading follows from an LF where the world variable of the DP restrictor is bound by the λ-operator of the embedded clause and the de re reading follows from an LF where the world variable of the DP restrictor is bound by the λ-operator of the matrix clause[5].

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[3]While the DP remaining in situ would be the case for definite DPs, if the DP is quantificational on the other hand, QR of that DP would still have to be assumed to resolve the type mismatch of a QDP in object position, but crucially this QR would move to a position still within the scope of the intensional operator, (i). A de re reading with a QDP would be derived in the same way as with a definite DP, (ii).

(i)   [John wants [[a book] 1 [PRO to read t_1]]]

(ii)   [[a book] 1 [John wants [PRO to read t_1]]]

[4]World variables are assumed to be generated as sisters to all lexical predicates. For getting the de re/de dicto distinction here we are concerned with the world variables that are sisters to the DP restrictor, e.g. as a sister to the NP.

[5]In (5), the DP remains in situ, which would be the case if the DP was non quantificational. If on the other hand the DP was quantificational, QR to resolve the type mismatch would be needed. QR targets the most local clausal node and the QDP in both (i) and (ii) below would adjoin to the embedded TP. Note that this position in both cases is below the intensional operator, thus the de re/de dicto distinction is coming not from the scope of the DP but from the binding of world variables, as in (i) and (ii) below.

(i) $[\lambda w_o \text{ John wants } [\lambda w_1 [\text{a book}_{w_1}] 2 [\text{PRO to read } t_2]]]$

(ii) $[\lambda w_o \text{ John wants } [\lambda w_1 [\text{a book}_{w_o}] 2 [\text{PRO to read } t_2]]]$

At this point, both accounts are successful in capturing the differences in evaluation worlds in order to derive a de re or de dicto reading. So, with regard to these basic examples, both accounts are on equal footing. Furthermore, as pointed out by Keshet (2010), there is other data beyond these basic cases showing that one account still does not seem preferred over the other. In brief, he shows that the scope account undergenerates, whereas the world variable account overgenerates.

This is where experimental evidence could prove useful in adjudicating between the two accounts. While both accounts derive the de re/de dicto distinction in terms of different worlds of evaluation, they do so with different theoretically assumed mechanisms. In order to derive a de re reading, the scope account uses covert movement, whereas the world variable account does not, and instead uses variable binding. The research presented here attempts to find experimental evidence for the use of these mechanisms in online LF structure building. Since the key distinguishing factor between these two accounts is movement versus no movement in the derivation of de re interpretations, the experimental question is reduced to whether or not there is processing evidence for covert movement in the real time comprehension of de re interpreted sentences.

3.   *Processing Covert Movement: ACD Paradigm*

Much recent experimental work by Martin Hackl and colleagues has addressed the question of whether there is processing evidence for covert movement, i.e. quantifier raising (QR), in online LF structure building (Hackl et al. 2012; Breakstone et al. 2011; Hackl et al. 2009; Varvoutis & Hackl 2006). Using self-paced reading methodology, an experimental paradigm was created that evaluates the processing time of ACD hosted in a DP to see if QR of that DP has occurred in online LF structure building.

Hackl et al. (2012) measured the processing time of ACD hosted in a quantified DP compared to ACD hosted in a definite DP and used their experimental findings contribute to the debate between type shifting (Jacobson 1998, 2008) versus QR approaches (Heim & Kratzer 1998) for resolving the type mismatch that arises with QDPs in object position. Hackl et al. (2012) found that processing ACD hosted in a QDP is quicker than processing ACD hosted in a definite DP, which they argue is evidence for the QR approach. This paradigm hinges on how ACD is assumed to be resolved in theory and in processing, which the next section will outline.

### 3.1.   *Antecedent Contained Deletion*

ACD is a type of verb phrase ellipsis where the elided VP is embedded in a relative clause which modifies the direct object of the sentence. Given the surface structure of the sentence, the elided VP also seems to be contained inside the VP that acts as its antecedent, as in (6)[6].

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[6]The size of the ellipsis can also vary. For example, in local ACD (ia), the elided VP *read* seems to be contained in the embedded VP that acts as its antecedent. On the other hand, in non-local ACD (ib), the elided VP *willing to read* seems to be contained inside the larger matrix VP that acts as its antecedent.
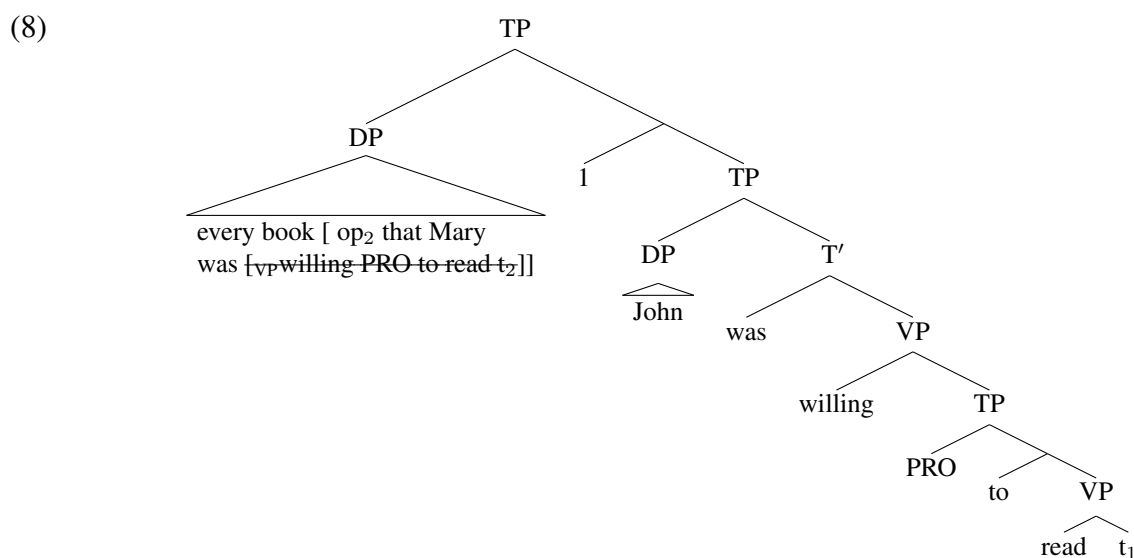
(6) John [$_{VP}$ read every book that Mary did [$_{VP}$ ~~read~~]]

This is problematic for theories of VP ellipsis that require an identity (or parallelism) condition to be satisfied between the elided VP and its antecedent (Bouton 1970; Sag 1976) since identity requires that, in order for the VP to be deleted, it must have an identical/parallel syntactic structure to its antecedent. If the elided VP is contained inside its antecedent then it is impossible for the two VPs to be structurally identical.

In order to resolve this problem, the standard analysis for ACD involves covert movement of the DP containing the elided VP to the closest clausal position where it is external to the antecedent VP (Sag 1976; May 1985), as in (7).

(7)
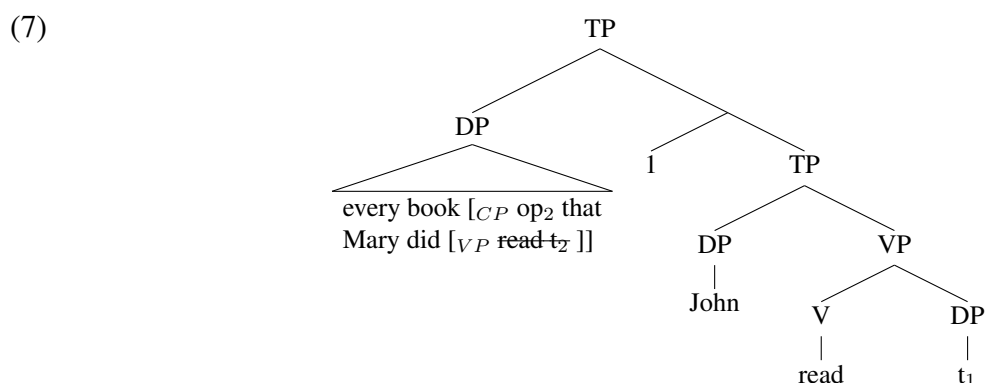
Note that for local and non-local ACD the landing site of QR to resolve antecedent containment will differ. For local ACD the DP will QR to adjoin to the embedded TP as in (7), whereas for non local ACD the DP will adjoin to the matrix TP, as in (8).

(8)

(i) a. John was willing to [$_{VP}$ read every book that Mary did [$_{VP}$ ~~read~~]]
     b. John was [$_{VP}$ willing to read every book that Mary was [$_{VP}$ ~~willing to read~~]] .

Lastly, if ACD resolution proceeds along these lines in processing, the parser will minimally have two operations to perform: First, QR of the DP to a position where it is no longer inside the VP that acts as the antecedent to ellipsis and second, the establishment of an anaphoric dependency between the elided material and its antecedent.

3.2. *Processing Evidence for Covert Movement*

Assuming this analysis of ACD, Hackl et al. (2012) predict that the type of DP that ACD is hosted in will have an effect on the processing time of ACD, but only under the QR account and not the type shifting account. These predictions follow from the left to right nature of sentence processing and the number of operations that are assumed the parser must carry out when it encounters the quantifier or definite article and again at the following ACD site.

It the garden path model of sentence processing (Frazier 1978), it is assumed that the parser proceeds along various economy principles (such as minimal attachment and late closure), and will build the simplest syntactic structure possible and try to integrate each word it comes across into the current syntactic structure it is building. If it cannot integrate a word into the syntactic structure, then that structure undergoes reanalysis so that integration can occur. Under the QR approach to QDP integration (Heim & Kratzer 1998), they predict that when the parser encounters the QDP, it cannot integrate it into the syntactic structure for semantic type reasons and must therefore reanalyze the current syntactic structure it is building into one where the QDP has undergone QR to adjoin to the most local clausal node. Continuing left to right, the parser then encounters the ACD site, and, all things being equal, the parser should have two operations to perform: 1) resolving antecedent containment 2) an operation linking the elided material to its antecedent. But, because of the prior QR of the DP, the number of operations the parser has to perform is reduced to one.

Facilitation in ACD processing will occur only when the DP is quantificational because it has already QR-ed the DP for type reasons to a position which also happens to coincide with the position that the DP would need to QR to for the resolution of antecedent containment. For definite DPs this facilitation would not occur because there is no type mismatch with a definite DP in object position, hence no motivation to do QR prior to encountering the ACD site. Basically, for QDPs and definite DPs, the final syntactic structures the parser builds are the same (see (7)), but the time-course differs depending on the type of DP the ellipsis is hosted in.

For the type-shifting account, no facilitation would be predicted, regardless of the type of DP. When the parser encounters the QDP, it resolves the type mismatch by leaving the DP *in situ*, which means that when ACD is encountered the standard two processing operations needed to resolve ACD would be carried out. Similarly, since there is no type mismatch with a definite DP, the processing operations at the ACD site would be the same under this account, thus predicting no difference in the processing time of ACD.

Turning to the results of the experiment run by Hackl et al. (2012) (Figure 1), there was a significant main effect of ellipsis ($F(1,43) = 5.619$; $p < 0.05$) and a significant interaction effect ($F(1,43) = 7.987$; $p < 0.017$) indicating that the processing cost of ACD was quicker when it was hosted in a QDP compared to when it was hosted in a definite DP. Hackl et al. (2012) argue that these results only follow if the DP hosting ACD had undergone prior QR, thus concluding

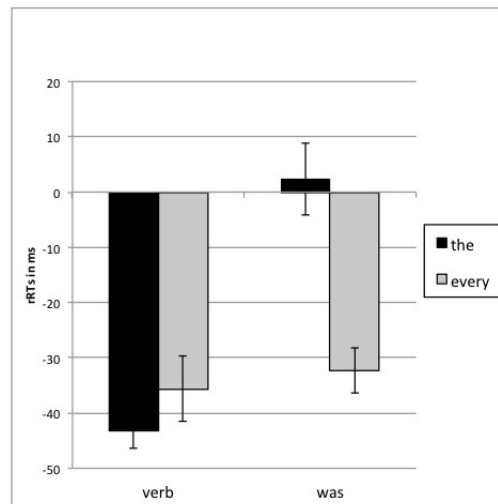that there is processing evidence for covert movement in the grammar.

Figure 1: Hackl et al. (2012) Experiment 1 Residual RTs three words after V/Aux (n=44)

4. Current Study

The current study uses the ACD paradigm of Hackl et al. (2012) to test whether or not covert movement has occurred in constructions where the restrictor of the DP is obligatorily interpreted as de re. The basic idea is that if the parser proceeds along the lines of the scope account when it encounters a DP restrictor which must be interpreted de re, then QR to a position above the intensional operator will occur, which would reduce the processing time of ACD downstream. On the other hand, if the parser proceeds along the lines of the world variable account, then the processing time of downstream ACD should not be affected.

4.1. Processing Assumptions

The main concern regarding how sentence processing proceeds here is how LF representations are built, or in other words, how interpretations are associated with sentences as they are perceived, word by word, online. First, I will assume that LF representations are built in tandem with PF representations, such that, as PF representations are incrementally being built, these syntactic structures are also incrementally being interpreted.

Second, I also assume that the parser prefers to build LF representations according to various economy principles. In general, that online sentence processing proceeds along principles of economy is widely accepted. In the syntactic processing literature there is a considerable amount of research claiming that the construction of surface structure representations is guided by structural economy principles, such as Frazier (1978)'s minimal attachment and late closure. Thus, I will assume that the construction of LF representations is similarly guided by principles of economy. What is the precise definition of this notion of economy with regard to LF struc-

ture building? One suggestion is that of Tunstall (1998), who proposes that the parser prefers to build the LF that deviates the least from the PF representation. Taking this idea, I assume that, by default, when the parser encounters a word, it will attempt to integrate it into an LF representation in the same way as it would for the PF representation. If this integration is not possible, for example, if a type mismatch occurs, then the LF structure being built will undergo reanalysis, which will incur some processing cost.

Lastly, I will also assume that LF structure building takes discourse context into consideration, such that, if the parse first built according to economy principles is inconsistent with contextual information, reanalysis of the LF being built will occur so that the interpretation of the structure is one consistent with the discourse context. That processing takes contextual information into consideration is a standard assumption in context sensitive processing models such as that of Altmann & Steedman (1988), and I adopt this notion of sentence processing being sensitive to context, while not necessarily committing to other aspects of their model.

In sum, I assume that the construction of LF representations is sensitive to discourse context, and is incrementally built alongside PF representations with similar syntactic structures by default. But reanalysis of this initial structure can occur when the interpretation of this structure cannot proceed or if the interpretation is not consistent with contextual information. Reanalysis can occur therefore when there is a type mismatch, or if the resulting interpretation of the structure is inconsistent with information established in the discourse context. This reanalysis of the LF structure is assumed to be costly and should result in an increase in observed reading times.

4.2. Design

The aim of the current study is to see if a bias for a de re reading affects the processing cost of ACD hosted in a QDP[7]. In other words, it aims to see whether there is a difference in the processing cost of ACD when preceded by a de re biased context compared to a non-biased context. As such, the experiment was a 2x2 design, crossing ellipsis ($\pm$ ACD) and contextual bias ($\pm$ Bias), as in (9).

(9)

	$-$ ACD	$+$ACD
$-$ Bias	A	B
$+$ Bias	C	D

The $-$ACD conditions act as a baseline to the $+$ACD conditions in order to first asses the processing cost of ACD. The idea is to take sentences with non-local ACD[8], as in (10a), and

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[7]A second experiment was also run to test the same thing but for definite DPs in order to see if the effects can be attributed to processing de re interpretations and not just an effect of the type of determiner. The results of this experiment have been difficult to interpret, visual inspection shows that definite DPs do pattern like QDPs, but statistical analysis has not given significant results. For this reason, as well as space considerations, I have excluded the results of this second experiment from the discussion here.

[8]The use of non-local ACD is crucial here since it is only in these ACD constructions that the landing site for

look at the difference between the reading times at the ACD site and the reading times at the verb site in sentences such as (10b), to assess the processing cost of ACD.

(10)   a.   John was willing to read every book that Mary was ~~willing to read~~.
            b.   John was willing to read every book that Mary bought.

Each of the sentences in (10) would also be preceded by a context that was either biased for a de re reading, or interpretation-neutral. The intention then would be that the $-$Bias conditions act as a baseline to the $+$Bias conditions to see whether contextual bias affects the processing cost of ACD. So basically, the experiment compares $(A - B)$ to $(C - D)$ for any differences in reading times.

4.3.   Predictions

For the two theories under consideration here there are two very different sets of predictions with regard to what is expected to happen in terms of processing at the V/Aux site when the sentence is biased for a de re interpretation compared to when it is not.

4.3.1.   Scope Account

For the scope account, an interaction effect is predicted with regard to reading times at the V/Aux site, as shown in Figure 2. To see why, consider the number of operations that the parser would have to perform here for each of the four conditions, (11).
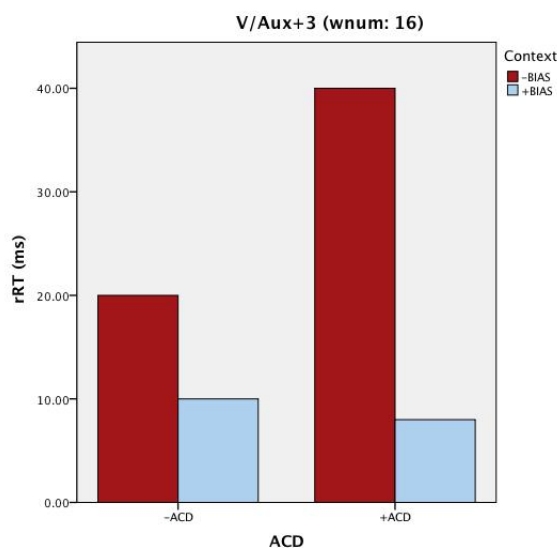

Figure 2: Predicted RTs for processing ACD under the scope account: $-BIAS > +BIAS$

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resolving antecedent containment coincides with the position that the DP would be required to be in for interpreting the sentence de re, according to the scope account.

(11)   Parsing operations/condition at the V/Aux site:

    a.   −BIAS−ACD: no movement at the verb site, integrate the verb into syntactic structure currently being built

    b.   −BIAS+ACD: QR where Q/DP is integrated as adjoined to the matrix TP, resolution of anaphoric dependency

    c.   +BIAS−ACD: no movement at the verb site, integration of verb into current syntactic structure

    d.   +BIAS+ACD: no movement, resolution of anaphoric dependency

For the −BIAS−ACD condition (11a), there is predicted to be no movement at the verb position in the relative clause. There is no contextual bias which would force movement of the DP prior to the ACD site or syntactic evidence for movement (the presence of ACD would be considered syntactic evidence which would force movement so that the elided VP is no longer contained within its antecedent VP). The verb is integrated into the syntactic structure currently being built in accordance with parsing economy conditions. Thus, no operations other than the default structure building operations are necessary.

In the −Bias+ACD condition (11b), when the ACD site is encountered there is syntactic evidence that structural reanalysis has to occur since the presence of the auxiliary *was* marks an ellipsis construction which can only be licit if the DP containing the elided VP QRs to a position where the elided VP is no longer contained within its antecedent VP. In addition there is also a dependency relationship which needs to be established between the elided VP and its antecedent. Thus, two operations occur.

In the case of the +BIAS−ACD condition, the LF structure building operations would be as in (11c). This condition has movement of the DP to adjoin to the matrix TP prior to the ellipsis site. The contextual bias for a de re interpretation motivates movement when the parser encounters the DP *every book*, which should be interpreted as having scope above the intensional predicate. Crucially, at the verb site, there is no movement necessary, and the verb is integrated into the syntactic structure currently being built.

For the +Bias+ACD condition, the LF structure building operations would be as in (11d), which involves movement of the DP to the matrix TP, similar to the −Bias+ACD condition. But, while the final LF is the same, the motivation and the time course for building this structure differs from the other +ACD condition. Whereas the −Bias+ACD condition has movement to the matrix TP at the ellipsis site which was motivated for syntactic reasons, this condition has motivation for movement prior to the ellipsis site due to the preceding biased context. Thus, the DP is reanalyzed as adjoined to the matrix TP when the parser encounters the DP *every book*, rather than at the ACD site. In terms of operations involved at the ACD site then, there would be no movement, but there would also have to be an operation which links the elided VP to its antecedent.

When comparing these operations between +ACD and −ACD conditions, the reading times in the −Bias+ACD condition should be slower than that of the −Bias−ACD condition because it requires two more operations at the ACD site. On the other hand the reading times for the +Bias+ACD condition should be around the same as that for the +Bias −ACD condition since both conditions involve no movement and the integration of the V/Aux into the current syntactic structure. Furthermore, when the differences between the +Bias and the −Bias conditions are

compared, the prediction is that the difference between the −Bias conditions should be greater than the difference between the +Bias conditions, thus predicting an interaction effect.

4.3.2.   World Variable Account

For the world variable account (Percus 2000; von Fintel & Heim 2011), a main effect of ellipsis is predicted at the V/Aux site, as shown in Figure 3, given the number of operations that the parser would have to perform at this region for each of the four conditions, (12).

(12)   Parsing operations/condition at the V/Aux site:[9]

     a.   −Bias−ACD: no movement at the verb site, integrate the verb into syntactic structure it's currently building

     b.   −Bias+ACD: QR where Q/DP is integrated as adjoined to the matrix TP, resolution of anaphoric dependency

     c.   +Bias−ACD: same as (12a)

     d.   +Bias+ACD: same as (12b)
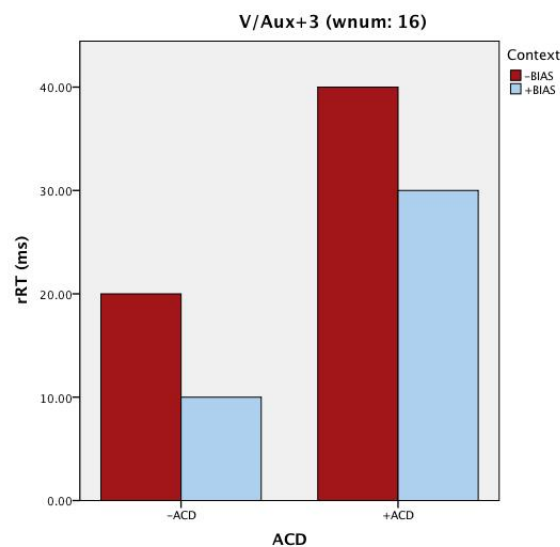
Figure 3: Predicted RTs for processing ACD under the world variable account: −BIAS ≈ +BIAS

For the −Bias−ACD condition (12a), when the parser encounters the verb, there is no movement required and it integrates the verb into the syntactic structure that is currently being built, according to parsing economy requirements. There is no motivation from the preceding context or from syntactic requirements do do any operations other than the default structure building operations.

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[9]Binding of a world variable would presumably happen when the parser encounters the NP, a dependency between the appropriate operator and the variable is established. For the processes under consideration here, this binding would not happen at the ACD site, but at some point earlier in the time course of the sentence.

For the −Bias+ACD condition, (12b), there is movement of the DP to adjoin to the matrix TP. When the ACD site is encountered there is syntactic evidence that structural reanalysis has to occur since the presence of the auxiliary *was* marks an ellipsis construction which needs to be resolved by moving the constituent containing the elided VP to a position in which it is no longer contained inside its antecedent. Thus the number of operations in this condition compared to the −Bias−ACD condition is greater.

In the case of the +Bias−ACD condition (12c), there is no movement required at verb site since there is no ellipsis in this condition which would force movement. The verb would thus be integrated into the syntactic structure currently being built. The prior context specifies that the NP should be interpreted de re, and therefore the world variable is bound by the actual world operator, but this binding operation would not happen at the verb site. In sum, this condition would be processed similarly to the −Bias−ACD condition and requires only the default structure building operations to occur at the verb site.

Lastly, for the +Bias+ACD condition (12d), there would be movement of the DP to adjoin to the matrix TP. This movement would happen when the parser encounters the auxiliary *was* and the motivation for movement in this condition comes from the need to resolve the problem of antecedent containment. In contrast to the scope account, the interpretation requirement that the NP be evaluated in the actual world does not require any movement of the DP. Thus, prior to the ellipsis site there is no motivation to move the DP. When the parser encounters the ellipsis site the number of operations that occur at this point in time are greater than those predicted to occur in the +Bias−ACD condition.

Therefore, I predict that the +ACD conditions, regardless of the presence or absence of bias should take longer to process than the −ACD (verb) conditions. Thus, when comparing the differences between the +ACD and the −ACD conditions (i.e. the processing cost of ACD) under a biasing and a non-biasing context, there should be no difference between +Bias and −Bias conditions, as shown in Figure 3.

4.4.   Methods
4.4.1.   Participants

Twenty-six participants were recruited through the McGill Linguistics Department's Prosody Lab and a McGill introductory course in Linguistics and were all adult native speakers of English. Participants were tested in the Prosody Lab using the Linger software (version 2.94 developed by Doug Rohde) which was installed and run on a Mac computer. All subjects were compensated for their participation, receiving $10.00.

4.4.2.   Stimuli

Twenty experimental items were constructed according to the format in (13). They consisted of a brief context that was either biased towards a de re reading or neutral towards a de re or de dicto reading for a subsequent sentence. Each sentence that followed the context consisted of a matrix modal predicate (either a deontic, epistemic or propositional attitude predicate), that takes as its complement an embedded clause with a quantificational object DP containing

a relative clause with ACD or a relative clause without ACD. The −ACD sentences had a lexical verb in the place where the +ACD sentences had the auxiliary verb *was*. The verbs that were used in the relative clauses in the −ACD conditions were all different from the verbs that occurred previously in the sentence.

Biasing contexts were constructed so that only a de re reading should be inferred from the context, and used a variant of the 'just so happens' paraphrase, which excludes a de dicto reading, thus making the de re reading the only one compatible with the context (13a). Non-biased contexts were created to be relevant to the following sentence, but neutral with regard to a de re or de dicto interpretation. Contexts were created so that they did not contain any information from which a de re or de dicto interpretation could be inferred (13b).

(13)   a.   **Biasing Context**: A violinist was deciding which songs she will play from a list during her rehearsal and was reluctant to play the 1812 Overture, Bolero, and the Blue Danube Waltz. It turns out that a talented flautist heard/was reluctant to play these exact same songs earlier during a rehearsal, but the violinist didn't know this. Therefore, . . .

        (i)   the violinist was reluctant to play [$_{DP}$ every song that the talented flautist **heard**]

        (ii)   the violinist was reluctant to play [$_{DP}$ every song that the talented flautist **was**]

    b.   **Non−Biasing Context**: A violinist in an orchestra had a rehearsal for an upcoming performance at the concert hall. A talented flautist who was also in the orchestra had to attend the same rehearsal. And, . . .

        (i)   the violinist was reluctant to play [$_{DP}$ every song that the talented flautist **heard**]

        (ii)   the violinist was reluctant to play [$_{DP}$ every song that the talented flautist **was**]

                      . . . during her rehearsal at the concert-hall.

Each sentence in a template was followed up by a comprehension question of either the type in (14a) or (14b) which served the purpose of testing how participants were interpreting the sentence, as well as to ensure that the participants continued to pay attention to the sentences that they were reading.

(14)   **Comprehension Questions**:

    a.   Was the violinist reluctant to play the songs because the flautist was reluctant to play/heard them?

    b.   Was it just a coincidence that the violinist was reluctant to play the songs that the flautist was/heard?

Lastly, since the region of interest for this study is the V/Aux site and the three words after this position,[10] all experimental sentences in the template had an adjunct clause following the

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[10]In previous studies using this paradigm, the facilitation effect of ACD was observed shortly after the V/Aux site, either two or three words after. Thus, if facilitation occurs in the current study, it will be at the same or similar region to these previous studies.

V/Aux site that was five to six words long so that any downstream effects from the processing of the verb or the ellipsis could potentially be observed. For all sentences in each template this adjunct clause was identical. In addition, adjectives modifying the subject of the relative clause were included to create more distance between the quantificational determiner so as not to run into any spill-over effects from the processing of these sentence elements into the V/Aux region. The adjective did not differ across the four sentences in a template.

4.4.3.   Procedure

The experimental items were counterbalanced across four lists using a Latin-square design so that each participant saw only one condition from each item and that each item was tested the same number of times in each condition, thus making sure that items or participants did not contribute more to one level of the independent variables ($\pm$ACD, $\pm$Bias) than another. In addition, to control for possible ordering effects, the presentation of experimental items in each list was randomized. Filler items were not used, so participants saw twenty experimental items in succession.

The experiment used masked self-paced reading methodology (Just et al. 1982) and each session started with instructions presented on the computer screen after which four practice items were presented. Two items were simple sentences and used as practice to familiarize participants with the moving window display, and the other two items were used as a warm-up and were similar to the experimental items in format and content, namely, they consisted of a context, followed by a target sentences, followed by a comprehension question. Participants were instructed to read the scenarios carefully and to take as much time as they wanted to fully understand the scenario before moving on. With regard to the target sentences, they were instructed to read at a natural pace but to also make sure they understood what they were reading.

4.5.   Analysis

Comprehension questions were answered correctly 75% of the time across participants, and participants were excluded who did not answer questions correctly more then 65% of the time. Based on this percentage, only two participants were excluded. Residual reading times were then calculated in order to control for differences in word length between experimental items and also to control for individual differences in participants' reading speeds. Further data were excluded from analysis where the comprehension question was answered incorrectly. Once the rRTs were calculated, z-scores for each rRT based on a given condition and word number were calculated. rRTs that had an absolute z-score of more than 2.5 were excluded from analysis. Lastly, a 2-way repeated measures ANOVA was conducted at the region of interest (V/Aux site +3).

Visual inspection of the pattern of rRTs at the region of interest (Figure 4, starting at the V/Aux site and continuing up until three words after the V/Aux site) shows that the −ACD conditions pattern in a similar way[11], and show similar increases and decreases in rRTs over the region. The +ACD conditions also appear to pattern together.
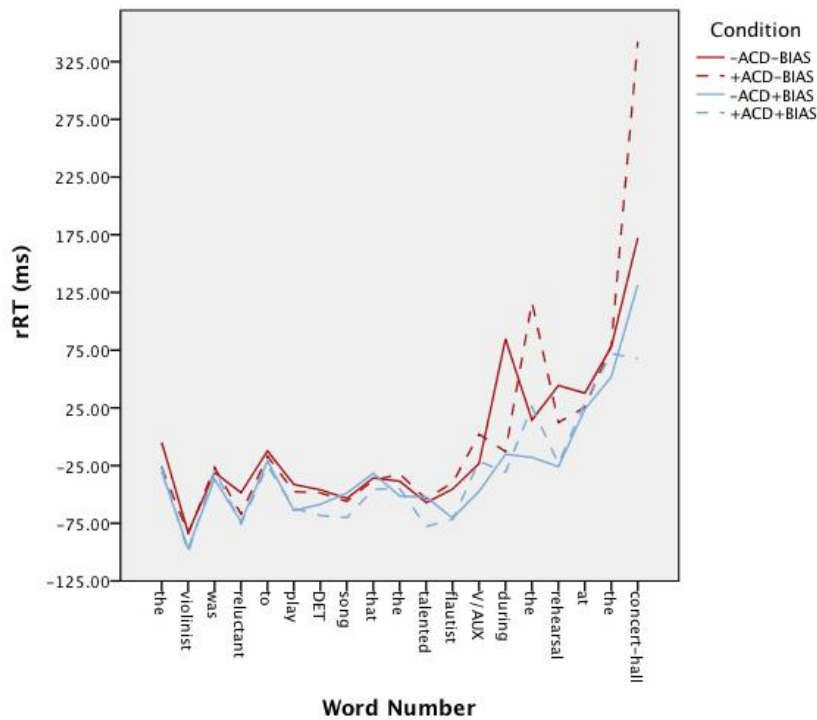

Figure 4: Mean rRTs across the sentence (n=24)

This pattern seems to change upon visual inspection at the primary region of interest, V/Aux+3 (at the word *rehearsal*), where the rRTs for both +ACD conditions decrease relative to the previous region. Whereas in the −ACD conditions, the one that was preceded by a neutral context increases, while the one that was preceded by a biased context decreases. In addition, when comparing the rRTs of the +ACD conditions relative to the verb conditions at this region, which given the experimental paradigm was necessary to assess the processing cost of ACD, the mean rRT for ACD with a biasing context is around the same as that for processing the verb. On the other hand, the mean rRT for processing ACD without a biasing context is quicker than the mean rRT for processing the verb. Thus indicating that the processing cost of ACD without a biasing context is quicker than with a biasing context. These differences between −ACD and +ACD conditions with a preceding biased or non-biased context are shown in Figure 5.

With regard to whether the observations from visual inspection are supported by statistical analysis, the results of the repeated measures ANOVA conducted on this region show that there

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[11] That is, despite the observed difference between rRTs for the +Bias words which are overall quicker than the rRTs for −Bias words, the general pattern of rRTs is similar for both −ACD conditions.
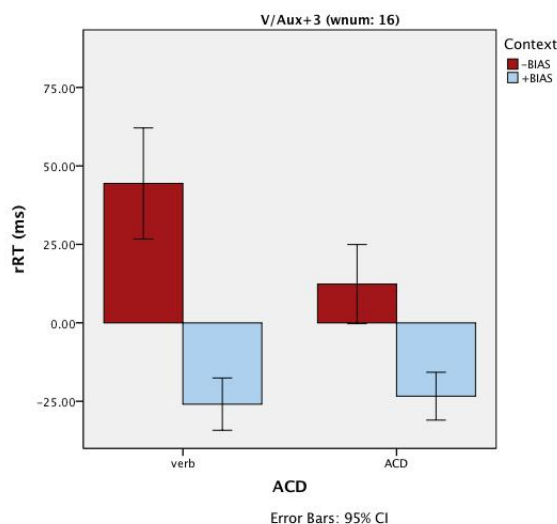
Figure 5: Mean rRTs at V/Aux +3 (n=24)

is a significant main effect of ellipsis (F(1,23)=4.723, p<0.05) indicating that on average, the conditions with ACD had quicker rRTs than conditions without. There is also a main effect of bias (F(1,23)=15.769, p<0.05), but there was no significant interaction effect (F(1,23) = 2.382, p>0.05). Thus despite what visually looks like an interaction effect, it was not statistically significant.

5. Discussion

There are two main findings of the experiment addressed in this section with regard to the theoretical accounts outlined in Section 2.1. The first is the main effect of ellipsis, and the second is the apparent lack of interaction effect. Both findings are problematic for the theoretical accounts' predictions at first glance, but it seems that the problematic aspects of the results can be more easily reconciled with the scope account than they can with the world variable account.

As outlined in Section 4.3, there is a predicted interaction effect for the scope account, given the number of parsing operations that are assumed to occur at the region of interest, see (11). When comparing these operations between +ACD and −ACD conditions, the mean rRT for the −Bias+ACD condition should be slower than that of the −Bias−ACD condition because it requires two more operations at the ACD site. On the other hand, the reading times for the +Bias+ACD condition should be around the same as that for the +Bias−ACD condition since both conditions involve no movement and the integration of the V/Aux into the current syntactic structure. Furthermore, when the differences between the +Bias and the −Bias conditions are compared, the prediction is that the difference between the −Bias conditions should be greater than the difference between the +Bias conditions, thus predicting an interaction effect.

It is clear from Figure 5 that this is not realized. First, with a neutral context, ACD is processed quicker relative to the verb, which explains where the main effect of ellipsis originates. Note that the scope account would have been compatible with a main effect of ellipsis in addi-

tion to the interaction effect, but the direction of this effect would be predicted to be the opposite of what is observed here. We would expect that on average the rRTs for ACD should be slower relative to the verb not quicker. The second problem is that there is no significant interaction effect, which is not what the scope account predicts. Even if we were able to statistically support what visually looks like an interaction effect, there would still be a major problem for the scope account since the interaction effect would be in the wrong direction. The main source of this problem is the fact the −Bias+ACD condition is processed quicker than the −Bias−ACD condition.

The world variable account does not fare any better in terms of its predictions being realized. As outlined in Section 4.3 this account predicts a main effect of ellipsis only, given the number of operations the parser is assumed to carry out in each of the four conditions in (12) above. In contrast to the scope account, the +ACD conditions, regardless of the presence or absence of contextual bias, should take longer to process than the verb conditions. Thus, when comparing the differences between the +ACD and the −ACD conditions (i.e. the processing cost of ACD) under a biasing and a non-biasing context, there should be no difference in rRTs, and there should only be a main effect of ellipsis. Turning to the observed results we see that these predictions are not borne out. While there is a main effect of ellipsis, the direction of this effect is not as predicted since the expectation was that the rRTs for ACD would be slower relative to the verb, but the results show that ACD is quicker relative to the verb.

While it seems to be the case that neither the scope account nor the world variable account are totally compatible with the results, the situation may be slightly better for the scope account since there is one observation which is compatible with its predictions. Namely, in the presence of a de re biased context, this account predicts that the rRTs for ACD should be around the same as those for the verb, and this is in fact borne out in the results. On the other hand, the world variable account makes no such predictions with regards to the rRTs for ACD relative to the verb with a preceding de re biased context. A dependent means t-test was run on the +Bias−ACD and +Bias+ACD conditions and no significant difference was found (t(23)=−0.192, p>0.05), indicating that the means for these two conditions are not particularly different from each other, which is exactly what the scope account predicts.

What complicates the compatibility of the results with the scope account is what is observed when the context is interpretation-neutral. The question this result raises then, is why the mean rRT for ACD is quicker relative to the verb. As a first attempt, if we are already assuming that the reduced rRTs for ACD in the +Bias conditions are the result of prior QR, then it might be the case that the reduced rRTs for ACD in the −Bias conditions are also the result of prior QR. The task at hand now would be to explain why there might be prior QR in these non-biased contexts. One possible explanation relates to interpretation preferences. If participants have a preference for de re interpretations of DPs, regardless of contextual bias, then the parser would QR the DP to a position above the intentional predicated no matter what, therefore facilitating ACD in both −Bias and +Bias contexts.

There are two ways that this interpretation preference could arise. The first is that participants in general have a preference for de re interpretations, the second is that the preference was experimentally induced. With regard to the first, it seems unlikely that people in general have a preference for de re interpretations, given the results reported by Hackl et al. (2012), who found that in the absence of context, sentences nearly identical to those tested here had a mean rRT for

ACD that was significantly slower relative to the corresponding verb condition.[12] The results in Figure 6 seem to reflect a default parsing strategy that builds the simplest syntactic structure first, i.e. one with no movement prior to the ACD site which, assuming the scope account, is a structure compatible with a de dicto interpretation. Then, when the parser does encounter the ACD site, it has to perform more operations to resolve ACD than if it had just encountered a verb, resulting in the observed increase in rRT for ACD compared to the verb. If people had a general preference for de re interpretations, this increase in rRT for ACD would not be expected to occur in the absence of context.
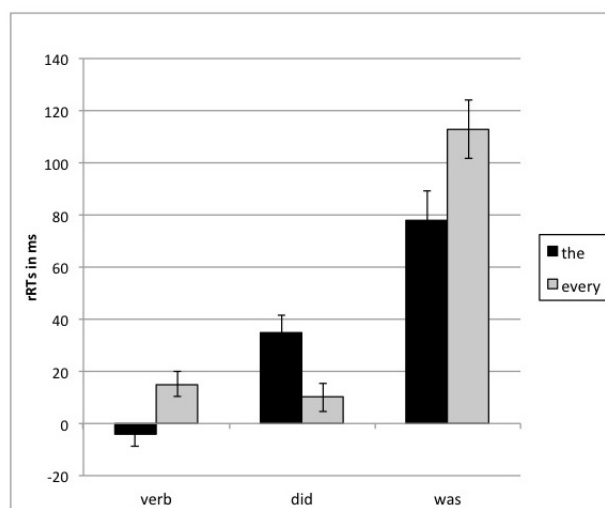
Figure 6: Hackl et al. (2012) Experiment 2 rRTs three words after V/Aux (n=48)

This leaves the other option of an experimentally induced interpretation preference. This is a possibility since no filler items were used in the experiment. Thus, the quicker rRTs for ACD in the −Bias conditions could be due to a learning effect of previously processing sentences which had to be interpreted de re. Indeed, looking at the scatter plots in Figure 7 of the rRTs at V/Aux+3 and the position of the item seen by the subject, we see that the rRTs for each condition decreased as the experiment progressed, and this relationship was significant in all conditions except the −ACD−Bias condition. Thus, a learning effect may be responsible for the quicker mean rRT for the +ACD−Bias condition.

On the other hand, while the rRTs did decrease over time for the +ACD−Bias condition, it is also possible that this decrease would not be enough to lower the predicted mean rRT as much as is actually observed. One crucial assumption with regard to this interpretation preference explanation of the data, is that the issue stems from the ACD conditions. Alternatively, instead of trying to explain why the ACD conditions may be quicker than expected, perhaps it is the verb conditions which are slower than expected. It has been suggested to me by Yosef Grodzinsky (p.c.) that the problem here may lie in the −ACD−Bias conditions and the processing of the verb in a non-biased context. If, for example, some of the verbs were unexpected, or not predictable in the neutral contexts, then encountering them would lead to a surprisal effect which

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[12]To see this, compare the mean rRT for the every/verb condition in Figure 6 to the every/was condition.
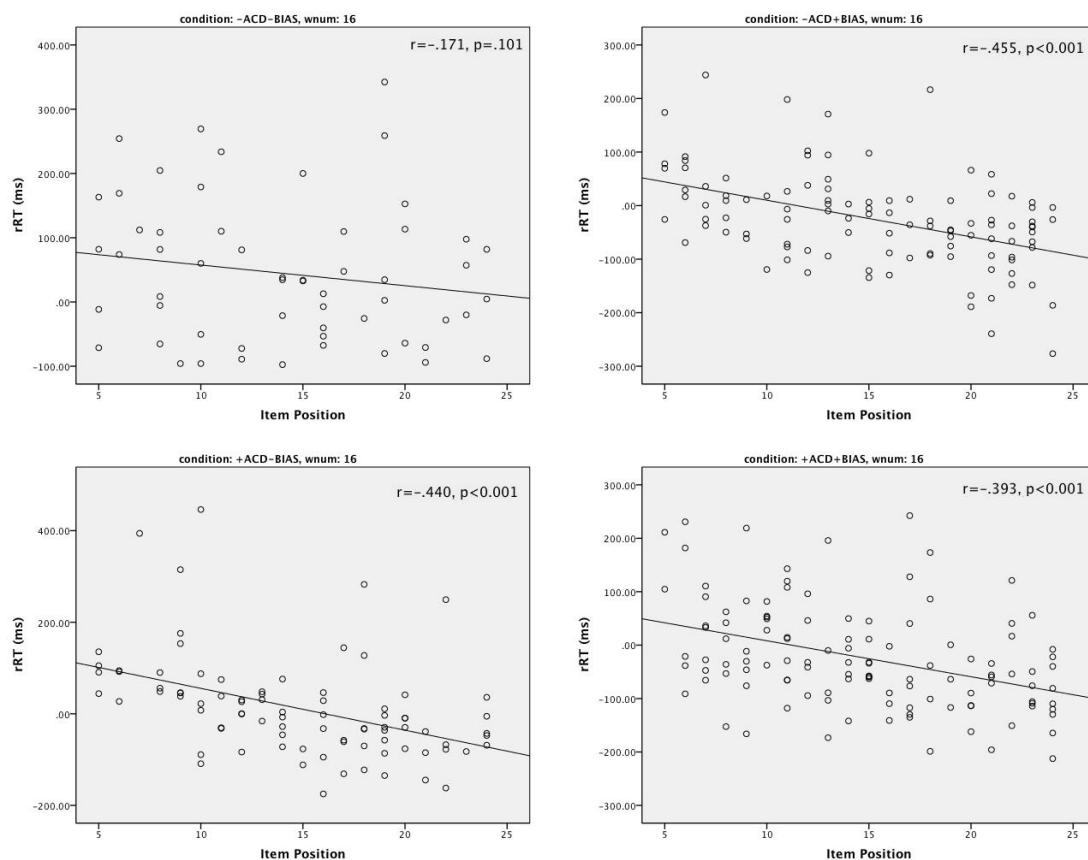
Figure 7: Scatter plots at V/Aux+3 of rRTs and item position in sequence

would in turn result in an increase in rRTs at this region for this condition. The distribution of the rRTs for each item at V/Aux+3 for the $-$ACD$-$Bias condition (Figure 8) show that some items do indeed have much slower rRTs than others and also that there is a lot of variability in the data for this condition. If these items with slower rRTs are not representative of standard verb processing, then they will inaccurately raise the mean rRT for this condition.

In sum, the results seem to be more compatible with the scope account given the fact that there was no significant difference in mean rRTs for processing the ACD condition compared to the verb condition under a biased context; a result predicted by the scope account but not the world variable account. One problem for the scope account though is the lack of interaction effect. This section addressed two possible explanations for this and, if either of these explanations is on the right track, then the observed incompatibility with the results may not be as problematic for the scope account as first thought.

6. Conclusions and Looking Ahead

At this point, there are certainly difficulties in concluding that the experimental results favour the scope account over the world variable account due to the lack of interaction effect that
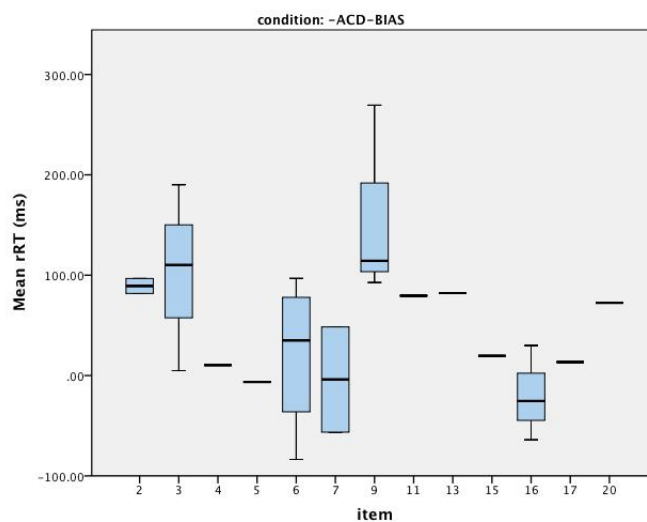
Figure 8: Distribution of rRTs per item at V/Aux+3 for −ACD−BIAS condition

was observed. The potential reasons suggested here for this lack of interaction effect can easily be controlled for in a follow-up experiment. First, to control for a potential learning effect, filler items can be used. Second, to control for a potential lexical surprisal effect, the non-biased contexts can be constructed so that the target verb is part of this preceding context. The expectation then, is that once these factors are controlled for, the results should coincide with the predictions of the scope account.

Lastly, there is one additional concern with the compatibility of the results with the scope account. Since the results of the experiment reported here only deal with QDPs, it would be necessary to show that definite DPs pattern in the same way as QDPs with regard to the processing of ACD in de re biased contexts. This would provide further support for the scope account, since under this account de re readings are derived via QR of the DP, regardless of the type of DP. It would thus be crucial to show that if an interaction effect is observed that it is the result of de re motivated covert movement as opposed to an effect of the DP being quantificational.

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Missing [HUMAN] objects: active and SE morphology investigated

Marta Ruda

In this paper, two constructions which have been described in the literature as involving missing/null objects denoting indeterminate humans will be compared with respect to their morphosyntactic and interpretational properties. The discussion will focus on Polish and will show that the relevant similarities and differences between the two constructions can be derived on the assumption that the interpretation of the internal theta role is partially achieved by different means in the two contexts and that there are differences between the constructions as far as the composition of the extended verbal projection is considered.

1. The theoretical and empirical problem

In constructions with missing or null objects, the objects are present in the semantic structure of the construction but absent from its phonological realisation. This is illustrated in (1) and (2), where the missing objects of the verbs *bites* and *leads* are understood as referring to people in general (cf. Levin 1993 and Rizzi 1986, respectively). In (3), the understood object of *ate* refers to any kind of food, the object of *drank* denotes alcoholic drinks, and the object of *smoked* refers to tobacco (cf. Rice 1988):

(1)   That dog bites.

(2)   This leads to the following conclusion.

(3)   Hemingway ate, drank, and smoked too much.

Given the absence of the argument at the level of the sound system and its presence in the semantics, questions arise as to whether such an argument is present in the syntactic component, and if so, how it is best represented. Investigations into these issues rely on applying various types of tests which are taken to diagnose whether an argument is syntactically active or not (e.g., checking for the ability of the argument to participate in anaphoric binding). In theoretical research, looking into the behaviour of missing objects has a bearing on assumptions made with respect to the nature of the lexicon-syntax interface. In particular, to the extent that a missing argument is syntactically inactive, it may be taken to be

saturated in the lexicon and not to be projected syntactically (cf., a.o., Bhatt & Pancheva 2006; Landau 2010; Marelj 2004; Rizzi 1986 for discussion).

The goal of the present paper is to look into two distinct constructions with missing internal arguments denoting indeterminate humans with arbitrary interpretation. The data used in this paper are taken from Polish and English. One of the constructions to be discussed (cf. (4)) involves an active verb (cf. also (1)), while the other (cf. (5)) involves a SE-marked predicate:[1]

(4) Tamten pies gryzie/ atakuje bez ostrzeżenia.
    that.NOM dog.NOM bite.3SG.PRES/ attack.3SG.PRES without warning.GEN
    'That dog bites/attacks without warning.'

(5) Ta dziewczynka się przezywa.
    this.NOM little.girl.NOM SE call.names.3SG.PRES
    'This little girl calls/is calling people/me/us names.'

The empirical picture of the missing [HUMAN] object constructions is presented further in section 2. The differences between the two constructions suggest differences in derivation. Accordingly, section 3 discusses the analysis of missing objects found with active morphology. I suggest there that this construction is syntactically intransitive and involves the saturation of the internal theta role in the lexicon. Section 4 presents the analysis of missing objects in the context of SE morphology, for which I assume that SE is the realisation of a head in the extended verbal projection which generates an antipassive structure and restricts the interpretation of the lexically-saturated internal theta role of a verb to human individuals. Section 5 concludes the paper.

2. Missing [HUMAN] object constructions in Polish

The two constructions discussed here are: the 'characteristic property of agent alternation' (henceforth CPAA; cf. Levin 1993), illustrated in (1) and (4) above and the [HUMAN] object SE construction (henceforth OSEC), illustrated in (5). The properties of the constructions are presented in section 2.1 and 2.2, respectively.

2.1. CPAA

CPAA is usually found with verbs such as *bite, butt, itch, kick, pinch, prick, scratch* and *sting* in English (cf. Levin 1993) and, similarly, with verbs such as *gryźć* 'bite', *kopać* 'kick', *kąsać* 'bite/sting' and *drapać* 'scratch' in Polish. Generally speaking, the construction predicates a characteristic property of the subject, whereby the referent of the subject (agent) shows a propensity for the action named by the verb. The object is frequently understood as 'people', as illustrated in (1) and (4) above and in the examples in (6)-(9), gathered in a corpus search (NKJP [National Corpus of Polish], Przepiórkowski et al. 2012):

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[1] The following abbreviations are used in the glosses: SE – the verbal marker realised as *się* in Polish, L – l-participle form of the verb, INF – infinitive, (IM)PERF – (im)perfective aspect, NOM – nominative, ACC – accusative, GEN – genitive, DAT – dative, VOC – vocative, 1/2/3 – 1st/2nd/3rd person, SG – singular, PL – plural, F – feminine, M – masculine, PRES – present, FUT – future, PREF – prefix, ADJ – adjective, P – preposition.

(6)   [*Context*: description of a breed of dogs]

Ten   pies   nie   gryzie,   ale   jest   niezwykle   skuteczny   przy
this.NOM   dog.NOM   not   bite.3SG.PRES   but   is   extremely   effective   at
wykrywaniu   narkotyków.
detecting   drugs.GEN
'This dog doesn't bite but it is extremely effective in detecting drugs.'   (NKJP)

(7)   Także   młode   koty   potrafią   drapać.
        also   young   cats.NOM   can.3PL.PRES   scratch.INF
        'Young cats can scratch as well.'   (NKJP)

(8)   [*Context*: advice for people who want to take up horse riding]

Po   trzecie – nie   mieć   lęku przed   zwierzętami, gdyż   koń   nie
P   third   not   have.INF fear   before   animals   because horse.NOM   not
kopie   i   nie   gryzie,   jeżeli nie   robi   się mu   krzywdy.
kick.3SG.PRES and   not   bite.3SG.PRES if   not   do.3SG.PRES   SE him   harm
'Thirdly, not to be afraid of animals, as the horse does not kick and does not bite if you
do not harm it.'   (NKJP)

(9)   [*Context*: description of a village]

A   kogut   jak dziobał   tak   dziobie,   lepiej   zejść   mu
and   rooster.NOM   how peck.*L*.3SG as   peck.3SG.PRES better   PREF.walk.INF him
z   drogi.
from   way
'And the rooster pecks (people) as it used to, it's better to get out of its way.'   (NKJP)

Even though Levin (1993) describes CPAA as involving exclusively [HUMAN] themes, the
object in fact need not be human, as shown in (10):

(10) [*Context*: a documentary about a bear cub with the narrator describing the cub's
        encounter with a snake]

Jeśli   podejdzie   do   węża   bliżej,   to   się   dowie,
if   come.3SG.PRES   to   snake.GEN closer   then   SE   find.out.3SG.PRES
że   wąż   kąsa.
that   snake.NOM   bite.3SG.PRES
'If it comes closer to the snake, it will learn that the snake bites.'

In (10), the property of being a biter is predicated of the snake but the theme is not necessarily
interpreted as human. Hence, (10) shows that even though CPAA is usually used with
[HUMAN] theme arguments, it is not restricted to them. What is more, the missing object in
CPAA does not introduce a discourse referent, as illustrated in (11b):[2]

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[2] Even though, as shown in (11), the missing object cannot be an antecedent to a pronoun, it can be an
antecedent to a deadjectival nominal:

(11) a. Tamten   pies   gryzie   ludzi.   Po   fakcie   zwykle
          that.NOM   dog.NOM   bite.3SG.PRES people.ACC after fact   usually
          winią   oni   właściciela za   to,   że   nie   wyszkolił go
          blame.3PL.PRES   they.NOM   owner.GEN   for   it   that not   train.*L*.3SG him
          dobrze.
          well
          'That dog bites people. Later on they usually blame the owner for not training it
          well.'
      b. Tamten   pies   gryzie.   # Po   fakcie   zwykle winią
          that.NOM   dog.NOM   bite.3SG.PRES after fact   usually blame.3PL.PRES
          oni   właściciela za   to,   że   nie   wyszkolił go   dobrze.
          they.NOM   owner.GEN   for   it   that not   train.*L*.3SG him   well

Furthermore, the construction is non-eventive and does not allow episodic readings, as shown
in (12):

(12) A: What is happening?
      B: *Ten   szczeniak   właśnie   gryzie!
          this.NOM   puppy.NOM   just.now   bite.3SG.PRES
          Intended: 'This puppy is biting people just now.'

Sentences instantiating CPAA can be used in the present tense (cf. (4)-(8)), past tense (cf. (9))
as well as in the future tense (cf. (13) below):[3]

(13) Jeżeli   fretka   jest   dobrze wychowana   to   nie   będzie   gryźć   aż
      if   ferret.NOM   is   well   bred   then   not   be.3SG.FUT bite.INF so
      tak   mocno.
      very hard
      'If a ferret is well bred, it will not bite so hard.'   (NKJP)

By contrast, there are restrictions on grammatical aspect in CPAA: while CPAA is compatible
with the imperfective, the perfective aspect is unavailable in CPAA, as illustrated in (14):

(i) a. Tamten   pies   gryzie   ludzi.   Zaatakowani zwykle   winią
          that.NOM   dog.NOM   bite.3SG.PRES people.ACC attacked.3PL usually   blame.3PL.PRES
          właściciela za   to, że   nie   wyszkolił   go   dobrze.
          owner.GEN   for   it that   not   train.*L*.3SG him   well
          'That dog bites people. The attacked usually blame the owner for not training it well.'
      b. Tamten   pies   gryzie.   Zaatakowani zwykle   winią   właściciela za   to,
          that.NOM   dog.NOM   bite.3SG.PRES attacked.3PL usually   blame.3PL.PRES owner.GEN   for   it
          że   nie   wyszkolił   go   dobrze.
          that not   train.*L*.3SG him   well
I assume that the nominal in (ib) facilitates a bridging reference.
  [3] That CPAA is available with future tense verb forms not only in conditionals but also in simple
characterising sentences with future temporal reference is shown in (i):
(i) Ten   szczeniak   będzie   gryzł   jak   dorośnie.
    this.NOM   puppy.NOM   be.3SG.FUT bite.*L*.SG.M   when grow.up.3SG.PERF
    'This puppy will bite when it grows up.'

(14) Pies   sąsiadów   gryzł/   * ugryzł.
      dog.NOM   neighbours.GEN bite.*L*.IMPERF.3SG/   bite.*L*.PERF.3SG
      'My/the neighbour's dog bit/*has bitten.'

The situation is different when the verb is accompanied by a modal, as shown in (15):

(15) Uważaj!   Ten   pies   może   ugryźć.
      be.careful.2SG this.NOM   dog.NOM   can.3SG.PRES bite.PERF.INF
      'Be careful! This dog sometimes bites.'

This shows that CPAA is not formally incompatible with perfective verbs and it seems that it is the semantic contribution of the modal which licenses the use of the construction in (15). I assume that the incompatibility of CPAA with perfective verbs in the absence of a modal follows from the clash between the characterising, property reading of CPAA and the semantics of the perfective aspect with verbs such as *bite*, which quantifies over a particular instance/particular instances of the event denoted by the predicate.

2.2.   OSEC

OSEC is found in Polish with a restricted set of verbs, which are characteristic of colloquial/child language (cf. also Rivero & Milojević Sheppard 2003) or language used with reference to activities done by children, as illustrated by the examples in (16)-(18):

(16) [*Context*: comparing a situation to children's behaviour in kindergarten]

      [...] to   już   tylko dziecinada   na poziomie przedszkola: ja ci
          this already just childishness   on level   kindergarten I you.DAT
      pokażę,   nie, to ja ci   pokażę,   proszę pani, a   on   się   bije.
      show.1SG no   it I you.DAT   show.1SG please lady   and he   SE   hit.3SG
      '[…] this is just some kindergarten childishness now: I will show you, no, I will show YOU, Miss, he is hitting me/us/others.'   (NKJP)

(17) [*Context*: humorous text; dialogue between Leon XIII and prelate Augustino about excommunicating a hamster; the hamster is personified]

      Leon XIII: Ocipiałeś,   Augustino,   ekskomunikowałeś   chomika?!
                     go.bonkers.2SG Augustino.VOC excomminicated.2SG   hamster.ACC
                     'Have you gone bonkers, Augustino, you've excommunicated a hamster, have you?!'
      Prałat Augustino: [...] No   bo   się   przezywał.
                                        well because SE   called.names.*L*.3SG
                                        'It's because he called me/others names.'   (NKJP)

(18) [*Context*: rules of behaviour in classroom]

Mówimy do siebie po imieniu; Nie przezywamy się.
talk.1PL.PRES to self by name not call.names.1PL.PRES SE
'We call each other by name; we don't call each other/others names.' (NKJP)

Both the subject and the object are interpreted as [HUMAN] (or personified). The object is existentially closed with the possibility of the switch to the speaker oriented-perspective by virtue of which it can also be understood as 'me/us', even though it is not required that the speaker using OSEC be the undergoer of the action denoted by the verb. Similarly to the object in the CPAA construction, the object in OSEC does not introduce a discourse referent, as shown in (19):

(19) a. Ten mały tyran ciągle kopie inne dzieci.
this.NOM little.NOM bully.NOM always kick.3SG.PRES other.ACC children.ACC
Zwykle potem wracają z siniakami do domu
Usually later return.3PL.PRES with bruises.INSTR to home.GEN
'This little bully is always kicking other children. They usually go back home with bruises.'
b. Ten mały tyran się ciągle kopie.
this.NOM little.NOM bully.NOM SE always kick.3SG.PRES
#Zwykle potem wracają z siniakami do domu.
usually later return.3PL.PRES with bruises.INSTR to home.GEN

Regarding other interpretational properties, OSEC is eventive and episodic readings are possible, as illustrated in (16) above and (20):

(20) A: What is happening?
B: Ten chłopak się znów przezywa/ kopie/
this.NOM boy.NOM SE again call.names.3SG.PRES/ kick.3SG.PRES/
popycha!
push.3SG.PRES
'This boy is calling people/me/us names/kicks/pushes people/me/us again.'

OSEC can be used with the past (cf. (17)), present (cf. (16) and (18)-(20)), and future tense (cf. (21)) but it cannot be used with the perfective aspect (cf. also Rivero 2000), as illustrated in (22), where the only interpretation possible is the reflexive one, reflexives in Polish also being rendered with the morpheme SE:

(21) Ten chłopak na pewno się znów będzie przezywał!
this.NOM boy.NOM on sure SE again be.3SG.FUT call.names.*L*.3SG
'This boy will call me/us/others names again for sure.'

(22) Ten chłopak się znów przezwał!
this.NOM boy.NOM SE again call.names.*L*.PERF.3SG
'This boy called himself another name again.'
NOT: 'This boy called people/me/us names again.'

In contrast to CPAA, introducing a modal verb into the structure does not make the (non-reflexive) human object interpretation possible, as shown in (23):

(23) Uważaj!   Ten   chłopak   może   się   ugryźć/   kopnąć!
     be.careful.2SG this.NOM boy.NOM   can   SE   bite.PERF.INF/ kick.PERF.INF
     'Be careful! This boy can bite/kick himself.'
     NOT: 'Be careful! This boy bites/kicks others sometimes.'

In sum, the two constructions discussed here differ in that (a) the internal argument in OSEC is interpreted as human, whereas it need not be human in CPAA; (b) CPAA is a characterising construction predicating a property of the subject, whereas OSEC is eventive and can refer to particular instances of the action denoted by the predicate; (c) whereas OSEC can be used only with imperfective verb forms, in CPAA the verb can be perfective on condition that it is used with a modal.[4]

2.3.   The problem of the syntactic projection of the object

The purpose of this section is to determine whether the internal arguments in CPAA and OSEC are projected syntactically. Importantly, the internal argument in OSEC has been assumed to be projected in the syntax in some analyses proposed in the literature but not in others (cf. Marelj 2004; Marelj & Reuland 2012; Rivero 2000; Rivero & Milojević Sheppard 2003; cf. also the discussion in section 4).

For example, Rivero (2000) aims at providing a uniform treatment for the impersonal subject and object SE construction in Polish, analysing the impersonal arguments in both constructions as a SE-anaphor. She shows that there is a syntactically active subject in the former context (a.o., by applying the anaphoric binding test; cf. (24)) and assumes that the same holds of the object in the SE construction:

(24) Teraz   się   myśli   tylko o   sobie.
     now   SE   think.3SG.PRES only about self
     'Now people think only of themselves.'

On the assumption that anaphoric binding requires the binder to be projected syntactically, (24) provides evidence that the subject in the subject SE construction is indeed represented in the syntax. Similarly to Rivero (2000), Rivero & Milojević Sheppard (2003) analyse OSEC to

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[4] Unless the verb is inherently telic, denoting a definite change of state or location (e.g., *break, die, arrive*), perfective aspect enforces bounded interpretation of its arguments in Polish, e.g.:
(i) a. Sekretarki   napisały   listy.
       secretaries.NOM   wrote.*L*.PERF.3PL letters.ACC
       'The secretaries wrote some letters/the letters.'
    b. Sekretarki   pisały   listy.
       secretaries.NOM   wrote.*L*.IMPERF.3PL letters.ACC
       'The secretaries wrote letters.'
In (ia), where the verb is perfective, context determines the exact number of the letters written but it is presupposed that there is a specific number of the letters. As revealed by the English translations, the imperfective aspect differs in this respect (cf. (ib)). This interaction between OSEC and aspect seems to support the conclusion reached in the paper that the object in OSEC is not a syntactically-projected NP, even though determining the exact nature of the interaction will be left for future research.

involve a null object argument marked for the accusative case, which implies that the Accusative Indefinite (OSEC here) parallels the Nominative Indefinite in structures like (25) and (26) on their account:

(25) Tutaj   się   pracuje   sporo.
     here   SE   work.3SG.PRES   a.lot
     'Here people work a lot.'

(26) Marek   się   bije.
     Marek   SE   fight.3SG.PRES
     'Marek fights/hits other people.'

Rivero & Milojević Sheppard (2003) suggest that the human external argument in (25) is represented syntactically as a null pronominal bearing nominative case, whereas the missing human internal argument in (26) is a pronominal bearing the accusative case. However, no evidence is provided for the assumption that the null arguments in the subject (cf. (25)) and the object (cf. (26)) SE construction are indeed the same syntactic object with the only difference being the value of the case feature. Since SE in Polish is found in a range of other constructions, the sole argument from the morphological similarity between the object and subject impersonal SE construction seems insufficient. This is especially important in light of the evidence suggesting that some of the SE constructions in Polish most plausibly do not involve a syntactically active missing argument. One such structure is the anticausative construction, which is incompatible with instrumental phrases and intentional adverbs, as illustrated in (27), suggesting that no agent is present in the syntactic representation of the construction:

(27) Drzwi   się   otwarły   (* kluczem/   * celowo).
     door.NOM   SE   open.*L*.PERF.PL   key.INSTR   intentionally
     'The door opened (*with a key/*intentionally).'

Thus, the similarity of the two constructions discussed in Rivero & Milojević Sheppard (2003) in their use of SE is not a reliable diagnostic for the presence of an argument in the syntax, which presents a challenge as far as their analysis of OSEC is considered.

Generally speaking, evidence for the presence of an object in the syntax in Polish is hard to find due to some independent features of the Polish grammar, including strict subject-orientedness of anaphors in Polish. However, one diagnostic which can be employed to determine whether an object is present in the syntactic structure is the object comparison test for transitivity from Zec (1985). This test relies on the assumption that for object comparison to be grammatical, a (syntactically) transitive verb is required. The logic behind this diagnostic can be illustrated with its application to the reflexive constructions in English, exemplified in (28)-(30) after Dimitriadis & Que (2009:85):

(28) John hates Bill more than George.
     a. *Subject comparison (irrelevant to transitivity)*
         John hates Bill more than George hates Bill.
     b. *Object comparison*
         John hates Bill more than John hates George.

(29)   John washes himself more than George.
   a.   *Subject comparison, strict or sloppy*
        John washes himself more than George washes John/himself.
   b.   *Object comparison: Shows that* washes himself *is transitive.*
        John washes himself more than he washes George.

(30)   John washes more than George.
   a.   *Subject comparison*
        John washes himself more than George washes himself.
   b.   *Object comparison: Impossible, showing that* washes *is intransitive.*
        *John washes himself more than he (John) washes George.

Whereas in (28) and (29), where the objects are overtly expressed, the structures are ambiguous between subject and object comparison, in (30), where the object is understood but is absent from the phonological string, the object comparison interpretation is unavailable, which implies that the verb is syntactically intransitive. With this background in mind, the object comparison test can be applied to the two constructions which are the focus of the present paper:

(31) a.   Ten   szczeniak   gryzie   ludzi   mocniej   niż
          this.NOM puppy.NOM bite.3SG.PRES people.ACC   more.strongly   than
          meble.
          furniture.ACC
          'This puppy bites people more strongly than it bites furniture.'
     b. *Ten   szczeniak   gryzie   mocniej   niż   meble.
          this.NOM puppy.NOM bite.3SG.PRES more.strongly   than   furniture.ACC

(32) a.   Ten   dzieciak   kopie   wszystkich/   nas   częściej   niż
          this.NOM kid.NOM   kick.3SG.PRES everyone.ACC/   us.ACC   more.often than
          swoje   zabawki.
          self's   toysACC
          'This kid kicks everyone/us more often than he kicks his toys.'
     b. *Ten   dzieciak   się   kopie   częściej   niż   swoje   zabawki.
          this.NOM kid.NOM   SE   kick.3SG.PRES more.often than self's   toys.ACC
          Intended: 'This kid kicks people more often than he kicks his toys.'

The ungrammaticality of (31b) and (32b) shows that the verb in the CPAA construction and in OSEC does not merge with a fully-fledged internal argument and that the structure of the constructions is not parallel to the transitive construction with lexical NP objects.

   The diagnostic used above relies on the difference between structures with an overtly realised object on the one hand and structures in which the object is not realised at all. This is why a note on the object comparison test and the phonological status of the object seems to be required; especially as Marelj & Reuland (2012) suggest that object comparison with clitics is ruled out by the need to focus the clitic, this being incompatible with the nature of clitics.[5] This line of reasoning could potentially constitute an argument against treating the object comparison facts as a reliable diagnostic for the presence of the object in the syntax, as (31b)

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[5] They use this argument to explain the unavailability of object comparison with the reflexive SE construction in French and Serbo-Croatian, which is unexpected on their account.

and (32b) would be ungrammatical for independent reasons. However, if Marelj & Reuland's (2012) explanation of the unavailability of object comparison with the reflexive SE construction should be understood as implying that focalisation is incompatible with clitics being phonologically weak and unable to receive stress, it seems that the phonological properties of the clitic could be expected to result in a structure being judged as degraded pragmatically rather than strictly ungrammatical. (33) illustrates that the mismatch between the information carried by the prosodic structure of a sentence and the information structural requirements does not render a sentence ungrammatical but rather that the pronominal clitic is pragmatically inappropriate when the information structure dictates that it be focused:

(33) A: Komu kupiłaś zegarek pod choinke?
    who.DAT buy.*L*.3SG.F watch.ACC under christmas.tree.ACC
    'For whom did you buy a watch for Christmas?'
  B: Zegarek # mu/ bratu/ jemu kupiłam.
    watch.ACC him.CL.DAT/ brother.DAT/ him.PRN.DAT buy.*L*.3SG.F
    'A watch, I bought for him/my brother.'

Example (33) can be compared with (34), which involves the same syntactic structure but a different pragmatic context:

(34) A: Co kupiłaś bratu?
    what.ACC buy.*L*.3SG.F brother.DAT
    'What did you buy for your brother?'
  B: Zegarek mu   kupiłam.
    watch.ACC him.CL.DAT buy.*L*.3SG.F
    'I bought him a watch.'

Additionally, (35) shows that given appropriate information structural conditions, the phonetically reduced form of a pronoun can be appropriate in the object comparison context:

(35) A: Co myślisz   o   naszym premierze?
    what think.2SG.PRES about our prime.minister.INSTR
    'What do you think about our Prime Minister?'
  B: Do wczorajszego skandalu ufałam   mu   bardziej niż
    to yesterday.ADJ skandal.GEN trust.*L*.3SG.F him.CL.DAT more than
    prezydentowi.
    president.DAT
    'Until yesterday's scandal, I trusted him more than I trusted the president.

The object clitic *mu* 'him.CL.DAT' in (35) does not render the sentence ungrammatical or even pragmatically inappropriate. This shows that Marelj & Reuland's (2012) suggestion that for the purpose of object comparison the object must be focused is not borne out by the data and hence does not constitute a convincing argument against employing the test in analysing CPAA and OSEC.[6] Given this, I conclude that the contrast between (31a) and (31b) and

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[6] Additionally, the following data from the reflexive SE construction in Polish suggest further that SE is not inherently incompatible with object comparison:

between (32a) and (32b) suggests that the verbs in CPAA and OSEC are not syntactically parallel with regular transitive structures.

3. Missing objects and active morphology

The focus of the present section will be on CPAA. The analysis will try to capture both the interpretational properties of the construction (specifically, the interpretive constraint making only the non-eventive reading possible in CPAA and the meaning assigned to the object; cf. section 2.1) and the conclusion drawn in the previous section, namely that the verb is syntactically intransitive in this context.

3.1. The proposal

As far as the extended verbal projection is considered, I will assume here that the *v* head is the categorising verbal head (cf., e.g., Acquaviva 2009; Embick & Marantz 2006; Embick & Noyer 2007; Panagiotidis 2011 for discussion of categorisers), whereas the Voice head is a transitiviser valuing the accusative case feature in the active variant. The interpretation of the CPAA construction (i.e., the characterising, property reading) follows on the assumption that the extended verbal projection does not introduce event implications. In particular, I propose here that the categorising *v* head does not contain the event argument in CPAA. That the CPAA construction lacks event implications is indicated further by the incompatibility of the construction with manner adverbs such as *furiously*, as shown in (36), where the grammaticality judgment is provided only for the relevant reading:

(36) *Ten   koń   wściekle   kopie.
      this.NOM   horse.NOM furiously   kick.3SG.PRES
      Intended: 'This horse kicks people furiously.'

However, as (37) shows, CPAA is not incompatible with all manner adverbs:

(37)   Z   czasem kotek   zaczął   mocno   gryźć   i
      with   time   kitten.NOM started.*L*.3SG.M hard   bite.INF and
      boleśnie drapać.
      painfully scratch.INF
      'Eventually, the kitten started to bite (people/us/me) hard and scratch (people/us/me) painfully.'

(i) a. Anna   myje   siebie   częściej   niż   swoją córeczkę.
       Anna.NOM   wash.3SG.PRES self.ACC more.often   than   self's little.daughter.ACC
       'Anna washes herself more often than she washes her little daughter.'
   b. ?Anna   myje   się częściej   niż   swoją córeczkę.
       Anna.NOM   wash.3SG.PRES SE more.often   than   self's little.daughter.ACC
       'Anna washes herself more often than she washes her little daughter.'
(ia) contains the reflexive anaphoric NP *siebie* 'self.ACC', whereas in (ib) only the SE clitic is present. Even though slightly awkward, (ib) is not ungrammatical, which shows that the object comparison test is appropriate for the SE constructions as well (in (i), in addition to interpretation, the accusative case marking on the NP object shows that the structure involves object and not subject comparison).

This observation can be derived following Katz's (2008) analysis of manner modification of state verbs, also limited to certain types of modifiers and interpretations. In short, I assume after Katz (2008) that manner modification of state verbs is predicate modification rather than event modification and that it can involve the modification of the degree argument (structurally parallel to the event argument) or is constructed post-syntactically, with event implications arising at a conceptual level of representation. The same holds of CPAA. Postulating that the verbal projection in CPAA lacks a head responsible for event implications makes it possible to derive the interpretation in which the subject is attributed the property of being a biter, scratcher, etc. Thus, CPAA sentences do not denote specific instances of events of biting, scratching, etc.

As far as the morphosyntactic properties of CPAA are concerned, I propose that active morphology on the verb is a reflex of the verbal root entering the syntactic computation in the intransitive frame. In general, I will assume that the distinction in the representation of intransitive and transitive predicates in the computational system can be made employing Chomsky's (2013) approach to the labelling of syntactic structures, where the labelling algorithm operates guided by minimal search.[7] Hence, the label of a syntactic object composed of a head and a phrase is the head, the label of a structure built with merge of a categorising head and a root is the categorising head, roots being opaque to the labelling algorithm, and instances of structures formed by two phrase-level projections cannot be labelled by the labelling algorithm based on minimal search unless the set can be labelled as φ (or possibly another feature set shared by XP and YP), which is possible if Agree (Y-XP) has valued the uninterpretable φ-features of Y by features of XP. These assumptions are summarised in (38):

(38) The labelling procedure (Chomsky 2013)
    a. The label of {H, XP} is H.
    b. The label of {*categorising head*, ROOT} is *categorising head.*
    c. {XP, YP} cannot be labelled by the labelling algorithm based on minimal search.

I propose an extension of Chomsky's (2013) mechanism to derive one of the differences between intransitive and transitive verbs. In particular, I propose allowing the merger of a categorising head and a root to yield either a head-level or a phrase-level projection.[8] Whether the {*categorising head*, ROOT} complex is treated as a complex head or a phrase in the system depends on the properties encoded in the root. More specifically, if the root is associated with an internal/theme theta role, the complex is treated as a head, whereas if only the external theta role is projected, the complex is a phrasal category. This is why, in the projection of unergative verbs, the {*v*, ROOT} complex is phrasal (no internal theta role is encoded in the root), whereas in the case of transitive verbs, the {*v*, ROOT} complex is a (complex) head (internal theta role is encoded in the root). These assumptions are illustrated in (39), which presents the derivation of the CPAA example:

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[7] A thorough discussion of this system and its possible consequences is beyond the scope of this paper.

[8] A similar proposal has been made in Rizzi (2012:4-5), who implements it in the following way:
'I will assume that items drawn from the lexicon bear a feature (which I will continue to notate as ""°"", as in X-bar theory, but the current assumptions do not violate Inclusiveness). When the category undergoing merge with another category projects, this feature may disappear (in which case we get a phrasal projection) or remain (in which case we get a lexical projection, a category which still is a (complex) lexical item). So, external merge yields, for instance, [$_{v°}$ root° v°]. This is now a derived lexical item labeled v°, a head (if we understand heads as elements bearing the ""°"" feature).'

(39) This horse kicks.
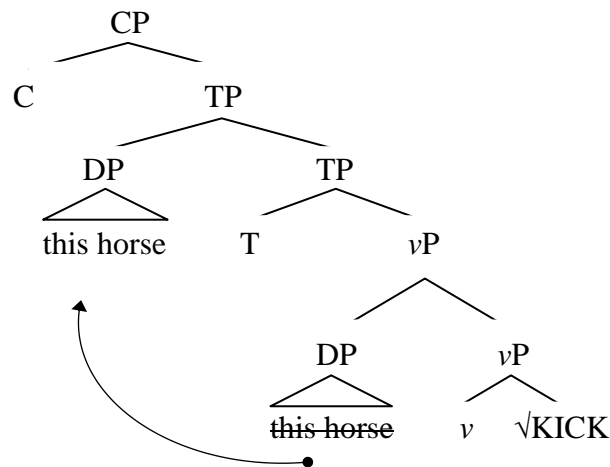
In (39), the {*v*, √KICK} complex projects as a phrase. As the Voice head is absent from the Numeration, the external argument is merged in Spec,*v*. The problem of accusative case assignment and the issue of the potential violation of the Inverse Case Filter do not arise (cf. Marelj & Reuland 2012 for a discussion of the ICF in the context of SE constructions and further discussion in section 4). While the verb is associated with two arguments as far as interpretation is considered, the patient/theme theta role may be taken to have been saturated in the lexicon along the lines proposed in Marelj (2004) and Rizzi (1986). A lexically saturated argument is assumed to be interpreted as [HUMAN] (cf., e.g., Marelj 2004; Marelj & Reuland 2012; Rizzi 1986). For instance, Rizzi (1986:509) suggests the following lexical rule, where *arb* is taken to be associated with properties such as [+human], [+generic], etc.:

(40) Assign *arb* to the direct Θ-role.

Marelj's (2004) proposal of creating the ARB-role (a theta role (cluster) for which there are no merging instructions within Reinhart's Theta System (cf., e.g., Reinhart 2002)) by a lexical operation of applying ARB-saturation (variable binding) at LF is the same in effect as Rizzi's rule in (40). Importantly, on these accounts, the feature [+human] is treated as inherently related to arbitrary interpretation.[9] However, as has been shown above (cf. (10)), CPAA does not necessarily enforce such a reading. Rizzi (1986) discusses the relation between lexical saturation and the interpretation of an argument as [+human] with respect to examples other than CPAA, as illustrated in (41):

(41) This sign cautions (people) against avalanches.

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[9] The arbitrary PRO is taken to be a standard example of the link between the arbitrary and human interpretation; cf., e.g., (i):
(i) To bark at strangers is good fun. (must be [+human]; (cf. Roberts 2012))
However, Moltmann (2006) shows that arbitrary reading enforces the [CONSCIOUS/SENTIENT] interpretation of the argument rather than exclusively [HUMAN] interpretation; cf. (ii):
(ii) a. PRO_{arb} to be a Martian means that one is not susceptible to human disease.
     b. PRO_{arb} to be an angel means PRO_{arb} to be neither human nor divine.

Yet, it seems that this type of the missing object construction does not enforce the human reading either, as indicated by the data from Polish presented in (43), which employ the same construction as (41) and its Polish equivalent in (42):

(42) Ten   znak   ostrzega   przed   lawinami.
     this.NOM   sign.NOM   caution.3SG.PRES   against   avalanches.INSTR
     'This sign cautions (people) against avalanches.'

(43) [*Context*: description of the typical patterns of communication of the Alpine Marmot]

     Ostry   świst   ostrzega   przed   niebezpieczeństwem.
     sharp   whistle.NOM   caution.3SG.PRES   against   danger
     'A sharp whistle cautions (the other animals) against danger.'

Given the data in (10) and (43), I assume that the human interpretation usually observed with CPAA (and related constructions) is an effect arising at the C-I interface rather than being a direct result of lexical saturation.

4. Missing objects and SE morphology

SE is sometimes referred to as a reflexive clitic (cf., a.o., Medová 2009; Rivero 2000; Rivero & Milojević Sheppard 2003), but it appears in a wide range of contexts, including, apart from the reflexive construction (cf. (44)), also anticausatives (cf. (45)), middles (cf. (46)), and the Involuntary State SE construction (cf. (47)):

(44) Dziewczyna   się   czesze.
     girl.NOM   SE   comb.3SG.PRES
     'The/a girl combs.'

(45) Waza   się   zbiła.
     vase.NOM   SE   broke.*L*.SG.F
     'The/a vase broke.'

(46) Młode   ziemniaki   się   szybko   gotują.
     young   potatoes.NOM   SE   fast   boil.3PL.PRES
     'New potatoes boil fast.'

(47) Ten   chleb   ciężko   mi   się   kroiło.
     this.ACC   bread.ACC   hard   me.DAT   SE   cut.*L*.3SG.N
     'It was hard for me to cut this bread.'

Comparable facts have been observed in other Slavic languages and in Romance (cf., a.o., Fehrmann et al. 2010; Marelj 2004; Medová 2009). Needless to say, a uniform analysis of the SE contexts would be desirable on parsimony grounds and numerous reductionist proposals have been offered in the literature. For instance, in a recent paper discussing the passives of reflexive and reciprocal verbs in German and Icelandic, Schäfer (2012) argues that the SE reflexives always contain anaphors subject to Binding Principle A, even in the case of

inherently reflexive verbs (i.e., verbs with which SE does not alternate with referential object NPs). The analysis relies on the following assumption, which is taken to account for the grammaticality of the SE reflexives in passive constructions, in which the reflexive lacks an antecedent, there being no external argument in the structure (cf. Schäfer 2012:237):

(48)   'Some languages can formally repair a violation of Principle A. However, the formally repaired structure is acceptable (i.e., easily interpretable) only if the underlying predicate/event is conceptualized as inherently or naturally reflexive.'

The variable introduced by SE appearing with inherently reflexive verbs is taken to be interpretable at the C-I interface by appeal to conceptual knowledge on the assumption that 'with inherently reflexive verbs, it is conceptually clear that the anaphor has to depend semantically on the referent acting as external argument' (Schäfer 2012:244). Given the existence of inherently reflexive verbs such as *modlić się* 'pray', *awanturować się* '(kick up a) row', and even inherently reflexive 'weather' verbs such as *wypogadzać się* 'to be clearing up' in Polish, for which it is difficult to see how the postulated variable taken to be introduced by the morpheme SE could be dependent for its interpretation on the external argument, the account proposed in Schäfer (2012) seems inadequate to capture the SE-related facts of Polish.

Some other existing proposals suggest different treatments of SE:

- SE realises the content of the Voice head (cf., e.g., Labelle's 2008 analysis of reflexives)
- SE is merged in the position of an argument as an argument expletive (cf. Wood submitted, for an analysis of the morpheme *-st* in the so-called figure reflexives and anticausatives in Icelandic)
- SE absorbs the offending case feature and can be merged either in an argumental or in a non-argumental position (cf. Marelj 2004; Marelj & Reuland 2012)
- SE is a clitic, which forms a SE-anaphoric chain with a null pronoun in the subject or object position (cf. Rivero & Milojević Sheppard 2003 for the subject SE construction, OSEC, and the Involuntary State SE construction).

Reviewing all these proposals here is beyond the intended focus. In what follows, I concentrate on OSEC, hoping that the analysis proposed can be extended to capture other uses of SE, if providing a uniform analysis of SE will prove justified not only on theoretical but also on empirical grounds.[10]

As far as analysing OSEC is concerned, Rivero and Milojević Sheppard (2003) suggest that this construction involves a null pronominal parallel to the one found with the subject SE impersonals to the exclusion of the value of the case feature. However, as has already been noted in section 2.3, even though the external argument in the impersonal subject SE construction is syntactically active (cf. (24)), there does not seem to be sufficient evidence for postulating a null object pronominal (cf. (32b)). Additionally, there are some suggestive interpretive differences between the arguments in the two constructions. Firstly, the internal argument in OSEC is strictly interpreted as [HUMAN], whereas the external argument in the

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[10] For further proposals and discussions of SE-related issues, cf., a.o., Fehrmann et al. (2010); Medová (2009); Svenonius (2006).

subject SE construction comes with the [CONSCIOUS/SENTIENT] restriction rather than with the [HUMAN] restriction, as shown in (49) from Kibort (2004:292):

(49) Gdy się jest bocianem, gniazdo buduje się wysoko.
 when SE is stork.INSTR nest.SG.ACC build.3SG.PRES SE high
 'When one is a stork, one builds the nest high up.'

A further difference relates to the quantificational variability of the object and the subject in the two SE constructions under quantificational adverbs. Rivero (2000) and Rivero & Milojević Sheppard (2003) suggest that the arguments in the SE constructions which they discuss bear resemblance to indefinite NPs as far as their semantics is concerned, as their quantificational force can vary depending on the semantics of a quantificational adverb present in the structure (cf. Chierchia 1995b). Rivero & Milojević Sheppard (2003:124) illustrate this point with the subject SE construction in (50), where, depending on the quantificational force of the adverb, the respective sentences with the impersonal subject have similar truth conditions to the sentences whose subjects are the quantified nominal expressions *everybody*, *many people*, and *few people* shown in (51):

(50) a. Jeśli się gra źle, zawsze się przegrywa.
 if SE plays badly always SE loses
 'If one plays poorly, one always loses.'
 b. Jeśli się gra źle, zazwyczaj się przegrywa.
 if SE plays badly usually SE loses
 'If one plays poorly, one usually loses.'
 c. Jeśli się gra źle, rzadko się przegrywa.
 if SE plays badly seldom SE loses
 'If one plays poorly, one seldom loses.'

(51) a. Everybody who plays poorly loses.
 b. Many people who play poorly lose.
 c. Few people who play poorly lose.

Rivero & Milojević Sheppard (2003) conclude that the quantificational force of the impersonal pronominal in the SE constructions can be supplied by adverbs. They adopt Chierchia's (1995a) analysis of indefinites, according to which indefinites are composed of bound variables and an existential quantifier. The variability in meaning under quantificational adverbs is derived with the operation of existential disclosure deleting the existential quantifier at LF, thereby making it possible for the indefinite to inherit the force of the adverb. Importantly from the point of view of the present study, the unrealised argument in OSEC does not behave in a parallel manner. Firstly, (52), for which the truth-conditionally equivalent paraphrases are presented in (53), shows that an indefinite in the object position is also sensitive to the force of quantificational adverbs:

(52) a. Jak   ten   wykladowca kogoś   nie   lubi,   zawsze go
         if   this.NOM   lecturer.NOM someone.GEN not   like.3SG.PRES always him.ACC
         oblewa.
         fail.3SG.PRES
         'If this lecturer doesn't like someone, he always fails him.'
      b. Jak   ten   wykladowca kogoś   nie   lubi,   zazwyczaj
         if   this.NOM   lecturer.NOM someone.GEN not   like.3SG.PRES usually
         go   oblewa.
         him.ACC   fail.3SG.PRES
         'If this lecturer doesn't like someone, he usually fails him.'
      c. Jak   ten   wykladowca kogoś   nie   lubi,   rzadko go
         if   this.NOM   lecturer.NOM someone.GEN not   like.3SG.PRES seldom him.ACC
         oblewa.
         fail.3SG.PRES
         'If this lecturer doesn't like someone, he seldom fails him.'

(53) a. This lecturer fails every person whom he doesn't like.
      b. This lecturer fails many people whom he doesn't like.
      c. This lecturer fails few people whom he doesn't like.

On the other hand, the interpretation of the object in OSEC is constant: the object is interpreted as 'other children' in all sentences in (54) regardless of the force of the quantificational adverb:[11]

(54) a. Jak   moja młodsza   siostra   się   kopie,   to   zawsze się   też
         if   my   younger   sister.NOM   SE   kick.3SG.PRES then always SE   also
         przezywa.
         call.names.3SG.PRES
         'If my younger sister kicks other children, she also always calls them names.'
      b. Jak   moja młodsza   siostra   się   kopie,   to   zazwyczaj się   też
         if   my   younger   sister.NOM   SE   kick.3SG.PRES then usually   SE   also
         przezywa.
         call.names.3SG.PRES
         'If my younger sister kicks other children, she also usually calls them names.'
      c. Jak   moja młodsza siostra   się   kopie,   to   rzadko się   też
         if   my   younger sister.NOM   SE   kick.3SG.PRES then seldom SE   also
         przezywa.
         call.names.3SG.PRES
         'If my younger sister kicks other children, she seldom calls them names.'

As the internal argument in both clauses in the sentences in (54) is interpreted as existentially closed, these sentences do not have the same truth conditions as the sentences in (55), which should be the case if the impersonal object could be interpreted similarly to the impersonal subject in the subject SE construction, with the quantificational force of the adverb determining the interpretation of the unrealised object:

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[11] Judgments are delicate, OSEC being restricted in use.

(55) a. My younger sister calls names all other children whom she kicks.
      b. My younger sister calls names many other children whom she kicks.
      c. My younger sister calls names few other children whom she kicks.

The adverbs in (54) quantify over people-name-calling events but do not bind the internal argument variables. The difference in sensitivity to the presence of a quantificational adverb between the impersonal arguments in the subject and object SE constructions is illustrated further with the sentences in (56), whose truth conditions are similar to the truth conditions of the sentences in (57) and (58), which are not equivalent in their truth conditions to the sentences in (59) and in which the adverbs quantify only over the event variables:

(56) a. Tu   się   zawsze przezywa   swoich przeciwników.
         here SE   always call.names.3SG.PRES   self's   opponents.ACC
         'People always call their opponents names here.'
      b. Tu   się   zwykle przezywa   swoich przeciwników.
         here SE   usually call.names.3SG.PRES   self's   opponents.ACC
         'People usually call their opponents names here.'
      c. Tu   się   rzadko przezywa   swoich przeciwników.
         here SE   seldom call.names.3SG.PRES   self's   opponents.ACC
         'People seldom call their opponents names here.'

(57) a. All people call their opponents names here.
      b. Most people call their opponents names here.
      c. Few people call their opponents names here.

(58) a. Mój mały brat   zawsze się przezywa   w przedszkolu.
         my   little brother.NOM always SE call.names.3SG.PRES in kindergarten
         'My little brother always calls other children names in kindergarten.'
      b. Mój mały brat   zazwyczaj się przezywa   w przedszkolu
         my   little brother.NOM usually   SE call.names.3SG.PRES in kindergarten
         'My little brother usually calls other children names in kindergarten.'
      c. Mój mały brat   rzadko się przezywa   w przedszkolu.
         my   little brother.NOM seldom SE call.names.3SG.PRES in kindergarten
         'My little brother seldom calls other children names in kindergarten.'

(59) a. My little brother calls all other children names in kindergarten.
      b. My little brother calls most other children names in kindergarten.
      c. My little brother calls few other children names in kindergarten.

This difference in the interpretational properties of the two SE constructions provides further evidence that the missing argument in the subject SE construction and in OSEC is not constituted by the same feature set, contra Rivero (2000) and Rivero & Milojević Sheppard (2003).

Importantly, the data in (50)-(59) show that the internal argument in OSEC does not pattern with indefinites. However, this argument does not seem to pattern with definites, either. Quantificational variability similar to the one found with indefinites under quantificational adverbs is triggered with plural (non-kind) definites with operators such as 'for the most part', as discusses in Malamud (2013), who suggests that, as far as semantics is

concerned, heterogeneous analysis of arbitrary pronouns is required, as some of them pattern with (plural non-kind) definites and others with indefinites. As shown in (60) and (62), respectively, the plural definite as well as the arbitrary third person plural pronoun in one of the impersonal subject constructions available in Polish are influenced by the presence of the operator 'for the most part' (cf. (61) and (63), which are possible interpretations of (60) and (62)). However, (64), which is ungrammatical and does not have the same truth conditions as (65), shows that the same does not hold of the impersonal object in OSEC:

(60) Mój mały brat   w przeważającej części   nie   lubi   tych
      my   little brother.NOM   in most   part   not   like.3SG.PRES these
      klaunów.
      colwns.ACC
      'My little brother doesn't like these clowns for the most part.'

(61) My little brother doesn't like most of these clowns.

(62) W tym przedszkolu   w przeważającej części   nie   znoszą   klaunów.
      in this kindergarten in most   part   not   bear.3PL.PRES   clowns.GEN
      'In this kindergarten kids for the most part can't bear clowns.'

(63) Most kids in this kindergarten can't bear clowns.

(64) *W tym przedszkolu   mój mały brat   w przeważającej   części   się
      in this kindergarten my   little brother.NOM   in most   part   SE
      przezywa.
      call.names.3SG.PRES
      'My little brother calls kids names in this kindergarten for the most part.'

(65) My little brother calls most kids names in this kindergarten.

The lack of parallelism between (60) and (62) on the one hand and (64) on the other reveals that quantifiers over parts do not yield the same effect with the impersonal object in OSEC as they do with the plural definite and the impersonal third person plural subject. Hence, the argument under discussion here cannot be grouped together with ordinary definites or indefinites. This suggests that the object cannot be represented in the syntax with a category which could be translated into or could contain a variable able to be bound by the quantificational elements of either one or the other type, in parallel to the impersonal SE subject or the impersonal third person subject.

An analysis which could potentially capture these facts of the object SE construction is offered in Marelj (2004) (cf. also Marelj & Reuland 2012). Details aside, Marelj takes the construction to be derived by applying the lexical operation of arbitrarisation, i.e., saturation of the internal theta role in the lexicon in some languages and at LF in others, which is taken to result in the [HUMAN] interpretation of the object. For the Slavic languages, which employ SE, it is suggested that arity operations apply in the syntax, which means that the operation of arbitrarisation applies to a variable at LF. In Marelj & Reuland's (2012) development of the analysis, which aims at providing a cross-linguistically more uniform mechanism, lexical saturation always applies pre-syntactically but in languages employing SE it has no effect on the ability of the verb to assign accusative case. Under the assumption that

the Inverse Case Filter, which requires that the case feature of a head be assigned/checked, is operative, SE is analysed as case-absorbing/checking morphology, whose role is to absorb/check the residue case feature, which would otherwise lead to the crash of the derivation (cf. also Reinhart & Siloni 2005). The derivation of OSEC is taken in Marelj (2004) to be parallel to the derivation of null objects in English discussed in Rizzi (1986). Yet, examples from Polish, which are modelled after Rizzi's English examples, involve active verbal morphology and the interpretation of the object is not necessarily restricted to humans (cf. (42) and (43)). Assuming parallel derivation of both types of missing object constructions makes it difficult to explain the interpretational difference (the object in OSEC is necessarily [HUMAN]) and the difference at the level of morphology, which would make it necessary to stipulate that saturation in Polish 'deletes' the case feature in some cases but not in others.

Another fact of Polish which seems to pose problems for Marelj's (2004) and Marelj & Reuland's (2012) proposal relates to the assumption that the function of SE is to absorb the case feature. The relevant data involve nominalisations with the prefix *samo-* 'self-'. Marelj & Reuland (2012) show that the languages which have prefixed verbs with morphemes such as *samo-* or *auto-* (e.g., Serbo-Croatian, French, and Italian) use SE even though, as they argue, the predicate is reflexivised by the prefix. This supports the analysis of SE as a case absorber rather than a reflexiviser. However, a *samo*-prefixed nominalised verb appears with its internal argument in the genitive still accompanied by SE, as illustrated in (66):

(66) a. samo·wyniszczanie się   organizmu/   ludzi/   przedsiębiorstw
        self·destruction   SE   organism.GEN/   people.GEN/   businesses.GEN
        'the self-destruction of an/the organism/people/businesses'
     b. samo·odnawianie   się   komórek macierzystych/   przyrody
        self·renewal   SE   stem cells.GEN/   nature.GEN
        'the self-renewal of stem cells/nature'

Importantly, in the nominal projection in Polish, only one argument can receive structural genitive case-marking (cf. Willim 2000) and no other structural case is available even in nominals derived from verbs:

(67) wyniszczać   organizm   →   wyniszczanie * organizm/   organizmu
   destroy.INF   organism.ACC   destruction   organism.ACC/   organism.GEN

Example (67) shows that it cannot be assumed that SE absorbs structural case in (66). As *samo*-prefixed nominalisations take genitive arguments in the presence of SE, it is difficult to explain the presence of SE in (66) in terms of case absorption, SE being compatible with a structural case-marked argument.

4.2.   *The proposal*

As discussed above, while CPAA is non-eventive and involves an internal argument which need not denote humans, OSEC is eventive and its internal argument is human. To capture the difference between CPAA and OSEC in terms of event implications present in the latter but not the former construction, I propose that the eventive nature of OSEC follows from the presence of the event argument on the categorising *v* head, as opposed to what has been assumed for CPAA.

As suggested by the object comparison test, OSEC is structurally intransitive. Following Marelj (2004), I assume that SE flags arity reduction but I suggest that, rather than serving the purpose of case absorption, the marker SE can be considered a realisation of one type of the Voice head or a functional head similar to the Voice head, marked in what follows as V_F (i.e. a functional head in the extended verbal projection). The V_F head affects the realisation of the internal argument, which is not linked to a syntactic position in OSEC, hence generating an antipassive structure. In OSEC, the verbal root is intransitivised and the action denoted by the verb is focused. In contrast to CPAA structures, in which the interpretation of the internal argument is determined exclusively at the C-I interface, SE restricts the range of possible interpretations of the patient/theme in OSEC. In particular, the V_F head realised as SE comes with the [HUMAN] restriction in OSEC, which limits the possible denotation of the internal argument to human individuals.[12] These assumptions are illustrated in (68):

(68) Ten   smarkacz się   kopie.
      this.NOM brat.NOM SE   kick.3SG.PRES
      'This brat kicks others.'
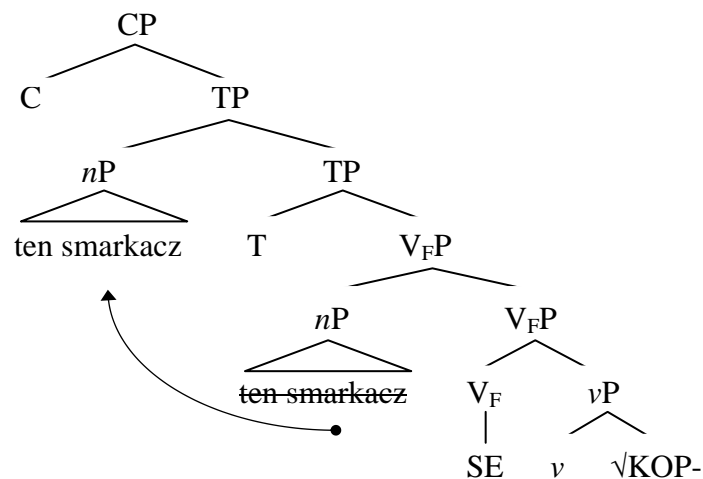
On the analysis suggested here, the missing object in OSEC is taken to be represented only semantically, yet the derivation differs from what has been proposed for CPAA, as supported by morphological and interpretational differences between the constructions. In OSEC, SE generates an antipassive structure and the feature [HUMAN] contributes the condition *human*(x) on the interpretation of the internal argument. The exact interpretation is specified further on in discourse, with the denotation of the human internal argument limited, for instance, to 'me/us' or 'other children', as guided by the context of a specific utterance.

5. Conclusions

The goal of this contribution has been to propose an account of certain cases of missing objects. Two constructions which have previously been taken in the literature to involve null

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[12] I assume that SE comes with the [HUMAN] restriction optionally, as not all constructions marked with SE require the unrealised argument to be interpreted as [HUMAN]. When SE bears this feature and when the internal argument is suppressed, OSEC is generated.

objects with human interpretation have been considered. In the analysis developed here, I have suggested that CPAA arises in the absence of the event argument, whereas in OSEC this argument is present. For the CPAA construction I have proposed that the internal theta role is saturated in the lexicon (and appropriately interpreted at C-I) and that, contra suggestions made in the literature, the interpretation of such objects is not inherently related to the feature [HUMAN]. OSEC likewise involves lexical saturation of the internal theta role, but the feature [HUMAN] on SE introduces an additional condition on the interpretation of the internal argument. I have suggested that the morpheme SE is the realisation of a head within the extended verbal projection which generates an antipassive structure. As indicated by the Polish data, SE is not intrinsically linked to structural case absorption (contra Marelj 2004, Marelj & Reuland 2012). Importantly, both CPAA and OSEC are structures that involve an arity reduction, but in the former context it is not flagged with SE in Polish, a language in which SE is taken to flag arity operations.

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Calculating scales from change of state verbs and their themes[1]

Alexandra Anna Spalek

In this paper I explore in detail the internal aspectual structure of events focusing on two Spanish change of state verbs. I begin by establishing the lexically coded scales of *romper* 'break' and *congelar* 'freeze'. Based on a large collection of corpus concordances of these verbs I then consider some theme arguments which these verbs typically combine with and explore the effects of the mereological structure of the theme on the scalarity of the verb phrases containing these verbs. Comparing the two verbs I find that simple scales coded in the verb can be overridden by complex scales coming from the theme, while complex scales in verbs are not reducible through combining them with a reduced argument. The research thus illustrates that, despite the general assumption that change of state verbs lexically encode certain kinds of scales, their scalar behaviour at the verb phrase level can undergo adjustments. The semantics of a scalar verb is provided within the measure of change function analysis (Kennedy & Levin 2008; Kennedy 2012).

1. Introduction

In the last years many verbs have received a scalar analysis, based on the gradable properties they lexicalise. This kind of analysis is grounded on the general intuition that the progress in a particular event implies a change along a scale projected by a property lexicalized in the verb. The change along a scale is understood to take into account the set of ordered degrees on a scale, the ordering of the degrees (increasing versus decreasing) and the dimension of measurement that is affected by the change. In a formal way Kennedy & McNally (2005) define a scale as a relation $\langle S, R, \delta \rangle$, where S stands for a set of ordered degrees, R for the ordering on S and δ for the value that represents the dimension of measurement.

Degree achievement verbs like *widen, cool* or *dry*, a subclass of change of state verbs, have been used most clearly to illustrate the scalar behaviour of verbs associated with their adjectival core (Hay et al. 1999). The crucial particularity of degree achievements is that they display aspecutal ambiguity in as far as they sometimes allow for telic readings and sometimes for atelic readings. This behaviour, namely, does not correspond to the general verbal classification provided by Dowty (1979:56) according to which *for*-adverbials modify atelic predicates, while *in*-adverbials modify only telic predicates:

(1)   a. ??John painted a picture for an hour.
        b.   John painted a picture in an hour.

(2)   a.   John walked for an hour.
        b.   *John walked in an hour.

Contrary to this regular distribution degree achievements appear with both, *for*-adverbials and *in*-adverbials, such as the verb *cool* in example (3).

(3)   a.   The soup cooled for an hour.
        b.   The soup cooled in an hour.

Thus Hay et al. (1999) in their analysis contribute to show that degree achievements behave in this variable way due to the fact that the change in the property of the verb is associated with the meaning of the base adjective. The broader claim that emerges out of this analysis is that, when the scalar structure associated with the base adjective has a natural bound, the derived verb is telic, when however the adjective's scalar structure has no such bound, the verb is atelic. Thus according to Hay et al. (1999:132) telicity is understood as 'a function of the boundedness of the difference value defined over a projected scale associated with one of the verb's arguments, where the nature of the scale depends on the lexical meaning of the verb'. Their analysis thus predicts that a degree achievement receives a telic interpretation when the difference value corresponds to a bounded measure of change, and an atelic interpretation when the difference value does not identify a bounded measure of change.

Extending Kennedy & McNally (2005) analysis of scalar adjectives and Hay et al's (1999) analysis of degree achievements, Kennedy & Levin (2008) provide an analysis on which degree achievements contribute a measure of change function: a function that measures the degree to which an object changes along a scalar dimension due to undergoing an event. This measure of change function represents a function from objects and events to degrees and thus measures the difference to which an object manifests a particular property at the beginning and the end of an event.

Given its success in explaining the aspectual behaviour of degree achievement verbs by correlating aspectual behaviour with the notion of measure, this scalar analysis has further been extended to describe the aspectual characteristics of the whole class of change of state verbs (Rappaport Hovav 2008; Beavers 2008). The fundamental idea for extending the analysis was the association of the unfolding of the event with the theme acquiring increasing values on the scale contributed by the property in the verb. Thus a relationship between the aspectual properties and a notion of measure has been established through the scalar analysis.

More recently the scalar analysis has even been applied to the group of incremental theme

verbs, such as *eat* or *read* (Kennedy 2012). Generally, however, the literature has distinguished between the class of change of state verbs for which telicity as well as the gradability of the event can be directly associated with the scales projected by the lexicalised properties in the verb, such as in events described by *cool, clean, dry*, and the class of incremental theme verbs, which draw their aspectual features from the structure of the theme, such as in the case of events described by *eat* or *read* (Rappaport Hovav 2008; Kennedy 2012). Thus a clear contrast has been drawn between the following two cases:

(4)   The dress dried completely.

(5)   John ate the apple.

While in example (4) the successful completion of the event is related to the property of dryness lexicalised in the verb, in example (5) it crucially has to take into account the extension of the affected theme, namely the 'apple'.

  Despite the general success of explaining some default telicity characteristics of change of state verbs through the scalar structure associated with a verbal property, this account does not capture the fact that certain verbs display a variable aspectual behaviour depending on the theme they are combined with. Spanish *romper* 'break', for example, can appear both in durative event descriptions, such as in (6) and in instantaneous events, such as in (7), where no duration to the event is possible.

(6)   La expedición rompía   el hielo durante dos horas.
        The expedition break.IMP the ice   during two hours
        'The expedition was breaking the ice for two hours'

(7)   #Juan rompía   el silencio durante 5 minutos.
        Juan break.IMP the silence during 5 minutes
        'Juan was breaking the silence for 5 minutes.'

Contrary to *romper* 'break' another member of the change of state (CoS) verb class, namely *congelar* 'freeze', does not seem to vary aspectually depending on the structure of the theme. Thus, no matter whether the theme of *congelar* has an extremely small surface or is rather extended and complex, freezing always represents a process that traverses a multi-point scale and is thus durative, as duration tests illustrate:

(8)   La célula se   congeló en 5 segundos.
        The cell   REFL froze   in 5 seconds
        'The cell froze in 5 seconds.'

The inherent duration of *congelar*-events corresponds to a distinction in truth conditional results, when *congelar*-VPs are combined with proportional modifiers. With respect to the entailments of the event, there is a difference as to whether the object is affected partially (9) or holistically (10).

(9)   La hamburguesa se   ha congelado parcialmente.
        The hamburger   REFL has frozen   partially
        'The hamburger has partially frozen.'
        $\not\models$ The hamburger has frozen.

(10)   La hamburguesa se   ha congelado completamente.
        The hamburger   REFL has frozen   completely
        'The hamburger has completely frozen.'
        $\models$ The hamburger has frozen.

Summing up, certain verbs seem to have the aspectual behaviour at VP-level that typically cor-relates with the lexicalised scale they encode, as in the case of *congelar*. Other verbs, however, as in the case of *romper*, display a variable aspectual nature at the level of the verb phrase.

Thus the primary goal of this paper is to explore aspectual properties of *romper* and compare them to the aspectual properties typical of *congelar*. That is done in section 2. The secondary goal of this paper is to observe whether the theme contributes to alter the aspectual behaviour of the verbs at the verb phrase level, which is done in section 3. I thus clearly separate between the aspectual properties lexicalised in the verb from the aspectual properties at the level of the verb phrase. The informally described aspectual behaviour of the verbs and their verb phrases is consequently formalised in terms of measure of change functions in section 4.1. Applying the measure of change function analysis in sections 4.2 and 4.3 I illustrate the measure of change function computation of *congelar*-VPs and *romper*-VPs respectively.

2.   *Two kinds of scales encoded by CoS verbs*

The two change of state verbs code two different scales. The scale encoded by a verb can be determined by considering the aspectual behaviour of the events a particular verb appears in. A series of aspectual tests (Dowty 1979) illustrate that *congelar* patterns together with accom-plishments:

First, accomplishments take adverbial prepositional phrases with *en* 'in', but only very marginally accept adverbials with *durante* 'for'-adverbials. If *durante* modification is possible at all, the sentence lacks the entailment to the result state:

(11)   Juan congeló la hamburguesa en 5 minutos.
        Juan froze   the hamburger   in 5 minutes
        'Juan froze the hamburger in 5 minutes.'

(12)   ??Juan congeló la hamburguesa durante 5 minutos.
        Juan froze   the hamburger   during 5 minutes
        'Juan froze the hamburger for 5 minutes.'
        $\not\models$ The hamburger has frozen.

Second, accomplishments allow for a measure of duration reading with *en* 'in'-adverbials and future tense:

(13) La hamburguesa se   congelará   en 5 minutos.
      The hamburger   REFL freeze.FUT in 5 minutes
      'The hamburger will freeze in 5 minutes.'

Third, only accomplishments can occur as the complement of the culminate periphrasis *acabar de* 'finish':

(14) La hamburguesa acabó   de congelarse.
      The hamburger   finished of freeze.REFL
      'The hamburger finished freezing.'

Fourth, the adverb *casi* 'almost' conveys that the event actually started but did not quite finish and thus emphasises the durativity of the event:

(15) La hamburguesa casi   se   ha congelado.
      The hamburger   almost REFL has frozen
      'The hamburger almost froze.'

Fifth, accomplishments typically do not pass the progressive to perfect entailments. Equally *congelar* does not entail that when freezing took place the affected object is actually frozen:

(16) La hamburguesa se   está congelando.
      The hamburger   REFL is   freezing
      'The hamburger is freezing.
      $\not\models$ The hamburger has frozen.

These tests illustrate altogether that *congelar* appears in durative events, which are felicitous only when the final state of the process has been reached. These aspectual properties can be associated with the notion of measure, as has been done in many recent studies of verb semantics (Hay et al. 1999; Kennedy & Levin 2008; Rappaport Hovav 2008). Recasting the telicity characteristics of *congelar* in scalar terms the durativity is reflected by the fact that the verb lexicalises a multi-point scale of change with an upper bound that needs to be reached to make the event felicitous. The upper bound, in the case of *congelar* corresponds to a maximal standard in scalar terms. This means, that *congelar* can only be predicted truthfully of an object if the whole object is frozen.

In contrast to *congelar*, *romper* proves to always be instantaneously telic and patterns together with achievements.

First, achievements allow for *en* 'in-adverbials', but are incompatible with *durante* 'for'-adverbials:

(17) a. Juan se   rompió el ligamento en 5 minutos.
          Juan REFL broke   the ligament in 5 minutes
          'Juan tore the ligament in 5 minutes.'
      b. #Juan se   rompió el ligamento durante 5 minutos.
          Juan REFL broke   the ligament during 5 minutes
          'Juan tore the ligament for 5 minutes.'

Contrary to accomplishments, achievements lack a measure of duration reading for the 'en'-adverbials together with future tense. They rather give the time that elapses before the event takes place. This, however, triggers the 'after 5 minutes has passed'-reading as illustrated in the following example.

(18) El ligamento se   romperá   en 5 minutos.
      The ligament   REFL break.FUT in 5 minutes
      'The ligament will break in 5 minutes.'

Third, unlike accomplishment verbs, achievements are generally unacceptable as complements of *acabar de* 'finish':

(19) #Juan acabó de romperse   el ligamento.
      Juan finished of break.REFL the ligament
      'Juan finished tearing the ligament.'

Fourth, the adverb *casi* 'almost' does not convey that the event actually started.

(20) Juan casi   se   rompió el ligamento.
      Juan almost REFL broke   the ligament
      'Juan almost tore the ligament.'
      $\not\models$ breaking took place.

Fifth, similarly to accomplishments, achievements do not allow for entailments from progressive to perfect. This makes *romper*-VPs standard-oriented in that the successful taking place of the event presupposes the reaching of a certain standard.

(21) El ligamento se   está rompiendo.
      The ligament   REFL is   breaking
      'The ligament is tearing.'
      $\not\models$ The ligament has torn.

The aspectual tests altogether illustrate that *romper* describes punctual events. That is, the set of degrees is in fact reduced to only two values $\{0,1\}$ and reflects why *romper* itself does not project a complex degree-scale. This translates into the fact that the minimal standard and the maximal standard for the measure of change function *romper* coincide. Consequently the standard of comparison of *romper* is always equal to 1 with no articulation in-between.

Theoretically two options are available, given that *romper* describes only instantaneous changes. One option would be to consider a two-value system non-scalar. In this case the change of state verb class cannot be considered to be scalar across the board, since such a crucial member as *romper* is not straightforwardly scalar. If, however, transitions with two available values are included as scalar then *romper's* scale can be considered a trivial case of a lexically encoded scale.

Together with previous researchers, who have included two-point scales in scalar analyses as a special subcase of scales (Ramchand 1997; Caudal & Nicolas 2005; Rappaport Hovav 2008; Beavers 2008; Rappaport Hovav & Levin 2010) I take *romper* to lexicalise a two-point scale in order to preserve the intuition that verbs of change in general can be associated with scales.

Thus the singularity of the *romper* measure of change function is that by default any minimum non-zero value on the brokenness-scale is identical to the maximum non-zero value.

What the contrast in aspectual behaviour of *congelar* and *romper* illustrates is that these verbs lexicalise two distinct scales. While *congelar* lexicalises a multi-point scale with a maximal standard, *romper* lexicalises a two-point scale with the maximum and the minimum points collapsing in one. In other words, for *congelar* to be true of an event it is necessary to reach the maximal degree. Conversely, any minimal degree of brokenness is sufficient as to felicitously predicate of an object that it is broken.

And yet, as observed in the introduction, *romper* can be used to describe events with complex degree-scales and thus behaves like an accomplishment. Given that this behaviour seems to arise through the part structure of the theme, a deeper exploration of these facts will be undertaken in the following section.

3.   *Contribution of the theme to the distinct scalarity of romper and congelar-VPs*

As sketched out briefly above the mereological structure of the theme seems to have an influence on the scalarity of *romper*-VPs, while it does not affect *congelar*-VPs. In the company of mereologically complex themes *romper*-VPs do actually describe events with duration, as a series of aspectual tests illustrates:

First, unlike the achievement *romper*-VPs the extent theme contributes to allow for the compositions with *durante* 'for'-adverbials:

(22)   La   expedición rompió el   hielo durante dos horas.
        The expedition broke   the ice   during two hours
        'The expedition broke the ice for two hours'

This, of course, is also the case for non-quantised objects such as mass objects, as in example (23).

(23)   La   expedición rompió hielo durante dos horas.
        The expedition broke   ice   during two hours
        'The expedition broke ice for two hours'

Second, *romper*-VPs with mereologically complex themes allow for the measure of duration reading with *en* in'-adverbials and future tense, such that we understand that a durative event is going on, rather than giving the time that elapsed before the expedition began to break the ice.

(24)   La   expedición romperá   el   hielo en 2 horas.
        The expedition break.FUT the ice   in 2 hours
        'The expedition will break the ice in 2 hours.'

Third, *romper*-VPs can occur as the complement of *acabar de* 'finish':

(25)   La expedición acabó   de romper   el hielo.
         The expedition finished of breaking the ice
         'The expedition finished breaking the ice.'

Fourth, durative *romper*-VPs do allow for progressive to perfect entailments:

(26)   La expedición estaba rompiendo el   hielo.
         The expedition was   breaking   the ice
         'The expedition was breaking the ice.'
         $\models$ The expedition broke the ice.

This durative reading is equally obtained for non-quantised objects:

(27)   La expedición estaba rompiendo hielo.
         The expedition was   breaking   ice
         'The expedition was breaking ice.'
         $\models$ The expedition broke ice.

This fact makes durative *romper*-VPs different from true accomplishments, such as illustrated for *congelar* in example (16), in that they do allow for the progressive to perfect entailment. Thus it illustrates that, unlike true accomplishments, *romper* in composition with mereologically complex themes still has a minimal standard.

Fifth, durative *romper*-VPs equally lack passing the *casi* 'almost' test:

(28)   La expedición casi   rompió el hielo.
         The expedition almost broke   the ice
         'The expedition almost broke the ice.'

These tests altogether illustrate that *romper*, which lexicalizes an inherently binary scale, can describe durative events by virtue of drawing a multi-point scale from a mereologically complex theme. This fact illustrates that the lexically coded scale of a verb is not enough to determine the scalarity of a VP. This way lexically scalar verbs such as the verb *romper* show a similar behaviour to incremental theme verbs, which do not code scales lexically but rather are associated with scales proceeding from their theme arguments (Rappaport Hovav 2008).

Congelar, on the contrary, does not seem to undergo any change with respect to the scale it lexicalises despite combining with distinctly mereologically complex themes. As was hinted at in the introduction no matter the extension of its theme *congelar* always describes a durative process. Thus taking as an example a microscopically-small object such as a *célula* 'cell' freezing events still pattern together with accomplishments, as shown by applying the following tests:

First, *durante* 'for'-adverbials are marginally accepted and in any case do not license the entailment to the result state:

(29)   ??Juan congeló la   célula durante 20 segundos.
         Juan froze   the cell   during 20 seconds
         'Juan froze the cell for 20 seconds'.
         $\not\models$ The cell has frozen.

Second, measure of duration readings with *en* 'in'-adverbials and future tense work well and thus illustrate the duration of the process:

(30)   La célula se   congelará   en 20 segundos.
       The cell   REFL freeze.FUT in 20 seconds
       'The cell will freeze in 20 seconds'.

Third, as a typical accomplishment, the culminate periphrasis *acabar de* 'finish' works well even with reduced themes:

(31)   La célula acabó de congelarse.
       The cell   finish of freeze.REFL
       'The cell finished freezing.'

The fact that *congelar*-events are always durative shows that *congelar* truly lexicalises a multi-point scale and that the mereological structure of the theme has no effect on the scalar properties of the *congelar*-VP. Even more, *congelar* does not only lexicalise a multi-point scale, in fact the scale is an upper closed scale and has a maximal standard. That is, only the reaching of the maximal degree on the scale can make *congelar* apply successfully to an object. This becomes even more clear when *congelar*-VPs are combined with proportional modifiers. Only completive proportional modifiers, as in example (33), imply that the event has successfully taken place, while proportional modifiers like *parcialmente* 'partially' fail to do so.

(32)   La hamburguesa se   ha congelado parcialmente.
       The hamburger   REFL has frozen   partially
       'The hamburger has partially frozen.'
       $\not\models$ The hamburger has frozen.

(33)   La hamburguesa se   ha congelado completamente.
       The hamburger   REFL has frozen   completely
       'The hamburger has completely frozen.'
       $\models$ The hamburger has frozen.

Again this observation applies independently of the reduced nature of the theme.

(34)   La célula se   ha congelado parcialmente.
       The cell   REFL has frozen   partially
       'The cell has partially frozen.'
       $\not\models$ The cell has frozen.

(35)   La célula se   ha congelado completamente.
       The cell   REFL has frozen   completely
       'The cell has completely frozen.'
       $\models$ The cell has frozen.

Furthermore, corpus data illustrate that *congelar* is used exclusively in telic events, even when applied to eventive themes such as processes.[2] Thus both in example (36) and (37) *congelar* de-

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[2]This study is based on the exploration of 200 concordance lines of a Spanish press corpus, the El País Corpus.

notes the total interruption of the processes of ratification as well as the process of deployment.

(36)   Rabat ha congelado la ratificación del   acuerdo   pesquero.
         Rabat has frozen   the ratification of the agreement fishing.ADJ
         'Rabat has frozen the ratification of the fishing agreement.'
         $\models$ No ratification took place at all.
         [El País Corpus]

(37)   Los soviéticos congelaron (# un poco/ parcialmente) el   despliegue de los cohetes
         The Sovietic froze   (# a bit/   partially)   the deployment of the rockets
         SS 20.
         SS 20
         'The Soviets (#partially) froze the deployment of the SS 20 rockets (#a bit).'
         $\models$ The deployment is not totally interrupted.
         [El País Corpus] with added proportional modifiers

What the contrast between *romper* and *congelar* illustrates altogether is what aspectually rele-
vant properties are encoded in the meanings of verbs and the reflex of these properties in the
formation of larger units. More concretely, while a binary scale lexicalised by *romper* has only
a limited contribution to the overall calculation of the scale of a VP, a multi-point scale, such as
the one lexicalised in *congelar* is not being affected by the mereological structure of the theme.

An apparent counter example to the maximality constraint for *congelar*-events is illustrated
in (38).

(38)   En Arcadia, ubicada en Odessa, el   Mar Negro se   ha congelado completamente.
         In Arcadia, located in Odessa, the Sea Black RELF has frozen   completely
         'In Arcadia, located in Odessa, the Black Sea has frozen completely.'
         [Internet]

In this case it is not necessarily true that the whole Black Sea is frozen, such that example
(38) demonstrates that despite an implicit maximal standard required by the verb *congelar* as
to truthfully apply some deviation from the maximal standard is possible as to still predicate
that the event has taken place. A plausible explanation for this case is to consider *en Arcadia*
a frame-setting modifier, as suggested by Maienborn (2001). Thus the frame-setter sets the
situation so that only the parts of the Black Sea in Arcadia are under consideration. According
to Maienborn (2001:194) '[f]rame-setting modifiers are not part of what is properly asserted but
restrict the speakers claim.' Consequently, when the frame-setting modifier is omitted the truth
is not necessarily preserved. That means, example (39) does not necessarily imply (40).

(39)   En Arcadia, ubicada en Odessa, el   Mar Negro se   ha congelado completamente.
         In Arcadia, located in Odessa, the Sea Black RELF has frozen   completely
         'In Arcadia, located in Odessa, the Black Sea has frozen completely.' *[Internet]*

(http://marke.upf.edu/cpa/index.php?action=main)

(40) El   Mar Negro se   ha congelado completamente.
      The Sea Black RELF has frozen   completely
      'The Black Sea has frozen completely.'

The frame-setting modifier thus essentially narrows down the applicability of the description and allows to account for the fact that it is perfectly plausible to claim that restricted to a particular location, *Arcadia*, the Black Sea is completely frozen.

All in all, however, it can be summarised that the scalar structure of the theme argument contributes differently to the computation of the scales at the verb phrase level and that for the overall result both the scale coming from the verb and the scale from the theme have to be taken into account.

4.   *Towards a formal account*

In the following I provide a formal analysis of the computation of the scale of *romper*-VPs, as allowing for a trivial and an articulated scale, and the scale of *congelar*-VPs, as only allowing for a multi-point scale. Previous to the concrete application I provide some detailed introduction to the measure of change function analysis.

4.1.   *Some background on measure of change functions*

In order to illustrate how the scale of change is computed at the level of the VP I will use the analysis developed by Kennedy & Levin (2008) and further elaborated in Kennedy (2012), according to which both scalar verbs as well as complex themes can be analysed as measure of change functions. This analysis is based on the intuition that any scalar change basically corresponds to a change in degree and thus can be represented by a difference function.

As mentioned above, Kennedy & Levin (2008) provide an analysis in which degree achievement verbs introduce a special kind of difference function: a function that measures the degree to which an object changes along a scalar dimension as a result of participating in an event (Kennedy & Levin 2008:18).

(41) **Measure of change**
      For any measure function $\mathbf{m}, \mathbf{m_\Delta} = \lambda x \lambda e.\mathbf{m}_{\uparrow m(x)(init(e))}(x)(fin(e))$

As formally expressed in (41) the measure of change function $\mathbf{m_\Delta}$ takes an object *x* and an event *e* and returns the degree that represents the amount that *x* changes in the property measured by $\mathbf{m}$ as a result of participating in *e*, with 'init' and 'fin' representing the initial and the final temporal points of the event. As a result the function provides a positive difference between the degree to which *x* measures at the beginning of *e* and the degree to which *x* measures at the end of *e*.

In order to denote a property of events the measure function must combine with some degree morphology. Given the absence of degree morphology on the verb Kennedy & Levin (2008) make use of a null degree morpheme *pos*, defined in (42):

(42) $pos(m_\Delta) = \lambda x \lambda e.m_\Delta\,(\mathrm{x})(\mathrm{e}) \geq stnd(m_\Delta)$

The formula in (42) indicates that a verb based on a measure of change function is true of *x* and *e* just in case the degree to which *x* changes by participating in *e* exceeds the standard of comparison for the measure of change.

According to this approach it is necessary to determine the standard of comparison involved in the truth conditions of the positive form of a gradable predicate. That is, what has to be determined is a minimum degree required to stand out to the kind of measurement encoded by the verbs *romper* and *congelar*, which is related to the fact that the standards for each verb are different. I will go deeper into this issue in the following two subsections.

Previous to that, however, it it is important to point out that, unlike Kennedy & Levin (2008), I apply the measure of change function analysis to verbs that are not based on adjectives thus extending the assumption that CoS verbs in general encode measure of change functions. This step is motivated by the observation that although it is useful to associate scalar semantics and telicity of a degree achievement, it is not true that the dimension of the scale has a direct relation to the underlying adjective (McNally 2012). Acknowledging this has led McNally (2012) to argue that what is actually relevant for the telicity of verbs in general is purely the part structure of the event being described. Consequently the gradable property associated with the adjective underlying a particular degree achievement plays exactly the same role that is played by any other property lexicalised in a change of state verb. That is, change of state verbs in general describe positive or negative changes on a value-scale that relates a set of degrees, with the ordering of the degrees and the dimension measured. This dimension of measurement, however, is nothing else than the property lexicalised in the verb.

4.2.   *Computing the scale of congelar-VPs*

The measure of change function encoded by *congelarse* is given in (43). It should be noted that for the sake of simplicity I provide the measure of change function for the intransitive verb *congelarse*.[3]

(43)   *congelarse*: $\lambda x \lambda e.\mathbf{congelarse}(x, e)$

As indicated above the measure of change function needs to type shift through degree morphology to denote properties of events and thus needs to be combined with a null degree morpheme *pos* (Kennedy & Levin 2008:19):

(44) $pos : \lambda g \lambda x \lambda e.g(x, e) \geq stnd(g)$

The measure of change function *g* combined with *pos* gives as a result a relation between entities and events:

(45) $pos(\,[\![congelarse]\!]\,)$: $\lambda x \lambda e.\mathbf{congelarse}(x, e) \geq stnd(\mathbf{congelarse})$

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[3]This simplification is based on the assumption that the external argument does not contribute to measuring out of the event described by a transitive change of state verb (Rappaport Hovav & Levin 2005).

This relation will hold iff the value of the measure of change function **congelarse** on the pair *x* and *e* is greater than or equal to the standard value of the measure of change function. As the tests from section 2 show, *congelar* 'freeze' lexicalises a multi-point scale with an upper bound. Thus the standard of *congelar* necessarily corresponds to a maximal standard. For a verb with an upper closed scale the positive form is true of its argument and an event just in case the value returned by applying the measure of change function **congelar** to the object and the event equals the maximal degree on the **congelar**$_\triangle$ scale. For example (46) we thus get the formula in (48).

(46)   La hamburguesa se   congeló.
           The hamburger   REFL froze
           'The hamburger has frozen.'

(47)   *congelarse la hamburguesa*: $(\lambda x \lambda e.\textbf{congelarse}(x, e) \geq stnd(\textbf{congelarse}))(\textbf{h}) = \lambda e.\textbf{congelarse}(\textbf{h}, e) \geq stnd(\textbf{congelarse})$

(48)   *congelarse la hamburguesa*: $\exists e.\textbf{congelarse}(\textbf{h}, e) \geq stnd(\textbf{congelarse})$

Given that *congelar* is a maximal standard verb, its standard should equal 1. Thus, the predicate will be true just in case there is a maximal degree of change in the relevant property of *hamburguesa*. That is, we only obtain truthful predication if the hamburger freezes completely.

    The same will happen in the case of any other even minimally small theme. That is, *congelar* imposes its multi-point scale with a maximal standard on any kind of theme. It can thus be stated that the mereological structure of the theme does not contribute visibly to the overall computation of the *congelar*-VP scale.

4.3.   Computing the scale of romper-VPs[4]

A *romper* measure of change function measures the difference in the degree to which an object has the property of being broken at the beginning of the event versus the end of that event. As was observed above, *romper* lexicalises a binary scale. Recall from above, however, that despite encoding a binary scale *romper* is not excluded from appearing in nontrivially gradable event descriptions. This occurs in virtue of the mereological structure of its theme. Generally, the combination of *romper* with physical objects results more easily in gradable VPs (49), while eventive theme arguments mostly yield non-gradable VPs (50).

(49)   El ligamento de Bojan se   rompió parcialmente.
           The ligament   of Bojan REFL broke   partially
           'Bojan's ligament partially tore.'
           [El País Corpus]

(50)   #El silencio se   rompió parcialmente.
           The silence REFL broke   partially
           'The silence partially broke.'

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[4]The analysis presented in this section was elaborated in greater detail in Spalek (2012).

Only when explicit mention of the event-argument's part structure is provided, can eventive themes appear in gradable *romper*-VPs.

(51)   Chávez rompió (parcialmente) el   acuerdo   con Colombia al   prohibir las
         Chávez broke   (partially)   the agreement with Colombia when prohibit the
         importaciones de productos colombianos.   El   intercambio cultural, sin
         imports   of products   Colombian.PL The exchange   cultural, without
         embargo,   se   mantuvo intacto.
         impediment, REFL maintain intact
         'Chávez partially broke the agreement with Colombia by prohibiting the imports of
         Colombian products. The cultural exchange nonetheless was maintained.'

The question that arises is thus how to account for the gradable VPs of inherently binary verbs like *romper*? To provide an explanation I will illustrate the semantic computation of *romper*-VPs with a gradable and a non-gradable theme argument using only the intransitive variant *romperse*. To capture the effects of the mereological structure of the theme argument and account for the variable gradability of *romper*-VPs, I will combine the measure of change function analysis of verbs with the approach to incremental themes of Kennedy (2012).

The measure of change function encoded by *romperse* is given in (52):

(52)   *romperse*: $\lambda x \lambda e.\textbf{romperse}(x, e)$

As already mentioned, according to Kennedy & Levin (2008:19) a measure of change function encoding verb needs to be type shifted through degree morphology to denote properties of events, which can happen by the use of the null degree morpheme *pos*, as illustrated in example (44).

The measure of change function *g* of type $\langle e, \langle \epsilon, d \rangle \rangle$ (ϵ being the type of events) is combined with *pos* and gives as a result a relation between entities and events:

(53) $pos(\llbracket romperse \rrbracket)$: $\lambda x \lambda e.\textbf{romperse}(x, e) \geq stnd(\textbf{romperse})$

This relation will hold iff the value of the measure of change function **romperse** on the pair *x* and *e* is greater than or equal to the standard value of the measure of change function, which is going to always be equal to 1.

There are two ways of computing the effect of the mereological complexity of the theme on the resulting scale at the VP level. If we take a theme argument that denotes a simple entity with no internal structure, such as *silencio* 'silence', we obtain the following calculation.

(54)   *romperse el silencio*: $(\lambda x \lambda e.\textbf{romperse}(x, e) \geq stnd(\textbf{romperse}))(\textbf{s}) =$
         $\lambda e.\textbf{romperse}(\textbf{s}, e) \geq stnd(\textbf{romperse})$

After existential closure over the event argument we obtain:

(55)   *romperse el silencio*: $\exists e.\textbf{romperse}(\textbf{s}, e) \geq stnd(\textbf{romperse})$

The predicate will be true just in case there is a positive degree of change in the relevant property of silence.

If *romperse* is associated with a two-point scale any minimal non-zero degree of the predicate *romper* d_{0+} is by default equivalent to the maximal degree d_{max}: $d_{0+} = d_{max} = 1$.

That is, given that the non-null degree of change yielded by the *romper*-measure of change function is 1 and the theme argument *silence* is atomic in part structure, the VP is not gradable in any interesting way. Consequently, the predicate should be instantaneously telic, which is corroborated by the lack of the possibility to use proportional modifiers like in example (56).

(56)   #El   silencio se   rompió parcialmente.
          The silence REFL broke   partially
          'The silence partially broke.'

Recall, however, that *romper*-VPs can be non-trivially gradable when the theme argument has a part structure that can undergo the event of breaking by parts. To account for examples such as *romperse el ligamento parcialmente* 'partially tore the ligament' it is necessary to access the part structure of the theme. To do that I follow Kennedy (2012), who argues that the part structure of the theme argument encodes its own measure of change function, which can be inherited by the VP as a whole.

Kennedy (2012) basically introduces the incremental partof$_\triangle$ function to the theme to handle incremental readings of DPs. He assumes that an individual-denoting DP can combine with a partitive head $part_{inc}$, which takes an individual x and provides an expression that measures the degree to which a portion of the constitutive parts y of x changes as a result of undergoing a change in an event e:

(57) $part_{inc}$: $\lambda x \lambda d \lambda y \lambda e.\textbf{partof}_\triangle(x, y, e) \geq d$

If we apply (57) to the argument *el ligamento* 'the ligament', this relation will be true if the portion y of ligament that has undergone a change as a result of the participation in the event exceeds the degree d:

(58) $part_{inc}$ ([[*el ligamento*]]): $\lambda d \lambda y \lambda e.\textbf{partof}_\triangle(\textbf{l}, y, e) \geq d$

Importantly, in Kennedy's analysis, when there is no overt degree phrase to saturate the degree argument of the incremental partitive, an appropriate standard takes over. In my case the degree argument is fixed to an implicit standard provided by the totally closed $\textbf{partof}_\triangle$ function. This total closure of the function is given by the fact that x is finite and thus the degrees of quantity of y that constitute the entity x are finite. Now with these facts in mind, two options for the appropriate standard arise:

1. Minimum standard: The value of $d > 0$, in the case that a minimal part of the individual x is affected.

2. Maximum standard: $d = 1$, in the case that the whole x is affected.

This offers the following two options for the $part_{inc}$ function when applied to *ligamento*, which correspond to examples (60) and (61) respectively.

(59)   ⟦part$_{inc}$ el ligamento⟧ =

 a. $part_{inc}$(⟦*el ligamento*⟧): $\lambda y \lambda e.\textbf{partof}_{\triangle}(\textbf{l}, y, e) {>} 0$
 b. $part_{inc}$(⟦*el ligamento*⟧): $\lambda y \lambda e.\textbf{partof}_{\triangle}(\textbf{l}, y, e) = 1$

(60)   El   ligamento se   rompió parcialmente.
 The ligament   REFL broke   partially
 'The ligament partially tore.'

Treating the theme as being affected holistically, as in (59-b), triggers readings as in (61).

(61)   El ligamento se   rompió completamente. *[El País Corpus]*
 El ligamento REFL broke   completely
 'The ligament tore completely.'

Now the measure of change function encoded in the verb *romper* and the measure of change function proceeding from the theme *el ligamento* are ready to combine. For the composition of the predicate *romperse* and $part_{inc}$ ⟦*el ligamento*⟧ it has to be taken into account that both have the same type $\langle e, \langle \epsilon, t \rangle \rangle$. Consequently functor-argument application is not possible. Again here following Kennedy (2012), I assume that the denotation of the nominal combines intersectively with the denotation of *romperse* via a version of Kratzer's Event Identification rule (Kratzer 1996:122) as defined in the following.

> Event Identification:
> If α is a constituent with daughters β, γ, such that ⟦β⟧ is type $\langle \epsilon, \text{t} \rangle$ *and* ⟦γ⟧ *is type* $\langle e, \langle \epsilon, \text{t} \rangle \rangle$ (ϵ the type of events), then ⟦β⟧ $(e) \wedge$ ⟦γ⟧ $(x)(e)$

Consequently the verb phrase *romper el ligamento* can be composed in the subsequent way:

(62)   ⟦$_{VP}$ *romperse el ligamento*⟧

 a. $\lambda y \lambda e[\textbf{romperse}(y, e) \geq stnd(\textbf{romperse}) \wedge \textbf{partof}_{\triangle}(\textbf{l}, y, e) {>} 0]$
 b. $\lambda y \lambda e[\textbf{romperse}(y, e) \geq stnd(\textbf{romperse}) \wedge \textbf{partof}_{\triangle}(\textbf{l}, y, e) = 1]$

For the composition, **romperse** brings in a default standard equivalent to 1, while its argument can bring in two distinct structures either an atomic one or an articulated one. Thus for the compositions of the two measure of change functions two options arise:

1. Applied to some *y*, which corresponds to a part of the theme argument and to some event *e*, the result will be true iff the value of the pair $\langle y, e \rangle$ on the **romperse** measure of change function equals or exceeds the standard for *romperse*, which is always = 1. That is, for each part that undergoes breaking, the breaking of the part is not a gradable event, but the whole VP can be gradable as the predicate holds of successively larger parts of the theme (62-a).

2. In (62-b), where 1 is the standard value, we get a completely non-gradable interpretation for *romperse el ligamento*. This corresponds to an achievement-like interpretation for the VP *romperse el ligamento* and thus allows for completive modifiers like *completamente* 'completely'.

The application of **romperse** to some theme *x* that is atomic, such as in the case of *silencio* in (56) can be considered as a special case of 2. In these cases the VP is non-gradable given the total lack of incremental parts of *silence*.

What is illustrated this way is that the mereological structure of the theme does in fact have an effect on the resulting scale of a *romper*-VP. More generally it is shown that the defualt-expected aspecual behaviour of an achievement verb can be modulated by the fact that the theme brings in a more complex scale.

5. Conclusions

I have analysed in detail the scalar behaviour of *congelar* and *romper* taking into account the scales the verbs individually can be associated with as well as the scalar structure of their respective themes. The comparison of the telicity and gradability of *congelar* and *romper* has illustrated that the endpoints of closed scales are potential standards for the predicate's telicity and thus provide the default behaviour of the lexical item.

Nevertheless, I have also shown that the default behaviour may be altered at the VP-level. Lexically coded scales can thus suffer modifications in composition. That is, it seems a mistake to predict the scalarity of a VP by referring to the scale of the verb or the argument only. Rather it has turned out that, although verbs as well as themes may be coding default scales, there is some interaction going on at the level of the verb phrase, which makes gradability of VP and the verb's inherent telicity appear as two independent phenomena.

The investigated data seem to point to a general tendency, which however should be investigated on more data. Specifically, verbs that encode multi-point scales, such as *congelar* seem to preserve their structure at the VP level regardless of the mereological structure of the theme they combine with. Verbs that encode trivial scales can appear in VPs with multi-point scales by virtue of a complex scale brought in by the theme. More generally, it seems to be easier to project a multi-point scale on top of a simple verbal scale, such as in the case of *romper*-VPs, while it seems impossible to reduce a complex scale encoded in the verb to a simple scale at the verb phrase level.

The data illustrated here corroborate the previously explored idea that telicity is not a purely lexical phenomena, but rather is construed at the sentence level (Dowty 1979; Krifka 1989). In particular it highlights the fact that the referential properties of a certain argument noun phrase are crucial for determining the gradability of the VP.

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