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# An alternative-based theory of distributivity: Non-local floating quantifiers and contextual monotonicity

Takanobu Nakamura

In this paper, I discuss the distributivity and locality of floating numeral quantifiers in Japanese. The challenge is that they are weakly distributive and selectively local. Building on Nakanishi's (2008a) event-based monotonicity analysis, I propose an alternative-based monotonicity analysis: floating numeral quantifiers presuppose monotonic ordering of alternatives, which can be based on logical entailment or informativity. This analysis derives an appropriate degree of distributivity and locality for floating numeral quantifiers in Japanese.

## 1. Introduction

Cardinal modification in Japanese generally requires a combination of a numeral and a classifier, which I call a *numeral quantifier*. For example in (1), the numeral quantifier *san-nin* consists of a numeral *san* '3' and a classifier *-nin* 'CL<sub>Person</sub>'. Numeral quantifiers can occur in at least three positions as shown in (1). As a general term, I call a noun phrase associated with a numeral quantifier its *host NP*. A numeral quantifier is boldfaced and its host NP is underlined in (1). A prenominal numeral quantifier precedes its host NP as in (1a), a postnominal numeral quantifier follows its host NP, but precedes a case particle as in (1b) and a floating numeral quantifier follows its host NP and a case particle as in (1c).

- (1) a. **San-nin**-no (\*kinoo) gakusei-ga hasi-tta. (Premotional)  
3-CL<sub>Person</sub>-GEN (yesterday) student-NOM run-PAST  
b. Gakusei (\*kinoo) **san-nin**-ga hasi-tta. (Postnominal)  
student (yesterday) 3-CL<sub>Person</sub>-NOM run-PAST  
c. Gakusei-ga (kinoo) **san-nin** hasi-tta. (Floating)  
student-NOM (yesterday) 3-CL<sub>Person</sub> run-PAST  
'Three students ran (yesterday).'

The prenominal position and the postnominal positions are within the nominal domain: the temporal adverb *kinoo* ‘yesterday’ cannot intervene between a numeral quantifier and its host NP as in (1a) and (1b).<sup>1</sup> On the contrary, the floating position is within the verbal domain: the intervention of *kinoo* ‘yesterday’ does not change the acceptability of the sentence as in (1c).

In this paper, I focus on the syntactic and semantic properties of floating numeral quantifiers in Japanese. It has been observed that floating numeral quantifiers in Japanese always induce a distributive reading and have to be local to their host NPs. However, I show that this is not always the case. To predict in which context the distributivity and locality arise, I propose that floating numeral quantifiers presuppose a monotonic ordering among alternatives. The rest of this paper is organised as follows. §2 is devoted to the distributivity and locality of Japanese floating numeral quantifiers. §3 reviews Nakanishi’s (2008a) event-based monotonicity account, which derives distributivity as a consequence of monotonic event measurement. In §4, I show that Nakanishi’s (2008a) account makes too strong predictions for the distributivity and locality of floating numeral quantifiers. In §5, I show that acceptability of non-local floating numeral quantifiers relies on an informativity scale. §6 proposes an alternative-based monotonicity account and §7 illustrates how it solves the issues with the distributivity and locality.

## 2. Syntax and semantics of numeral quantifier floating in Japanese

In this section, I introduce two observations which have been discussed in the previous literature. §2.1 introduces the observation that a floating numeral quantifier always induces a distributive reading. §2.2 introduces the observation that a floating numeral quantifier has to be local to its host NP.

### 2.1. Distributivity

Nakanishi (2008a) argues that floating numeral quantifiers in Japanese always induce a distributive reading. This can be shown with several diagnostics. First, a non-floating numeral quantifier allows an indefinite in the object position to take the wide scope or the narrow scope with respect to it as in (2), whereas a floating numeral quantifier always takes the wide scope with respect to the indefinite in the object position as in (3).

- (2) Otokonoko-**san-nin**-ga kinoo moderu booto-o tukut-ta.  
boy-3-CL<sub>Person</sub>-NOM yesterday model boat-ACC make-PAST
  - a. ‘Three boys made a model boat yesterday.’ (non-distributive)
  - b. ‘Three boys each made a model boat yesterday.’ (distributive) (Nakanishi 2008a)
- (3) Otokonoko-ga kinoo **san-nin** moderu booto-o tukut-ta.  
boy-NOM yesterday 3-CL<sub>Person</sub> model boat-ACC make-PAST
  - a. ?? ‘Three boys made a model boat yesterday.’ (non-distributive)
  - b. ‘Three boys each made a model boat yesterday.’ (distributive) (Nakanishi 2008a)

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<sup>1</sup> Yasu Sudo (p.c.) pointed out that (1a) and (1b) with an intervening *kinoo* ‘yesterday’ are definitely degraded, but not terribly bad. I suspect that there is always a possibility of left-branching extraction in Japanese, but it requires a certain discourse condition.

Second, floating numeral quantifiers are compatible with verbs with repeatable actions, e.g., *tataku* ‘hit’ as in (4a) but are incompatible with verbs with irrepeatable actions, e.g., *korosu* ‘kill’ as in (4b). If (4b) allowed a collective reading in which three students collaboratively killed Peter, it could have been felicitous.

- (4) a. Gakusei-ga kinoo **san-nin** Peter-o tatai-ta.  
          student-NOM yesterday 3-CL<sub>Person</sub> Peter-ACC hit-PAST  
          ‘Three students hit Peter yesterday.’

b. ?? Gakusei-ga kinoo **san-nin** Peter-o korosi-ta.  
          student-NOM yesterday 3-CL<sub>Person</sub> Peter-ACC kill-PAST  
          ‘Three students killed Peter yesterday.’ (Nakanishi 2008a)

These observations are suggestive of obligatory distributivity of floating numeral quantifiers.

## 2.2. Locality

It has been claimed that floating numeral quantifiers in Japanese need to be local to their host NPs (Haig 1980, Kuroda 1980, Miyagawa 1989). The typical case of locality violation is seen in a post-object floating numeral quantifier whose host NP is the subject as in (5b).

- (5) a. Gakusei-ga **san-nin** hon-o ka-tta.  
student-NOM 3-CL<sub>Person</sub> book-ACC buy-PAST  
b. \* Gakusei-ga hon-o **san-nin** ka-tta.  
Student-NOM book-ACC 3-CL<sub>Person</sub> buy-PAST  
'A student bought three books.'

Similarly, embedding of the host NPs leads to ungrammaticality as in (6).



When a sentence involves two arguments whose denotations are compatible with the sortal restriction of a floating numeral quantifier, its host NP must be the closest c-commanding argument as in (7).

- (7) Gakusei<sub>i</sub>-ga gakusei<sub>j</sub>-o huta-ri<sub>\*i/j</sub> nagu-tta.  
 student-NOM student-ACC 2-CL<sub>Person</sub> hit-PAST  
 ‘A student hits two students.’

<sup>2</sup>These observations are suggestive of some locality constraint on numeral quantifier floating.

<sup>2</sup> There are three views on the syntax of floating numeral quantifiers, namely *movement analyses* (Miyagawa 1989, Watanabe 2006, Furuya 2008, Nomura 2013, a.o.), *adverbial analyses* (Inoue 1978, Nakanishi 2008a, a.o.) and *hybrid analyses* (Ishii 1999, Fitzpatrick 2006, Ko 2014, a.o.). The discussion in this paper is orthogonal to this debate because I focus on the semantic-pragmatic side of floating numeral quantifiers. I later adopt Nakanishi's (2008a) adverbial analysis, but the proposed account can be implemented in other approaches, too.

### 3. Event-based monotonicity

In this section, I introduce Nakanishi's (2008a) account for distributivity of floating numeral quantifiers in Japanese. The gist of her analysis is that floating numeral quantifiers are monotonic measure phrases with their own measurement dimension, but when they are used to measure an event, it requires verbal denotation to be homomorphic to the denotation of its host NP. Distributivity arises due to the combination of measurement monotonicity and the homomorphism requirement. §3.1 introduces the notions of measurement monotonicity and derived measure functions. §3.2 explains how the combination of measurement monotonicity and derived measure functions derives the distributivity requirement of floating numeral quantifiers. §3.3 illustrates how Nakanishi's (2008a) analysis predicts locality of floating.

#### 3.1. Monotonicity and derived measure functions

Naively speaking, *monotonicity* is a property of relations/functions which preserves the order pertaining in the domain of them. Nakanishi's (2008a) theory utilises monotonicity defined for measurement functions and proposes that floating numeral quantifiers are *monotonic* measure phrase for verbal predicates.

Application of monotonicity to measurement is not new (see Krifka 1989, 1992, Schwarzschild 2002, 2005, 2006, Nakanishi 2008a, Wellwood 2015, a.o.). Among them, Schwarzschild (2002, 2005) defines this measurement monotonicity as in (8).  $\sqsubset$  is a proper part relation,  $<$  is a total order relation and  $\mu$  is a function from individuals to degrees.<sup>3</sup>

$$(8) \text{ Mon}(\mu)(P) \Leftrightarrow \forall x \forall y [[y \sqsubset x \& P(y) \& P(x)] \rightarrow \mu(y) < \mu(x)]$$

If a measurement is monotonic, its value reflects the mereological structure of individuals. For example, litre-measurement is monotonic: a part of a portion of water necessarily has smaller litre amounts, but temperature-measurement is non-monotonic: a part of a portion of water need not have lower temperature. Measurement monotonicity is often tied with a particular syntactic structure. For example, English pseudo-partitives only allow monotonic measurement.

- (9) a. Monotonic measurement: 40 litres of water
- b. Non-monotonic measurement: \*40 degrees of water

Measurement monotonicity also constrains the denotation of NPs. Pseudo-partitives allow mass nouns and plural nouns, but disallow singular count nouns as in (10).

- (10) 40 pounds of water / books / \*book

This is expected under (8) because if an individual  $x$  satisfies the denotation of a singular count noun, none of the subparts of  $x$  satisfies the same predicate. For example, if  $x$  is a book, its parts, e.g., pages, sections, chapters, do not qualify as a book. This makes (8) false.

When a measure function is applied to a type of entity which is not within its domain, one can construct a *derived measure function* if there is a homomorphism between the domain of that type of entities and the domain of the original measure function (Link 1983, Bach 1986, Krifka 1992,

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<sup>3</sup> This is slightly different from Schwarzschild's (2005) original formulation and closer to Champollion's (2017). This does not matter in the discussion here.

Nakanishi 2008a, a.o.). For example, to measure the temporal extension of an event by using the measure phrase *hour*, one needs a derived measure function of *hour* because it denotes a measure function from time to numbers. I henceforth use  $\text{HOUR}$  to express this measure function. The runtime function  $\tau$ , a function from events to their runtime, is a homomorphism between events and time: the runtime of the sum of two events  $e$  and  $e'$  is identical to the sum of the runtime of the event  $e$  and the runtime of the event  $e'$  as in (11a).  $\cup$  is the sum-forming operator and the subscript parametrises domains of different entities. As a result, one can construct a derived measure function  $\text{HOUR}'$  as defined in (11b).

- (11) a.  $\forall e, e' [\tau(e \cup_E e') = \tau(e) + \cup_T \tau(e')]$  (homomorphism)  
b.  $\forall e [\text{HOUR}'(e) = \text{HOUR}(\tau(e))]$  (derived measure function)

In the next section, I show how Nakanishi (2008a) applies these notions to the semantics of floating numeral quantifiers.

### 3.2. Monotonic event measurement

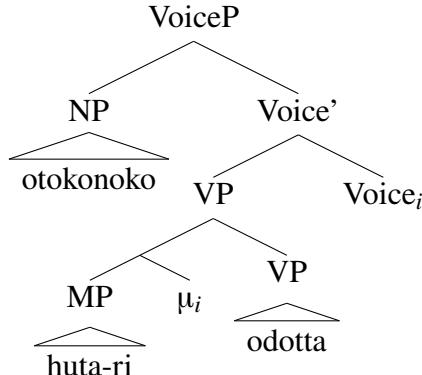
Nakanishi (2008a) argues that floating numeral quantifiers monotonically measure the participants of events. To introduce measurement monotonicity, she postulates a covert mapping operator  $\mu_{VP}$ . Note that  $K$  stands for a degree predicate, i.e.  $\langle dt \rangle$ ,  $S$  stands for an event predicate, i.e.  $\langle vt \rangle$  and  $\mu$  stands for a measure function from individuals to degrees, i.e.  $\langle ed \rangle$ .  $\mu_{VP}$  presupposes monotonicity between  $\mu$  and an event predicate  $S$ .

- (12)  $[\![\mu_{VP}]\!] = \lambda K_{\langle dt \rangle} \lambda S_{\langle vt \rangle} : \text{Mon}(\mu)(S). \lambda e_v [S(e) \& K(\mu(e))]$

With this operator, Nakanishi (2008a) gives the structure (13b) and the LF (13c) to the example (13a).<sup>4</sup> She assumes a Neo-Davidsonian event semantics.<sup>5</sup>

- (13) a. otokonoko-ga huta-ri odo-tta.  
boy-NOM 2-CL<sub>Person</sub> dance-PAST  
‘Two boys danced.’

b.



<sup>4</sup> \* stands for the star operator, which *cumulativises* a predicate. For example, if  $P(x)$  and  $P(y)$  are true, then  $*P(x+y)$  is also true. Here, I follow the assumptions that verbs and thematic relations are all cumulative as default and Japanese has transnumeral denotation, which Nakanishi (2008a) also follows.

<sup>5</sup> More specifically, she assumes that the agent relation is severed from the denotation of a lexical verb, but the theme relation is not (Kratzer 1996). In this paper, I sever theme relation from the denotation of a lexical verb, too, but this is orthogonal to my proposal.

- c.  $\exists e \exists x [*\text{boy}(x) \& \text{agent}(e) = x \& * \text{dance}(e) \& \text{CARD}(h(e)) = 2 \text{ person}]$

Presupposition: Cardinality of individuals is monotonic to  $\lambda e_v [*\text{dance}(e)]$ .

The idea is that the original measurement function that *-nin* ‘CL<sub>Person</sub>’ denotes is defined for individuals, but if there is a homomorphism between events and individuals, the result of the measurement on individuals can be applied to events.<sup>6</sup> To specify which function serves as a homomorphism  $h$ , Nakanishi (2008a) proposes that  $\mu_{VP}$  and the head taking its closest c-commanding NP as its argument must bear the same index and the co-indexed head provides a homomorphism. In (13b), the closest c-commanding NP for  $\mu_{VP}$  is *otokonoko* ‘boy’ and the head taking it as its argument is Voice head. Thus, the agent relation is chosen as a homomorphism  $h$ . To be a homomorphism, the agent relation has to relate atomic individuals to events. This is visualised in Figure 1 (adopted from Nakanishi 2008a).

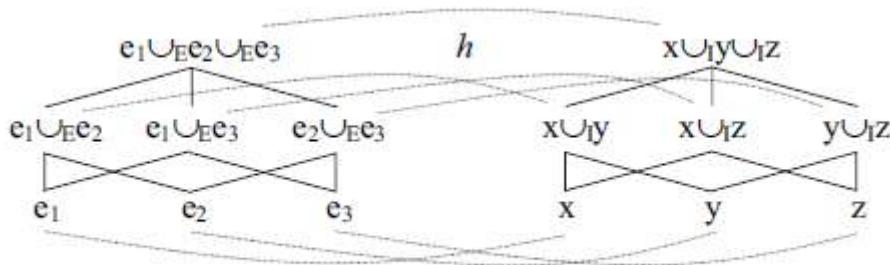


Figure 1: Homomorphism between events and individuals

Truth-conditionally, it means that for each atomic individual, it is an agent of an event. This is a distributive reading. Therefore, Nakanishi’s (2008a) event-monotonicity account correctly derives the distributivity requirement of floating numeral quantifiers.

### 3.3. Event-monotonicity and locality of floating

Although the core insight of Nakanishi’s (2008a) analysis is independent of locality of floating, her co-indexing mechanism correctly accounts for it. Consider the previous example (7), which is recited here.

- (14) gakusei<sub>i</sub>-ga gakusei<sub>j</sub>-o huta-ri<sub>\*i/j</sub> nagu-tta.  
 student-NOM student-ACC 2-CL<sub>Person</sub> hit-PAST  
 ‘A student hits two students.’

Here, the homomorphism is required between hitting events and the themes of those events. This is because the object *gakusei* ‘student’ is the closest c-commanding NP for the floating numeral quantifier *huta-ri* ‘2-CL<sub>Person</sub>’ and the head which take the object as its argument is the verb *nagur-u* ‘hit’. As a result, a derived measure function PERSON'(e) such that PERSON'(e) = PERSON(theme(e)) is constructed. Thus, this co-indexing mechanism correctly predicts that a floating numeral quantifier has to be associated with the closest c-commanding NP.<sup>7</sup>

<sup>6</sup> -ri is an allomorph of -nin.

<sup>7</sup> This predicts a weaker version of Miyagawa’s (1989) mutual c-command requirement.

#### 4. Weak distributivity and selective locality

Although Nakanishi's (2008a) event-monotonicity analysis elegantly derives the distributivity requirement and the locality constraint of floating numeral quantifiers, it makes too strong predictions. §4.1 introduces some counterexamples to the distributivity of floating numeral quantifiers and §4.2 introduces some counterexamples to the locality of numeral quantifier floating.

##### 4.1. Collectivity and weak distributivity

Floating numeral quantifiers are compatible with a collective predicate *atumaru* 'gather', whereas the distributive universal quantifier *daremo* 'everyone' is not.<sup>8</sup>

- (15) a. Tomodachi-ga kinoo **huta-ri** atsuma-tta.  
          friend-NOM     yesterday 2-CL<sub>Person</sub> gather-PAST  
          'Two friends gathered yesterday.'  
       b. ?? **Daremo**-ga kinoo atsuma-tta.  
          everyone-NOM yesterday meet-PAST  
          'Everyone gathered yesterday.'

Seemingly, this is problematic for Nakanishi's (2008a) account. However, Nakanishi (2008a) discusses some cases in which her event-monotonicity analysis predicts collective readings to be possible. For example, if the verb in a sentence takes the progressive form, then a floating numeral quantifier allows both a collective reading and a distributive reading.

- (16) Otokonoko-ga kinoo san-nin isu-o tuku-tte-ita.  
      boy-NOM       yesterday 3-CL<sub>Person</sub> chair-ACC make-PROG-PAST  
      a. 'Three boys were making a chair together yesterday.' (non-distributive)  
      b. 'Three boys were each making a chair yesterday.' (distributive) (Nakanishi 2008a)

Nakanishi (2008a) explains that progressives are tied with the notion of partiality and the extensions of verbal predicates in progressives are plural. Thus, homomorphism is met between atomic individuals and the sub-events which are part of an event expressed by a verbal predicate in progressives. This analysis can be extended to the collective predicate *atumaru* 'gather': a gathering event consists of sub-events and each of those sub-events is mapped to an atomic friend. Therefore, the acceptability of (15a) is not a serious problem for Nakanishi (2008a).<sup>9</sup>

However, there is another problem which cannot be solved in the same way. A numeral indefinite in the object position can take either the narrow scope or the wide scope with respect to a floating numeral quantifier as in (17). Compare it with bare indefinites in (3).<sup>10</sup>

<sup>8</sup> Dowty (1987) claims that *gather* is not a genuine collective predicate and Tancredi (2005) proposes a mixed semantics of *gather*. If so, this verb might not be appropriate to test distributivity, but it still shows a contrast between *every* and floating numeral quantifiers.

<sup>9</sup> A collective predicate *au* 'meet' sounds much worse with a floating numeral quantifier. However, some native speakers, including myself, report that combination of *au* 'meet' and a floating numeral quantifier sounds slightly more acceptable if these are not adjacent. I leave this issue for future work. At least, it is not the case that collective predicates are always incompatible with floating numeral quantifiers.

<sup>10</sup> This is not due to specific readings of indefinites. Floating numeral quantifiers have been claimed to disallow specific readings (Kamio 1977).

- (17) Gakusei-ga kinoo san-nin piano-o **yon-dai** hakon-da.  
 student-NOM yesterday 3-CL<sub>Person</sub> piano-ACC 4-CL<sub>Object</sub> carry-PAST  
 a. ‘Three students carried four pianos yesterday.’ (non-distributive)  
 b. ‘Three students each carried four pianos yesterday.’ (distributive)

If three students together carried four pianos, (17) is true.<sup>11</sup> This is not expected under the event-monotonicity analysis. In such a scenario, there are three atomic students and four events of carrying a piano. Thus, there is no one-to-one correspondence between individuals and events. Also, (17) does not involve the progressive form of a verb nor a collective predicate. So, one-to-one correspondence between individuals and sub-events is not met, either.<sup>12</sup> Therefore, the homomorphism requirement is violated in any case. As a result, the event-monotonicity account wrongly predicts (17) to be infelicitous.

#### 4.2. Selective locality of numeral quantifier floating

Nakanishi’s (2008a) analysis predicts that a floating numeral quantifier has to take the closest c-commanding NP as its host NP, but there are various counterexamples to this prediction.<sup>13</sup>

- (18) NP-internal host NPs
- a. Yamada Sensei-ga [gakusei-no kami]-o **san-nin** kit-ta.  
 Yamada Professor-NOM [student-GEN hair]-ACC 3-CL<sub>Person</sub> clip-PAST  
 ‘Prof. Yamada cut three students’ hair.’ (Takami 2001)
  - b. Ano isya-wa [zidoo-no me]-o **sanjuu-nin** sirabe-ta.  
 that doctor-TOP [pupil-GEN eye]-ACC 30-CL<sub>Person</sub> examine-PAST  
 ‘That doctor examined 30 pupils’ eyes.’ (Kikuchi 1994)
- (19) PP-internal host NPs:
- Gantan-ni [osiego-kara] **go-nin** nengazyoo-o morat-ta.  
 New Year’s Day-on [my student-from] 5-CL<sub>Person</sub> postcard-ACC receive-PAST  
 ‘(I) received a card from five students of mine on New Year’s Day.’ (Takami 2001)
- (20) Post-object floating of numeral quantifier whose host NP is the subject
- a. Gakusei-ga repooto-o **san-nin-dake** teisytusi-ta.  
 student-NOM report-ACC 3-CL<sub>Person</sub>-only hand in-PAST  
 ‘Only three students handed in a report.’ (Takami 2001)
  - b. i. A: Kono sinkan zassi uretemasu-ka?  
 this new magazine is selling-Q  
 ‘Is this new magazine selling well?’

<sup>11</sup> Although I do not discuss cumulative readings of floating numeral quantifiers in this paper, (17) also has a cumulative reading. For example, if one of the three students carried two pianos and the other two students each carried one piano, (17) is true.

<sup>12</sup> The extensions of verbal predicates in progressives and collective predicates are *cumulative*, whereas the extension of a verbal predicate with a numeral indefinite argument is *quantised* in Krifka’s (1989) sense.

<sup>13</sup> For reasons of space, I am not able to have an exhaustive list of such counterexamples. See Nakanishi (2008b) for a comprehensive and thorough review of the counterexamples to the locality of floating.

In none of the examples above, does the floating numeral quantifier take the closest c-commanding NP as its host NP. This is unexpected under the co-indexing mechanism of Nakanishi (2008a).<sup>14</sup>

### 4.3. *Interim summary*

So far, I have shown that Nakanishi's (2008a) event-monotonicity analysis offers a principled account of the distributivity and locality of floating numeral quantifiers in Japanese. However, it makes too strong predictions. I aim to solve this problem while preserving the insight of her analysis. Instead of attributing monotonicity to the mereological structure of events and individuals, I attribute it to a monotonic ordering of propositional alternatives. I call it an *alternative-based monotonicity* approach. The main difference between these approaches is whether monotonicity is found in the mereological structure of events or in an ordering among alternative propositions. The merit of this alternative approach is that it can also explain in what condition non-local floating numeral quantifiers are acceptable. In the next section, I show that acceptable non-local floating numeral quantifiers exhibit a certain contextual entailment pattern.

## 5. Selective locality and contextual entailment

In this section, I show that non-local numeral quantifiers are acceptable if there is a contextually given informativity scale. §5.1 discusses floating numeral quantifiers whose host NPs are embedded in an NP or a PP. In §5.2, I discuss post-object floating numeral quantifiers whose host NPs are at the subject position.

### 5.1. Embedded host NPs

I start with non-local floating numeral quantifiers whose host NPs are embedded in an NP or a PP. First, consider (18b), which is recited here. This example involves an inalienable possession *zidoo-no me* ‘pupils’ eyes’.<sup>15</sup>

- (21) Ano isya-wa [zidoo-no me]-o sanjuuu-nin sirabe-ta.  
       that doctor-TOP [pupil-GEN eye]-ACC 30-CL<sub>Person</sub> examine-PAST  
       ‘That doctor examined 30 pupils’ eyes.’

<sup>14</sup> Note that the core part of Nakanishi's (2008a) analysis does not rely on the co-indexing mechanism and the fact that this mechanism cannot account for non-local cases does not necessarily falsify her account.

<sup>15</sup> The importance of the semantics of possession is already mentioned in a footnote in Nakanishi (2008b). She claims that examples improve whenever a one-to-one correspondence between the possessor and his/her body part is clear from the context.

If *zidoo-no me* ‘pupils’ eyes’ is replaced with an alienable possession, e.g., *kanja-no kuruma* ‘patients’ cars’, non-local floating becomes unacceptable.

- (22) ?\* Ano isya-wa [kanja-no kuruma]-o **sanjuu-nin** sirabe-ta.  
           that doctor-TOP [patient-GEN car]-ACC 30-CL<sub>Person</sub> examine-PAST  
      ‘That doctor examined 30 patients’ cars.’

The difference between inalienable possession and alienable possession becomes visible in their capability to license a contextual entailment pattern based on the cardinality-based scale.

- (23) a. That doctor examined 30 pupils’ **eyes**.  
       \models\_c That doctor examined 29/28 ... 2/1 pupils’ **eyes**.  
      b. That doctor examined 30 patients’ **cars**.  
       \n\models\_c That doctor examined 29/28 ... 2/1 patients’ **car(s)**.

The same thing applies to embedding to PPs. In (19), which is recited here, the participants are *nengazyoo* ‘New Year’s postcards’. Conventionally, there is just one New Year’s postcard per person in a year. Once this is replaced with a noun without such convention, e.g., *sake* ‘alcohol’, non-local floating is degraded.

- (24) a. Gantan-ni [osiego-kara] **go-nin** nengazyoo-o morat-ta.  
       New Year’s Day-on [my student-from] 5-CL<sub>Person</sub> postcard-ACC receive-PAST  
       ‘(I) received a card from five students of mine on New Year’s Day.’  
      b. ?? Gantan-ni [osiego-kara] **go-nin** osake-o morat-ta.  
       New Year’s Day-on [my student-from] 5-CL<sub>Person</sub> alcohol-ACC receive-PAST  
       ‘(I) got some alcohol from five students of mine on New Year’s Day.’

Again, this difference is tied with availability of a contextual scalar entailment.

- (25) a. I got **New Year’s postcards** from five students.  
       \models\_c I got **New Year’s postcards** from 4/3/2/1 student(s).  
      b. I got **sake** from five students.  
       \n\models\_c I got **sake** from 4/3/2/1 student(s).

### 5.2. Post-object floating with the subject host NP

Floating numeral quantifiers that float in the post-object position can be associated with the subject NP if there is a contextual scalar entailment. First, (20a), which is repeated here, has an overt focus item *dake* ‘only’, which negates logically stronger alternatives.

- (26) Gakusei-ga repooto-o san-nin-dake teisytus-i-ta.  
       student-NOM report-ACC 3-CL<sub>Person</sub>-only hand in-PAST  
       ‘Only three students handed in a report.’

To avoid vacuous exhaustification, (20a) has to have weaker alternatives. For a numeral quantifiers, it is not possible to have stronger alternatives without having weaker alternatives. So, *only*-focus semantically explicates a scalar alternatives.

- (27) 3 students handed in a report.
- Stronger alternatives: ... 5/6/4 students handed in a report.  
⇒ Negated by the assertion of *dake* ‘only’
  - Weaker alternatives: 2/1 student(s) handed in a report.  
⇒ Entailed by the prejacent

Second, (20b-ii) involves a verb with the *V-te-iku* ‘go V-ing’ form. (28b) is a simplified version of (20b-ii). In addition to this, the *V-te-kuru* ‘come V-ing’ form also licenses a non-local floating numeral quantifier as in (28c).<sup>16</sup>

- (28) a. ??? Gakusei-ga {sono-zassi / sore}-o go-nin ka-tta.  
student-NOM {the-magazine / it}-ACC 5-CL<sub>Person</sub> buy-PAST
- b. ? Gakusei-ga {sono-zassi / sore}-o go-nin kat-te-i-tta.  
student-NOM {the-magazine / it}-ACC 5-CL<sub>Person</sub> buy-TE-go-PAST
- c. ? Gakusei-ga {sono-zassi / sore}-o go-nin kat-te-ki-ta.  
student-NOM {the-magazine / it}-ACC 5-CL<sub>Person</sub> buy-TE-come-PAST  
'Five students bought {the magazine / it} this morning.'

The *te-iku* ‘go V-ing’ form and the *te-kuru* ‘come V-ing’ form introduce incrementality to the semantics of verbs.<sup>17</sup> To observe it, consider the contrast in (29). Here, an achievement verb *kiduk-u* ‘notice’ takes a plural subject.

- (29) a. Sankasya-tachi-ga torikku-ni kidui-ta. ?? Daga, zen'in-wa mada  
participant-PL-NOM hotel-DAT notice-PAST but everyone-TOP yet  
kidui-tei-na-i.  
notice  
'The participants noticed the trick, but not everyone has noticed it yet.'
- b. Sankasya-tachi-ga torikku-ni kidui-te-{?it / ki}-ta. Daga, zen'in-wa  
participant-PL-NOM hotel-DAT notice-TE-{go / come}-PAST but everyone-TOP  
mada kidui-tei-na-i.  
yet noticeTE-NEG-PRES  
'The participants started to notice the trick, but not everyone has noticed it yet.'

The plain form is telic and only picks up the maximal point of a scale as in (29a), whereas the *te-iku* ‘go V-ing’ form and the *te-kuru* ‘come V-ing’ form are atelic and can pick up any mid point in a scale as in (29b). So, one can see that there is a contextually given ordering ≪ which goes along with the cardinality-based scale.

- (30) a. 1 participant noticed the trick ≪ 2 participants noticed the trick ≪ ... ≪ all the participants noticed the trick.
- b. 1 student bought the magazine ≪ 2 students bought the magazine ≪ ... ≪ 5 students bought the magazine ≪ ...

<sup>16</sup> I thank the anonymous reviewer for bringing the contribution of the *V-te-iku* ‘go V-ing’ form and the *V-te-kuru* ‘come V-ing’ form and providing some data in this regard.

<sup>17</sup> See Kubota (2010) for a scale-based semantics of the *V-te-iku* ‘go V-ing’ form and the *te-kuru* ‘come V-ing’ form. Putting aside the details, these two forms take a verbal measure function and modify it so that the scale structure associated with the measure function changes.

Summing up, the counterexamples to locality of floating involve some strategies to introduce a scale which goes along with the ordering of numerals. In the next section, I propose a revision of Nakanishi's (2008a) event monotonicity approach so that this effect of contextual scalar entailment is incorporated into the monotonicity account.

## 6. *Proposal: An alternative-based monotonicity*

I aim to modify Nakanishi's (2008a) event-based monotonicity analysis to account for the exceptional collective readings and acceptable non-local floating numeral quantifiers. I propose that a floating numeral quantifier presupposes contextual monotonicity among relevant alternatives. The gist is that monotonicity is defined for ordering among alternatives, instead of the mereological structure of events. §6.1 informally describes the analysis and §6.2 introduces the ingredients to formalise the idea. In §6.3, I sketch a formal implementation of the analysis.

### 6.1. *The idea in a nutshell*

I preserve Nakanishi's (2008a) idea that the distributivity effect of floating numeral quantifiers comes from monotonicity of measure phrases. However, I do not define monotonicity based on the mereological structure, but based on an informativity scale of alternatives. Now, monotonicity is reformulated as a constraint on alternatives such that the ordering among degree alternatives is preserved in propositional alternatives.

- (31)  $\text{ALT}_\mu(p)$  is a set of *monotonic alternatives* with respect to  $\mu$  iff
  - a.  $\text{ALT}_\mu(p) = \{q \mid \mu(q) < d \vee d < \mu(q)\}$ ,
  - b.  $\mu(p) = d \Leftrightarrow \exists f \forall s [p(s) \rightarrow [\mu(f(s)) = d]]$ , and
  - c. there is an ordering  $\ll$  such that  $\forall q, q' \in \text{ALT}_\mu(p) [q \ll q' \vee q' \ll q]$

With this notion of monotonic alternatives, I propose that floating numeral quantifiers presuppose the existence of a monotonic alternative. Importantly, the monotonicity requirement eliminates collective readings because these lack a monotonic ordering among alternatives.

- (32) a. 5 boys **each** made a boat.  $\models 4/3/2/1$  boy(s) **each** made a boat.
- b. 5 boys **together** made a boat.  $\not\models 4/3/2/1$  boy(s) **together** made a boat.

However, collective predicates are tolerated.

- (33) 5 boys **gathered**.  $\models 4/3/2$  boys **gathered**.

An alternative with the numeral 1 is excluded from the monotonic alternatives. This is consistent with the analysis because the presupposition requires there to be at least one monotonic alternative, but does not require every possible alternative to be ordered.

As for locality, I claim that local floating always licenses the alternative-based monotonicity, whereas non-local floating sometimes does not. This is because local floating can always resort to logical entailment via the semantics of thematic relation, whereas non-local floating cannot. Thus, non-local floating requires an additional factor to provide an informativity scale.

## 6.2. Alternatives and distributivity: the case of Mandarin *dou*

An alternative-based approach to distributivity is already found in the recent literature on Mandarin *dou* (Liu 2017, Zhao 2019, Xiang 2020, a.o.). It can be used as a quantifier distributor.



Xiang (2020) proposes the semantics of *dou* in (35).<sup>18</sup> The most crucial ingredient is the *anti-exhaustification* in (35c). It negates the exhaustification of weaker alternatives.

- (35)  $\llbracket \text{dou} \rrbracket = \lambda p \lambda w : \exists q \in \text{SUB}(p, C). [p(w) \& \forall q \in \text{SUB}(p, C)[\neg \text{EXHC}(q)(w)]]$

  - a. **Non-vacuity:** the prejacent has at least one sub-alternative.
  - b. **Prejacent assertion:** the prejacent is true.
  - c. **Anti-exhaustification:** the exhaustification of each sub-alternative is false.

(Xiang 2020)

SUB and EXCL each stand for *sub-alternatives* and *excludable alternatives*.

- $$(36) \quad \text{a. } \text{SUB}(p, C) = \{q \mid p \subset q \& q \in C\} \quad \text{b. } \text{EXCL}(p, C) = \{q \mid p \not\subseteq q \& q \in C\}$$

**EXH** stands for *exhaustivity operator*. It asserts the negation of excludable alternatives.

- $$(37) \quad \text{EXH}_C = \lambda p \lambda w [p(w) = 1 \& \forall q [q \in \text{EXCL}(p, C) \rightarrow [q(w) = 0]]]$$

It derives the distributivity effect of *dou*. In (38), Xiang's (2020) semantics produces the truth-condition that John and Mary arrived, not only John arrived, and not only Mary arrived.

- (38) [John and Mary] DOU arrived.

  - $\text{DOU}_C$  [s [John and Mary]<sub>[+f]</sub> arrived]
  - $\llbracket S \rrbracket = \text{arrive}(\text{John}+\text{Mary})$
  - $C = \{\text{arrive}(x) | x \text{ is a relevant individual}\}$
  - $\text{SUB}(\llbracket S \rrbracket, C) = \{\text{arrive}(\text{John}), \text{arrive}(\text{Mary})\}$
  - $\llbracket \text{DOU}_C(S) \rrbracket = \text{arrive}(\text{John}+\text{Mary}) \& \neg \text{EXH}[\text{arrive}(\text{John})] \& \neg \text{EXH}[\text{arrive}(\text{Mary})]$   
 $= \text{arrive}(\text{John}+\text{Mary})$  (Xiang 2020)

### 6.3. Situation semantics

To build a bridge between event-based theory of monotonicity and alternative-based theory of distributivity, I adopt the probabilistic version of situation semantics (Kratzer 1989, 2002, 2012, Elbourne 2005, 2013).

<sup>18</sup> *Dou* can also be used as a free choice inference licenser, *even* focus and so on. Thus, researchers aim for a unified analysis of these. Although I do not go into the detail, Xiang (2020) shows that different ways to choose alternatives derive different uses of *dou*.

- (39) a. a proposition  $p$  is a set of situations:  $p = \{s_1, s_2, \dots\}$   
 b. the part-whole relation  $\sqsubseteq$  is defined for situations.  
 c. individuals are part of situations.  
 d.  $s$  is a possible world iff  $\forall s' [s \sqsubseteq s' \rightarrow s = s']$

I assume Neo-Davidsonian logical form based on situation semantics. Following Kratzer (1998, 2007b), I assume that events are situations that obligatorily *exemplify* a proposition.

- (40) **Exemplification** (Kratzer 1989, 2007b, Schwarz 2009):

A situation  $s$  exemplifies a proposition  $p$ , iff  $p$  is true in  $s$ , and (i) there is no  $s'$  such that  $p$  is true in  $s'$  and  $s'$  is part of  $s$  or (ii) for all  $s'$  which is part of  $s$ ,  $p$  is true in  $s'$ .

A situation  $s$  exemplifies a proposition  $p$  if  $p$  is not true in any part of  $s$  or  $p$  is true in any part of  $s$ . I use  $\text{EXEM}(s)(p)$  to notate it.<sup>19</sup> Based on this, I assume the following eventive predicates.

- (41) a. Eventive predicates  $V: \lambda s [\text{EXEM}(V)(s)]$   
 b. Thematic roles  $\theta: \lambda p \lambda x \lambda s : \text{EXEM}(p)(s). [\theta(s) = x \& p(s)]$

#### 6.4. An alternative monotonicity account

Now, I am ready to spell out the semantics of an alternative-based  $\mu$  operator. I assume two versions of  $\mu$  operator based on logical entailment and an informativity scale.<sup>20</sup> I first refine the exhaustivity operator for situations and monotonic alternatives.

- (42)  $\text{EXHALT}_\mu = \lambda p \lambda s [p(s) = 1 \& \forall q [q \in \text{EXCL}(p, \text{ALT}_\mu) \rightarrow [q(s) = 0]]]$

The entailment-based  $\mu$  operator is defined in (43) and the informativity-based  $\mu$  operator is defined in (44).<sup>21</sup>  $f$  is a variable for a contextually given mapping from events to the measurement dimension selected by a measure phrase.

- (43) Entailment-based  $\mu$  operator

$\llbracket \mu_E \rrbracket = \lambda K_{\langle dt \rangle} \lambda p_{\langle st \rangle} \lambda \theta_{\langle e, \langle st \rangle} \lambda x \lambda s : \exists q \in \text{ALT}_{\mu_E} (\lambda s' [p(s') \& \theta(s') = x]).$   
 $[p(s) \& \theta(s) = x \& K(\theta(s)) \& \forall q \in \text{SUB}(p)(\text{ALT}_{\mu_E}) [\neg \text{EXH}(q)(s)]]$   
 A set of propositions  $C$  is  $\text{ALT}_{\mu_E}$  iff  $\forall q, q' \in C [q \models q' \vee q' \models q]$

- (44) Informativity-based  $\mu$  operator

$\llbracket \mu_I \rrbracket^f = \lambda K_{\langle dt \rangle} \lambda p_{\langle st \rangle} \lambda s : \exists q \in \text{ALT}_{\mu_I} (p)$   
 $[p(s) \& K(f(s)) \& \forall q \in \text{SUB}(p)(\text{ALT}_{\mu_I}) [\neg \text{EXH}(q)(s)]]$   
 A set of propositions  $C$  is  $\text{ALT}_{\mu_I}$  iff there is an ordering  $\ll$  such that  
 $\forall q, q' \in C [q \ll q' \vee q' \ll q]$

<sup>19</sup> If situations  $s'$  all exemplify  $p$ , then the sum of these situations  $s'$  broadly exemplifies  $p$ .

<sup>20</sup> This dichotomy of two  $\mu$  operators with different semantic types remains stipulative at this point, but let me note two intuitive defences. First, various versions of EXH operator have been proposed and entailment-based versus informativity-based dichotomy plays a crucial role in various places. Thus, it is not entirely new to assume that  $\mu$  also comes in two varieties. Second, Japanese floating numeral quantifiers can host various focus particles, e.g., the additive/scalar ‘mo’ (also), the exhaustive *dake* ‘only’, the upper-bound *made* ‘upto’ and so on. Thus, it is not surprising even if there are various strategies among covert operators which manipulate alternatives

<sup>21</sup> Instead of anti-exhaustification, one can also use *innocent inclusion* (Bar-Lev & Fox 2020).

The semantics of these operators can be decomposed into three components.

- (45) a. **Non-vacuity presupposition:** the prejacent has at least one monotonic alternative.
- b. **Prejacent assertion:** the prejacent is true.
- c. **Anti-exhaustification:** the exhaustification of each sub-alternative is false.

The gist is that the entailment-based  $\mu$  is always felicitous as long as collective readings are eliminated, whereas the informativity-based  $\mu$  requires a contextually given informativity scale.

## 7. Solution and consequence

This section illustrates how the proposed analysis solves the issues with the distributivity and locality. Also, I discuss a consequence of the proposed analysis. §7.1 discusses the way how the alternative-based analysis derives the distributivity effect and selective locality. §7.2 discusses an independent issue concerning non-counting classifiers, which is problematic for the event monotonicity account, but not for the alternative-based monotonicity account.

### 7.1. Solution

The entailment-based  $\mu$  operator and Nakanishi's (2008a) event-based  $\mu$  operator make the same predictions with respect to locality of floating. The  $\theta$  term of  $\mu_E$  is always saturated by the thematic relation which comes from the head taking the closest c-commanding NP for  $\mu_E$ . Importantly, event modifiers between  $\mu_E$  and the head taking the closest c-commanding NP can be ignored. To illustrate it, I adopt two familiar composition rules, namely the *Geach rule* and a generalised version of *Predicate Modification*.

- (46) a. **Geach rule:**  
A function of type  $\langle\alpha, \beta\rangle$  can be lifted to a function of type  $\langle\langle\gamma, \alpha\rangle, \langle\gamma, \beta\rangle\rangle$ .
- b. **Predicate Modification:** If  $X$  is a node whose daughters are  $Y$  and  $Z$ , and if  $\llbracket Y \rrbracket$  and  $\llbracket Z \rrbracket$  are both of type  $\langle\alpha, \beta\rangle$ , then  $\llbracket X \rrbracket$  is the following function of type  $\langle\alpha, \beta\rangle$ :  

$$\llbracket X \rrbracket = \lambda x_\alpha [ \llbracket Y \rrbracket(x) \& \llbracket Z \rrbracket(x) ]$$

With the Geach rule, event modifiers of type  $\langle\langle st \rangle, \langle st \rangle\rangle$  can all be lifted to modifiers of type  $\langle\langle e, \langle st \rangle \rangle, \langle e, \langle st \rangle \rangle\rangle$ . After  $\mu_E$  is combined with a numeral quantifier, it also has the same type. Thus, with Predicate Modification, these together form a modifier of the same type. This strategy does not apply to thematic relations of type  $\langle\langle e, \langle st \rangle \rangle, \langle st \rangle\rangle$ .<sup>22</sup> Therefore, the  $\theta$  term of  $\mu_E$  is always saturated by the closest thematic relation.

Next, the entailment-based  $\mu$  operator utilises the semantics of thematic relations. To illustrate it, I first assume that the denotations of lexical verbs and thematic relations satisfy *n-ary cumulativity* (Krifka 1992, Landman 1996, Kratzer 2007a, a.o.).<sup>23</sup>

- (47) **n-ary cumulativity** (Krifka 1992, Landman 1996, Kratzer 2007a, a.o.):  
For any entities  $x_1, \dots, x_n, y_1, \dots, y_n$ , if  $P(x_1) \dots (x_n) = 1$  and  $P(y_1) \dots (y_n) = 1$ , then  $P(x_1 \cup y_1) \dots (x_n \cup y_n) = 1$ .

<sup>22</sup> Alternatively, one can adopt *Event Identification* (Kratzer 1996) and assume that their type is  $\langle e, \langle st \rangle \rangle$ .

<sup>23</sup> I omit the subscript of the sum formation operator for brevity.

When a cumulative thematic relation holds between two plural entities, it can license a logical scalar entailment as in (48e-i). This logical entailment is absent when a thematic relation expresses collective relation as in (48e-ii). Note that the denotation of a lexical verb is already plural, but the denotation of a VP is not. Thus, \*-operator has to be inserted to pluralise the denotation of a VP. As a result, an obligatory distributive reading arises.

- (48) Students 3-PERSON touched the ceiling.
- a. PERSON( $s$ ) = 3
  - b.  $\llbracket \text{student} \rrbracket = \{x_1, x_2, x_3\}$
  - c.  $\llbracket \text{touch the ceiling} \rrbracket = \{s_1, s_2, s_3 \dots\}$
  - d.  $\llbracket \text{*touch the ceiling} \rrbracket = \{s_1, s_2, s_3 \dots s_1 \cup s_2 \cup s_3\}$
  - e. i.  $\text{*agent} = \{\langle s_1, x_1 \rangle, \langle s_2, x_2 \rangle, \langle s_3, x_3 \rangle, \dots, \langle s_1 \cup s_2 \cup s_3, x_1 \cup x_2 \cup x_3 \rangle\}$   
 $\Rightarrow$  two students touched the ceiling and one student touched the ceiling
  - ii.  $\text{*agent} = \{\langle s_1, x_1 \cup x_2 \cup x_3 \rangle\}$   
 $\Rightarrow$  two students touched the ceiling and one student touched the ceiling

It follows that local floating is always acceptable due to logical entailment via cumulative thematic relation. In that case, only a distributive reading arises. Note that an obligatory distributive reading comes from insertion of \*-operator and \*-operator is necessary because a singular event does not license a scalar logical entailment. Conversely, if a verbal predicate is already plural, it licenses a scalar logical entailment without \*-operator. Thus, a distributive reading is not obligatory. Collective predicates and VPs in progressives provide such cases.

- (49) Students 3-PERSON gathered.
- a. PERSON( $s$ ) = 3
  - b.  $\llbracket \text{student} \rrbracket = \{x_1, x_2, x_3\}$
  - c.  $\llbracket \text{gather} \rrbracket = \{s_1 \cup s_2, s_2 \cup s_3 \dots s_1 \cup s_2 \cup s_3\}$
  - d. i.  $\text{*agent} = \{\langle s_1, x_1 \rangle, \langle s_2, x_2 \rangle, \langle s_3, x_3 \rangle, \dots, \langle s_1 \cup s_2 \cup s_3, x_1 \cup x_2 \cup x_3 \rangle\}$   
 $\Rightarrow$  two students gathered.
- (50) Students 3-PERSON were making a chair.
- a. PERSON( $s$ ) = 3
  - b.  $\llbracket \text{student} \rrbracket = \{x_1, x_2, x_3\}$
  - c.  $\llbracket \text{making a chair} \rrbracket = \{s_1, s_2, s_3 \dots s_1 \cup s_2 \cup s_3\}$
  - d. i.  $\text{*agent} = \{\langle s_1, x_1 \rangle, \langle s_2, x_2 \rangle, \langle s_3, x_3 \rangle, \dots, \langle s_1 \cup s_2 \cup s_3, x_1 \cup x_2 \cup x_3 \rangle\}$   
 $\Rightarrow$  two students are making a chair and one student is making a chair.

Thus, the entailment based  $\mu$  operator correctly derives an obligatory distributive reading for VPs whose extensions are singular, but not for VPs whose extensions are plural.

On the other hand, the informativity-based  $\mu$  operator allows non-local floating and do not rely on the semantics of thematic relations. Thus, it requires another source of a monotonic ordering of alternatives. Consider the case of non-local floating with an embedded host NP.

- (51) Ano isya-wa [zidoo-no me]-o sanjuu-nin sirabe-ta.  
that doctor-TOP [pupil-GEN eye]-ACC 30-CL<sub>Person</sub> examine-PAST  
‘That doctor examined 30 pupils’ eyes.’

In (51),  $\mu_I$  takes the verb *siraberu* ‘examine’ and the numeral quantifier *sanjuu-nin* ‘30-CL<sub>Person</sub>’ as in (52a). Here, the function  $f$  maps situations to pupils’ eyes.

- (52) a.  $[[\mu_I]]^f(\text{examine})(30 \text{ CL}_{\text{Person}}) = \lambda s : \exists q \in \text{ALTPERSON}_I (\lambda s [\text{EXEM}(*\text{examine})(s)]).$   
 $[\text{EXEM}(*\text{examine})(s) \& \text{PERSON}(f(s)) = 30 \&$   
 $\forall q \in \text{SUB}(\lambda s [\text{EXEM}(*\text{examine})(s)]) (\text{ALTPERSON}_I)[\neg\text{EXH}(q)(s)])]$   
b.  $\text{ALTPERSON}(p) = \{q | q(s) \& \text{PERSON}(f(s)) < d \vee d < \text{PERSON}(f(s))\}$

This logical form alone does not support a scalar entailment. Once the context provides the common knowledge that a person generally has exactly two eyes, it supports a contextual scalar entailment and a set of monotonic alternatives is obtained.

Also, consider the cases of non-local floating with the *V-te-iku* ‘go V-ing’ form and the *V-te-kuru* ‘come V-ing’ form. Here, I repeat the example with the *V-te-iku* ‘go V-ing’ form.

- (53) ? Gakusei-ga {sono-zassi / sore}-o go-nin kat-**te-i-tta**.  
student-NOM {the-magazine / it}-ACC 5-CL<sub>Person</sub> buy-TE-go-PAST  
‘Five students bought the magazine/it this morning.’

Here,  $\mu_I$  takes the verb *kau* ‘buy’ and the numeral quantifier *go-nin* ‘5-CL<sub>Person</sub>’ as in (54a). The function  $f$  maps situations to students.

- (54) a.  $[[\mu_I]]^f(\text{buy})(5 \text{ CL}_{\text{Person}}) = \lambda s : \exists q \in \text{ALTPERSON}_I (\lambda s [\text{EXEM}(*\text{buy})(s)]).$   
 $[\text{EXEM}(*\text{buy})(s) \& \text{PERSON}(f(s)) = 5 \& \forall q \in \text{SUB}(\lambda s [\text{EXEM}(*\text{buy})(s)]) (\text{ALTPERSON}_I)[\neg\text{EXH}(q)(s)])]$   
b.  $\text{ALTPERSON}(p) = \{q | q(s) \& \text{PERSON}(f(s)) < d \vee d < \text{PERSON}(f(s))\}$

As I discussed in §5.2, the semantics of the *V-te-iku* ‘go V-ing’ form introduces incrementality and it provides a monotonic ordering among alternatives.

Now that I have shown how  $\mu_E$  and  $\mu_I$  work, I move on to the issue of the exceptional collective reading. I show that  $\mu_E$  cannot derive the exceptional collective reading, whereas  $\mu_I$  can. The contrast between a bare indefinite and a numeral indefinite is repeated here.

- (55) Otokonoko-ga kinoo **san-nin** moderu booto-o tukut-ta.  
boy-NOM yesterday 3-CL<sub>Person</sub> model boat-ACC make-PAST  
a. ?? ‘Three boys made a model boat yesterday.’ (non-distributive)  
b. ‘Three boys each made a model boat yesterday.’ (distributive)
- (56) Gakusei-ga kinoo san-nin piano-o **yon-dai** hakon-da.  
Student-NOM yesterday 3-CL<sub>Person</sub> piano-ACC 4-CL<sub>Object</sub> carry-PAST  
a. ‘Three students carried four pianos yesterday.’ (non-distributive)  
b. ‘Three students each carried four pianos yesterday.’ (distributive)

Nakanishi’s (2008a) analysis predicts that the collective reading of (56) is infelicitous because there is no way to provide a homomorphism between three students and four events of carrying a piano. Although the alternative-based monotonicity account do not require a homomorphism,  $\mu_E$  also fails to derive this reading.<sup>24</sup>

<sup>24</sup> Technically speaking, the floating numeral quantifier *yon-dai* ‘4-CL<sub>Object</sub>’ involves  $\mu_E$ , which triggers insertion of \*-operator. As a result, the verbal predicate *piano-o yon-dai hako-bu* ‘carry four pianos’ have a plural extension. I do not illustrate this process to focus on the other floating numeral quantifier *san-nin* ‘3-CL<sub>Person</sub>’.

- (57) Students 3-PERSON carried four pianos. (Collective reading)
- $\text{PERSON}(s) = 3$
  - $[\![\text{student}]\!] = \{x_1, x_2, x_3\}$
  - $[\![\text{carry four pianos}]\!] = \{s_1 \cup s_2 \cup s_3 \cup s_4\}$
  - i.  $^*\text{agent} = \{\langle s_1, x_1 \cup x_2 \cup x_3 \rangle, \langle s_2, x_1 \cup x_2 \cup x_3 \rangle, \langle s_3, x_1 \cup x_2 \cup x_3 \rangle, \langle s_4, x_1 \cup x_2 \cup x_3 \rangle, \dots, \langle s_1 \cup s_2 \cup s_3 \cup s_4, x_1 \cup x_2 \cup x_3 \rangle\}$   
 $\Rightarrow$  two students carried four pianos and one student carried four pianos.

However, the alternative-based monotonicity approach has an option of the informativity-based  $\mu$  operator. In this case,  $\mu_I$  takes the VP *piano-o yon-dai hakob-u* ‘carry four pianos’ and the numeral quantifier *san-nin* ‘3-CL<sub>Person</sub>’ as in (58a). The function  $f$  maps situations to students.

- (58) a.  $[\![\mu_I]\!]^f(\text{buy-four-pianos})(3 \text{ CL}_{\text{Person}}) =$   
 $\lambda s : \exists q \in \text{ALTPERSON}_I (\lambda s \exists y [\text{EXEM}(*\text{buy})(s) \& \text{theme}(s) = y \& 4 \text{ pianos}(y)]).$   
 $\exists y [\text{EXEM}(*\text{buy})(s) \& \text{theme}(s) = y \& 4 \text{ pianos}(y) \& \text{PERSON}(f(s)) = 3 \&$   
 $\forall q \in \text{SUB}(\lambda s \exists y [\text{EXEM}(*\text{buy})(s) \& \text{theme}(s) = y \& 4 \text{ pianos}(y)]) (\text{ALTPERSON}_I$   
 $[\neg \text{EXH}(q)(s)])]$
- b.  $\text{ALTPERSON}(p) = \{q | q(s) \& \text{PERSON}(f(s)) < d \vee d < \text{PERSON}(f(s))\}$

(58a) requires a contextually given ordering among the alternatives. However, such an ordering cannot be a contextual entailment scale. Otherwise, (58a) runs into the same problem as (57d-i). Here, I suggest that (56) informs one of the maximum number of students who carried four pianos and involves a reversed scale. A crucial observation on this point is that *san-nin* ‘3-CL<sub>Person</sub>’ in (56) only allows an *exact* reading. This can be shown by using modified numerals as in (59).

- (59) Gakusei-ga kinoo {choodo / \*sukunakutomo} san-nin piano-o **yon-dai**  
student-NOM yesterday {exactly / at least} 3-CL<sub>Person</sub> piano-ACC 4-CL<sub>Object</sub>  
hakon-da.  
carry-PAST  
‘{Exactly / At least} three students carried four pianos yesterday.’ (non-distributive)

However, other cases of collective readings allow an *at least* reading, too, as in (60).

- (60) a. {Choodo / Sukunakutomo} san-nin-no gakusei-ga kinoo piano-o  
{exactly / at least} 3-CL<sub>Person</sub>-GEN student-NOM yesterday piano-ACC  
**yon-dai** hakon-da.  
4-CL<sub>Object</sub> carry-PAST  
‘{Exactly / At least} three students carried four pianos yesterday.’ (non-distributive)
- b. Otokonoko-ga kinoo {choodo / sukunakutomo} san-nin isu-o  
boy-NOM yesterday {exactly / at least} 3-CL<sub>Person</sub> chair-ACC  
tuku-tte-ita.  
make-PROG-PAST  
‘{Exactly / At least} three boys were making a chair together yesterday.’ (non-distributive)
- c. Tomodachi-ga kinoo {choodo / sukunakutomo} huta-ri **atsuma-tta**.  
friend-NOM yesterday {exactly / at least} 2-CL<sub>Person</sub> gather-PAST  
‘{Exactly / At least} two friends gathered yesterday.’

Thus, this obligatory *exactly* reading should be due to the semantics of floating numeral quantifiers. Actually, anti-exhaustification of  $\mu_I$  predicts an obligatory *exact* reading of numerals when the alternatives are ordered without entailment. (61) shows the prejacent and the anti-exhaustification claim of (56).

- (61) a. Prejacent: three students carried four pianos.  
 b. Anti-exhaustification:  $\neg\text{EXH}[\text{four students carried four pianos}] \& \neg\text{EXH}[\text{five students carried four pianos}] \& \dots$   
 $= \neg[\text{four students carried four pianos} \& \neg[\text{five students carried four pianos} \& \dots] \& \neg[\text{five students carried four pianos} \& \neg[\text{six students carried four pianos} \& \dots]] \& \dots]$   
 $= [\neg[\text{four students carried four pianos}] \vee \text{five students carried four pianos} \vee \dots] \& [\neg[\text{five students carried four pianos}] \& \text{six students carried four pianos} \vee \dots] \vee \dots$

In (61), none of the alternative can be true. To see it, I translate (61b) into a formula in the propositional logic as in (62). I do not give a formal proof, but (62) falls into an infinite regression if one suppose P. Thus,  $\neg P$ . The same thing applies to Q, R and so on.

- (62)  $\neg(P \wedge \neg Q) \wedge \neg(Q \wedge \neg R) \wedge \neg(R \wedge \neg S) \dots$
- a. Suppose P
  - b.  $\neg(P \wedge \neg Q)$  ( $\wedge$  elimination)
  - c.  $(\neg P \vee \neg \neg Q)$  (De Morgan)
  - d.  $\neg \neg Q$  ( $\vee$  elimination)
  - e.  $\neg(Q \wedge \neg R)$  ( $\wedge$  elimination)
  - f.  $(\neg Q \vee \neg \neg R)$  (De Morgan)
  - g.  $\neg \neg R$  ( $\vee$  elimination)
  - :

So, when the relevant scalar alternatives do not entail each other, anti-exhaustification forces every sub-alternative to be false. Therefore, the *exact* reading of a numeral follows from it.

Summing up,  $\mu_E$  operator maintains the same distributivity requirement and locality requirement of Nakanishi's (2008a)  $\mu$  operator, whereas  $\mu_E$  allows non-local floating and an exceptional collective reading, in which the numeral only induces an *exact* reading.

## 7.2. Consequence

There is an independent problem for the event-based monotonicity account. Non-counting classifiers, e.g., *rittoru* 'litre' express no counting unit to distribute over, but non-counting floating numeral quantifiers require plural events. (63b) is infelicitous with a single event context as in (63a).

- (63) a. Context: Yuji found a 3-litre beer bucket and bought it as it is rare.  
 b. ?? Yuji-ga beeru-o san-rittoru ka-tta.  
     Yuji-NOM beer-ACC 3-CL<sub>Litre</sub> buy-PAST  
     ‘Yuji bought three litres of alcohol.’

Contexts with plural events makes non-counting floating numeral quantifiers acceptable as in (64). Here, alcohol is portioned into different containers and buying events are homomorphic to these portions.

- (64) a. Context: Yuji wants to buy alcohol for his colleagues. He bought a litre of wine for Nao, two cans of 500ml beer for Yu and five bottles of 200ml liquor for Ken.  
 b. Yuji-ga osake-o san-rittoru ka-tta.  
     Yuji-NOM alcohol-ACC 3-CL<sub>Litre</sub> buy-PAST  
     ‘Yuji bought three litres of alcohol.’

However, this homomorphism does not make *rittoru* ‘litre’ measure the buying events: it just measures the amount, but not portions. One might say that buying event and alcohol mass are homomorphic. However, it wrongly predicts that (63b) is acceptable because such mapping is already satisfied in (63b). On this point, the alternative-based monotonicity account makes a weaker prediction than Nakanishi’s (2008a) with respect to non-counting floating numeral quantifiers. As for counting floating numeral quantifiers, monotonic alternatives are ordered along with the sequence of natural numbers: an alternative with  $n$  entails another alternative with  $n-1$  and it goes on until  $n = 1$ . This is not the case with non-counting floating numeral quantifiers because they lack pre-defined counting units. So, they rely on contextually salient alternatives. This predicts (63b) to be unacceptable and (64b) to be acceptable: (63a) contains no weaker alternatives and thus violates the non-vacuity presupposition, but (64a) contains alternatives with *200ml*, *500ml*, *one litre* which are weaker than (63b). As another piece of support, (63b) is acceptable under the context (65).

- (65) Context: Yuji visits a brewery where one can buy any amount of beer from one barrel for souvenirs. He consider how much he wants and finally decided to buy 3 litres.

(65) provides a context in which Yuji could have bought any amount of beer. Thus, it provides a contextual informativity scale and makes insertion of  $\mu_I$  felicitous.

The point here is that the event-based monotonicity relies on atomicity of individuals to derive the distributivity requirement because events themselves do not have inherent atomicity. However, this fails to include non-counting cases because atomic individuals are not given in those cases. Shift of focus to entailment patterns solves this problem.

## 8. Conclusion

I discussed distributivity and locality of floating numeral quantifiers in Japanese. The challenge was that floating numeral quantifiers are sometimes, but not always distributive and local to their host NPs. Extending Nakanishi’s (2008a) event-based monotonicity analysis, I proposed an alternative-based monotonicity analysis: floating numeral quantifiers presuppose monotonic ordering among alternatives. There are two ways to order alternatives, namely logical entailment and an informativity scale. These make different predictions which are summarised in Table 1.

	Distributive readings	Collective readings	Non-local floating
$\mu_E$	ok	*	*
$\mu_I$	ok (a contextual entailment scale)	ok (a non-entailment scale)	ok

Table 1: The entailment-based  $\mu$  operator and the informativity-based  $\mu$  operator

Toward the end of the paper, I discuss some of the remaining issues. First, the detail of the sources of a contextually given informativity scale should be clarified. Although more work is needed on this point, there is one relevant phenomenon which I did not discuss in this paper. Kitaoka (2015) observes a class of non-local floating numeral quantifiers which only allows collective readings. If this is the case, this is exactly what the proposed semantics of  $\mu_I$  predicts.

Second, the proposed analysis should be compared with the previous analyses on non-local floating numeral quantifiers. There seems to be some overlap between the idea pursued in this paper and the idea pursued in the previous analysis, especially that of Mihara (1998), Gunji & Hashida (1998) and Takami (2001).

Third, the anonymous reviewer pointed out that non-local floating with an embedded host NP is much degraded at the subject position even though it uses an inalienable possession. This is unexpected under the proposed account.

- (66) ?? [Kodomo-no me]-ga go-nin hare-ta.  
           [children-GEN eye]-NOM 5-CL<sub>Person</sub> swell-PAST  
       ‘The eyes of 5 children swelled.’

The anonymous reviewer points out that another case. Usually, there is exactly one manager per department and this should license a contextual scalar entailment, but (67) is unacceptable.

- (67) \* Syatyoo-wa [busyo-kara] mit-tu butyoo-o kaigi-ni hakensi-ta.  
       CEO-TOP [department-from] 3-CL<sub>Thing</sub> manager-ACC conference-to dispatch-PAST  
       ‘The CEO sent the department managers to the conference from three departments.’

The proposed account predicts (67) to be acceptable. However, one can construct a slightly different example, which sounds much better.

- (68) ? Syatyoo-wa [kogaisya-kara] go-sya juuyaku-o kaigi-ni hakensi-ta.  
       CEO-TOP [branch-from] 5-CL<sub>Company</sub> executive-ACC conference-to dispatch-PAST  
       ‘The CEO sent the executives to the conference from five branches.’

The difference between (67) and (68) is that (i) difference in convention between manager-department relation and executive-branch relation and (ii) the classifier ‘sya’ (CL<sub>Company</sub>) is more specific than the classifier ‘tu’ (CL<sub>Thing</sub>). This contrast suggests that acceptability of non-local floating numeral quantifiers heavily relies on pragmatics.

Lastly, more work is needed to justify the dichotomy of two types of operators. One possible approach is to implement these under a hybrid analysis of floating numeral quantifiers. After being combined with a numeral quantifier,  $\mu_E$  has the type of a generalised quantifier, whereas  $\mu_I$  has the type of an adverbial modifier. So, difference in their semantic type could be attributed to difference in their syntactic positions.

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### Abbreviations

NOM	nominative case particle	ACC	accusative case particle
GEN	genitive case particle	DAT	dative case particle
TOP	topic particle	PAST	past tense morpheme
PRES	present tense morpheme	PERF	perfective aspectual morpheme
PL	plural morpheme	RECP	reciprocal morpheme
Q	question particle	NEG	negation
TITLE	honorific title	POL	politeness morpheme

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### References

- Bach, E. (1986). The algebra of events. *Linguistics and philosophy* 9:1, pp. 5–16.
- Bar-Lev, M. E. & D. Fox (2020). Free choice, simplification, and innocent inclusion. *Natural Language Semantics* 28:3, pp. 175–223.
- Champollion, L. (2017). *Parts of a whole: Distributivity as a bridge between aspect and measurement*. Oxford University Press, Oxford, UK.
- Dowty, D. (1987). Collective predicates, distributive predicates and all. Miller, A. & Z.-s. Zhang (eds.), *Proceedings of the 3rd Eastern States Conference on Linguistics*, Ohio State University, Columbus, pp. 97–115.
- Elbourne, P. (2005). *Situations and individuals*. MIT Press, Cambridge, MA.
- Elbourne, P. (2013). *Definite descriptions*. Oxford University Press, Oxford, UK.
- Fitzpatrick, J. M. (2006). *The syntactic and semantic roots of floating quantification*. [PhD thesis]. Massachusetts Institute of Technology. <https://dspace.mit.edu/handle/1721.1/37420>.
- Furuya, K. (2008). DP hypothesis for Japanese “bare” noun phrases. Abramowicz, L., S. Brody, T. Cook, A. Diertani, A. Eilam, K. Evanini, K. Gorman, L. MacKenzie & J. Tauberer (eds.), *University of Pennsylvania Working Papers in Linguistics*, University of Pennsylvania, Pennsylvania, vol. 14, pp. 149–162.
- Gunji, T. & K. Hashida (1998). Measurement and quantification. Gunji, T. & K. Hashida (eds.), *Topics in constraint-based grammar of Japanese*, Kluwer, Dordrecht, pp. 39–79.

- Haig, J. H. (1980). Some observations on quantifier floating in Japanese. *Linguistics* 18:11-12, pp. 1065–1084.
- Inoue, K. (1978). *Nihongo no bunpoo hoosoku: Nichi-Ei taisho* [Rules of Japanese grammar: Japanese-English Contrast]. Taishukan, Tokyo.
- Ishii, Y. (1999). A note on floating quantifiers in Japanese. Muraki, M. & E. Iwamoto (eds.), *Linguistics: In search of the human mind: A festschrift for Kazuko Inoue*, Kaitakusha, Tokyo, pp. 236–267.
- Kamio, A. (1977). Suuryoushi-no shintakkusu [syntax of numeral quantifiers]. *Gengo* 6:8, pp. 83–91.
- Kikuchi, A. (1994). Extraction from NP in Japanese. Nakamura, M. (ed.), *Current topics in English and Japanese*, Hituzi Syobo, Tokyo, pp. 79–104.
- Kitaoka, D. (2015). Non-floating collective numeral quantifiers in Japanese. Vinerte, S. (ed.), *Proceedings of the 2015 annual conference of the Canadian Linguistic Association*, The University of Ottawa, Ottawa, pp. 1–15.
- Ko, H. (2014). *Edges in syntax: Scrambling and cyclic linearization*. Oxford University Press, Oxford, UK.
- Kratzer, A. (1989). An investigation of the lumps of thought. *Linguistics and philosophy* 12:5, pp. 607–653.
- Kratzer, A. (1996). Severing the external argument from its verb. Rooryck, J. & L. Zaring (eds.), *Phrase structure and the lexicon*, Springer, Dordrecht, pp. 109–137.
- Kratzer, A. (1998). Scope or pseudoscope? Are there wide-scope indefinites? Susan, R. (ed.), *Events and grammar*, Springer, Dordrecht, pp. 163–196.
- Kratzer, A. (2002). Facts: Particulars or information units? *Linguistics and philosophy* 25:5-6, pp. 655–670.
- Kratzer, A. (2007a). On the plurality of verbs. Dölling, J., T. Heyde-Zybatow & M. Schäfer (eds.), *Event structures in linguistic form and interpretation*, De Gruyter, Berlin, pp. 269–300.
- Kratzer, A. (2007b). Situations in natural language semantics. Zalta, E. N. (ed.), *Stanford Encyclopedia of Philosophy*, CSLI, Stanford.
- Kratzer, A. (2012). *Modals and conditionals: New and revised perspectives*. Oxford University Press, Oxford, UK.
- Krifka, M. (1989). Nominal reference, temporal constitution and quantification in event semantics. Bartsch, R., J. van Benthem & P. van Emde Boas (eds.), *Semantics and contextual expression*, CSLI, Stanford, pp. 75–115.
- Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. Sag, I. & A. Szabolcsi (eds.), *Lexical matters*, CSLI, Stanford, pp. 29–53.
- Kubota, Y. (2010). Marking aspect along a scale: The semantics of -te iku and -te kuru in Japanese. Li, N. & D. Lutz (eds.), *Proceedings of Semantics and Linguistic Theory 20*, CLC Publications, Ithaca, pp. 128–146.
- Kuroda, S.-Y. (1980). Bunkoozoo-no hikaku [comparative grammar]. Tetsuya, K. (ed.), *Nichi-ei-go hikaku kooza 2: bunpoo* [The Lecture on Comparison between Japanese and English 2: grammar], Taishukan, Tokyo, pp. 23–62.
- Landman, F. (1996). Plurality. Lappin, S. (ed.), *Handbook of Contemporary Semantics*, Blackwell, Oxford, UK, pp. 425–457.
- Link, G. (1983). The logical analysis of plurals and mass terms: A lattice-theoretic approach. Bäuerle, R., C. Schwarze & A. von Stechow (eds.), *Meaning, Use, and Interpretation of Language*, De Gruyter, Berlin, pp. 302–323.
- Liu, M. (2017). Varieties of alternatives: Mandarin focus particles. *Linguistics and Philosophy* 40:1, pp. 61–95.
- Mihara, K. (1998). Suuryoosi renketu koobun-to ‘kekka’-no gan’i [quantifier linking construction and the implication of ‘resultative’]. *Gengo* 27:6-8, pp. 86–95 / 94–102 / 104–113.
- Miyagawa, S. (1989). *Structure and case marking in Japanese*. Academic Press, New York.
- Nakanishi, K. (2008a). *Formal properties of measurement constructions*. De Gruyter, Berlin.
- Nakanishi, K. (2008b). The syntax and semantics of floating numeral quantifiers. Miyagawa, S. & S. Mamoru (eds.), *The Oxford Handbook of Japanese Linguistics*, Oxford University Press, Oxford, UK, pp. 287–319.
- Nomura, J. (2013). DP-internal movements and floating quantifiers in Japanese. Özge, U. (ed.), *Proceedings of the 8th Workshop on Altaic Formal Linguistics*, MIT Press, Cambridge, MA, pp. 257–268.
- Schwarz, F. (2009). *Two types of definites in natural language*. [PhD thesis]. University of Massachusetts Amherst. [https://scholarworks.umass.edu/open\\_access\\_dissertations/122/](https://scholarworks.umass.edu/open_access_dissertations/122/).
- Schwarzschild, R. (2002). The grammar of measurement. Jackson, B. (ed.), *Proceedings of Semantics and Linguistic Theory 12*, CLC Publications, Ithaca, pp. 225–245.
- Schwarzschild, R. (2005). Measure phrases as modifiers of adjectives. *Recherches linguistiques de Vincennes* 34, pp. 207–228.
- Schwarzschild, R. (2006). The role of dimensions in the syntax of noun phrases. *Syntax* 9:1, pp. 67–110.
- Takami, K. (2001). *Nichieigo-no kinooteki koobun bunseki* [a functional analysis of English and Japanese constructions]. Hoo Syoboo, Tokyo.
- Tancredi, C. (2005). Plural predicates and quantifiers. Noriko, I. (ed.), *Gengo kenkyuu no uchuu* [The World of

- linguistic research: A Festschrift for Kinsuke Hasegawa on the occasion of his seventieth birthday],* Kaitakusya, Tokyo, pp. 14–28.
- Watanabe, A. (2006). Functional projections of nominals in Japanese: Syntax of classifiers. *Natural Language & Linguistic Theory* 24:1, pp. 241–306.
- Wellwood, A. (2015). On the semantics of comparison across categories. *Linguistics and Philosophy* 38:1, pp. 67–101.
- Xiang, Y. (2020). Function alternations of the mandarin particle *dou*: Distributor, free choice licensor, and ‘even’. *Journal of Semantics* 37:2, pp. 171–217.
- Zhao, Z. (2019). Bridging distributivity and free choice: The case of Mandarin *dou*. Schlöder, J. J., D. McHugh & F. Roelofsen (eds.), *Proceedings of the 22nd Amsterdam Colloquium*, University of Amsterdam, Amsterdam, pp. 427–436.

## **Exceptional in Hill Mari and Moksha Mordvin**

Irina Khomchenkova

This paper deals with the syntax of exceptive constructions in Hill Mari and Moksha Mordvin. In Hill Mari the semantics of exception is conveyed by the construction *gäc pasna* <EL separate>. In Moksha Mordvin it is conveyed by the construction *-də baška* <-ABL except>. In both languages exceptives can be adjacent to the quantifier phrase, forming a constituent (Connected Exceptive, CE) and at the periphery of the clause (Free Exceptive, FE). I claim that Hill Mari and Moksha Mordvin FEs are derived from CEs, since unreduced exceptive clauses and multiple exceptions are impossible, and the exception must be a NP.

## *1. Introduction*

Exceptives are constructions that express exclusion (1). Their semantics is described in many papers, see, *inter alia*, von Fintel (1993), Hoeksema (1995), Moltmann (1995), Lappin (1996), Vostrikova (2019).

- (1) Everyone **REstricted QP** voted, [except / but / besides / except for [Sandy]]  
**EXCEPTIVE PHRASE** **EXCEPTION**  
(Polinsky 2019:1)

However, the syntactic structure of exceptions has gained attention only recently, see, e.g., O'Neill (2011) on French, Pérez-Jiménez & Moreno-Quibén (2012) on Spanish, Soltan (2016) on Egyptian Arabic and Polinsky (2019) with data mainly on English and Russian.

I introduce new data on the syntax of exceptives in two Finno-Ugric languages: Hill Mari and Moksha Mordvin, using my field data collected by elicitation in the village of Kuznetsovo and its surroundings (the Republic of Mari El, Russia) and in the village of Lesnoje Tsibayevо (the Republic of Mordovia, Russia) in 2019.

Throughout the text, all the examples that are not marked otherwise come from my own fieldwork. I also use Hill Mari (Kashkin et al. 2019) and Moksha (Zhurnik et al. 2016) corpora. The Hill Mari corpus was collected during the Lomonosov Moscow State University field trips in 2016–2018. It is available at <http://hillmari-exp.tilda.ws/corpus>. The Moksha corpus was collected during the Lomonosov Moscow State University field trips in 2013–2016. It is available upon request to the author of the article. The speakers of Hill Mari and Moksha use their native languages on an everyday basis. The median of speakers' age in both corpora are

similar: in the Moksha corpus it is 62 and in the Hill Mari corpus it is 60. Half of Hill Mari speakers have higher education, and half of them have secondary / vocational education. Most of the Moksha speakers have secondary / vocational education, some people have incomplete secondary education, and only few people have higher education.

These two languages are chosen because they are genetically and areally close to each other. I have first-hand field data on them, which are necessary for the description of exceptives, since there is not much information on this topic in reference grammars, see, e.g. only one example of the exceptive construction in Savatkova (2002:261) for Hill Mari and one example in Eseviev (1963:308) for Moksha Mordvin.

Finno-Ugric languages are agglutinative. Many Finno-Ugric languages have a large set of grammatical cases, e.g. Hungarian was described as having from 17 (Abondolo 1988:26) to 26 (Tompa 1968:206–209) cases. There are 16 cases in Moksha Mordvin (Kholodilova 2018a:66) and 11 cases<sup>1</sup> in Hill Mari (Savatkova 2002:93). Finno-Ugric languages lack grammatical gender (including one pronoun for both ‘he’ and ‘she’). Mostly postpositions are used. Another notable feature is the use of possessive affixes, cf. Hill Mari *moren-em* (hare-POSS.1SG) ‘my hare’ and Moksha Mordvin *jalga-z'a* (friend-1SG.POSS.SG) ‘my friend’. Many Finno-Ugric languages are rigidly verb-final, while some of them are not: Mari is SOV, as well as, e.g., Khanty, Hungarian and Udmurt, and Moksha has shifted from SOV to SVO, as well as, e.g. Komi and Estonian (Hájdu 1975:149).

The paper is organized as follows. In Section 2 I discuss the syntax of exceptive constructions. Sections 3 and 4 describe the properties of exceptives in Hill Mari and Moksha Mordvin, respectively. In Section 5 I discuss the data, in particular, I propose an account of the absence of clausal exceptives. Moreover, in this section I compare the analysis of the exceptive construction to the analysis of comparative constructions. Conclusions are drawn in Section 6.

## 2. Syntax of exceptive constructions

There are two types of exceptive constructions: connected exceptives (CE) and free exceptives (FE), see, e.g., Hoeksema (1996). In CE the exceptive phrase is a nominal modifier, it is adjacent to QP (in the case of (2) it is *every child*). The syntactic structure for CE is provided in Figure 1.

- (2) Every child except Mary cried. (Polinsky 2019:2)  
 [NP [NP Every child] [except Mary] ] cried.

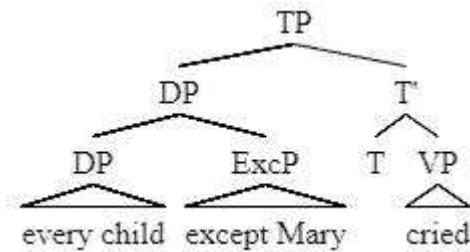


Figure 1. The syntactic structure of connected exceptives (Polinsky 2019:2)

<sup>1</sup> In the Kuznetsovo subdialect where I carried out my fieldwork, there are 10 cases.

In FEs the exceptive phrase is located at the periphery of the clause. According to Postdam & Polinsky (2019), FEs could be derived in two different ways. First, FEs could arise as the result of clausal ellipsis (this is called clausal derivation). Second, FEs could be derived from CEs by extraposition (rightward movement) of the exceptive phrase (this is called phrasal derivation). These two analyses are illustrated in Figure 2. For example, English FEs with *except* involve clausal ellipsis (Polinsky 2019:5), while Russian FEs with *krome* are dislocated phrasal categories (Polinsky 2019:10). Nominal modifiers can be displaced from a NP via scrambling (see, e.g. Ross 1967) in many languages.

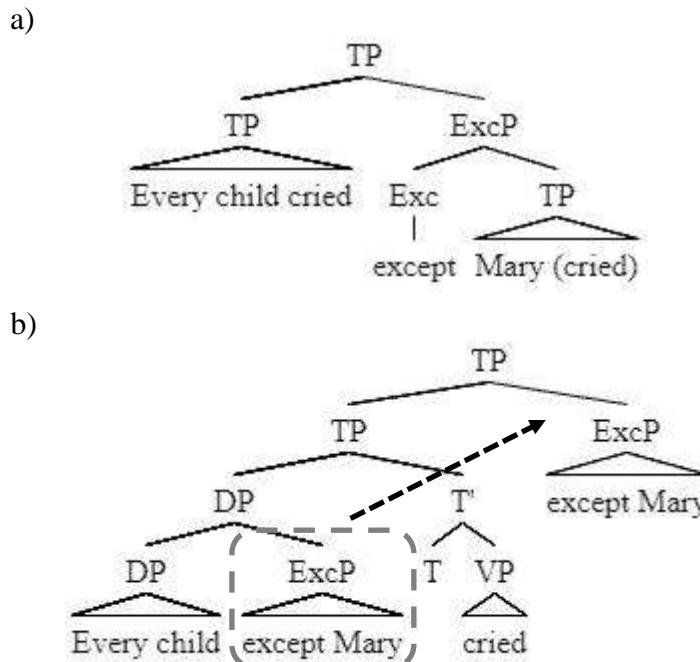


Figure 2. Clausal analysis (a) and phrasal analysis (b) of free exceptives (Polinsky 2019:3)

In order to distinguish between these two analyses one can use the following diagnostics: the existence of unreduced exceptive clauses, multiple exceptions, category restrictions on the exceptive phrase (Polinsky 2019). I will discuss these diagnostics on the basis of English FEs with *except* as in (3), and Russian FEs with *krome* as in (4).

- (3) Every child cried, **except** Mary. (Polinsky 2019:2)

- (4) RUSSIAN  
 Vse deti za-plaka-l-i, **krome** Maš-i.  
 all children INCH-cry-PST-PL except Mary-GEN.  
 'All the children started crying, except Mary.' (Polinsky 2019:9)

In English the unreduced exceptive clause is possible (5). Being able to pronounce a TP (*Mary didn't cry*) after the exceptive marker supports the clausal analysis of this exceptive construction, or, in other words, the account where the exceptive is analysed as the remnant of clausal ellipsis. On the contrary, the unreduced exceptive clause is impossible in Russian exceptives (6), which supports its phrasal analysis.

- (5) Every child cried, **except** Mary didn't cry. (Polinsky 2019:4)

## (6) RUSSIAN

- \* Vse deti za-plaka-l-i, **krome** Maš-i / Maša ne za-plaka-l-a  
 all children INCH-cry-PST-PL except Mary-GEN Mary NEG INCH-cry-PST-SG.F  
 Intended meaning: ‘All the children started crying except Mary did not start crying’.  
 (Polinsky 2019:9)

In English multiple exceptions are possible (7), which means that *except* precedes a clause. In Russian they are not possible (8). Thus, *krome* does not precede a clause.

- (7) Every philosopher complained about every linguist, except Stalnaker about Partee.  
 (Polinsky 2019:4)

## (8) RUSSIAN

- \* Ni-kto ni-komu ne pomogaj-et, **krome** Pet-i Dim-e /  
 NEG-who NEG-who.DAT NEG help-NPST.3SG except Peter-GEN Dima-DAT  
**krome** Pet'a Dim-e  
 except Peter Dima-DAT  
 Intended meaning: ‘Nobody is helping anyone except Peter helping Dima’.  
 (Polinsky 2019:9)

In English the category of exception is not limited to a NP, see, e.g. (9) with a PP. In Russian it can be only NP (10). This also supports the clausal analysis for English exceptives and the phrasal analysis for Russian exceptives.

- (9) He didn’t speak, **except** [PP in riddles]. (Polinsky 2019:4)

## (10) RUSSIAN

- Pet'a ni o čom ne govor-it, **krome** pogod-y /  
 Peter NEG about what.LOC NEG talk-NPST.3SG except weather-GEN  
**\*krome** o pogod-e  
 except about weather-LOC  
 ‘Peter talks about nothing except about weather’.

The question arises whether Hill Mari and Moksha Mordvin have both CEs and FEs, and if they have FEs, how FEs are derived. I will discuss Hill Mari exceptives in section 3, and Moksha Mordvin exceptives in section 4.

### 3. Hill Mari exceptives

In Hill Mari the semantics of exception is conveyed by the construction *göc(-öñ) pasna* <EL-FULL separate>.

*Göc* is an elative postposition. Sometimes it is used with the marker *-öñ*, which can also be attached to some other postpositions, e.g. *verc(-öñ)* ‘behind’, *gac(-äñ)* ‘through’. According to the available data, postpositions with the marker *-öñ/-äñ* (the choice of the vowel is determined by vowel harmony) are always interchangeable with postpositions without this marker, compare (11) and (12).

## (11) HILL MARI

- jäm **göc-ön** läkt-ät, eče vâč-en šõnz-ät  
 pit EL-FULL come\_out-NPST.3PL more wait-CVB sit-NPST.3PL  
 ‘They come out of the pit, sit more for some time and wait’.  
 (Hill Mari corpus: ‘Two old men’, 18)

- (12) jäm **göc** läkt-ät=ät, pop-at  
 pit EL come\_out-NPST.3PL=ADD say-NPST.3PL  
 ‘They come out of the pit and say’. (Hill Mari corpus: ‘Two old men’, 31)

As can be seen from the examples (11) and (12), the postposition *göc* governs nominative (unmarked) noun forms. In case of 3SG pronouns (which are used as demonstrative pronouns as well) it can also assign genitive (13).

- (13) vara tidë-n **göc-ön** nosk'i-m pid-eš nav'ernâ  
 then this-GEN EL-FULL socks-ACC knit-NPST.3SG probably  
 ‘Later she will probably knit socks from it’. (Hill Mari corpus: ‘A photo description’, 36)

The lexeme *pasna* ‘separate’ was borrowed from Chuvash (Galkin 1964:32). It can be used as an adjective (14)–(15) and as an adverb (16).

- (14) d'iktant-šâ-m=at **pasna** blank-eš sir-ät  
 dictation-POSS.3SG-ACC=ADD separate form-LAT write-NPST.3PL  
 ‘And the dictation is written on separate forms’. (Hill Mari corpus: ‘Education’, 26)

- (15) tön' ik blank-eš sir-et, a mën'-žö **pasna-vlä-eš**  
 2SG one form-LAT write-NPST.2SG but 1SG-POSS.3SG separate-PL-LAT  
 sir-em  
 write-NPST.1SG  
 ‘You are writing on one form, and I am writing on separate ones’.

- (16) tidë **pasna** vâžal-alt-eš  
 this separate sell-MED-NPST.3SG  
 ‘They are sold separately’. (Hill Mari corpus: ‘Poultry plant’, 118)

In both instances *pasna* governs elative (17)–(18).

- (17) tä-län-dä ik kõdež kel-eš, a mä-län-nä tä  
 2PL-DAT-POSS.2PL one room need-NPST.3SG but 1PL-DAT-POSS.1PL 2PL  
**göc-tä** **pasna-vlä** kel-ät  
 EL-POSS.2PL separate-PL need-NPST.3PL  
 ‘You need one room, and we need rooms separate from you’.

- (18) mä ät'ä-ävä **göc** **pasna** öl-äš tõngäl-ën-nä  
 1PL father-mother EL separate live-INF start-PRET-1PL  
 ‘We started living separately from our parents’.

Exceptional constructions in Hill Mari are possible both with affirmative (19) and negative (20) verb forms. In these cases the exception (Ivan) is subtracted from the set of objects for which the predication ('X came' or 'X did not come', respectively) is true. These examples also illustrate the Polarity Generalization: 'The propositions expressed in the main clause and exceptive clause must have opposite polarity' (García Álvarez 2008:129), cited from (Postdam & Polinsky 2019).

- (19) ivan **göc pasna** cilä-n tol-ən-ət  
 Ivan EL separate all-ADV come-PRET-3PL  
 'Everyone except for Ivan came'.
- (20) ivan **göc pasna** ik-t=ät tol-tel-ət  
 Ivan EL separate one-FULL=ADD come-NEG.PRET-3PL  
 'Nobody except for Ivan came'.

There is also a different type of exceptional construction illustrated in (21), which I will call 'additive construction'. In this case the exception is not subtracted from any set (since tangerines are not a subset of lemons). On the contrary, the exception is included in the set of objects for which the predication ('X is grown') is true.<sup>2</sup>

- (21) mandarin **göc pasna** ti-štö eče l'imón-əm kušt-at  
 tangerine EL separate this-IN more lemon-ACC grow-NPST.3PL  
 'Apart from tangerines, they also grow lemons here'.

Hill Mari has both connected exceptives (22)–(23) and free exceptives (24). In the case of CE, the exceptive phrase is a nominal modifier. In the case of FEs, there are two options: a clausal or phrasal analysis.

- (22) mën' [[pet'a **göc pasna**] [cilä t'et'ä-län]] kanfetkä-m pu-en-äm  
 1SG Peter EL separate all child-DAT candy-ACC give-PRET-1SG  
 'I gave candies to all children except for Peter'.
- (23) pet'ä **göc pasna** cilä t'et'ä  
 Peter EL separate all child  
 {Who came?} 'All the children except for Peter'.
- (24) mën' cilä t'et'ä-län kanfetkä-m pu-en-äm [pet'a **göc pasna**]  
 1SG all child-DAT candy-ACC give-PRET-1SG Peter EL separate  
 'I gave candies to all children except for Peter'.

Let us now consider arguments in favour and against each analysis. First, the unreduced exceptive clause is not possible in Hill Mari (25). Multiple exceptions are also impossible (26), which supports the phrasal analysis.

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<sup>2</sup> According to Oskolskaya (2011:39), the negative exceptive construction is intermediate between affirmative exceptive construction and additive construction. The relation between exceptive constructions and additive construction is also discussed in (Boguslavskij 2008) and (Oskolskaya, Kholodilova 2009) on the basis of Russian data.

- (25) cilä t'et'ä mägör-äš tängäl-ön maša **göc pasna** (\*mägör-äl-Ø koltē-de)  
 all child cry-INF start-PRET Mary EL separate cry-ATT-CVB send-NEG.PRET  
 'All the children started crying, except Mary'.
- (26) \* ik-t=ät ik-të-län=ät a-k palš-ep pet'a (**göc pasna**)  
 one-FULL=ADD one-FULL-DAT=ADD NEG.NPST-3help-3PLPeter EL separate  
 d'ima-lan / pet'a dima-lan (**göc pasna**)  
 Dima-DAT Peter Dima-DAT EL separate  
 Expected: 'Nobody is helping anybody, except Peter helping Dima'.

Second, there are category restrictions on the exceptive phrase. The Hill Mari construction *göc pasna* can only be used with NPs and, for example, PPs are not possible (27). This fact also supports the phrasal analysis.

- (27) igečö (\*gišän) **göc pasna** vas'a n'i-ma gišän a-k šajěšt  
 weather about EL separate Vasya NEG-what about NEG.NPST-3talk  
 'Vasya talks about nothing, except about weather'.

Moreover, if Hill Mari exceptive constructions are analyzed as clauses, it is impossible to explain case government. For instance, in (28) the noun *tägä* 'sheep' can only be in nominative. However, if *tägä* was a part of a clause, one would expect to see accusative marking on it (cf. (29)). Example (30) illustrates the same point: *čemodan* 'suitcase' cannot have illative marking, as would be expected if it were a part of a clause (31).

- (28) vas'a n'i-ma=t a-k šöšk-ël tägä / \*tägä-m **göc pasna**  
 Vasya NEG-what=ADD NEG.NPST-3hit-SEM sheep sheep-ACC EL separate  
 'Vasya slaughters nothing, except sheep'.
- (29) vas'a tägä-m / \*tägä šöšk-ël-eš  
 Vasya sheep-ACC sheep hit-SEM-NPST.3SG  
 'Vasya is slaughtering a sheep'.
- (30) vas'a n'i-gě-šk=at oksa-m a-k optě čemodan /  
 Vasya NEG-which-ILL=ADD money-ACC NEG.NPST-3put suitcase  
 \*čemodan-ěškē **göc pasna**  
 suitcase-ILL EL separate  
 'Vasya puts his money nowhere except in the suitcase'.
- (31) vas'a oksa-m čemodan-ěškē / \*čemodan opt-a  
 Vasya money-ACC suitcase-ILL suitcase put-NPST.3SG  
 'Vasya puts money in a suitcase'.

Thus, Hill Mari free exceptive constructions should be analyzed as phrases: unreduced exceptive clause and multiple exceptions are impossible, the exception must be a noun phrase, *göc pasna* always assigns nominative (or genitive), and no other case marking is possible.

#### 4. Moksha Mordvin exceptives

In Moksha Mordvin the semantics of exception is conveyed by the construction ABL + *baška* ‘except’, where *baška* was borrowed from Tatar (Feoktistov 1975:342). The lexeme *baška* can also be used in the meaning ‘separate’, both as an adjective (32), and as an adverb (33). In this use it can govern the ablative postposition *ezdə* (34)–(35) or the ablative case (36), see (Kholodilova 2018a:91) on their distribution.

(32) MOKSHA MORDVIN

min'-d'ej-nək	er'av-i	<b>baška</b>	/	<b>baška-n'</b> <sup>3</sup>	komnata
we.OBL-PRON.DAT-1PL.POSS	need-NPST.3SG	separate	separate-GEN		room

‘We need a separate (from everyone) room’.

- (33) **baška** ul'-i-∅ körta-ma-s' t'ε-n' kolga  
 separate be-NPST.3-SG say-NZR-DEF.SG this-GEN about  
 ‘I will talk about this {song} separately’.

(Moksha Mordvin corpus: LVJ\_EK\_01082015\_tost, 13)

- (34) min'-d'ej-nək er'av-i (s'embə-n' ezdə) **baška** komnata  
 we.OBL-PRON.DAT-1PL.POSS need-NPST.3SG all-GEN in.ABL separate room  
 ‘We need a separate (from everyone) room’.

- (35) mon jor-an rabota-ms t'ε s'ora-t' ezdə **baška**  
 I want-NPST.1SG work-INF this boy-DEF.SG.GEN in.ABL separate  
 ‘I want to work separately from this boy’.

- (36) mon jor-an rabota-ms s'ora-də **baška**  
 I want-NPST.1SG work-INF boy-ABL separate  
 ‘I want to work separately from boys’.

The two meanings ‘separate from’ and ‘except for’ are different. In the latter use *baška* governs ablative case *-də*, and ablative postposition is not possible (37).

- (37) maša kel'k-sin'ə s'embə lomat'-t'n'ə-n' t'ε s'ora-də **baška** /  
 Mary love-NPST.3PL.O.3SG.S all man-DEF.PL-GEN this boy-ABL except  
 \*s'ora-t' ezdə **baška**  
 boy-DEF.SG.GEN in.ABL except  
 ‘Mary loves all people, except this boy’. (Kashkin 2018:130)

Exceptional constructions are possible with affirmative (38) and negative (39) verb forms, the additive construction is also grammatical (40).

- (38) s'embə sa-s'-t' ivan-də **baška**  
 all come-PST.3-PL Ivan-ABL except  
 ‘Everyone came, except for Ivan’.

<sup>3</sup> The fact that *baška* is used attributively in (32) is supported by the acceptability of the genitive marker, which can mark the attributive derivation from adverbs (Pleshak, Kholodilova 2018:273), see, e.g. *t'en'ij-ən' pink-s <now-GEN time-ILL>* ‘at the current time’ (Pleshak, Kholodilova 2018:274).

- (39) ki-vək iz' sa ivan-də **baška**  
 who-ADD NEG.PST come Ivan-ABL except  
 'Nobody came, except for Ivan'.
- (40) mandarin-də **baška** t'asə kas-ft-ij-t' l'imot-t  
 tangerine-ABL except here grow-CAUS-NPST.3-PL lemon-PL  
 'Apart from tangerines they also grow lemons here'.

Moksha Mordvin also has both connected exceptives (41)–(42), where the exceptive phrase is a nominal modifier, and free exceptives (43). I will once again discuss two options for FEs: a clausal and a phrasal analysis.

- (41) [[ivan-də **baška**] [s'embə]] sa-s'-t'  
 Ivan-ABL except all come-PST.3-PL  
 'Everyone came, except for Ivan'.
- (42) ivan-də **baška** s'embə  
 Ivan-ABL except all  
 {Who came?} 'Everyone, except for Ivan.'
- (43) s'embə sa-s'-t' [ivan-də **baška**]  
 all come-PST.3-PL Ivan-ABL except  
 'Everyone came, except for Ivan'.

To begin with, unreduced exceptive clauses (44) and multiple exceptions (45) are not possible, which rules out the clausal analysis.

- (44) s'embə sa-s'-t' ivan-də **baška** (\*iz' sa)  
 all come-PST.3-PL Ivan-ABL except NEG.PST come  
 'Everyone came, except Ivan did not come'.
- (45) \*ki-vək ki-n'd'i-ngə af pomaga-j pet'a-də **baška** d'ima-n'd'i /  
 who-ADD who-DAT-ADD NEG help-NPST.3SG Peter-ABL except Dima-DAT  
 pet'a d'ima-n'd'i **baška**  
 Peter Dima-DAT except  
 Expected: 'Nobody is helping anybody, except Peter helping Dima'.

Furthermore, the exceptive phrase can only be a noun phrase. The fact that it cannot be, for example, a PP is illustrated in (46).

- (46) vas'ε mejə-n'-gə kolga af kɔrta-j pagoda-də **baška** /  
 Vasya what-GEN-ADD about NEG speak-NPST.3SG weather-ABL except  
 \*pagoda-t' kolga **baška**  
 weather-GEN about except  
 'Vasya talks about nothing, except about weather'.

Finally, only ablative marking is possible on noun phrases. For example, if *vas'a* in (47) is a part of a clause, one would expect to see genitive marking<sup>4</sup> on it (cf. (48) where the verb *kel'k-* ‘love’ assigns genitive), which is not possible in Moksha Mordvin.

- (47) maša kel'k-sin'ə s'embə lomat'-t'nə-n' vas'a-də /  
     Mary love-NPST.3PL.O.3SG.S all man-DEF.PL-GEN Vasya-ABL  
     \*vas'ε-n'      **baška**  
     Vasya-GEN except  
     ‘Mary loves all people, except Vasya’.

(48) maša kel'k-si                        vas'ε-n'  
     Mary love-NPST.3SG.O.3SG.S Vasya-GEN  
     ‘Mary loves Vasya’.

Thus, Moksha Mordvin free exceptive constructions have the phrasal analysis: unreduced exceptive clause and multiple exceptions are impossible, the exception must be a noun phrase, *baška* always assigns ablative, and no other case marking is possible.

## *5. Discussion*

I have shown that Hill Mari and Moksha Mordvin free exceptives have the phrasal analysis, but not the clausal one. This property leads to the conclusion that Hill Mari and Moksha Mordvin free exceptives are derived from connected exceptives via scrambling, as in Russian and Georgian, see Polinsky (2019). Scrambling (or pragmatically motivated movement of a constituent, see, e.g. Corver & van Riemsdijk (1994)) is attested in other constructions as well both in Hill Mari and Moksha Mordvin. This can be illustrated by the examples (49) and (50): the comitative phrase in the Hill Mari constituent [*maša [pet'a dono]*] and in the Moksha Mordvin constituent [*maša [pet'e mṛtə]*] can be detached from the noun phrase *maša* despite the plural verbal agreement.

- (49) HILL MARI  
maša šörgö-škë pet'a dono ke-n-ët  
Mary forest-ILL Peter with go-PRET-3PL  
‘Mary and Peter went to the forest.’ (Khomchenkova 2019:141)

(50) MOKSHA MORDVIN  
maša is'ak pet'ε maṛtə tus't'  
Mary yesterday Peter with go-PST.3-PL  
‘Yesterday Mary and Peter left.’ (Khomchenkova 2019:142)

Another scrambling examples can be found in Garejshina (2018:149), Pleshak (2020:11) for Hill Mari and in Pleshak, Kholodilova (2018:303ff.) for Moksha Mordvin.

<sup>4</sup> The direct object in Moksha Mordvin can be either marked by genitive or by nominative, see, e.g. Cygankin (1980:161–162). See also Toldova (2018:574–608) on differential object marking in this language.

### 5.1 The absence of clausal exceptives

According to Polinsky (2019), clausal free exceptives are attested in the following languages: Spanish (Pérez-Jiménez & Moreno-Quibén 2012), Egyptian Arabic (Soltan 2016), French (O'Neill 2011), Malagasy (Potsdam 2018). Interestingly, in all these languages cited above exceptive constructions look like EXCEPTIVE MARKER + EXCEPTION, while in Hill Mari and Moksha Mordvin they look like EXCEPTION + EXCEPTIVE MARKER, since these languages are left-branching.

One may suppose that clausal FEs are only possible in constructions where the exceptive marker precedes the exception. However, this assumption seems to be incorrect, since postpositive conjunctions (which follow a clause) are widespread, see, e.g. the conjunction of purpose *manân* (it is a grammaticalized verb of speech, see Galkin 1964:80) (51) or the conditional conjunction *gän'* (52) in Hill Mari.

(51) HILL MARI

kečõ-nüšmõ-m	pereg-äš	<b>man-ân</b>	čučâlê-m	šagal-t-at
sun-seed-ACC	keep-INFsay-CVB	scarecrow-ACC	rise-CAUS-NPST.3PL	

'They put up a scarecrow in order to save a sunflower'.

(Hill Mari corpus: Summer (picture description), 7)

(52)	lu=at	kud-ât-ân	âl-âda	<b>gän'</b> ,	kud	ödöräš	dä	lu
	ten=ADD	six-FULL-ADV	be-NPST.2PL	if	six	girl	and	ten

ärvezäš, an'e?

boy yes

'If there are 16 of you, then there are 6 girls and 10 boys, aren't there?'

(Hill Mari corpus: A dialogue with a child, 88)

The absence of clausal exceptive constructions may be explained by the fact that Hill Mari *pasna* is used with the elative postposition, which governs the nominative noun form or the genitive form in the case of 3SG pronouns. Moksha Mordvin *baška* always assigns ablative to its complement. A similar situation is in Russian, where the preposition *krome* assigns genitive to its complement, and this construction has the phrasal analysis. However, in Russian there is another type of exceptive construction with the conjunction *krome kak* <except how>, which has the clausal analysis, see (53), where *krome* + GEN cannot be used with PP, but *krome kak* can.

(53) RUSSIAN

Ne	vedi	razgovor-ov,	<b>krome</b>	*( <b>kak</b> )	[o pogod-e]
NEG	conduct.IMP	conversation-GEN.PLexcept	how	on weather-LOC	

'Don't talk about anything, except about weather'.

(Oskolskaya 2014:367)

Thus, the conclusion can be drawn that if there are no "caseless" constructions (like the Russian conjunction *krome kak*, which does not assign any case, as opposed to the Russian preposition *krome*, which assigns genitive to its complement), then there are no exceptive constructions with clausal derivation. Indeed, Hill Mari exceptive constructions require the elative postposition, both when the exceptive phrase follows the main clause and when it precedes it (54). Moksha Mordvin exceptive construction are also impossible without the ablative marker, see (47).

## (54) HILL MARI

- a) mõn' cilä t'et'ä-län kanfetkä-m pu-en-äm pet'a \*(gäc) **pasna**  
     1SG all child-DAT candy-ACC give-PRET-1SGPeter EL separate  
     'I gave candies to all children except for Peter'.
- b) pet'a \*(gäc) **pasna** mõn' cilä t'et'ä-län kanfetkä-m pu-en-äm  
     Peter EL separate I all child-DAT candy-ACC give-PRET-1SG  
     'I gave candies to all children except for Peter'.

5.2 *The comparison of exceptives to comparatives*

The options of a phrasal and clausal analysis are widely discussed for comparative constructions, see, e.g. (Lechner 2001). The example of comparative construction is provided in (55), where *Peter* is the object of comparison and *Mary* is the standard of comparison.

## (55) Peter is taller than Mary.

In terms of Stassen (2013), phrasal comparatives are fixed-case ones, while clausal comparatives are derived-case ones. This distinction can be illustrated by the following examples from Classic Latin. In (56) the case of the standard of comparison is derived — it depends on its function. Thus, in (56)a the standard of comparison has the nominative form, while in (56)b it has the accusative marking. In (57) the case marking of the standard of comparison is fixed — it does not depend on its function, and both readings are available with the ablative marking.

## (56) CLASSICAL LATIN

- a. Brutum ego non minus amo quam **tu**  
     Brutus.ACC 1SG.NOM not less love.1SG.PRES than 2SG.NOM  
     'I love Brutus no less than you (love Brutus).'
- b. Brutum ego non minus amo quam **te**  
     Brutus.ACC 1SG.NOM not less love.1SG.PRES than 2SG.ACC  
     'I love Brutus no less than (I love) you.'
- (Kühner, Stegmann 1955:466), cited from Stassen (2013)

(57) Brutum ego non minus **te** amo

Brutus.ACC 1SG.NOM not less 2SG.ABL love.1SG.PRES

'I love Brutus no less than you (love Brutus).'

'I love Brutus no less than (I love) you.'

(Kühner, Stegmann 1955:466), cited from Stassen (2013)

In Hill Mari comparative constructions, the elative postposition *gäc*, which is used in exceptive constructions, also marks the standard of comparison (58).

## (58) HILL MARI

vas'a pet'a **gäc** kogo(-rak)  
 Vasya Peter EL big-CMPR  
 'Vasya is older than Peter.'

(Sinitsyna 2019:5)

Comparative constructions with *gäc* also have the phrasal, but not clausal analysis, since the marking of the standard of comparison is fixed (Sinitsyna 2019), e.g. it cannot be accusative in (59) as would be expected in the construction with a direct object (60).

- (59) pet'a kal'avongâ-vlä-m käckä/ \* käckä-m **gäc** šukâ(-rak) pog-en  
 Peter mushroom-PL-ACC berry berry-ACC EL many-CMPR collect-PRET  
 'Peter has collected more mushrooms than berries'. (Sinitsyna 2019:5)
- (60) pet'a käckä-m/ \* käckä pog-en  
 Peter berry-ACC berry collect-PRET  
 'Peter collected some berries'.

In the Moksha Mordvin comparative construction, the standard of comparison takes ablative marking (61), similarly to the exceptive constructions.

## (61) MOKSHA MORDVIN

mon zvon'-c'-an t'ejə-t t'ed'a-**də**-n s'a-də  
 I call-FREQ-NPST.1SG PRON.DAT-2SG.POSS mother-ABL-1SG.POSS that-ABL  
 s'id'ə-stə  
 frequent-EL  
 'I call you more often than (I call) my mother.'  
 'I call you more often than my mother (does).' (Kholodilova 2018b:791)

Comparative constructions with ablative marking are fixed-case ones, but not derived-case ones (Kholodilova 2018b:793), so they have the phrasal, but not clausal analysis as well. For example, in (61) the case marking is fixed and does not depend on the function of the standard of comparison. Moreover, the standard of comparison, which does not make up a constituent less than a clause, is only possible with derived-case comparatives. As expected, in the construction with the marker *čem*, borrowed from Russian, which has the clausal analysis, the sequence *čem ton t'ejə-n* <than 2SG PRON.DAT-1SG.POSS> is possible (62)a; in the construction with the ablative marking, which has the phrasal analysis, the sequence *ton'-d'ədə-t t'ejə-n* <2SG.OBL-ABL-2SG.POSS PRON.DAT-1SG.POSS> is not possible (62)b (cf. also the diagnostic of multiple exceptions in Section 2).

- (62) a. mon t'ej-t zvon'-c'-an s'a-də s'idə-stə **čem** ton  
 I PRON.DAT-2SG.POSS call-FREQ-NPST.1SG that-ABL frequent-EL than 2SG  
 t'ejə-n  
 PRON.DAT-1SG.POSS
- b. \*mont'ej-t zvon'-c'-an s'a-də s'idə-stə  
 I PRON.DAT-2SG.POSS call-FREQ-NPST.1SG that-ABL frequent-EL  
 ton'-**d'ədə-t** t'ejə-n  
 2SG.OBL-ABL-2SG.POSS PRON.DAT-1SG.POSS  
 'I call you more often than you (call me)' (Kholodilova 2018b:793)

Thus, the phrasal analysis of exceptive constructions in Hill Mari and Moksha Mordvin is also supported by the phrasal analysis of comparatives with the same markers in these languages.

### 6. Conclusion

To conclude, Hill Mari and Moksha Mordvin have both connected exceptives and free exceptives. Free exceptives have the phrasal analysis. The results of the diagnostics used to distinguish between clausal and phrasal analyses are presented in Table 1. Thus, Hill Mari and Moksha Mordvin free exceptives are derived from connected exceptives via scrambling, as, e.g. in Russian (Polinsky 2019).

Test	Hill Mari	Moksha Mordvin	Russian ( <i>krome</i> )	English ( <i>except</i> )
unreduced exceptive clause	phrasal	phrasal	phrasal	clausal
multiple exceptions	phrasal	phrasal	phrasal	clausal
category restrictions	phrasal	phrasal	phrasal	clausal
case licensing	phrasal	phrasal	phrasal	clausal

Table 1. Diagnostics for distinguishing between clausal and phrasal analyses of FEs for Hill Mari and Moksha Mordvin

The absence of an exceptive construction with clausal derivation can be explained by the fact that Hill Mari *pasna* (or *gäc pasna*) cannot be used as a conjunction, as well as Moksha Mordvin *baška*. The Hill Mari lexeme *pasna* requires the postposition *gäc*, which in its turn assigns nominative (or genitive in case of 3SG pronouns) to the exception. The Moksha Mordvin lexeme *baška* always assigns ablative case to the exception. This pattern corresponds to fixed-case comparative constructions in terms of Stassen (2013), where the standard of comparison is always marked in the same way.

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### Abbreviations

1, 2, 3	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> person	DEF	definite
ABL	ablative	EL	elative
ACC	accusative	F	feminine
ADD	additive	FREQ	frequentative
ADV	adverbializer	FULL	full form
ATT	attenuative	GEN	genitive
CAUS	causative	ILL	illative
CMPR	comparative	IMP	imperative
CVB	converb	INCH	inchoative
DAT	dative	INF	infinitive

LAT	lative	PL	plural
LOC	locative	POSS	possessive
MED	middle voice	PRES	present tense
NEG	negation	PRET	preterite
NOM	nominative	PRON	pronoun
NPST	non-past tense	PST	past tense
NZR	nominalization	S	subjective conjugation
O	objective conjugation	SEM	semelfactive
OBL	oblique stem	SG	singular

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### References

- Abondolo, D. M. (1988). *Hungarian inflectional morphology*. Akadémiai Kiadó, Budapest.
- Boguslavskij, A. (2008). Odnoznachnoje krome [Krome with one meaning]. Rozina, R. I. & G. I. Kustova (eds.), *Dinamicheskie modeli: Slovo. Prelozhenije. Tekst* [*Dynamic models: Word. Sentence. Text*], LRS Publ., Moscow, pp. 99–109.
- Corver, N., van Riemsdijk, H. (1994). Introduction: Approaches to and properties of Scrambling. Corver, N. & H. van Riemsdijk (eds.), *Studies on Scrambling: Movement and Non-movement approaches to Free Word-Order Phenomena*. Mouton de Gruyter, Berlin, pp. 1–16.
- Cygankin, D. (1980). Grammatika mordovskih jazykov: fonetika, grafika, orfografiya, morfologija [*Grammar of Mordvin languages: phonetics, graphics, orthography, morphology*], Ogarev Mordovia State University, Saransk.
- Evseeviev, M. E. (1963). Osnovy mordovskoj grammatiki [*The basics of Mordvin grammar*], Mordovia publishing, Saransk.
- Feoktistov, A. P. (1975). Mordovskije jazyki. Osnovy finno-ugorskogo jazykoznanija 2. [Mordvin languages. The essentials of Finno-Ugric linguistics 2]. V. I. Lytkin et al. (eds.), *Pribaltijsko-finniske, saamskij i mordovskije jazyki* [*Finnic, Saami and Mordvin languages*], Nauka, Moscow, pp. 248–343.
- Galkin, I. S. (1964). Istoricheskaja grammatika marijskogo jazyka, morfologija [*Historical grammar of Mari, morphology*]. Marijskoje knozhnoje izdatelstvo, Yoshkar-Ola.
- García-Álvarez, I. (2008). *Generality and exception: A case study in the semantics of exceptives*. [PhD thesis]. Stanford University.
- Garejshina, A. (2018). Korrelativy v gornomariiskom jazyke — otnositelnye predlozhenija ili topic? [Correlatives in Hill Mari — relative clauses or topic?]. *Acta Linguistica Petropolitana* 14 (2), pp. 132–153.
- Hájdu, P. (1975). Arealógia és urálisztika. *Nyelvtudományi Közlemények* 77, pp. 147–152.
- Hoeksema, J. (1995). The semantics of exception phrases. Van der Does, J. & J. van Eick (eds.), *Quantifiers, logic and languages*. CSLI, Stanford, pp. 145–177.
- Kashkin, E. (2018). Opredelennoje sklonenije [Definite declension]. Toldova, S. Yu., M. A. Kholodilova, S. G. Tatevosov, E. V. Kashkin, A. A. Kozlov, L. S. Kozlov, A. V. Kukhto, M. Yu. Privizentseva & I. A. Stenin (eds.), *Elementy mokshanskogo jazyka v tipologicheskem osveshchenii* [*Elements of Moksha from the typological point of view*], Buki Vedi Publ., Moscow, pp. 122–153.
- Kashkin, E. et al. (2019). Hill Mari corpus. [Corpus]. Lomonosov Moscow State University. <http://hillmari-exp.tilda.ws/corpus>
- Kholodilova, M. A. (2018a). Morfologija imeni [Nominal morphology]. Toldova, S. Yu., M. A. Kholodilova, S. G. Tatevosov, E. V. Kashkin, A. A. Kozlov, L. S. Kozlov, A. V. Kukhto, M. Yu. Privizentseva & I. A. Stenin (eds.), *Elementy mokshanskogo jazyka v tipologicheskem osveshchenii* [*Elements of Moksha from the typological point of view*], Buki Vedi Publ., Moscow, pp. 63–121.

- Kholodilova, M. A. (2018b). Sravnitelnye konstrukcii [Comparative constructions]. Toldova, S. Yu., M. A. Kholodilova, S. G. Tatevosov, E. V. Kashkin, A. A. Kozlov, L. S. Kozlov, A. V. Kukhto, M. Yu. Privizentseva & I. A. Stenin (eds.), Elementy mokshanskogo jazyka v tipologicheskem osveshchenii [Elements of Moksha from the typological point of view], Buki Vedi Publ., Moscow, pp. 779–798.
- Khomchenkova I. (2019). On the syntax of comitative constructions in some Finno-Ugric languages. Van Alem A., M. de Sisto, E. J. Kerr & J. Wall (eds.), *ConSOLE XXVII: Proceedings of the 27th Conference of the Student Organization of Linguistics in Europe* (21-23 February 2019, Humboldt-Universität zu Berlin), Leiden University Centre for Linguistics, Leiden, pp. 135–149.
- Kühner, R., Stegmann, C. (1955). *Ausführliche Grammatik der lateinischen Sprache: Satzlehre*. Gottschalk, Leverkusen.
- Lappin, Sh. (1996). Generalized quantifiers, exception phrases, and logicality. *Journal of Semantics* 13, pp. 197–220.
- Lechner, W. (2001). Reduced and phrasal comparatives. *Natural Language and Linguistic Theory* 19, pp. 683–735.
- Moltmann, F. (1995). Exception sentences and polyadic quantification. *Linguistics and Philosophy* 18, pp. 223–280.
- O'Neill, T. (2011). The syntax of ne...que exceptives in French. *University of Pennsylvania Working Papers in Linguistics* 17, pp. 175–184.
- Oskolskaya, S. A. (2011). Funkcionirovaniye konstrukcij so znachenijem iskljuchenija uchastnika v russkom jazyke [The functioning of constructions with the meaning of participant exclusion in Russian]. [MA thesis]. Saint Petersburg State University.
- Oskolskaya, S. A., Kholodilova, M. A. (2009). Nekotorye osobennosti upotrebleniya predloga krome [Some peculiarities of the use of Russian preposition krome]. *Russian philology* 20, pp. 192–196.
- Pérez-Jiménez, I., Moreno-Quibén, N. (2012). On the syntax of exceptions. Evidence from Spanish. *Lingua* 122, pp. 582–607.
- Pleshak, P. S. (2020). Subject Case marking and agreement in Hill Mari nominalizations and participles. [Manuscript]. University of Maryland.
- Pleshak, P. S., Kholodilova, M. A. (2018). Imennaja gruppa [Noun phrase]. Toldova, S. Yu., M. A. Kholodilova, S. G. Tatevosov, E. V. Kashkin, A. A. Kozlov, L. S. Kozlov, A. V. Kukhto, M. Yu. Privizentseva & I. A. Stenin (eds.), Elementy mokshanskogo jazyka v tipologicheskem osveshchenii [Elements of Moksha from the typological point of view], Buki Vedi Publ., Moscow, pp. 272–310.
- Polinsky, M. (2019). The landscape of exceptives. [Handout]. Chicago Linguistics Colloquium, 8.03.2019.
- Potsdam, E. (2018). Exceptives and ellipsis. [Poster]. NELS 48, Reykjavík.
- Potsdam, E., Polinsky, M. (2019). *Clausal and Phrasal Exceptives*. [Poster]. GLOW-42, Oslo.
- Ross, J. R. (1967). Constraints on variables in syntax. [PhD thesis]. Massachusetts Institute of Technology.
- Savatkova, A. A. (2002). Gornoje narechije marijskogo jazyka [Hill Mari dialect]. Savariae, Szombathely.
- Sinitsyna, J. (2019). Struktura standartov sravnjenija v gornomarijskom jazyke [The structure of standards of comparison in Hill Mari]. [Ms].
- Soltan, U. (2016). On the syntax of exceptive constructions in Egyptian Arabic. Davis, S. & U. Soltan (eds.), *Perspectives on Arabic linguistics XXVII*. John Benjamins, Amsterdam, pp. 35–57.
- Stassen, L. (2013). Comparative Constructions. Dryer, M. S. & M. Haspelmath (eds.), *The World Atlas of Language Structures Online*. Max Planck Institute for Evolutionary Anthropology, Leipzig. <http://wals.info/chapter/121>
- Toldova, S. Iu. (2018). Predikacija s glagolnym skazujemym [Verbal predication]. Toldova, S. Yu., M. A. Kholodilova, S. G. Tatevosov, E. V. Kashkin, A. A. Kozlov, L. S. Kozlov, A. V. Kukhto, M. Yu. Privizentseva & I. A. Stenin (eds.), Elementy mokshanskogo jazyka v tipologicheskem osveshchenii [Elements of Moksha from the typological point of view], Buki Vedi Publ., Moscow, pp. 546–615.
- Tompa, J. (1968). *Ungarische Grammatik*. Mouton, The Hague.
- von Fintel, K. (1993). Exceptive constructions. *Natural Language Semantics* 1, pp. 123–148.
- Vostrikova, E. (2019). Compositional analysis for clausal exceptives. *Proceedings of SALT* 29, pp. 420–440.
- Zhornik, D. et al. (2016). Moksha corpus. [Corpus]. Lomonosov Moscow State University.

## **Goals and beliefs**

Sara Amido

I propose a new discourse model that can represent goals, beliefs, and their interrelationships. Using insights about the interpretation of *biscuit* and canonical conditionals, I demonstrate that the semantic analysis of language objects must account for the co-existence and interaction between these two dimensions: beliefs as attitudes about the way things are; and goals as the intention behind actions, including speech acts. I build on existing theories that already model beliefs, to develop a more complete semantic tool for the analysis and formalization of the pragmatic concepts of goals as well as relevance.

### *1. Introduction*

I am proposing a new discourse model that integrates the representation of both goals and beliefs and the relations between these, mapping the structure underlying utterance selection.

Currently, no discourse model represents the different goals that utterances can have. Roberts (2012) put forth a widely used discourse model that works in questions and answers about states-of-affairs: any given assertion is always answering a specific question, the question under discussion (QUD). The underlying claim, tracing back to Stalnaker (1978), is that we speak in order to establish common ground between each other, to determine which beliefs hold true in our common context. The ultimate question interlocutors seek to answer completely is *what is the way things are?* The more beliefs they agree on, the less they have to determine about remaining states-of-affairs, the less they have to talk about. The QUD model lies on the assumption that the speaker's goal is always to update the addressee's beliefs and does not allow the possibility for the goal of speech to be other than this.

However, we also use language as a way to perform actions that change the world beyond the conversational domain. Austin's (1962) speech act theory observed the different forces utterances can have. We can ask, order, or suggest someone to perform an action, such as passing the salt. We can acknowledge or thank someone. We can promise or pledge and we can lie and use sarcasm. We can threaten, declare, or refuse. We can invite and offer, and we can use

language to do nothing more than show politeness. It's clear that in natural language we don't speak only to persuade each other about the way things are, but that the goals of what we say can vary widely. The QUD model is only able to represent questions and assertions of beliefs, but lacks the capacity to represent this broader, but fundamental aspect of language use. Our intention is what determines what we choose to say. The underlying goals of an utterance must therefore be formalized and included in an integral semantic analysis.

The discourse model I propose has the capacity to represent the different kinds of goals of linguistic objects, alongside the beliefs carried by them, and allows for the analysis of the relationships and its effects between both aspects.

In section 2, I will explain why Roberts' QUD model is insufficient as a discourse model for natural language. In section 3, I will lay out the data. The minimal pair of biscuit and canonical conditionals will be compared and contrasted. In section 3.1, I will explain the notion of relevance, which is what binds different conditional structures within the same family, and must be represented within an integral discourse model. Section 4 defines goals, beliefs, and how they interrelate. Section 5 introduces the proposed model, how it works, and representations of the data. The last section concludes what the model has set out and achieved to do, what it is lacking, and the next steps in its development.

## 2. *The QUD*

The QUD model would be enough if we only talked about the way things are, if we only uttered objects that were either true or false, in order to share information. Take the following example.

- (1) *If you're hungry, your body burns fat.*

This is a canonical conditional, of the form If  $P, Q$  where both  $P$  and  $Q$  are propositions with a truth value.  $Q$  is true whenever  $P$  is true and  $Q$  is answering the main QUD. The QUD would be something like *what does your body do?* or *what burns fat?*, depending on the context. The if-clause restricts the situations in which  $Q$  is true, and is equivalent to a sub-QUD, or a what-if question framing the QUD: *What if you're hungry? What does your body do then?* Or simplified to *In all cases in which you're hungry, what does your body do?* Utterances whose only goal is to update beliefs can be modeled in terms of such questions within the QUD theory.

But we also speak in order to effect extralinguistic change. A clear example is in thinking of any imperative (e.g.: *Eat!*) where we observe that it has no truth value. Furthermore, the goal in uttering it is not to talk about the way things are. This is a crucial point in this analysis. The goal in saying it is to get the addressee to perform an action. This is a clear example for which there is no question such utterance could be an answer to. It is not conveying a belief about the way things are. For this reason, the QUD model is an insufficient model for representing this equally pervasive part of natural language, that is, speech that seeks to change more than just beliefs.

It is clear that we must re-open the question of what we are trying to do when we speak. And when we realize the answer is broader than Stalnaker's assumption, we must also update the theory to allow us to make better predictions. Speech goals span talking about the way things are as well as changing the way things are. We need a model that can represent both semantic dimensions: not only propositional content, like Roberts' QUD, but it must also account for the

distinct goals an utterance can have. A complete discourse model gives us a clear view of both the beliefs and goals that underlie an utterance, and how their interactions leads to it.

### 3. Introducing biscuit conditionals

I demonstrate, using biscuit conditionals, that the goal underlying an utterance is not uniform. That is, contrary to the prevalent thought, the goal of utterances is not always to update the addressee's mental model with new beliefs. I claim that the goals of an utterance are in themselves a second semantic dimension (after beliefs), and that these goals are complex and structurally similar to beliefs. These points are fundamental in drawing out a discourse model.

In order to carry out the following analysis, I will introduce a biscuit conditional to form a minimal pair with the canonical conditional. They contrast precisely in the goal underlying the utterance.

- (1) *If you're hungry, your body burns fat.*
- (2) *If you're hungry, there are biscuits on the table.*

In both cases we have a syntactically canonical conditional of the form If  $P$ ,  $Q$ . Each part of either conditional carries a proposition that can be true or false, and in both cases, whenever  $P$  is true,  $Q$  is also true. So far, so good.

Now, let's look at the difference. The peculiarity of a biscuit conditional, is that even if  $P$  is false,  $Q$  is still true. In fact,  $Q$  is always true. So it is unlike the canonical conditional in that the antecedent restricts the situations in which the consequent is true. Despite the fact that (2) is composed of two propositions, or objects of belief, it intuitively reads more like an imperative or some sort of call to action. We get a strong sense the speaker wants the addressee to take the biscuits and eat them, if, and because, they are hungry.

Biscuit conditionals (BC) differ from canonical conditionals (CC) in that the antecedent does not restrict the context for when the main clause is true, but it does restrict the context, like CCs, for when it is relevant (Siegel 2006). With a BC, the speaker may either be uncertain as to the truth of the antecedent and so it stands as a defeasible proposition, or it may be an echoic BC, where they know it to be true but want to make it salient, i.e. reaffirm the context in which the main clause is relevant, thereby confirming the goal of utterance. The if-clause denotes the situations in which the utterance of the main clause is justified, since in these contexts it is relevant (Predelli 2009).

DeRose & Grandy (1999) organize canonical and biscuit conditionals in a simple classification method. For all conditionals, an assertion is made in the main clause and the condition is imposed by the antecedent. They argue that this condition falls into one or both categories: either the antecedent provides the contextual grounds on which the truth of the main clause depends (and this results in a canonical if-conditional), or it delimits the context in which it is relevant to assert the main clause (and this constitutes a BC). Lastly, if it falls into the first category, it automatically falls into the second too, since relevance (of the consequent with regards to the antecedent) is the pragmatic element present in all conditionals.

They explain BCs using Gricean pragmatics (Grice 1975): if the speaker knows the assertion to be relevant, then they will not need to utter the antecedent; if they know it to be irrelevant, then they will not utter the assertion at all. If they are unsure, then they will express the condition

under which the assertion would be relevant, since asserting the main clause without antecedent would implicate its relevance and possibly wrongly so. So if the speaker doesn't know that the addressee is not hungry, but still chooses to utter *There are biscuits on the table* without antecedent, it is not that the assertion is false in itself, but it falsely implicates that this information is somehow relevant for the addressee (assuming communication is cooperative). Because the assertion is relevant only on the occasion of the addressee being hungry, the speaker adds the condition *If you are hungry*.<sup>1</sup>

### 3.1. Relevance

At this point, I am making bold and loose statements about this idea of relevance. What exactly is this glue that links antecedent and consequent in both BCs and CCs? Why is it that the same restricting if-clause sounds perfectly adequate in both complex structures, yet doesn't seem to be doing exactly the same thing? I will expand on what I mean by relevance.

In the CC (1), the relation between antecedent and consequent is one of consequentiality. As a result of being hungry, your body burns fat. Relevance in this case is translated as: what follows from  $P$ ? Compare with an example of a conditional lacking this relevance: *If ice is cold, dinosaurs are extinct*. Assuming both propositions are true, the pragmatic glue is missing. Modeling this conditional within the QUD framework evidences the infelicitousness of *What if ice is cold?* being the sub-QUD of *Are dinosaurs extinct?*  $Q$  is not relevant to, or does not follow from,  $P$ . The utterance is odd. A canonical conditional requires that  $Q$  is true whenever  $P$  is true, but also link the beliefs of antecedent and consequent through this consequentiality relationship, or relevance.

In (2), what makes the felicitous link between antecedent and consequent is that  $Q$  addresses a goal implied by  $P$ . We have established that  $P$  holds no truth-conditional influence over  $Q$ , and in this sense it lacks the consequentiality link mentioned above. The biscuits are on the table not as a consequence of you being hungry. So why is it still perfectly acceptable? While the truth of  $P$  is irrelevant to the truth of  $Q$ , notice that we would find it hard to make sense of If  $\neg P$ ,  $Q$ : *If you're not hungry, there are biscuits on the table*. It is hard to imagine why it would be uttered, even if the main clause is true. Knowing that whether  $P$  or  $\neg P$ ,  $Q$  is true, but finding If  $\neg P$ ,  $Q$  odd, gives us insight into the acceptability of the original If  $P$ ,  $Q$ . The latter works because the main clause addresses a goal implied by the antecedent, it is relevant to it. In this case, to get  $Q$ , we are asking: *what does one do about P?* If indeed you are hungry, there are biscuits on the table for you to eat and not be hungry anymore. (This intuitive inference process is formalized within my proposed model in section 5.1). Relevance in biscuit conditionals means addressing a goal implied by the antecedent.

So canonical and biscuit conditionals are syntactically similar, and to an extent, truth conditionally. But while the relevance aspect that links the complex structure of CCs has to do with relationships between beliefs, in BCs, it has to do with extralinguistic goals sometimes implied

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<sup>1</sup> DeRose & Grandy (1999) allow little leeway regarding the utterance of antecedents in BCs. Although their elimination method is valid, it is completely acceptable to utter the antecedent when the speaker already knows the content to be relevant. For example,

**Speaker 1:** I'm starving!

**Speaker 2:** If you're hungry, there are biscuits on the table.

In this echoic BC, Speaker 2 confirms the situations in which the subsequent assertion is relevant.

by beliefs. My goal is to model BCs in a way that relates them as closely as possible to other conditional structures, allowing us to clearly compare and contrast between them, and in the bigger picture enabling a more complete representation of natural language meaning.

By introducing biscuit conditionals alongside canonical ones, I have laid out a minimal pair whose antecedents and consequents are in both cases propositions, or belief-objects. Their differences are observed at the pragmatic level, where the underlying goals of the utterances diverge. For this reason, a discourse model must be able to probe this aspect of meaning.

#### 4. Some principles on goals and beliefs

Beliefs are attitudes about the way things are; goals designate a plan to change the way things are (von Fintel & Iatridou 2005). The co-existence of these two semantic dimensions – within complex structures like conditionals as well as in the larger discourse – demonstrates that they impact on one another.

We take (2) to be uttered by A to B and observe that in the mental models of the interlocutors there are: beliefs (B is hungry); goals (B to eat/not be hungry; A to facilitate that); beliefs about goals (A believes B has a goal to eat); and goals based on beliefs (A's goals depend on A's beliefs about B's state) (compare Heim 1992, who demonstrated a dependence of goals on beliefs based on very different empirical considerations). We have already established that utterances carry both beliefs and goals, so the mental models of interlocutors must hold a space for representing each of these.

##### 4.1. Beliefs about goals

Just like the semantic content of our interactions and real world experience, we also hold beliefs that embed goals. The antecedent of BCs tends to imply a lack, need, or desire. Given our (and A's) general beliefs about the world, *hungry* describes a state but also implies a lack or need of food and, when experienced, is generally accompanied by a goal of not being in that state, of solving the hunger. A believes B is hungry so A infers that B has a goal to change that state. Consequently, A accommodates the belief that B has a goal of not being hungry. The fact that both these propositions (B is hungry and B doesn't want to be hungry) exist in A's mental model allows A to develop (or assimilate) the goal of making B not hungry.

##### 4.2. Beliefs about goals

If goals are plans to change the way things are, then we must first hold beliefs about the way those things are in order to know that we want to change them and how we want to do so. If A has a goal to satisfy B's hunger, A must first believe that B is hungry, that B exists, what *hungry* means and implies, and so on. A's plan to satisfy B's hunger includes causing B to believe proposition *Q* (that there are biscuits on the table). In other words, the first subgoal of the plan is to instruct B to add *Q* to their beliefs.<sup>2</sup>

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<sup>2</sup> It is not unlikely that the beliefs A holds could be false. It is possible that B is not hungry in the first place, and it is possible that B is hungry but does not want to change that. However, it is precisely the accommodating of

With these principles we start tracing the underlying structure of an utterance. Beliefs and goals are structurally similar, yet distinct. Beliefs comprise the context of previous discourse and knowledge. They may be updated by beliefs about goals people have. Goals draw on existing beliefs. And we assume goals do not restrict beliefs, i.e. we believe things independently of how we want them to be. The voluntary action of utterance is dictated by our communicative intentions or goals, which are based on our beliefs. So first come the beliefs, then the goals, then the utterance. My theory of discourse will formally illustrate these properties and interrelationships.

## 5. *The model*

In this model, mental representations are an ordered pair of beliefs and goals: ⟨Epistemic State (ES), Goal State (GS)⟩. ESs are classic Discourse Representation Structures (DRS): a two-part box containing the individuals and belief-objects in a participant’s universe at the top (I have assigned discourse referents to objects of belief so as to make them accessible from the GS.) The bottom holds propositional content, i.e. sets of constraints as applied to the discourse referents. ESs, like traditional DRSs, are monotonically incremented by utterances and events in the real world.

GSs look the same as the two-part structure but with special features. Some goals involve influencing others’ beliefs about the way things are so GSs must be able to access ESs. Within the ordered pair, the GS can pick the individuals in the ES universe, and can likewise be informed by its propositional content. Because goals do not restrict beliefs, the tuple is an ordered pair where the GS can access the ES but not the other way around.

The GS contains goals, stacked hierarchically in the fashion of Roberts’ QUD model, in that: the goal that is driving the current action is at the top of the stack; subgoals can exist in order to achieve the main one; once a goal is achieved, it is removed from the stack, along with its subordinates. Importantly, goals do not have to be achieved to be removed, since a change in circumstances brought about by external events might call for a change in goals. Consequently, goals can be added, removed or re-ordered depending on the updated ES. Goals immediately precede and determine action in the real world, like utterances.

### 5.1. *Modeling biscuit conditionals*

In (2a) below we have speaker A’s mental representation of (2). In the ES, the universe contains individuals A, B, belief-objects  $P$  (that B is hungry) and  $Q$  (that there are biscuits on the table). The DRS also represents (with the symbol  $\Rightarrow$ ) the inference that follows from  $P$ : that if it is the case that  $P$ , then according to typical beliefs about the state of hunger (how it is undesirable, and one tends to address the lack implied by it), then B probably has as a goal to change that state. It is something about A’s internal nature that drives them to adopt the goal of helping B (represented in the GS). Not shown for simplicity, nonetheless part of A’s ES, is that they believe that one way to address the lack implied by the state of being hungry is to eat food. A

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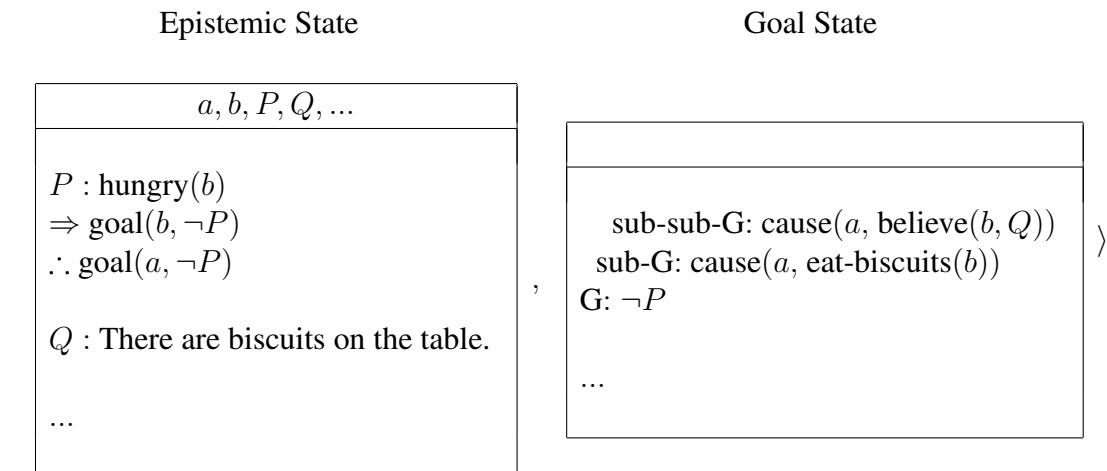
beliefs about B’s state and B’s goals that leads A to utter (2). Whether B finds the utterance useful or completely superfluous is irrelevant to the analysis.

also believes  $Q$ , that there are biscuits on the table, and (again omitted) believes biscuits are food, hence the relevance of  $Q$  with regards to the goal implied by  $P$ .

The GS contains A's goals. It follows that one thing A can do about  $P$  is to cause B to believe it too. In doing so, A is carrying out the first step of the plan to solve B's hunger. The most immediate goal G is for B not to be hungry. Its subgoals map out a plan to achieve it: before B becomes not-hungry, A must cause B to eat the biscuits (sub-G), by first causing B to believe that the biscuits are on the table (sub-sub-G). The latter, the goal at the top of the stack, results in the selection of utterance (2). The plan is for B to know about the biscuits, eat them, and not be hungry anymore. If the plan is followed through, G is achieved and removed from the stack along with its subgoals, and A's next goal for making changes in the world rises to the top of the stack.

(2) *If you're hungry, there are biscuits on the table.*

a.

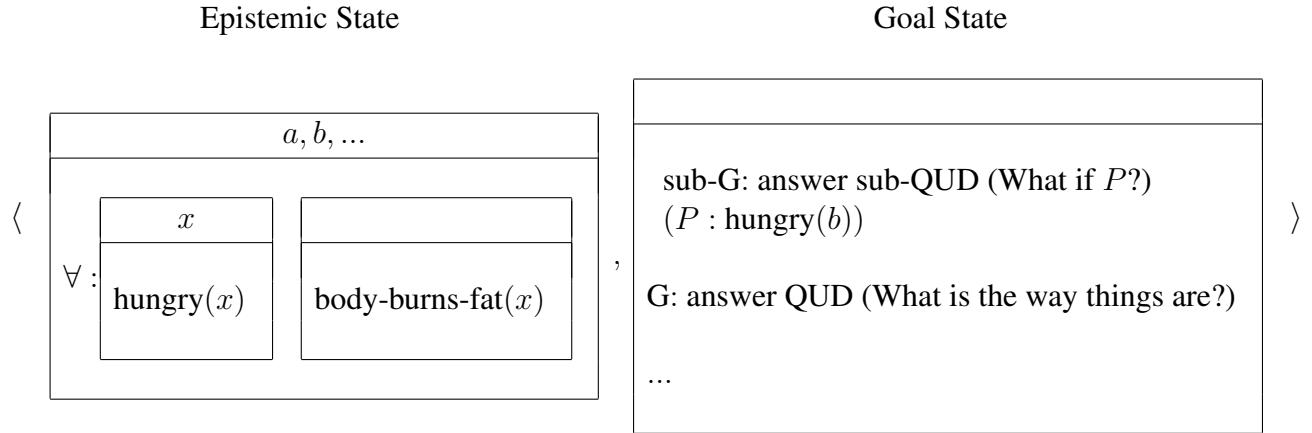


Recall relevance in BCs is shown by asking what does one do about  $P$ ? If it is the case that  $P$ , (uttering)  $Q$  is what A does about  $P$ . In this sense  $Q$  is relevant to  $P$ . Of course, events might pan out differently. B might eat an apple in the meantime and no longer be hungry. If A learns this (meaning it is accommodated into A's ES), then G is removed altogether, since the function of goals is to change the ES and the ES would already include  $\neg P$ . Or B might not have been hungry to begin with, rendering A's utterance useless. This is not an unusual occurrence in the real world, given that we cannot see into other people's mental states, and can only make an educated guess. It was based on the possibility of  $P$  that A acted. Had A believed  $\neg P$ , they would not have uttered (2).

## 5.2. Modeling canonical conditionals

Now we take a look at how the model is used to represent a canonical conditional, in order to fully compare the semantic structure of the minimal pair (1a) and (2a). We see below, how the Goal State differs between the two.

- (1) *If you're hungry, your body burns fat.*
- a.



The speaker A believes that all cases in which an individual is hungry is a case where their body burns fat. The top QUD is What if B is hungry? If B is hungry ( $P$ ), the consequence is that B's body burns fat ( $Q$ ). If it is the case that  $P$  is true,  $Q$  is relevant to it, in that it follows from  $P$ . As we have established before, the goal of canonical conditionals is to answer the QUD. Their antecedent indicates a subquestion, or a subgoal, which the main clause addresses. The sub-QUD above can be interpreted as *Given that you're hungry, what is the way things are?* and answering it is equivalent to the subgoal that gives rise to utterance selection. In this sense, we can see that like in BCs, relevance in CCs also means they address a goal implied by the antecedent (the goal being the question under discussion).

In comparing (1a) and (2a), there are two important points to take: how the difference between goals of utterance explains similar structures with different meaning, and the formalization of relevance. Within the same model, I am able to show that the goal of CCs is to answer a QUD framed by the antecedent, and in BCs it is an extralinguistic goal implied by the antecedent, successfully representing the contrasting aspects of these conditionals. Their common component of relevance, is also visible within this framework: in either case, the goal addresses the antecedent. In (1a) it is to answer *what if P?* and in (2a) it is to  $\neg P$ , which is an inference (using ES content) of what action to take given that  $P$ .

## 6. Conclusions

### 6.1. Summary

When we talk, we don't just accommodate new information. We also interpret the intentions underlying the utterance. The proposed model is a framework for representing the mechanics of goals and beliefs as key components in the inferential process behind utterance selection. The implications of my contribution are the formalization of important pragmatic factors to language meaning. By revealing a more integrated structure of the interplay between beliefs and goals underlying a linguistic object, not just things like biscuit conditionals become more clear in how they convey the meaning that they do – BCs are only a sample of what can unfold in the larger discourse. Such a significant chunk of natural language is non-literal or non-truth

conditional. With this model we are able to reconcile two fundamental aspects of language that are in constant interaction in the interlocutors' minds before every move in the conversation game. It is a tool for analyzing a much wider range of natural language objects.

## 6.2. Next steps

This is the first stage of the model, which I intend to develop in future research. Following my claim, that BCs and CCs are similar because their consequents are linked to their antecedents by relevance, the natural next step is to look at unconditionals, which are explicitly markers of irrelevance. Recall that in BCs,  $Q$  is true, whether  $P$  is true or not. Whether-unconditionals can be interpreted as a set that is the truth-conditional equivalent of biscuit conditionals: If  $P$ ,  $Q$  and If  $\neg P$ ,  $Q$  (Rawlins 2008). *Whether you are hungry or not, there are biscuits on the table.* But pragmatically, they are excluded from the conditional category because  $P$  bears no relation to the goal addressed by  $Q$ . The antecedent is there precisely to express what the consequent is not relevant to. That is, it acknowledges the QUD (e.g.: *Are you hungry?*) and explicitly leaves it unanswered, and then shifts the focus to answering another QUD (e.g.: *Is there any food?*).

When we test the whether-unconditionals in the model, we would predict the Goal State to show us a rejection of the at-issue content implied by the antecedent, or the QUD. The representation of underlying goals, and not just truth conditions, should enable us to formally distinguish BCs from whether-unconditionals. Furthermore, comparing the Epistemic States should also give us valuable insights regarding non-echoic BCs (that is, when the speaker doesn't necessarily know that  $P$ ) and more generally about defeasible propositional content within the ES and how that affects the GS.

Generally, there are practicalities to be worked on such as adequate and coherent notation for the model, but also more fundamental aspects, such as how to address the complex nature of goals. When we consider goals that go beyond the linguistic realm, are there patterns that can be formalized? At the moment, these elements seem to be floating freely and arbitrarily without much order but the goal is to systematize them.

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## References

- Austin, J. L. (1962). *How to Do Things with Words*. University Press.
- DeRose, K. & R. E. Grandy (1999). Conditional assertions and biscuit conditionals. *Noûs* 33:3, pp. 405–420.
- von Fintel, K. & S. Iatridou (2005). What to do if you want to go to Harlem: Anankastic conditionals and related matters. [Ms]. [Http://web.mit.edu/fintel/fintel-iatridou-2005-harlem.pdf](http://web.mit.edu/fintel/fintel-iatridou-2005-harlem.pdf).
- Grice, P. (1975). Logic and conversation. Cole, P. & J. L. Morgan (eds.), *Syntax and Semantics*, Academic Press, vol. 3, pp. 41–58.

- Heim, I. (1992). Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:3, pp. 183–221.
- Predelli, S. (2009). Towards a semantics for biscuit conditionals. *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition* 142:3, pp. 293–305.
- Rawlins, K. (2008). *(Un)conditionals: An investigation in the syntax and semantics of conditional structures*. [PhD thesis]. The University of California, Santa Cruz.
- Roberts, C. (2012). Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 5:6, pp. 1–69.
- Siegel, M. E. A. (2006). Biscuit conditionals: Quantification over potential literal acts. *Linguistics and Philosophy* 29:2, pp. 293–305.
- Stalnaker, R. (1978). Assertion. *Syntax and Semantics: Pragmatics* 9, pp. 315–332.

# The syntax of Puss in Boots and Sleeping Beauty

## Proper names between productivity and atomicity

Pietro Baggio and Alexander Cairncross

This paper explores the syntactic formation of proper names. Due to their syntactic productivity and internal complexity, work stemming from Longobardi (1994) has assumed that proper names are created in the syntax via  $N^\circ$ -to- $D^\circ$  movement. However, these approaches leave unexplained a set of semantic and syntactic asymmetries between common and proper names. Our paper will highlight three: the DP Divergence Point, the Semantic Exocentricity of Proper DPs, and the Featural Inaccessibility of Proper DPs. Building on Longobardi (1994) and the split DP hypothesis (Aboh 2004; Haegeman 2004 *et seq.*), we suggest that proper names require intermediate movement to a lower projection: DeixP.  $N^\circ$ -to-Deix $^\circ$  movement renders the NP as a whole an indexical.

### 1. Introduction

This article is *not* about proper names. This is because insofar as ‘proper names’ are understood as a particular formal class of items stored in the lexicon, or as a brand of roots with some common lexical semantic property, they do not constitute a syntactician’s primary interest. Rather, this article concerns itself with the distinctive syntactic behaviour of the *structures* in which what we call ‘proper names’ typically appear, which we will henceforth refer to as *proper DPs*.

Consider the sentences in (1) and (2), from English and Italian respectively.

- (1) [DP (\*The) Alex ] ran eight miles.
- (2) [DP (\*L') Alessio ] ha corso otto miglia.  
(\*the) Alessio has run eight miles  
'Alessio ran eight miles.'

First, the DPs *Alex* and *Alessio* are referential expressions that appear in an argument position, where they introduce the agent of the relevant event. Second, they can be set apart from most other referential DPs as there is no determiner before the noun. Furthermore, the presence of

one results in complete ungrammaticality (*pace* Longobardi 1994:622). Finally, they can be set apart from bare mass DPs because they denote a unique individual, rather than a mass.<sup>1</sup>

Based on these preliminary observations, (3) provides a simple descriptive definition of proper DPs that will constitute the starting point of our discussion. We should stress that this surface definition is only meant to apply to English and Italian, which are the languages that this article will concentrate on.

- (3) **Proper DP:** (preliminary descriptive definition)  
 A referential individual-denoting DP that appears in argument positions without an overt determiner.

Taking the lead from Longobardi (1994), the aim of this paper will be to argue that proper DPs are constructed in the syntax by movement of the noun to  $D^\circ$  via an intermediate projection we call ‘DeixP’. We claim that DeixP is responsible for turning the NP as a whole into a semantically and featurally atomic indexical expression, accounting for a number of ways in which proper DPs do not behave like any other syntactically complex DP. We implement this technically by adapting Ramchand’s (2018) quotational semantics.

We will begin in section 2 by laying out the reasons for adopting a constructivist approach to proper DPs, highlighting how they display systematic rule-governed productivity, which is the hallmark of syntax. In section 3, we present three crucial puzzles that a constructivist approach must face. First, there are some unpredicted syntactic asymmetries between proper and nonproper DPs in terms of how much structure they can freely include (§3.1), and in terms of word order (§3.2). Second, there are two distinct respects in which proper DPs seem to behave ‘atomically’, as if they were *not* syntactically complex structures. We will discuss these under the label of semantic atomicity (§3.3) and featural inaccessibility (§3.4). To account for these puzzles, in section 4 we will propose to update Longobardi’s (1994) and Borer’s (2005) constructivist approaches by exploiting a version of the split DP hypothesis (cf. Aboh 2004; Haegeman 2004 *et seq.*). Our analysis will crucially rely on the projection DeixP, where we encode the indexical nature of proper DPs. Finally, section 5 will summarise and conclude.

### 1.1. Proper names and proper DPs

Before proceeding to the main discussion, some comments are in order to clarify how our syntax-oriented focus differs from many traditional approaches to proper names.

First, the definition in (3) makes no reference to *rigid designation*. In the philosophical tradition, this property is often taken to be a defining feature of proper names (Kripke 1972 *et seq.*): that is to say, proper names are assumed to invariably refer to the same individual across all worlds and situations. However, there are proper DPs that do not behave like rigid designators. Exemplifying this point, the DP 007 in (4) is referential, individual-denoting, and appears in argument position without any determiner, thereby displaying all the essential traits of an English proper DP. Nonetheless, it is not a rigid designator: it does not invariably denote the same

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<sup>1</sup> There are many well-known properties that distinguish these two classes of determinerless referential DPs in English. Unlike proper DPs, bare mass DPs have cumulative reference (Quine 1960, Krifka 1989, 2003), they may appear as postverbal subjects in existential sentences, and they are interpreted as obligatorily *narrow scope* existentials in the context of episodic stage-level predicates (Carlson 1977, Gerstner-Link & Krifka 1993, Wilkinson 1991, Chierchia 1998, Longobardi 2001).

individual across all worlds and times, as demonstrated in the given scenario.

(4) CONTEXT:

Jeremy was once punched by James Bond. Unbeknownst to him, MI6 decided to sack James Bond, and hire Janet Fleming as 007. Years later, Jeremy decides to come forward and denounce James Bond to the authorities.

Jeremy intends to sue 007. (false in the given context)

Conversely, there are also cases of expressions that would be traditionally regarded as proper names that we cannot classify as proper DPs. Consider the DPs in sentence (5), which contain nouns that may be described as proper names under a lexicalist viewpoint: *Pietro*, *Alex*, and *Tom*. However, all three form ordinary nonproper DPs, with a syntactic profile and a structural semantics no different from that of *a certain tree*, *the wine that you drank*, or *those two cookbooks on that shelf*.

- (5) During university I only dated [<sub>DP</sub> a certain Pietro ], [<sub>DP</sub> the Alex that you met ], and [<sub>DP</sub> those two Toms in that picture ].

For the purposes of this paper, we will restrict the focus to those proper DPs that refer to animate individuals (people and pets), thereby excluding DPs that name places, objects, and institutions, as well as book or film titles. We hope that our rather limited investigation can set the stage for a more thorough and inclusive analysis of proper DPs as a whole.

## 2. *The creativity and complexity of proper DPs*

In this section, we will review evidence demonstrating that proper DPs can be structurally complex, and that their complexity appears to be governed by the same rule-based productivity that characterises nonproper DPs, warranting a constructivist account. With this background, sections 3 to 3.4 will lay out a series of novel puzzles that syntactic approaches to proper names must face.

### 2.1. *Productivity and root-insensitivity*

First, as was pointed out in Borer (2005), any noun, or root, that can be typically used in a nonproper DP may be also freely used as part of a proper DP. This is demonstrated in (6).

- (6) a. I am going to introduce my new friends to Grandma.  
 b. Mary has been going out with Pothead for a month.  
 c. Howl, my pet husky, is playing in the garden with Snow, my neighbour's cat.  
 d. Cumin-o, il mio coniglio, gioca in giardino con Crusc-a, la mia tartaruga.  
     cumin-M.SG the my rabbit plays in garden with bran-F.SG the my tortoise  
     ‘Cumin, my rabbit, is playing in the garden with Bran, my tortoise.’ (Italian)

Examples like those in (6) immediately cast doubt on any lexicalist approaches to the nature of proper names, such as those in Matushansky (2006, 2008, 2014). Matushansky (2008), for example, proposes that the proper name *Alice* is a noun that, as a primitive lexical property, has

a denotation as in (7): it denotes a set of individuals that are associated with the phonological string /'ælis/ by a salient naming convention.

- (7)  $\llbracket \text{Alice} \rrbracket(R_0) = \lambda x \in D_e. R_0 \text{ holds between } x \text{ and the phonological string } /'ælis/$   
 Where  $R_0$  is a contextually salient naming convention. (Matushansky 2008:16)

The problem with this approach is the following. If *any* noun can surface in a proper DP, given suitable context and linguistic creativity, Matushansky would have to postulate rampant homophony, and populate the lexicon with a proper name double for each common noun. Alternatively, she would have to postulate a lexical operation that takes place *presyntactically* and is able to turn a common noun into a proper name. In either case, beyond the obvious worries that pervasive homophony or *presyntactic* operations raise, such an account fails to capture the fact that the ‘common noun’–proper name ambiguity displayed by roots such as *Howl* and *Snow* in (6) is not random. On the contrary, the proper name interpretation of *Howl* and *Snow* is specifically tied to that syntactic structure that we have been referring to as a proper DP. As soon as these nouns occur in the definite DPs *the howl* and *the snow*, only their common noun reading becomes possible. A lexicalist account would have to postulate not only homophony in the lexicon, it would also have to posit some mapping principle to ensure a one-to-one mapping between proper names in the lexicon, and proper DP structures in the syntax. This theoretically redundant move seems to miss the generalisation that it is *syntax* that regulates whether a root is interpreted as a common noun, or as a proper name.

In summary, following Borer (2005), we have argued that *any* noun can be used to form a proper DP. This represents a non-trivial hurdle for any lexicalist approach that would encode the distinction between proper and common nouns outside of the syntax.

## 2.2. *The internal complexity of proper DPs*

Tying in with our discussion above, the aim of this section will be to lay out a battery of data attesting to the internal syntactic complexity of proper DPs. We will also show how this complexity systematically mirrors the structural complexity found in nonproper DPs. To this end, we will now review the various elements that may appear inside proper DPs, as well as the ordering and concord effects that they display.

We will begin by looking at the range of elements that may be found as affixes within a proper DP, observing the striking parallel to the affixes found in nonproper DPs. First, proper DPs exhibit the full range of inflectional morphology that is found inside nonproper DPs. This is demonstrated for gender morphology in Italian (8), as well as for number morphology in both Italian (9) and English (10).

- (8) a. Alessi-o/-a  
 Alessi-M.SG/-F.SG  
 ‘Alessio/Alessia’  
 b. il/la casaling-o/-a  
 the.M.SG/F.SG houseperson-M.SG/F.SG  
 ‘the househusband/housewife’

- (9) a. Occhial-on-i  
glasses-AUG-M.PL  
'Big Glasses'
- b. i can-i  
the.M.PL dog-M.PL  
'the dogs'
- (10) a. Bubble-s  
b. the dog-s

Moving onto 'derivational' morphology, proper DPs in Italian also exhibit the full range of so-called *suffisi alterativi* ('alterative suffixes', see Cinque 2015), namely diminutive, affective, pejorative, and augmentative suffixes. This is exemplified in (11) and (12).

- (11) a. Carl-in-o  
Carlo-DIM-M.SG  
'Little Carlo'
- b. il gatt-in-o  
the.M.SG cat-DIM-M.SG  
'the kitty'
- (12) a. Pietr-acci-o  
Pietro-PEJ-M.SG  
'Nasty Pietro'
- b. il libr-acci-o  
the.M.SG book-PEJ-M.SG  
'the nasty book'

Moreover, proper DPs may also contain derivational morphology typical of deverbal and deadjectival nominalisations. For example, *-er* in (13a) is a deverbal nominaliser, while *-ity* and *-y* in (13b) are deadjectival nominalisers.

- (13) a. The fight against Shadow Weav-er was difficult.  
b. On the left of the fresco, Chast-ity and Humil-ity are spearing Glutton-y in the heart.

Moving beyond bound affixes onto larger phrasal material, proper DPs may also include adjectives (14), prepositional phrases (15), numerals (16), and participial modifiers (17). In the data below, all the *a*-examples are from English and the *b*-examples from Italian.

- (14) a. Fat Albert ~ a/the fat cat  
b. Carlo caro ~ un amico caro  
Carlo dear a friend dear  
'Sweet Carlo' ~ 'a dear friend'
- (15) a. Catherine of Aragon ~ a/the woman from Ávila  
b. Elisabetta d' Inghilterra ~ una parola d' Inglese  
Elisabeth of England a word of English  
'Elisabeth of England' ~ 'a word of English'
- (16) a. Four Eyes ~ (the) four cats  
b. Quattro Dit-a ~ le quattro dit-a  
four finger-F.PL the.F.PL four finger-F.PL  
'Four Fingers' ~ 'the four fingers'
- (17) a. Sleep-ing Beauty ~ a/the sleeping cat  
b. Tor-o Sedu-t-o ~ un tip-o sedu-t-o  
bull-M.SG sit-PTCP-M.SG a guy-M.SG sit-PTCP-M.SG  
'Sitting Bull' ~ 'a seated guy'

Finally, it also appears to be possible for relative clauses to surface in proper DPs, as exemplified in (18). This is however less productive and restricted in various ways. For instance, the English examples are only acceptable with *who*, rather than *that*, for which we have no explanation. It should be noted that such examples do not have a comma intonation, and are therefore not interpreted as proper DPs with an appositive nonrestrictive relative clause: the relative clause is an integral part of the name, to which it is internal.

- (18) a. Mary-who-fell-from-the-sky  
      b. Jane-who-came-back-from-the-dead  
      c. Maria -che -cadde -da-l -cielo  
           Mary -who -fell -from-the -sky  
           ‘Mary-who-fell-from-the-sky’

Having reviewed the multitude of elements that may occur internal to proper DPs, we can now observe that they may co-occur. When this happens, the linear ordering of these elements conforms to the ordering effects observed in nonproper DPs. With affixes, this is demonstrated by the fact that Italian *suffisi alterativi* obligatorily precede gender and number morphology, as shown in (19). Moreover, when multiple types of *suffisi alterativi* co-occur, they must surface in the same hierarchical order as in nonproper DPs, which is summarised in (20). The basic pattern is demonstrated in (21) and (21b).

- (19) a. Pietr-in-o ~ \*Pietr-o-in  
           Pietro-DIM-M.SG    Pietro-M.SG-DIM  
           ‘Little Pietro’

b. un       gatt-in-o ~ \*un       gatt-o-in  
       a.M.SG cat-DIM-M.SG    a.M.SG cat-M.SG-DIM  
       ‘a kitty’

- (20) **Hierarchy of *Suffissi Alterativi*:**  
 $\sqrt{\text{Root}} < \text{Affective}^2 < \text{Diminutive} < \text{Pejorative} < \text{Augmentative}$   
 (based on Cinque 2015, Rizzi & Cinque 2016, and Savoia et al. 2017)

- (21) a. Pietr-acci-on-e ~ \*Pietr-on-acci-o  
           Pietro-PEJ-AUG-M.SG    Pietro-AUG-PEJ-M.SG  
           ‘Big Nasty Pietro’

b. un om-acci-on-e ~ \*un om-on-acci-o  
       a.M.SG man-PEJ-AUG-M.SG    a.M.SG man-AUG-PEJ-M.SG  
       ‘a big nasty man’

The ordering effects we have observed are not restricted to affixes. First, adjectival and prepositional modifiers, as well as numerals, conform to the basic constituency orderings that are observed in nonproper DPs. Namely, as is demonstrated with English in (22) to (24), adjectival modifiers and numerals must precede the head noun, while prepositional modifiers must follow it.

- (22) a. Fat Albert ~ \*Albert Fat  
       b. a fat man ~ \*a man fat

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<sup>2</sup> Note that we have substituted Cinque's term *endearing* with our *affective*, for the sake of morphological coherence with the rest of the terminology.

- (23) a. Four Eyes ~ \*Eyes Four  
b. (the) four men ~ \*(the) men four

(24) a. Catherine of Aragon ~ \*Of Aragon Catherine  
b. the queen of Scotland ~ \*the of Scotland queen

Additionally, when multiple adjectives co-occur in a proper DP, their ordering obeys the typical ‘cartographic’ hierarchies of nominal phrasal elements, as schematised in (25) and demonstrated in (26) and (27).

- (25) **Hierarchy of Specifiers of the Nominal Spine:**  
Demonstrative > Numeral > Evaluative > Size > Age > Shape > Colour > Origin >  
Material > NP (adapted from Scott 2002 and Cinque 2005)

(26) a. Grumpy German Alex ~ #German Grumpy Alex  
b. the grumpy German guy ~ #the German grumpy guy

(27) a. Big Blue Bruno ~ #Blue Big Bruno  
b. the big blue alien ~ #the blue big alien

A third parallel between proper and nonproper DPs emerges from concord effects. Element that can bear inflection within a complex proper DP obligatorily display concord just as it would in any nonproper DP. This is demonstrated with Italian gender and number marking in (28).

- (28) a. Carl-o car-o/\*-a/\*-i/\*-e  
           Carl-M.SG dear-M.SG/\*-F.SG/\*-M.PL/\*-F.PL  
           ‘Sweet Carlo’

In summary, we have observed three basic symmetries between the syntax of proper and nonproper DP: (i) The range of available morphology and modifiers is very similar, if not identical. (ii) When multiple elements co-occur, they are restricted by the same ordering hierarchies. (iii) Modifiers that would exhibit concord inside a nonproper DP obligatorily do so also inside proper DPs.

### 3. Syntactic asymmetries between proper and nonproper DPs

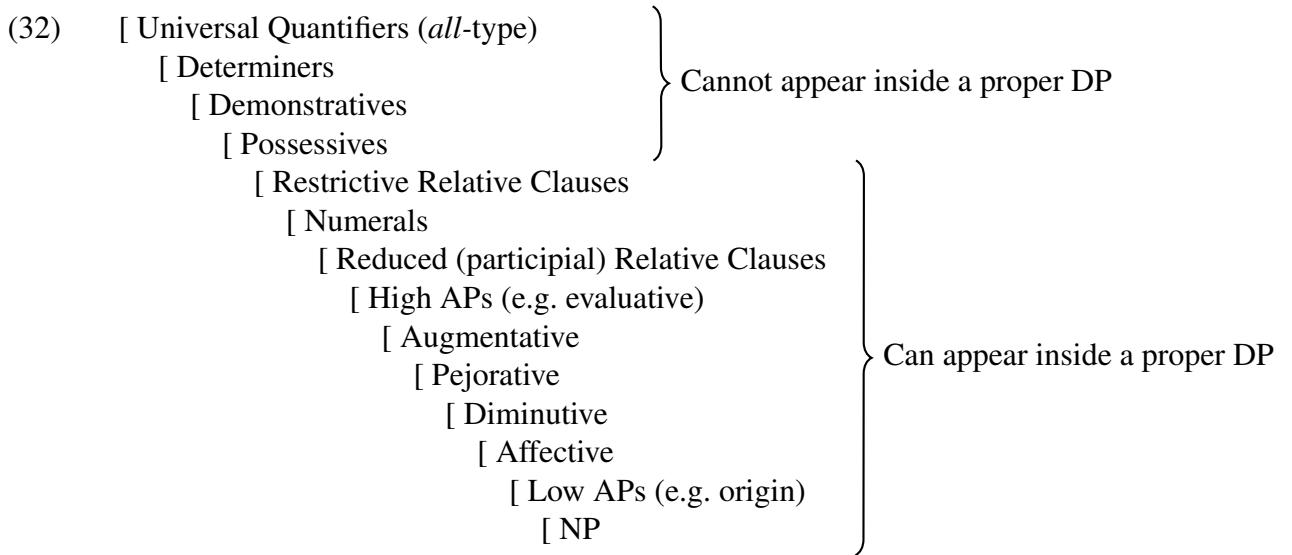
### 3.1. Divergent derivations

Despite the ample structural complexity of proper DPs and their symmetry to nonproper DPs, there do seem to be some elements which can appear freely in nonproper DPs and yet *cannot* appear inside proper DPs. Namely, in both English and Italian, proper DPs do not admit demonstratives (29) or high quantifiers (30). Moreover, possessive pronouns may not appear inside English proper DPs, although they may do so in Italian (31).<sup>3</sup> In the following examples, the *a*-items are from Italian, and the *b*-items from English.

<sup>3</sup> Note that the ungrammaticality of the examples provided is relative to their interpretation as proper names. For instance, *every Alex* is a perfectly well-formed quantificational DP that quantifies over individuals bearing the name Alex. However, it can only be interpreted as a generalised quantifier and *not* as a proper DP: that is, it *cannot* be intended as (nick)name for a certain individual, similar to *Sleepy Alex*.

- (29) a. \*Quest-o Carl-o  
this-M.SG Carlo-M.SG b. \*This Alex
- (30) a. \*Ogni Carl-o  
every Carlo-M.SG b. \*Every Alex
- (31) a. Carl-o mi-o  
Carlo-M.SG my-M.SG b. \*My Carlo  
'My Carlo'

Integrating the range of specifiers and modifiers that are *not* found inside proper DPs with the range of specifiers, modifiers, and suffixes that *are* attested, we can observe that proper DPs do not exhibit a random smattering of nominal functional elements. To elucidate this point, assume a simplified but standard functional sequence such as the one presented in (32).<sup>4</sup>



From (32), it is clear that what is and what is not attested in proper DPs is the result of a natural partition. Namely, it appears that proper DPs can exhibit the same range of functional material found inside nonproper DPs up to a specific structural point, after which the higher functional material is attested only inside nonproper DPs. Tying this in with the morpheme ordering effects, the modifier ordering effects, and concord effects discussed in the previous section, there is strong evidence for a shared functional structure between the two types of DP, *up to* the relevant point. From this we suggest the generalisation in (33):

<sup>4</sup> The cartography in (32) is based on Rizzi & Cinque (2016), with some minor modifications. First, following Shlonsky (2004), Roehrs (2010), and Dékány (2011) *a.o.*, we take demonstratives to be base-generated in a position immediately lower than the projection where determiners appear — even though they may then move higher and appear in the position where the determiner would otherwise be. Secondly, we have added a position for pronominal possessors, which we take to be immediately lower than demonstratives. This is based, amongst various reasons, on the Italian data in (i), where the possessive, but not the demonstrative, is within the scope of the quantificational element *altra*:

- (i) {la / questa} altra mia grossa farfalla  
the this other my large butterfly  
'the/this other large butterfly of mine'

- (33) **The DP Divergence Point:** (to be revised)

Proper and nonproper DPs are structurally identical *up to* a set position:

- (i) the position where possessives are merged (in English).
- (ii) the position where demonstratives are merged (in Italian).

### 3.2. A proper DP-specific word order

Before discussing what might derive the DP Divergence Point, there is a second syntactic asymmetry which presents a wrinkle that any constructivist approach to proper DPs must account for. In the preceding sections, we based our modifier word order effects inside proper and nonproper DPs primarily on English data. This was not without reason: as was observed in Longobardi (1994), the word order inside Italian proper DPs deviates slightly from what is observed elsewhere. Namely, modifiers that can be either prenominal or postnominal in nonproper DPs obligatorily appear postnominally in proper DPs, as is demonstrated in (34). While the adjective *furba* may surface both pre- and postnominally in the nonproper DP headed by the definite article *la* (34a,b), the prenominal position is ungrammatical in the proper DP counterpart (34b,c).

- |  |  |
|--|--|
| (34) a. la ragazza furba<br>the girl clever<br>'the CLEVER girl' | c. Alice furba<br>Alice clever<br>'Clever Alice' |
| b. la furba ragazza<br>the clever girl<br>'the clever girl'      | d. *Furba Alice<br>clever Alice                  |

This syntactic asymmetry is mirrored by a semantic one. Inside nonproper DPs, high (e.g. evaluative) adjectives in postnominal position are typically interpreted as restrictive modifiers with contrastive focus: for instance, the definite DP in (34a) gives rise to a restrictive interpretation where there is another salient girl in the conversational background that the clever one is being contrasted with. Conversely, the same adjectives in prenominal position, as in (34b), are interpreted as nonrestrictive modifiers, and the focal reading is unavailable (cf. Cinque 2010). Turning to proper DPs, the postnominal adjective in (34c) does not have the restrictive focal reading of *furba* in (34a), in clear contrast with its nonproper DP counterpart. In fact, its interpretation is much closer to that of the nonrestrictive prenominal *furba* in (34b). We will come back to the interpretation of adjectives inside proper DPs in section 3.3.

Summarising the syntactic asymmetries between proper and nonproper DPs, there are two desiderata that we must fulfil if we want to maintain a constructivist account for proper DPs as motivated in section 2.2. First, we must find an independent motivation for what we have labelled the DP Divergence Point. Second, we must account for the unexpected word order effects in Italian. Some clues may be offered by the second family of puzzles. These are the peculiar atomicity effects that the following two sections explore.

### 3.3. Semantic atomicity

In section 2.2 we provided evidence to show that proper DPs are structurally complex, and that they are internally organised in conformance with the principles governing the syntax of

ordinary DPs. In this section and the following one, we will be concerned instead with two starkly different phenomena. We will show that, in certain respects, proper DPs display a kind of ‘atomicity’ that is unattested for ordinary DPs.

The first phenomenon we will look at concerns the apparent lack of compositionality in the semantics of proper DPs. Consider first the following sentences, which contrast proper DPs containing an adjective (35a,c), and ordinary DPs with an adjective (35b,d):

- (35) a. Grumpy Alex isn't grumpy.  
       b. #That grumpy man isn't grumpy.  
       c. American Alex isn't American.  
       d. #My American friend isn't American.

When the adjectives *grumpy* and *American* are contained inside a proper DP, they are not interpreted as restrictive modifiers of the noun's denotation. In fact, they are not predicated of the proper DP's referent at all, as evidenced by the non-contradiction of (35a,c). For example, the referent in (35a) may have been given the moniker *Grumpy Alex* ironically, or as a provocation, while the referent in (35c) may have been nicknamed *American Alex* because of an obsessive interest in American culture, or because of an accident when they were confused for an American tourist. Neither (35a) nor (35c) entail that the referent is in the denotation of the adjectival predicate. This seems to be, at best, a cancellable implicature. Conversely, (35b,d) are indeed contradictory, indicating that when the DP is an ordinary definite description, the same adjectives *grumpy* and *American* are obligatorily predicated of the DP's referent. Moreover, a similar point can be made for other proper DP internal modifiers such as the PP in (36).

- (36) a. Anna da-i Capelli Rossi aveva lunghi ricci mori.  
           Anna from-the hair red had long curls black  
           ‘Red-haired Anne had long black curls.’  
       b. #La ragazza da-i capelli rossi aveva lunghi ricci mori.  
           the girl from-the hair red had long curls black  
           ‘The red-haired girl had long black curls.’

(Italian)

At a first pass, we can suggest the following generalisation.

(37) **Semantic Opacity of modifiers of proper DPs:**

In a proper DP, nominal modifiers are semantically opaque and are not predicated of the DP's referent.

As a matter of fact, the generalisation in (37) is part of a larger phenomenon, whereby the referent of a proper DP is not calculated from the denotation of any of the DP's subcomponents. Consider the following DPs:

- (38) a. Everybody used to pick on Four Eyes.  
       b. Those immature kids kept insulting Chubby Cheeks.  
       c. I always take Snowdrift out for a walk in the evening.

In (38a), the DP *Four Eyes* does not refer to a set of eyes or a set of four individuals. Rather, it refers to a person who is nicknamed ‘Four Eyes’. Similarly, in (38b), the DP *Chubby Cheeks* does not refer to a set of cheeks, but rather to an individual. A similar point can be made with

*Snowdrift*, which does not refer to a meteorological phenomenon but, presumably, a pet. The upshot of this is the following generalisation, which subsumes the Semantic Opacity generalisation proposed in (37):

(39) **Semantic Exocentricity of proper DPs:**

Proper DPs are semantically exocentric. Their referent is not calculated based on the semantic denotation of their component parts.

It must be recognised, of course, that by choosing one proper DP rather than another to refer to a certain individual, we can generate pragmatic implicatures which may look, *prima facie*, like the direct semantic contribution of the DP's subparts. Upon hearing a proper DP like *Grumpy Alex* or *American Alex*, it would be natural to infer that the relevant referent is grumpy or American, respectively. The data reviewed in this section, however, has shown that this is not part of the asserted meaning.

To be more concrete, we can appeal to something akin to the *Go-Lighter Principle* of Balaban et al. (2016). *Go-Lighter* is an economy principle applying to discourse, that requires the speakers to choose the simplest pragmatically possible R-expression to refer to the intended referent. Consider (40): *Alex* is a simpler R-expression than (40b-d), and will be therefore favoured by discourse-pragmatic economy, all else being equal. Out-of-the-blue use or coinage of a more complex expression, like (40c), will trigger the implicature that the speaker had a specific reason for choosing it, such as highlighting that the referent is a sleepy person. Nevertheless, use of (40c) does not entail that *Alex* is sleepy, and the implicature is indeed defeasible, as shown above.

- |      |                |                         |
|------|----------------|-------------------------|
| (40) | a. Alex        | c. Sleepy Alex          |
|      | b. Grumpy Alex | d. Grumpy American Alex |

### 3.4. Featural inaccessibility

Given the suggestion that proper DPs contain rich internal structure, there is a second surprising atomicity effect that deserves consideration. We can sometimes observe an obligatory featural mismatch between complex proper DPs and the elements that agree with them. As an example, the plural number feature inside the proper DP in (41) cannot control the agreement inflection on the finite verb. This contrasts sharply with the nonproper DP in (41b) which is only grammatical when the tensed verb matches in  $\phi$ -features with the subject DP.

- |      |  |                          |
|------|--|--------------------------|
| (41) | a. [Four Eyes] does/*do not appreciate the nickname. | (proper DP)              |
|      | b. [Four eyes] are/*is better than two.              | (ordinary indefinite DP) |

This disconnect between the  $\phi$ -features inside the proper DP and the agreeing verb is even more apparent in Italian. In (42), which contains a nonproper DP subject, we can observe both concord for number and gender within the subject DP itself, as well as number and gender agreement on the predicate. The latter is manifest both on the participial verb and on the predicate adjective. If either the verb or the predicate adjective were to appear with a mismatching gender or number value (e.g. masculine or singular) the string would be ungrammatical, as shown in (42b). However, consider (43), where the subject is a proper DP understood to refer to a single male individual. As in the English example above, the predicate no longer matches with

the subject's  $\phi$ -features but must show masculine singular agreement. It is important to observe that, as discussed above (§2.2), concord within the nominal remains obligatory, whether this is a proper or nonproper DP (43c). This suggests that even in (43a), where agreement with the subject seems to be blocked, the 'inaccessible' features cannot be absent from within the proper DP itself.

- (42) a. Le gamb-e lungh-e sono considerat-e bell-e.  
the.F.PL leg-F.PL long-F.PL be.3PL considered-F.PL pretty-F.PL  
'Long legs are considered pretty.'
  - b. \*Le gamb-e lungh-e è considerat-o/-a bell-o/-a.  
the.F.PL leg-F.PL long-F.PL be.3SG considered-M.SG/-F.SG pretty-M.SG/F.SG
- (43) a. Ieri, Gamb-e Lungh-e è venut-o a trovar-ci.  
yesterday leg-F.PL long-F.PL be.3SG come-M.SG to find-1PL.ACC  
'Yesterday Long Legs came to visit us.'
  - b. \*Ieri, Gamb-e Lungh-e sono venut-e a trovar-ci.  
yesterday leg-F.PL long-F.PL be.3PL come-F.PL to find-1PL.ACC
  - c. \*Ieri, Gamb-e Lungh-o/-a/-i è venut-o a trovar-ci.  
yesterday leg-F.PL long-M.SG/F.SG/M.PL be.3SG come-M.SG for find-1PL.ACC

Thus, the Italian and English facts lead us to suggesting the following generalisation:

- (44) **Featural Inaccessibility of proper DPs:**  
 $\phi$ -features active within proper DPs are inaccessible to the rest of the derivation.

If the features within a proper DP are inaccessible to agreement, the immediate task is to determine what regulates the value of the  $\phi$ -features on the verb. Both the proper DPs in (41) and (43) triggered singular agreement on the verb and were interpreted as having a singular referent. Plural agreement on the verb is not in fact systematically ruled out. Rather, it is only acceptable if the proper DP refers to a plural individual. Indeed this appears to be the case with so-called 'ship names',<sup>5</sup> which have a plural referent and trigger obligatory plural agreement, as is exemplified in (45) with *Brangelina*.

- (45) a. Brangelina were married (to each other) until 2019.  
b. \*Brangelina is married (to each other) until 2019.

Similarly, the gender agreement on the verb also carries a semantic effect. In (43) masculine agreement forced a male referent interpretation on the subject DP. The counterpart in (46), where the verb shows feminine agreement, must be interpreted as referring to female individual. This suggests that it is the features of the referent that control the verbal agreement.

- (46) Ieri, Gamb-e Lungh-e è venut-a a trovar-ci.  
yesterday leg-F.PL long-F.PL be.3SG come-F.SG to find-1PL.ACC  
'Yesterday Long Legs came to visit us.' (Italian)

Using Corbett's (2000, ch.6) terminology, we conclude that proper DPs always control *semantic* agreement, as stated in the following generalisation:

---

<sup>5</sup> 'Ship names' are portmanteaux that are used to refer to couples. *Brangelina*, for instance, refers to the couple constituted by Brad Pitt and Angelina Jolie.

(47) **Reference-Dependent Agreement with proper DPs:**

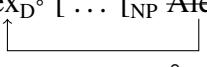
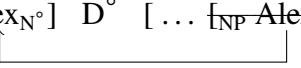
$\phi$ -probes agreeing with a proper DP exhibit the  $\phi$ -features of the DP's intended referent.

4. *Constructing proper DPs: an analysis*

Having observed both the systematic rule-governed productivity of proper DPs and their symmetry with nonproper DPs, it is clearly theoretically desirable that proper DPs should be constructed in the syntax in a way that conforms to the nominal Extended Projection. However, in order to do so a constructivist approach must also account for the three puzzles that we have raised. Accordingly, this section explores the extant constructivist accounts and presents our suggested alternative.

4.1. *Current constructivist proposals*

The main constructivist proposals to analyse the syntactic profile of proper DPs all stem from Longobardi (1994) (see Longobardi 1994, 1996, 2001; Giusti 2002; Borer 2005). They all share the assumption that the presence of a DP layer in the extended nominal projection is essential for referentiality. Given this assumption, the crux of these accounts is the claim that the absence of an overt determiner inside proper DPs, despite the fact that these are fully referential, is due to the movement of the nominal to the DP projection. This is achieved by N°-to-D° movement in Longobardi (1994) and Borer (2005), or by NP-to-Spec,DP movement in Giusti (2002). After the relevant movement has occurred, the presence of a determiner in D° becomes impossible. For Longobardi and Borer this is because the position is already occupied by N°. For Giusti, some extended version of the Doubly-Filled Comp Filter must obtain, which prevents any functional projection from having both a contentful head and a contentful specifier in the same derivation. The two versions of the proposal are schematically represented in (48).

- (48) a. [<sub>DP</sub> Alex<sub>D°</sub> [ ... [<sub>NP</sub> Alex<sub>N°</sub>] ]] (N°-to-D° head-movement)  
  
 b. [<sub>DP</sub> [<sub>NP</sub> Alex<sub>N°</sub>] D° [ ... [<sub>NP</sub> Alex<sub>N°</sub>] ]] (NP-to-Spec,DP phrasal movement)  


Following Longobardi (1994), the crucial piece of evidence for this movement operation comes from Italian, as was already presented in section 3.2. (49a,b) and (50a,b) are two definite noun phrases that contain an overt determiner and an adjective. The latter can freely appear both in prenominal and in postnominal position. Crucially, in the proper counterpart of these definite DPs in (49c) and (50c), where the determiner is absent, the adjective can only appear in postnominal position. Longobardi suggests that this pattern can be given a natural explanation if we suppose that the noun in (49c) and (50c) has head-moved to D°, to the left of the adjective. This single syntactic operation, schematised in (51b), can account both for the obligatory linearisation of the noun to the left of the adjective and for the absence of an overt definite determiner, in contrast with the definite counterpart.

- (49) a. la domenica scorsa  
the sunday past  
'last sunday'  
b. la scorsa domenica  
the past sunday  
'last sunday'
- (50) a. la nostra Alice  
the our Alice  
'our Alice'  
b. la Alice nostra  
the Alice our  
'our Alice'
- (51) a.  $[_{DP} la_D^\circ [ \dots _{NP} Alice_{N^\circ} ] ]$   
b.  $[_{DP} Alice_{D^\circ} [ \dots _{NP} Alice_{N^\circ} ] ]$

As further evidence for the core component of this approach, we should note that Italian proper DPs allow for the presence of postnominal elements that would *never* occur postnominally when inside an ordinary DP. The ordinal numeral *ottavo* 'eighth' in (52) is a case in point:

- (52) a. \*l' Enrico ottavo  
the Henry eighth  
b. l' ottavo Enrico  
the eighth Henry  
'the eighth Henry (out of many)'  
c. Enrico Ottavo  
Henry Eighth  
'Henry the Eighth'  
d. \*Ottavo Enrico  
Eighth Henry

As the reader may have noticed, the word order facts observed by Longobardi do not carry over to English, where adjectives remain prenominal even inside proper DPs. To account for this, Longobardi suggests that N°-to-D° movement in English is covert (53a). As an alternative that does not rely on covert movement, we can suggest that English displays phrasal movement to Spec,DP, and that this movement pied-pipes along all the modifiers of the noun, as in (53b).<sup>6</sup>

- (53) a.  $[_{DP} D^\circ [ \dots Grumpy \dots [ _{NP} Alex_{N^\circ} ] ] ]$   
b.  $[_{DP} [Grumpy \dots [ _{NP} Alex_{N^\circ} ]] D^\circ [ \dots [ Grumpy \dots [ _{NP} Alex_{N^\circ} ] ] ] ]$

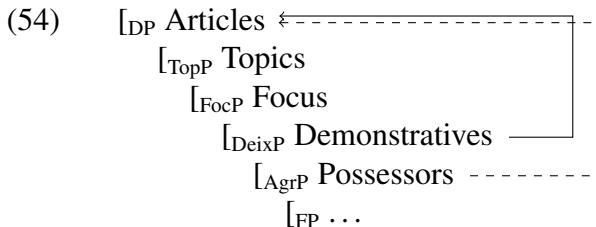
While the Longobardian approach to proper names offers a starting point for a syntactic account of the derivation of proper DPs, there are various phenomena that do not immediately follow from it. Earlier in the paper, we proposed a series of generalisations that define the limits of the syntactic complexity and productivity of proper DPs. First, we have seen that there is an upper bound on the syntactic material that can be present inside proper names (our DP Divergence Point). While the approach just reviewed offers a straightforward way to derive the obligatory absence of definite articles from proper names, more needs to be said to also rule out quantifiers,

<sup>6</sup> For the sake of simplicity, we will only represent the head-movement alternative for the remainder of this paper. This is not the authors' theoretical commitment on the issue, but rather a simple matter of exposition.

demonstratives, and the English possessive pronouns, as discussed below. Secondly, we have shown that proper DPs display two unexpected forms of ‘atomicity’: semantic atomicity (our Semantic Exocentricity generalisation), and featural atomicity. The next section will present an analysis that will build on Longobardi’s (1994) system and tackle our three puzzles.

#### 4.2. Our proposal: the DeixP projection

The starting point of our proposal for proper DPs lies in the recognition that the DP layer of the nominal extended projection should be broken down into a finer-grained structure, consisting of a series of functional projections in a specific hierarchical order. This is exemplified in the schema in (54), based on Aboh (2004), Haegeman (2004), Alexiadou et al. (2007), Roehrs (2010), and Dékány (2011).



Leaving aside topic and focus projections, which do not seem to play any relevant role in English and Italian, the highest DP in (54) is the projection where uniqueness and referentiality are encoded, and where the definite article *the* is merged. Conversely, the projection we have labelled DeixP (akin to DefP in Alexiadou et al. (2007), and especially IndexP in Roehrs (2010)) is the syntactic locus for the encoding of deixis and indexicality, where demonstratives are base-generated. Our claim will be that DeixP has an essential role to play in the formation of proper names. Finally, AgrP (akin to  $D_{fin}P$  in Haegeman 2004 or  $Gen_S P$  in Longobardi & Sivestri 2013) is the projection where possessive pronouns are licensed. It should be noted that demonstratives obligatorily move to the highest DP position in English and Italian (indicated in (55) by the full arrow), and that possessive pronouns also do so in English, but not in Italian (indicated by the dashed arrow). This accounts for the fact that articles, demonstratives, and possessive pronouns are all in complementary distribution in English, but only the former two are in Italian, as shown in (55).

- (55)
- a. { the / this / my } beetle
  - b. { il / questo } mio coleottero  
the this my beetle  
'the/this beetle of mine'

The proposal that we want to make capitalises on the fact that proper names, together with demonstratives, can be described as a subtype indexical expressions (cf. Recanati 1997, and Pelczar & Rainsbury 1998), suggesting that the projection DeixP should be involved in their syntactic construction. We therefore propose that proper DPs are formed by moving the  $N^\circ$  (or the NP) to  $Deix^\circ$  (or  $Spec, DeixP$ ), and from there on to  $D^\circ$  (or  $Spec, DP$ ). This is exemplified in (56). As noted above it is necessary to assume that the relevant movement is covert in English, as it does not cause any word order effects. Alternatively, one can assume that English has NP-to-Spec,DeixP-to-Spec,DP ‘snowballing’ movement, pied-piping any adjectives or numerals

along the way. The schema in (56) glosses over these implementational details.  $N^\circ$ -to-Deix $^\circ$  movement is the operation responsible for giving proper DPs their indexical flavour, as will be made clearer below, while Deix $^\circ$ -to-D $^\circ$  movement is the operation responsible for guaranteeing the referentiality of the whole DP.

- (56) [DP Alex<sub>D°</sub> [DeixP Deix $^\circ$  [ ... [NP Alex<sub>N°</sub>] ] ]] (N°-to-Deix $^\circ$ -to-D $^\circ$  movement)
- 
- The diagram shows a bracket under the entire structure [DP Alex<sub>D°</sub> [DeixP Deix $^\circ$  [ ... [NP Alex<sub>N°</sub>] ] ]]. Inside this bracket, another bracket covers the inner structure [DeixP Deix $^\circ$  [ ... [NP Alex<sub>N°</sub>] ] ]. An upward arrow points from the bottom of the inner bracket to the top of the outer bracket, indicating movement from the NP level to the DeixP level.

Note that only the former movement is necessary for the creation of a proper DP: if movement of the noun stops at DeixP, the whole nominal can still be made into a full referential expression by merging an article in the DP projection. This, we suggest, is what happens in those languages where proper names occur with articles. In Greek, for example, all proper DPs must contain a definite article, as in (57) and (58). Similarly, in Venetian, all feminine proper DPs must appear with the definite determiner, while masculine proper DPs behave like the English ones (59).

- (57) a. \*(o) Iáson  
the.M.SG Iason  
'Iason'
- b. \*(i) Stamatína  
the.F.SG Stamatina  
'Stamatina'
- (58) [DP o<sub>D°</sub> [DeixP Iáson<sub>Deix°</sub> [ ... [NP Iásön<sub>N°</sub>] ] ]] (N°-to-Deix $^\circ$  movement only)
- 
- The diagram shows a bracket under the entire structure [DP o<sub>D°</sub> [DeixP Iáson<sub>Deix°</sub> [ ... [NP Iásön<sub>N°</sub>] ] ]]. Inside this bracket, another bracket covers the inner structure [DeixP Iáson<sub>Deix°</sub> [ ... [NP Iásön<sub>N°</sub>] ] ]. An upward arrow points from the bottom of the inner bracket to the top of the outer bracket, indicating movement from the NP level to the DeixP level.
- (59) a. (\*el) Chéco  
the.M.SG Checo  
'Francesco'
- b. \*(a) Chéca  
the.F.SG Checa  
'Francesca'

Note that despite the presence of the article, in contrast with English and Italian, these DPs share all the other relevant properties of proper DPs that were pointed out throughout the paper, and therefore should not be analysed as ordinary definite descriptions.

With this background on our analysis, we can move on to explain how the proposal can tackle those problematic facts about proper DPs that we highlighted in the course of the paper: the DP Divergence Point, the Semantic Exocentricity of proper DPs, and the Featural Inaccessibility of proper DPs.

Concerning the DP Divergence Point, the original Longobardian approach goes a long way towards accounting for it, but falls short at a crucial juncture.  $N^\circ$ -to-D $^\circ$  movement in itself is capable of accounting for the obligatory absence of articles inside proper DPs, because the D $^\circ$  position is already filled by the noun itself. Similarly, demonstratives, quantifiers, and possessive pronouns in English must obligatorily move to the DP projection, as evidenced by their complementary distribution with articles. Some extended version of the Doubly-Filled Comp Filter must be at play here, ruling out a DP with a demonstrative or possessive in its specifier, and an article as its head. If the obligatory movement of demonstratives and possessives to Spec,DP is rendered impossible by the presence of the noun in D $^\circ$ , their systematic absence inside proper DPs also follows. Interestingly, only the former in Italian must obligatorily move to the DP, while the latter remain in AgrP. This immediately explains the contrast between English and Italian with respect to the availability of possessives inside a proper DP: while *Alessio mio* 'my Alex' is possible as a proper name in Italian, *my Alex* in English can only be interpreted as the definite description 'my Alex, rather than someone else's'.

However, the Longobardian account is hard put to account for languages where articles *do* co-occur with proper names inside proper DPs. As we have already seen in (57), Greek is one such language: proper names obligatorily appear preceded by an article. Venetian is similar: as shown in (59), proper DPs with a feminine noun must contain a definite article.

Longobardi (1994) has to stipulate that the noun does not move to  $D^\circ$  in these languages, and an ‘expletive article’ fills in the  $D^\circ$  head instead. Given such a concession, however, it is not clear how the presence of a demonstrative can be ruled out as there is no moved noun in  $D^\circ$  to compete with it. Nevertheless, demonstratives inside proper DPs are impossible in both Standard Italian and Venetian, as demonstrated in (60) with Venetian.



The addition of the  $N^\circ$ -to- $\text{Deix}^\circ$  movement step, obligatory for the formation of proper DPs in all languages, readily solves this issue. As demonstratives are base-generated in  $\text{Spec}, \text{DeixP}$ , we suggest that  $N^\circ$ -to- $\text{Deix}^\circ$  movement blocks demonstratives from merging in the structure because of the extended Doubly-Filled Comp Filter. To conclude, we are now in a position to revise our earlier statement of the DP Divergence Point into the more general form in (61).

- (61) **The DP Divergence Point:** (final version)  
Proper and nonproper DPs are structurally identical *up to* the DeixP projection.

It should be noted that our proposal makes a novel prediction. If the word order effects that Longobardi (1994) noted in Italian nouns are the result of overt  $N^\circ$ -to- $\text{Deix}^\circ$  movement, we should expect to see them even in languages where proper DPs include an article in  $D^\circ$ . This seems to be the case in Venetian, as shown in (62). Just like in Italian, Venetian masculine proper DPs cannot co-occur with the definite article, and require all adjectives to follow the noun. This is demonstrated by the contrast between (62a) and (62b), below and follows unproblematically both under an  $N^\circ$ -to- $D^\circ$  account, and under our  $N^\circ$ -to- $\text{Deix}^\circ$ -to- $D^\circ$  story. Feminine proper DPs, conversely, *require* the definite article, indicating that the noun does not raise all the way to  $D^\circ$ . Interestingly, the requirement that all adjectives should follow the noun still holds, as shown by the contrast between (62c) and (62d). By positing movement of the noun to  $\text{Deix}^\circ$  in all proper DPs, regardless of the presence of the article, our analysis is able to derive the Venetian facts directly.

Moving on to the second puzzle that we have discussed, Semantic Exocentricity, we suggest that the DeixP projection plays a fundamental role in accounting for the semantic opacity of proper DPs. Recall that DeixP is the projection of the extended nominal spine that is responsible for encoding indexicality. Typically, this will be achieved by merging an indexical element, such as the demonstrative *this* or *that*, in the specifier of DeixP. However, when DeixP is projected and *the noun itself* moves to it, as is the case in proper DPs, we suggest that this results in the noun phrase as a whole becoming an indexical expression. Fundamentally, we are suggesting that proper names are a kind of demonstrative: not a functional one like *this* or *that*, but a ‘lexical’ one that can be freely created in the syntax by putting together the atoms available in the lexicon. Adapting insights from Henderson (2016) and Ramchand (2018), we propose the following semantics for  $\text{Deix}^\circ$  under  $N^\circ$ -to- $\text{Deix}^\circ$  movement.

(63)  $\llbracket \text{Deix}^\circ \rrbracket = \lambda u. \lambda x. \lambda d. \text{UTTERANCE}(d) \wedge \text{THEME}(d) = u \wedge \text{DEMONSTR}(d, x)$   
 Function that takes a linguistic object  $u$  and returns a property of an individual  $u$  and an utterance event  $d$ , which has  $u$  as its theme and is deployed to demonstrate  $x$

Inside a proper DP that has undergone  $N^\circ$ -to-Deix $^\circ$  movement, the result of combining Deix $^\circ$  with its complement — let us refer to it as XP for convenience — will be the set of individuals that are picked out by *employing* the linguistic object XP in the relevant context of utterance. In other words, DeixP will not denote the set of individuals that semantically fulfil the denotation of XP, but rather the set of those individuals that we are able to identify via the mention of XP in the utterance. Two things must be immediately noted. First, regardless of  $N^\circ$ -to-Deix $^\circ$ (-to-D $^\circ$ ) movement, the noun itself must be obligatorily reconstructed and interpreted as part of XP, in order to give the intended interpretation of the proper DP. Secondly, DeixP denotes a *set* of individuals: the uniqueness and referentiality needed for the proper DP to be used as an argument are supplied higher in the derivation, by D $^\circ$ , where the  $\iota$ -operator resides. Consider the DeixP below, which is part of the proper DP *Grumpy German Alex*.

(64) [<sub>DP</sub> D° [<sub>DeixP</sub> Deix° [<sub>XP</sub> ... Grumpy German Alex ] ] ]

The individual denoted by (64) need not be either grumpy or German. The reason that neither the AP *Grumpy* nor the AP *German* are predicated of the DP's referent is that XP as a whole is only *mentioned*, rather than *used*, in order to identify the referent. To put the matter differently, we have followed a long philosophical and semantic tradition (cf. Kneale 1966, Bach 1981 *et seq.*, Geurts 1997) in giving Deix<sup>°</sup> in (63) a *quotational* semantics. The denotation of the complement of DeixP is not predicated of the individuals that DeixP picks out: rather, XP *qua* linguistic object is deployed — or ‘quoted’ — in the utterance context to pick out those individuals.

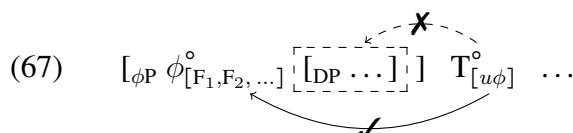
With this analysis in place, we are now in the position to give a formal definition of proper DPs to replace the descriptive one in (3), which was based on the surface facts in English and Italian. We have suggested that the crucial operation that creates a proper DP is the movement of  $N^\circ$  to  $Deix^\circ$ , which gives rise to the indexical nature of proper names. In addition, we need a DP layer to introduce a  $\iota$ -operator and thereby render the whole expression referential. This layer can either be licensed by further movement of  $N^\circ$  to  $D^\circ$ , as in English and Italian, or by merging a definite determiner in  $D^\circ$ , as in Greek and a subset of Venetian nouns. A new definition of proper DPs is provided in (65), below.

- (65) **Proper DP:** (formal definition)  
A proper DP is a referential, individual-denoting definite DP that has undergone N°-to-Deix° movement, rendering the complement of Deix° as a whole an indexical.

We can finally move to the third and final puzzle that was discussed, Featural Inaccessibility. We observed that the verbal agreement controlled by a proper DP does not necessarily reflect the  $\phi$ -features that appear inside that proper name. Rather, as is repeated in (66), agreement will systematically reflect the features of the proper DP's intended referent.

- (66) a. Salad Fingers is/\*are walking in the park.  
*(Salad Fingers refers to a single individual)*  
 b. Brangelina are/?is walking in the park.  
*(Brangelina is a ‘ship name’ referring to a couple)*

At a first pass, one may suggest that we follow Sauerland (2003) in positing a  $\phi P$  projection dominating all referential DPs, where the features that are semantically compatible with the DP's referent are introduced. For reasons of locality and Relativised Minimality (Rizzi 1990, 2004), these will be the only features visible for agreement, as shown schematically in (67).



If this analysis were correct, the obligatory ‘semantic agreement’ effects that we observed with proper names in (66) can be given exactly the same explanation that Sauerland (2003) gives to the agreement effects that arise with coordinated DPs. In (68a), for example, two coordinated DPs, both singular in their  $\phi$ -features, are able to control *plural* agreement on the verb because they denote, as a whole, a plural individual.

- (68) a. [ &P [DP<sub>1</sub> A crow]<sub>[SG]</sub> and [DP<sub>2</sub> a finch]<sub>[SG]</sub> ] were/\*was debating the meaning of life.

X

b. [ <sub>φP</sub>  $\phi^o_{[PL, \dots]}$  [ [ &P DP<sub>1</sub>[SG] & DP<sub>2</sub>[SG] ] ] T<sub>[uφ]</sub><sup>o</sup> ... ] ]

The analysis we have just provided can readily account for the Featural Inaccessibility and the Reference-Dependent Agreement generalisations both in English and in Italian. However, extending it to other languages may require some revisions, as we will sketch out in the concluding paragraphs of this section. In languages where proper DPs appear with a determiner, we can observe that the determiner itself will display the  $\phi$ -features corresponding to the noun's intended referent, rather than those introduced further down in the noun phrase. Consider the

Venetian examples in (69). The noun phrase in (69a) contains a feminine plural noun, *gambe* ‘legs’, with a feminine plural modifier. Under the interpretation where the proper DP is used as a woman’s nickname, however, the article will be feminine singular, reflecting the features of the understood referent. Similarly, in (69b) the noun and its modifier are masculine plural, but the article is feminine singular, indicating that the proper DP is referring to a single female individual. Note that the verb in (69b) also shows feminine singular agreement.

- (69) a. So andà a trovàre [DP a Gamb-e Longh-e ].  
           am gone to meet       the.F.SG leg-F.PL long-F.PL  
           'I went to meet Long Legs.'

b. [DP A Cavé-i Ónt-i ] a xe vegnù-a a trovàr-me.  
           the.F.SG hair-M.PL dirty-M.PL CL.F.SG is come-F.SG to meet-1SG.ACC  
           'Dirty Hair came to meet me.'

A full account for these facts goes beyond the restrictive scope of this paper, but we will nevertheless offer some speculative remarks. First, we will assume, following Danon (2011) a.o., that all the  $\phi$ -features introduced in the nominal extended projection are ‘gathered up’ in its highest functional head,  $D^\circ$ , from which they will then be visible for agreement with clausal material. This can be given a natural explanation if we follow Svenonius (2004), Bošković (2005, 2012), Kramer (2009), and Citko (2014) amongst many others, and assume that DP is a phase, whose complement becomes invisible to the syntactic computation once the DP is complete, because of the Phase Impenetrability Condition (the PIC in Chomsky 2000). In order for  $\phi$ -features introduced lower than the DP layer to remain visible for agreement, it is necessary that they should all be represented on the head  $D^\circ$  as well, thereby escaping the effects of the PIC.

In a proper DP, however, we suggest that all the features in the complement of DeixP become inaccessible for agreement with the head D°, as shown in (70).



We attribute the inaccessibility of the features inside XP to the quotational semantics that we have proposed for DeixP, in conjunction with the fact that *mentioned* linguistic objects, in contrast to *used* linguistic objects, display a high degree of internal opacity (cf. the debate stemming from Quine 1980 and Davidson 1979). Once a feature becomes part of quoted material, it will remain ‘flagged’ as such, and therefore inaccessible to the syntactic computation for the rest of the derivation. This is exemplified below, where verbal agreement is incapable of tracking either the number (71a) or the person (71b) features of the mentioned linguistic expression.

- (71) a. ‘Children’ has/\*have two syllables.  
       b. ‘You’ is/\*are used regardless of politeness distinctions.

Unable to agree with the features introduced in XP, the head  $D^\circ$  will instead display  $\phi$ -features matching with the semantics of the intended referent, as a last-resort strategy (cf. Wechsler & Zlatić 2000, 2003; Sauerland 2004; Steriopolo & Wiltschko 2010; Ackema & Neeleman 2013; Matushansky 2013). Note that, in order for this account to generalise to proper DPs across languages, the featural opacity just described must hold regardless of whether  $N^\circ$  has moved to  $D^\circ$ :  $N^\circ$ -to-Deix $^\circ$ -to- $D^\circ$  cannot be able to evacuate features of the quoted material out of XP and to make them syntactically accessible. An implementational solution that avoids this last worry

is to suggest that the second movement step is always phrasal: whether  $N^\circ$  moved to  $\text{Deix}^\circ$  or whether NP moved to  $\text{DeixP}$ , it will always be  $\text{DeixP}$  as a whole that moves to  $\text{Spec}, \text{DP}$ , thereby preventing the ‘escape’ of the head  $N^\circ$  from the indexical structure.

In summary, we have suggested that the formation of proper DPs crucially relies on the presence of a  $\text{DeixP}$  projection immediately below the DP projection. Movement of the noun to  $\text{Deix}^\circ$  both licenses this projection, and renders the noun phrase as a whole a complex indexical expression that can be used to pick out an individual. Once the head  $\text{Deix}^\circ$  is merged with its complement XP, the XP becomes ‘quoted’ material, opaque both semantically and featurally.

### 5. Conclusion

The aim of this paper has been to analyse the syntactic structure in which proper names typically occur, which we have called *proper DP* and defined as follows.

(72) **Proper DP:**

A proper DP is a referential, individual denoting definite DP that has undergone  $N^\circ$ -to- $\text{Deix}^\circ$  movement, rendering the complement of  $\text{Deix}^\circ$  as a whole an indexical.

Granted that proper DPs, just like any other DPs, are syntactically rich and complex, we have been concerned with two main sets of challenges that a constructivist approach to proper names faces. First, we have observed that the structural identity of proper DPs with ordinary DPs is bounded in a principled fashion, as summarised in (73).

(73) **The DP Divergence Point:**

Proper and nonproper DPs are structurally identical *up to* the  $\text{DeixP}$  projection.

Secondly, we have observed that there are two respects in which proper DPs behave ‘atomically’. We have discussed what appears to be semantic atomicity on the one hand, as in (74), and featural atomicity on the other, as in (75).

(74) **Semantic Exocentricity of proper DPs:**

Proper DPs are semantically exocentric. Their referent is not calculated based on the semantic denotation of their component parts.

(75) **Featural Inaccessibility of proper DPs:**

$\phi$ -features active within proper DPs are inaccessible to the rest of the derivation.

We have proposed an account for the syntactic formation of proper DPs that builds on and expands Longobardi’s (1994) approach. Crucially, we have suggested that the presence of a  $\text{DeixP}$  projection in the DP layer of the nominal spine, licensed by  $N^\circ$ -movement, is responsible for the three generalisations above. Following the insight that proper names are essentially indexical expressions, and that their semantics involves a form of ‘quotation’, we have proposed that the role of  $\text{Deix}^\circ$  is to turn its complement into a *mentioned* linguistic expression, employed in the utterance context to pick out the intended referent.

There is an interesting problem, raised by our analysis, that we should mention before closing. Once it is granted that some languages, such as Greek, require proper DPs with an overt determiner, and that some, such as Venetian, do so for a well-defined subset of their proper DPs, the question arises whether we can rule out the possibility that English also has a set of proper

DPs that *do* appear with an article. Likely candidates are DPs such as *the University of Cambridge* and *the Black Sea*. Semantically, they display a degree of opacity highly reminiscent of our Semantic Exocentricity generalisation: the Black Sea is certainly not black, and the University of Cambridge is not in fact *the* (unique) university of Cambridge, since there are two. Syntactically, however, they differ from typical English proper DPs in the presence of the determiner. Are these instances of proper DPs where movement stops at Deix°, and the article fills the D° position? Or are these ordinary definite descriptions with a somewhat idiomatic meaning? In this article, this issue was already prejudged by the descriptive definition for proper DPs adopted in (3), but a more thorough approach to proper names will need to tackle this question explicitly.

There are two main ways this project can be taken further: first, we have limited our purview to proper DPs denoting people and pets. A comprehensive analysis of the syntax of proper DPs should expand its scope to also include names of objects, titles, and possibly quotations themselves. Second, our remarks on the ‘quotational’ nature of Deix° have been rather cursory. A more in-depth study of the mechanisms for mentioning linguistic material is called-for.

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### Abbreviations

1–3	Person	M	Masculine
ACC	Accusative	PEJ	Pejorative
AUG	Augmentative	PL	Plural
CL	Critic	PTCP	Participle
DIM	Diminutive	SG	Singular
F	Feminine		

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### References

- Aboh, E. O. (2004). Topic and focus within D. *Linguistics in the Netherlands* 21:1, pp. 1–12.  
 Ackema, P. & A. Neeleman (2013). Subset controllers in agreement relations. *Morphology* 23:2, pp. 291–323,  
 URL <https://doi.org/10.1007/s11525-013-9218-4>.  
 Alexiadou, A., L. Haegeman & M. Stavrou (2007). *Noun Phrase in the Generative Perspective*. Mouton de Gruyter,  
 URL <https://doi.org/10.1515/9783110207491>.

- Bach, K. (1981). What's in a name. *Australasian Journal of Philosophy* 59:4, pp. 371–386, URL <https://doi.org/10.1080/00048408112340341>.
- Balaban, N., A. Belletti, N. Friedmann & L. Rizzi (2016). Disentangling principle C: A contribution from individuals with brain damage. *Lingua* 169, pp. 1–20, URL <https://doi.org/10.1016/j.lingua.2015.09.004>.
- Borer, H. (2005). *In Name Only. Structuring Sense, Volume 1*. Oxford University Press, Oxford.
- Bošković, Ž. (2005). On the locality of left branch extraction and the structure of NP. *Studia Linguistica* 59:1, pp. 1–45, URL <https://doi.org/10.1111/j.1467-9582.2005.00118.x>.
- Bošković, Ž. (2012). Phases in NPs and DPs. Gallego, A. J. (ed.), *Phases: Developing the Framework*, Mouton de Gruyter, Berlin, pp. 343–384.
- Carlson, G. N. (1977). *Reference to Kinds in English*. [PhD thesis]. University of Massachusetts.
- Chierchia, G. (1998). Reference to Kinds across Language. *Natural Language Semantics* 6:4, pp. 339–405, URL <https://doi.org/10.1023/a:1008324218506>.
- Chomsky, N. (2000). Minimalist inquiries: The framework. Martin, R., D. Michaels & J. Uriagereka (eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, MIT Press, Cambridge, MA, pp. 89–115.
- Cinque, G. (2005). Deriving Greenberg's universal 20 and its exceptions. *Linguistic Inquiry* 36:3, pp. 315–332.
- Cinque, G. (2010). *The Syntax of Adjectives: A Comparative Study*. MIT Press, Cambridge, MA.
- Cinque, G. (2015). Augmentative, pejorative, diminutive and endearing heads in the extended nominal projection. Di Domenico, E., C. Hamann & S. Matteini (eds.), *Structures, Strategies and Beyond: Studies in honour of Adriana Belletti*, John Benjamins, Amsterdam, pp. 67–82.
- Citko, B. (2014). *Phase Theory: An Introduction*. Cambridge University Press, Cambridge.
- Corbett, G. G. (2000). *Number*. Cambridge University Press, Cambridge, URL <https://doi.org/10.1017/cbo9781139164344>.
- Danon, G. (2011). Agreement and DP-internal feature distribution. *Syntax* 14:4, pp. 297–317, URL <https://doi.org/10.1111/j.1467-9612.2011.00154.x>.
- Davidson, D. (1979). Quotation. *Theory and Decision* 11:1, pp. 27–40, URL <https://doi.org/10.1007/bf00126690>.
- Dékány, E. (2011). *A Profile of the Hungarian DP. The Interaction of Lexicalization, Agreement and Linearization with the Functional Sequence*. [PhD thesis]. University of Tromsø, Tromsø.
- Gerstner-Link, C. & M. Krifka (1993). Genericity. Jacobs, J., A. von Stechow & D. Wunderlich (eds.), *Handbuch der Semantik*, Walter de Gruyter, Berlin, pp. 966–978.
- Geurts, B. (1997). Good news about the description theory of names. *Journal of Semantics* 14:4, pp. 319–348, URL <https://doi.org/10.1093/jos/14.4.319>.
- Giusti, G. (2002). The Functional Structure of Noun Phrases: A bare phrase structure approach. Cinque, G. (ed.), *Functional Structure in DP and IP: The Cartography of Syntactic Structures*, Oxford University Press, vol. 1, pp. 54–90.
- Haegeman, L. (2004). DP-periphery and clausal periphery: Possessor doubling in West Flemish. Adger, D., C. De Cat & G. Tsoulas (eds.), *Peripheries: Syntactic Edges and their Effects*, Kluwer Academic Publishers, Dordrecht, pp. 211–240, URL [https://doi.org/10.1007/1-4020-1910-6\\_9](https://doi.org/10.1007/1-4020-1910-6_9).
- Henderson, R. (2016). A demonstration-based account of (pluractional) ideophones. Moroney, M., C.-R. Little, J. Collard & D. Burgdorf (eds.), *Proceedings of SALT 26*, Linguistic Society of America, pp. 664–683, URL <https://doi.org/10.3765/salt.v26i0.3786>.
- Kneale, W. (1966). Modality *de dicto* and *de re*. *Studies in Logic and the Foundations of Mathematics* 44, pp. 622–633.
- Kramer, R. (2009). *Definite Markers, Phi-Features, and Agreement: A Morphosyntactic Investigation of the Amharic DP*. [PhD thesis]. University of California, Santa Cruz.
- Krifka, M. (1989). Nominal reference, temporal constitution and quantification in event semantics. Bartsch, R., J. van Benthem & P. van Emde Boas (eds.), *Semantics and Contextual Expression*, Mouton De Gruyter, Amsterdam, pp. 75–116, URL <https://doi.org/10.1515/9783110877335-005>.
- Krifka, M. (2003). Bare NPs: Kind-referring, indefinites, both, or neither? Young, R. B. & Y. Zhou (eds.), *Proceedings of SALT 13*, Linguistic Society of America, pp. 180–203, URL <https://doi.org/10.3765/salt.v13i0.2880>.
- Kripke, S. A. (1972). *Naming and Necessity*. Harvard University Press, Cambridge, MA, URL [https://doi.org/10.1007/978-94-010-2557-7\\_9](https://doi.org/10.1007/978-94-010-2557-7_9).
- Longobardi, G. (1994). Reference and proper names: A theory of N-movement in syntax and Logical Form. *Lin-*

- guistic Inquiry* 25:4, pp. 609–665, URL <http://www.jstor.org/stable/4178880>.
- Longobardi, G. (1996). *The syntax of N-raising: A minimalist theory*. OTS Working Papers, Research Institute for Language and Speech, University of Utrecht.
- Longobardi, G. (2001). How comparative is semantics? A unified parametric theory of bare nouns and proper names. *Natural Language Semantics* 9:4, pp. 335–369.
- Longobardi, G. & G. Sivestri (2013). The Structure of NPs: Some Insights on Case, Empty Categories, and Poverty of Stimulus. Luraghi, S. & C. Parodi (eds.), *The Bloomsbury Companion to Syntax*, Bloomsbury, London, pp. 88–117.
- Matushansky, O. (2006). Why Rose is the Rose: On the use of definite articles in proper names. *Empirical Issues in Syntax and Semantics* 6, pp. 285–307.
- Matushansky, O. (2008). On the linguistic complexity of proper names. *Linguistics and Philosophy* 31:5, pp. 573–627.
- Matushansky, O. (2013). Gender confusion. Cheng, L. & N. Corver (eds.), *Diagnosing Syntax*, Oxford University Press, Oxford, pp. 271–294, URL <https://doi.org/10.1093/acprof:oso/9780199602490.003.0013>.
- Matushansky, O. (2014). The other Francis Bacon: On non-bare proper names. *Erkenntnis* 80:2, pp. 335–362.
- Pelczar, M. & J. Rainsbury (1998). The Indexical Character of Names. *Synthese* 114:2, pp. 293–317, URL <https://doi.org/10.1023/a:1004992629004>.
- Quine, W. V. O. (1960). *Word and Object*. The MIT Press, Cambridge, MA.
- Quine, W. V. O. (1980). *From a logical point of view: Nine Logico-Philosophical Essays*. Harvard University Press, Cambridge, MA.
- Ramchand, G. (2018). *Situations and Syntactic Structures*. The MIT Press, Cambridge, MA.
- Recanati, F. (1997). *Direct Reference: From Language to Thought*. Blackwell, Oxford.
- Rizzi, L. (1990). *Relativized Minimality*. The MIT Press, Cambridge, MA.
- Rizzi, L. (2004). Locality and Left Periphery. Belletti, A. (ed.), *Structures and Beyond: The Cartography of Syntactic Structures*, Oxford University Press, Oxford, vol. 3, pp. 223–251.
- Rizzi, L. & G. Cinque (2016). Functional categories and syntactic theory. *Annual Review of Linguistics* 2:1, pp. 139–163, URL <https://doi.org/10.1146/annurev-linguistics-011415-040827>.
- Roehrs, D. (2010). Demonstrative-reinforcer constructions. *The Journal of Comparative Germanic Linguistics* 13:3, pp. 225–268, URL <https://doi.org/10.1007/s10828-010-9038-4>.
- Sauerland, U. (2003). A new semantics for number. Young, R. B. & Y. Zhou (eds.), *Proceedings of SALT 13*, Linguistic Society of America, pp. 258–275, URL <https://doi.org/10.3765/salt.v13i0.2898>.
- Sauerland, U. (2004). A comprehensive semantics for agreement. Ms., ZAS Berlin.
- Savoia, L. M., M. R. Manzini, B. Baldi & L. Franco (2017). A morpho-syntactic analysis of evaluatives in Italian. *Studi Italiani di Linguistica Teorica e Applicata* 46:3, pp. 413–440.
- Scott, J. (2002). Stacked adjectival modification and the structure of noun phrases. Cinque, G. (ed.), *Functional Structure in DP and IP: The Cartography of Syntactic Structures*, Oxford University Press, Oxford, pp. 91–122.
- Shlonsky, U. (2004). The form of semitic noun phrases. *Lingua* 114:12, pp. 1465–1526, URL <https://doi.org/10.1016/j.lingua.2003.09.019>.
- Steriopolo, O. & M. Wiltzschko (2010). Distributed GENDER Hypothesis. Zybatow, G. et al. (eds.), *Formal Studies in Slavic Linguistics: Proceedings of the Formal Description of Slavic Languages*, 7(5), Lang, New York, pp. 155–172.
- Svenonius, P. (2004). On the Edge. Adger, D., C. De Cat & G. Tsoulas (eds.), *Peripheries: Syntactic Edges and their Effects*, Kluwer Academic Publishers, Dordrecht, pp. 259–287, URL [https://doi.org/10.1007/1-4020-1910-6\\_11](https://doi.org/10.1007/1-4020-1910-6_11).
- Wechsler, S. & L. Zlatić (2000). A theory of agreement and its application to Serbo-Croatian. *Language* 76:4, pp. 799–832, URL <https://doi.org/10.2307/417200>.
- Wechsler, S. & L. Zlatić (2003). *The Many Faces of Agreement*. Center for the Study of Language and Information, Palo Alto, CA.
- Wilkinson, K. (1991). *Studies in the Semantics of Generic Noun Phrases*. [PhD thesis]. University of Massachusetts at Amherst.

# Aspect and verbalising morphology in Polish nominalisations

Arkadiusz Kwapiszewski

This paper investigates the contrast between Verbal and Deverbal Nominals in Polish. VNs encode aspectual distinctions and incorporate verbal suffixes, DNs do neither of those things. I argue that Voice and Asp are necessary for the emergence of event and argument structure in derived nominals (van Hout & Roeper 1998, Alexiadou 2009, Borer 2013). The aspectual ambiguity of DNs follows from the absence of the category-defining head *v*, which blocks telicity/quantity. To derive this result, I develop an analysis of Polish verb stems within Distributed Morphology (DM), involving fusion, the  $\neg$  specification (Siddiqi 2009) and PF crashing.

## 1. Introduction

There are two types of Argument Structure nominals (ASNs) in Polish: Verbal Nominals (VNs) and Deverbal Nominals (DNs) (Rozwadowska 2000).<sup>1</sup> Verbal Nominals preserve the formal distinction between perfective and imperfective aspect. This is evidenced by the fact that imperfective VNs can be modified by *for X time* to the exclusion of *in X time*, while perfective VNs display the opposite pattern, as shown in (1a) and (1b). In addition to that, VNs incorporate verbalising suffixes, which take the form of theme vowels in Slavic languages (Svenonius 2004a, Biskup 2019). In the case at hand, the verbalising suffix is realised as *-owa-*.

(1) *Verbal Nominals, ASN reading*

- a. prezent -owa -nie<sup>I</sup> tego systemu ??w / przez pół godziny  
present -TH -n this.GEN system.GEN in for half hour  
'the presenting of this system for half an hour'
- b. za- prezent -owa -nie<sup>P</sup> tego systemu w / \*przez pół godziny  
PFX- present -TH -n this.GEN system.GEN in for half hour

<sup>1</sup> These labels are taken from Puzynina (1969), who refers to VNs and DNs as *substantiva verba* and *substantiva deverba*, respectively.

'the presentation of this system in an hour'

Unlike Verbal Nominals, Deverbal Nominals are aspectually ambiguous. Depending on their context of use and the properties of the internal argument, DNs can be modified by either *in X time* or *for X time* adverbials. Another respect in which Deverbal Nominals differ from VNs is that DNs lack any verbalising morphology, as evidenced by the absence of *-owa-* in (2).

(2) *Deverbal Nominal, ASN reading*

prezent -acja tego systemu w / przez pół godziny  
 present -n this.GEN system.GEN in for half hour  
 'the presentation of this system in / for half an hour'

The ASN status of Verbal and Deverbal Nominals can be verified using the standard diagnostics for argument and event structure (Grimshaw 1990; Borer 2013). As shown in (3), VNs and DNs are compatible with aspectual modifiers, agentive *by*-phrases and control into purpose clauses. Furthermore, the presence of the internal argument is necessary for the ASN reading to emerge.

- (3) **za-** prezent -owa -nie<sup>P</sup> / prezent -acja \*( tegó systemu ) przez studentów w  
 PFX- present -TH -n present -n this.GEN system.GEN by students in  
 pół godziny, żeby zaimponować profesorowi  
 half hour in order to impress professor  
 'the presentation \*(of this system) by the students in half an hour in order to impress the professor'

Apart from the ASN reading, many VNs and DNs have Simple Event and Result readings as well (in the terminology of Grimshaw 1990). Following Borer (2013), I refer to all non-AS Nominals collectively as Referential Nominals (RNs). A minimal pair in which one and the same VN is interpreted as an ASN in one context and as an RN in another is given in (4) below.

(4) *Verbal Nominal, ASN vs. RN reading*

- a. czyt -a(j) -nie<sup>I</sup> tej książki przez Adama cały dzień, żeby...  
 read -v -n this.GEN book.GEN by Adam all day in order to  
 'The reading of this book by Adam all day in order to...'
- b. Pierwsze czyt -a(j) -nie (\*tej książki ) jest ze Starego Testamentu.  
 first read -v -n this.GEN book.GEN is from Old Testament  
 'The first reading (\*of this book) is from the Old Testament.'

The goal of this paper is to capture the similarities and differences between VNs and DNs in Polish. In particular, how should we analyse the aspectual ambiguity of DNs? The standard answer is that the structure of DNs does not include the aspectual layer AspP (cf. Schoorlemmer 1995, Rozwadowska 1997). More recently, however, Borer (2005, 2013) has argued that Argument Structure is licensed by verbal functional projections. This includes not only Voice ( $\approx E[\text{event}]$  in Borer's system), which hosts the external argument, but also Asp ( $\approx \text{Asp}_{Q[\text{quantity}]}$ ), which introduces the internal argument. If the link between the presence of Voice/Asp and Argument Structure is on the right track, then Asp must project not only in Verbal Nominals but also in Deverbal Nominals. But if Asp projects in DNs, then why are they aspectually ambiguous? I will argue that this ambiguity arises at Vocabulary Insertion: DNs are morphologically underspecified for Asp[Q/HOM] (where [Q] is event quantity and [HOM] is homogeneity).

The structure of this paper is as follows. In Section 2, I review the basic facts about Slavic aspect and Polish verb morphology, followed by a more in-depth discussion of Verbal and De-verbal Nominals. In Section 3, I turn to the internal structure of VNs and DNs, with particular emphasis on the categorising head *v* and the functional heads Voice and Asp. I argue that DNs contain Voice and Asp, but that they lack *v*, with the root categorised contextually by the verbal functional projections. The aspectual ambiguity of DNs is argued to follow from the absence of *v*, which blocks telicity/quantity in bare verbs and VNs. To derive this result, I develop an explicit account of the morphosyntax of verb stems in Polish within the framework of Distributed Morphology. The analysis is presented in Section 4 and extended to semelfactive and bi-aspectual verbs in Section 5. Finally, Section 6 concludes.

## 2. The Empirical Picture

### 2.1. Slavic Aspect

Depending on their performance in the standard aspectual diagnostics, Slavic verb stems can be classified as either perfective or imperfective (cf. Schoorlemmer 1995, Borik 2006, Łazorczyk 2010). Perfective stems denote delimited or completed events. Imperfective stems have a broader range of functions, encompassing atelic, stative, progressive, iterative, habitual and generic uses. As an illustration, consider the minimal pair below. While the bare imperfective in (5a) does not entail event culmination, the prefixed perfective in (5b) does.

#### (5) Bare Imperfective vs. Prefixed Perfective

- a. Adam pis -a -ł<sup>I</sup> wiersz (ale go nie skończył).  
Adam write -TH -PST poem but it NEG finished  
'Adam had been writing a poem (but he didn't finish it).'
- b. Adam na- pis -a -ł<sup>P</sup> wiersz (\*ale go nie skończył).  
Adam PFX- write -TH -PST poem but it NEG finished  
'Adam wrote this poem (\*but he didn't finish it).'

Most perfective verbs can be turned imperfective again through the addition of the secondary imperfective suffix *-aj* / *-ywa* (2IMP). Despite their morphological complexity, secondary imperfectives pattern with bare imperfectives in all aspectual tests. Just like the bare imperfective in (5a), the secondary imperfective in (6b) does not entail that the event culminated.

#### (6) Prefixed Perfective vs. Secondary Imperfective

- a. Adam prze- pis -a -ł<sup>P</sup> ten wiersz (\*ale go nie skończył)  
Adam PFX- write -TH -PST this poem but it NEG finished  
'Adam re-wrote this poem (\*but he didn't finish it)'
- b. Adam prze- pis -(a) -ywa -ł<sup>I</sup> ten wiersz (ale go nie skończył)  
Adam PFX- write -TH -2IMP -PST this poem but it NEG finished  
'Adam had been re-writing this poem (but he didn't finish it)'

There is some controversy concerning the aspectual function of Slavic prefixes and the 2IMP suffix: Are they markers of inner (situational) or outer (viewpoint) aspect? According to Borer (2005), Arsenijević (2006), Łazorczyk (2010) and Corre (2015), Slavic prefixes are markers of telicity/quantity. As for secondary imperfectives, I follow Łazorczyk (2010) in analysing the

2IMP suffix as a marker of atelicity/homogeneity. This is not to say that aspectual morphology has no effect at the level of outer aspect, only that this effect is indirect. Specifically, I propose that telicity/quantity maps onto Perfect viewpoint aspect, while atelicity/homogeneity is compatible with Perfect and Imperfect viewpoints alike.<sup>2</sup>

For the semantics of inner aspect, I adopt the mereological definitions of quantity and homogeneity from Borer (2005). An event predicate like *run* is cumulative because two events of running are also in the denotation of *run*. It is also divisive because any part of a running event is also in the denotation of *run*. In turn, the predicate *kick the ball into the net* is a quantity, since no proper part of such an event can also be described as kicking the ball into the net.

- (7)    a. Quantity: P is a quantity iff P is not homogeneous.
- b. P is homogeneous iff P is cumulative and divisive.
- (8)    a. P is cumulative iff  $\forall x[P(x) \wedge P(y) \rightarrow P(x \cup y)]$ .  
*P is cumulative iff for all x and y with property P, the union of x and y also has property P.*
- b. P is divisive iff  $\forall x[P(x) \rightarrow \exists y(P(y) \wedge y < x)] \wedge \forall x,y[P(x) \wedge P(y) \wedge y < x \rightarrow P(x-y)]$ .  
*P is divisive iff for all X with property P there is a proper part of x which also has property P, and for all x and y with property P if y is a proper part of x then the subtraction of y from x also has property P.*

By assumption, the distinction between quantity and homogeneity is encoded on a syntactic projection Asp[Q/HOM]. While the perfective verbs in (5b)/(6a) project Asp[Q] and entail culmination, the imperfective verbs in (5a)/(6b) are specified as Asp[HOM] and do not entail culmination.<sup>3</sup> In what follows, I will use (in)compatibility with *in X time* and *for X time* adverbials as a primary diagnostic for quantity/homogeneity in derived nominals.

## 2.2. A Brief Note on Verbal Morphology

The structure of Slavic verbs follows the template in (9) (Jakobson 1948, Svenonius 2004a).

- (9)    (**PREFIX**) - ROOT - THEME - (**2IMP**) - AGR

Roots do not appear as verbs in isolation. Instead, they must combine with one of the so-called ‘theme vowels’ first. The set of theme vowels in Polish includes *-a-*, *-aj-*, *-owa-*, *-i-*, *-e-*, *-ej-*, *-nq-* and *-Ø-* (cf. Laskowski 1975, Rubach 1984, Czaykowska-Higgins 1998). Theme vowels determine the conjugation class of the verb. They also condition the realisation of the secondary imperfective suffix in the following way: the themes *-a-*, *-aj-*, *-owa-* and *-e-* select for the 2IMP suffix *-ywa*, while *-i-*, *-nq-* and *-Ø-* select for *-aj*.<sup>4</sup> Note that the 2IMP suffix *-aj* is homophonous with the theme vowel *-aj-*.

With this background in place, we can proceed to the main topic of this paper, which is

<sup>2</sup> For an in-depth discussion of the interaction between inner and outer aspect in Polish, the reader is referred to Łazorczyk (2010). See also Bohnemeyer & Swift (2004) for a related approach in terms event realisation.

<sup>3</sup> This is a departure from Borer (2005), who assumes that only quantity is syntactically represented and that homogeneity is the default interpretation.

<sup>4</sup> The unaccusative theme vowel *-ej-* does not derive secondary imperfectives. The reasons for this are outside the scope of this paper, but see Jabłońska (2007) for some discussion.

language-internal variation in the structure of derived nominals. The exposition starts with Verbal Nominals in Section 2.3, and then proceeds to Deverbal Nominals in Section 2.4.

### 2.3. Verbal Nominals

The derivation of Verbal Nominals by means of the suffix *-nie/-cie*<sup>5</sup> is fully productive. Almost any verb can be nominalised in this way. What is more, VNs inherit the aspectual value of the verb stem from which they are derived: bare VNs are atelic/homogenous (10a), while prefixed VNs are telic/quantity (10b) (the examples are adapted from Rozwadowska 2000:248). The aspectual value of these nominals can be diagnosed by their (in)compatibility with *in X time* and *for X time* adverbials. Generally speaking, quantity VNs are incompatible with *for X time*, while homogeneous VNs reject modification by *in X time* on a single-event episodic reading.<sup>6</sup>

(10) *Bare Imperfective vs. Prefixed Perfective VN*

- a. prezent -owa -nie<sup>I</sup> systemu przez studentów przez dwie godziny / \*w dwie present -TH -n system.GEN by students for two hours in two godziny (spowodowało skrócenie następnego wykładu)  
hours caused shortening next.GEN lecture.GEN  
'the presenting of the system by the students for 2 hours (caused the shortening of the next lecture)'
- b. za- prezent -owa -nie<sup>P</sup> systemu przez studentów w dwie godziny / \*przez PFX- present -TH -n system.GEN by students in two hours for dwie godziny (potwierdziło ich umiejętności).  
two hours confirmed their skills  
'the presentation of the system by the students in 2 hours (confirmed their skills)'

(11) *Prefixed Perfective vs. Secondary Imperfective VN*

- a. po- praw -ie -nie<sup>P</sup> tych błędów przez redaktora w dziesięć PFX- correct -TH -n these.GEN mistakes.GEN by editor in ten minut / \*przez dziesięć minut (zaimponowało Adamowi)  
minutes for ten minutes impressed Adam  
'the correction of these mistakes by the editor in ten minutes (impressed Adam)'
- b. po- praw -i -a(j) -nie<sup>I</sup> tych błędów przez redaktora przez PFX- correct -TH -2IMP -n these.GEN mistakes.GEN by editor for dziesięć minut / \*w dziesięć minut (zanudziło mnie na śmierć)  
ten minutes in twenty minutes bored me to death  
'the correcting of these mistakes by the editor for ten minutes (bored me to death)'

Homogeneous VNs resemble ING nominals in English with respect to their aspectual behaviour. This is evident from the English translation of (11b), which is incompatible with *in ten minutes*. Another similarity concerns *by frequent* and *constant* in the singular, which is possible with homogeneous VNs (12a) but impossible with quantity VNs (12b). The judgements flip in the presence of the punctual adjective *instant*, which is degraded on a single-event reading of (12a).

<sup>5</sup> The alternation between *-nie* and *-cie* is phonologically conditioned.

<sup>6</sup> For ease of exposition, I give the orthographic spelling of the nominals in (11), glossing over certain vowel deletion and palatalisation facts.

The English translation shows that ING nominals again pattern with homogeneous VNs.

- (12) a. częste / ciągłe / ??natychmiastowe wit -a(j) -nie<sup>I</sup> gości przez Jana  
           frequent constant instant       greet -TH -n    guests.GEN by John  
           ‘the frequent / constant / ??instant greeting of (the) guests by John’  
   b. \*częste / \*ciągłe / natychmiastowe po- wit -a(j) -nie<sup>P</sup> gości przez  
           frequent constant instant       PFX- greet -TH -n    guests.GEN by  
           Jana  
           John

Borer (2013:162-167) argues that the nominaliser *-ing* enforces a homogeneous reading by blocking the emergence of telicity/quantity. In this way, ING nominals contrast with ‘-ation and kin’ (ATK) nominals derived by means of such suffixes such as *-ation*, *-ment*, *-al* and *-ance/-ence*. Unlike ING nominals, ATK nominals are compatible with telicity/quantity (13a)-(13b).

- (13) a. Kim’s (\*gradual) formulating of several procedures for the past few weeks / \*in a few weeks / ??twice.  
   b. Kim’s (gradual) formulation of several procedures twice / in two weeks.

The parallel behaviour of homogeneous VNs and ING nominals suggests that these constructions have the same aspectual value. I identify this value with the homogenous feature [HOM] hosted on the inner aspectual head Asp (cf. van Hout & Roeper 1998, Alexiadou et al. 2010).

#### 2.4. Deverbal Nominals

In contrast to Verbal Nominals, the formation of Deverbal Nominals is not productive in Polish. DNs incorporate a wide variety of root-dependent suffixes, including *-acja*, *-aż*, *-ek*, *-unek* and *-∅*. Most importantly, DNs are aspectually ambiguous. The aspectual properties of DNs resemble those of ATK nominals in English, which are often ambiguous between telic and atelic readings (see especially Borer 2013). In many cases, an ATK nominal may denote either a single completed event (modifiable by *in X time*) or an unbounded activity (modifiable by *for X time*), as illustrated in (14a). Note that ATK nominals are also compatible with iterative and habitual readings when modified by the adjectives *frequent* and *regular* (14b).

- (14) a. the examination of this patient by the doctor in / for ten minutes  
   b. the frequent / regular examination of this patient by the doctor

Returning to Polish, we see that bare unprefixed DNs are ambiguous between atelic/homogenous (15a) and telic/quantity (15b) readings (adapted from Rozwadowska 2000:242). This sets DNs apart from both verbs and VNs, which are almost always homogeneous in the absence of a prefix. Another thing to point out is that the theme vowel *-owa-* found in the verb *prezent-owa-ć<sup>I</sup>* and the VN *prezent-owa-nie<sup>I</sup>* is missing from the DN *prezent-acja*.

- (15) a. Prezent -acja systemu przez studentów przez dwie godziny spowodowała  
           present -n    system.GEN by students for two hours caused  
           skrócenie następnego wykładu.  
           shortening next.GEN lecture.GEN

- 'The presentation of the system by the students for two hours caused the shortening of the next lecture.'
- b. Prezent -acja całego systemu przez studentów w pół godziny  
 present -n whole.GEN system.GEN by students in half hour  
 umożliwiła sprawne przeprowadzenie seminarium.  
 enabled efficient conducting seminar.GEN  
 'The presentation of the whole system by the students in half an hour made it possible to conduct the seminar efficiently.'

Turning to prefixed DNs, we find the same pattern. Prefixed DNs are ambiguous between telic/quantity (16a) and atelic/homogeneous (16b) readings. This is so even though the corresponding prefixed verbs and VNs are telic/quantity (cf. *po-praw-i-c<sup>P</sup>* 'to correct'). Neither is it possible to attach the 2IMP suffix to a prefixed DN (cf. \**po-praw-aj-a*). The lack of palatalisation on the root indicates that the theme vowel *-i-* is also missing from this nominal. Finally, *po-praw-a* is a Ø-derived nominal, as the suffix *-a* is a portmanteau marker of nominative case, feminine gender and singular number rather than a nominalising suffix.<sup>7</sup>

- (16) a. **Po-** praw -a tych błędów przez redaktora w dziesięć minut  
 PFX- correct -FEM these.GEN mistakes.GEN by editor in ten minutes  
 zaimponowała Adamowi.  
 impressed Adam  
 'The correction of these mistakes by the editor in ten minutes impressed Adam.'
- b. **Po-** praw -a tych błędów przez redaktora przez dziesięć  
 PFX- correct -FEM these.GEN mistakes.GEN by editor for ten  
 minut zanudziła mnie na śmierć.  
 minutes bored me to death  
 'The correction of these mistakes by the editor for ten minutes bored me to death.'

The aspectual ambiguity of DNs is confirmed by the adjectival modification test in (17). Polish DNs and English ATK Nominals are compatible with durative and punctual modifiers alike.

- (17) a. częsty / ciągły / natychmiastowy ład -unek walizek do samochodu  
 frequent constant instant load -N suitcases.GEN to car  
 przez Patryka  
 by Patrick  
 cf. 'the frequent / constant / ??instant loading of suitcases into the car by Patrick'
- b. częsta / ciągła / natychmiastowa **o-** bron -a stolicy przez  
 frequent constant instant PFX- defend -FEM capital.GEN by  
 armię  
 army  
 'the frequent / constant / instant protection of the capital by the army'

As already mentioned, Argument Structure DNs are much less common than Argument Structure VNs. The only domain in which DN formation is more or less productive involves *-acja*

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<sup>7</sup> This also applies to the *-a* at the end of *prezent-acja* in (15). That is, the form of the nominalising suffix is actually *-acj-*, followed by the nominative/feminine/singular suffix *-a*. In what follows, I abstract away from this complication and refer to the nominaliser *-acja* as a single unanalysed whole.

nominals, which are modelled on *-ation* nominals borrowed from English, Latin and French (18a). Since most foreign loanwards in Polish combine with the theme marker *-owa-*, DNs derived from *-owa-* roots tend to be borrowings as well, with (18b) containing several loans from German and (18c) from English and French. Setting *-owa-* roots aside, we are left with a rather idiosyncratic set of native items, some of which are listed in (18d) and (18e). The important thing is that all of the forms in (18) are ambiguous between RN and ASN readings, and that the ASN readings are themselves ambiguous between telic/quantity and atelic/homogeneous aspect. This remains the case regardless of whether the nominal is prefixed or not.

- (18)    a. *-owa-* roots with *-acja*  
*prezent-acja* ‘presentation’, *nacjonaliz-acja* ‘nationalisation’, *polaryz-acja* ‘polarisation’, *transform-acja* ‘transformation’, *integr-acja* ‘integration’
- b. *-owa-* roots with *-unek*  
*pak-unek* ‘packing’, *ład-unek* ‘loading’, *werp-unek* ‘recruitment’, *rat-unek* ‘rescue’, *meld-unek* ‘reporting’, *o-patr-unek* ‘dressing’, *po-cał-unek* ‘kiss’
- c. *-owa-* roots with  $\emptyset$   
*ofert-a* ‘offer’, *barykad-a* ‘barricade’, *eskort-a* ‘escort’, *szarż-a* ‘charge’, *analiza* ‘analysis’, *mord* ‘murder’, *paraliz* ‘paralysis’, *angaż* ‘engagement’, *opieka* ‘care’
- d. *-i-* roots with  $\emptyset$   
*od-now-a* ‘renewal’, *wy-mow-a* ‘pronouncement’, *wy-płat-a* ‘payment’, *o-brona* ‘defence’, *ob-sług-a* ‘service’, *z-drad-a* ‘betrayal’, *o-słon-a* ‘shielding’, *przemian-a* ‘transformation’, *prze-szczep* ‘transplant’, *o-brót* ‘rotation’, *prze-chwyty* ‘interception’, *prze-wóz* ‘transport’, *za-kup* ‘purchase’, *roz-dział* ‘distribution’
- e. *-i-, -a-, -aj-* and  $\emptyset$ - roots with *-(e)k*  
*prze-rób-k-a* ‘alteration’, *wy-sył-k-a* ‘dispatch’, *pod-wyz-k-a* ‘increase’, *ob-niz-k-a* ‘decrease’, *u-ciecz-k-a* ‘escape’, *s-pad-ek* ‘fall’, *po-chów-ek* ‘burial’

## 2.5. Interim Summary

The contrasting properties of VNs and DNs are summarised in Table 1. I have divided these properties into three clusters. The first four properties A-D demonstrate that both VNs and DNs are capable of licensing Argument Structure and event modifiers (Grimshaw 1990).

This section has focused mainly on properties E-G, which distinguish between VNs and DNs. Recall that while VNs encode aspectual distinctions and incorporate verbal suffixes, DNs do neither of those things. Capturing this variation is the primary goal of this paper.

Finally, properties H-L have not been addressed yet. Concerning H and I, the judgements go in different directions. While some native speakers find adverbs and accusative time phrases degraded in DNs (19), others accept them (the present author included). A similar state of affairs holds in English. Fu et al. (2001:549) report that the adverb in (20) is grammatical, but many speakers find it less than fully acceptable. As for reflexive clitics (J), superlexical prefixes (K) and negative particles (L), I postpone their discussion until Section 5.

- (19)    **o-** bron -a stolicy przez armię ?bardzo szybko / ?dwie godziny  
PFX- defend -FEM capital.GEN by army very quickly two.ACC hours.ACC  
‘the protection of the capital by the army very quickly / for two hours’

	VNs	DNs
A. internal arguments	✓	✓
B. agentive <i>by</i> -phrases	✓	✓
C. implicit argument control	✓	✓
D. aspectual modifiers <i>for X time / in X time</i>	✓	✓
E. aspectual distinctions	✓	✗
F. secondary imperfective suffix	✓	✗
G. theme marker	✓	✗
H. adverbial modification	✓	?
I. accusative temporal phrases	✓	?
J. reflexive clitic	✓	✗
K. superlexical prefixes	✓	✗
L. negative particle	✓	✗

Table 1: The Properties of Verbal and Deverbal Nominals in Polish (partly based on Schoorlemmer 1995 and Rozwadowska 1997, 2000)

(20) Kim's explanation of the problem to the tenant ?thoroughly (did not prevent the riot)

In the next section, I turn to the syntactic structure of VNs and DNs with the aim of capturing their contrasting properties. I will focus on the following questions: Why are DNs aspectually ambiguous? What is the function of verbalising morphology? What is the minimal structure required for the emergence of the ASN reading?

### 3. The Structure of Verbal and Deverbal Nominals

Polish Verbal Nominals have received plenty of attention in the literature on the syntax and semantics of nominalisations (e.g. Puzynina 1969, Schoorlemmer 1995, Rozwadowska 1997, 2000, Alexiadou et al. 2010, Bloch-Trojnar 2017). According to the standard analysis, the internal structure of VNs consists of a nominalising head *n* attaching on top of the AspP layer, as illustrated in (21). This proposal straightforwardly captures the fact that VNs are specified for aspect. It also predicts the appearance of the secondary imperfective suffix in this construction: *-ajl-ywa* are exponents of Asp[HOM] in the context of a VP-internal prefix.

(21) *Verbal Nominals: Asp-over-VP/vP analysis*

- a. [<sub>nP</sub> *n* [<sub>AspP</sub> Asp[Q/HOM] [<sub>VP</sub> *V* (PFX) ]]]]
- b. [<sub>nP</sub> *n* [<sub>AspP</sub> Asp[Q/HOM] [<sub>vP</sub> *v* [<sub>✓P</sub> ✓ (PFX) ]]]]]

The difference between (21a) and (21b) concerns the status of the traditional VP. (21a) presupposes that verb stems enter syntax specified for a lexical category. (21b), in turn, assumes the existence of category-less roots, which become categorised in the course of syntactic derivation. In this system, the category-defining head *v* merges with the root to derive a verb. Syntactic categorisation is one of the main tenets of Distributed Morphology (Marantz 1997, 2007).

By generating verb stems in narrow syntax, we eliminate the need for a pre-syntactic com-

ponent of word formation. This makes for a more parsimonious model of the grammar, with syntax as the only locus of combinatorial operations. All we need to assume is that theme vowels realise the categorising head *v*, in accordance with the proposals in Svenonius (2004a), Jabłońska (2007), Caha & Ziková (2016) and Biskup (2019). Support for this analysis comes from the fact that theme vowels are restricted to verbs and deverbal formations, while missing from nouns derived from the same root (22)-(23). Moreover, some theme vowels give rise to argument structure effects by participating in the causative/inchoative alternation (24)-(25).<sup>8</sup>

- |      |  |      |   |
|------|--|------|---|
| (22) | a. pis -a -ć <sup>I</sup><br>write -v -INF<br>'to write'                       | (23) | a. kos -i -ć <sup>I</sup><br>mow -v -INF<br>'to mow'                              |
|      | b. pis -mo<br>write -n<br>'a document'   |      | b. kos -a<br>write -FEM<br>'a scythe'   |
| (24) | a. gas -i -ć <sup>I</sup><br>extinguish -v -INF<br>'to put out' (causative)    | (25) | a. czern -i -ć <sup>I</sup><br>black -v -INF<br>'to make black' (causative)       |
|      | b. gas -na -ć <sup>I</sup><br>extinguish -v -INF<br>'to go out' (unaccusative) |      | b. czerni -e(j) -ć <sup>I</sup><br>black -v -INF<br>'to get black' (unaccusative) |

Assuming that VNs should be analysed as in (21b), what is the proper analysis of DNs? It seems natural to suggest that the structure of DNs should be a subset of that of VNs. But which subset? Let us begin by considering the minimal structure in (26), with the nominaliser attaching directly to the root. Is this analysis sufficient for Argument Structure DNs?

- (26) *Deverbal Nominals: n-over-root analysis*  
 $[_{nP} \; n \; [\sqrt{P} \; \checkmark \; (PFX) \; ]]$

There are good reasons to think that the analysis in (26) is too minimal. It presupposes that Argument Structure and aspectual modification are available in the absence of any verbal projections. As such, it fails to capture the well-known generalisation that ASNs inherit their properties from a verbal source. Event-denoting nominals such as *trip* or *lesson* do not license Argument Structure, as evidenced by the ungrammaticality of *\*the trip of the children to France by the teacher in two days*. This is related to the fact that *trip* and *lesson* are not attested as verbs with the same meaning, cf. *#The children tripped to France*. The same state of affairs holds in Polish, as illustrated in (27). The observation that ASNs are systematically derived from verbs militates against the *n-over-root* analysis in (26). See also Borer (2001), Fu et al. (2001) and Alexiadou (2009) for the claim that ASNs are syntactically derived from a verbal source.

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<sup>8</sup> The fact that the causative/inchoative alternation involves a change in the theme vowel does not necessarily entail that *v* is responsible for licensing Argument Structure. In fact, I will go on to claim that the only function of *v* is to categorise the root, and that Argument Structure is licensed by higher functional projections Voice and Asp. From this perspective, the data in (24)-(25) can be captured by saying that the unaccusative themes *-na-* and *-ej-* are inserted into *v* only in the absence of Voice. Assuming fusion to be the default option, this restriction can be implemented by specifying the Vocabulary Items associated with *-na-* and *-ej-* for the negative feature  $[\neg \text{Voice}]$ . See Section 4 and Siddiqi (2009) for more details. I thank the anonymous reviewer for raising this issue.

- (27) \*wycieczka tych dzieci do Francji przez nauczyciela w dwa dni  
 trip these.GEN children.GEN to France by teacher in two days

Next, consider the structure in (28), where *v* is present but Asp is missing. This is probably the most intuitive approach to the VN/DN distinction. It reflects the widespread idea that nominalisers may attach at different heights in the verbal functional sequence (e.g. Alexiadou 2017). If *n* attaches higher up, the nominal inherits more verbal properties; if it attaches lower down, some of the verbal projections are ‘cut off’, with corresponding effects on the syntax and semantics of the nominalisation. Thus, according to (28), both VNs and DNs have a verbal source, but only VNs incorporate the Asp layer, which explains why they are specified for aspect. In the literature, the *n*-over-VP analysis of Polish DNs is tentatively suggested in Rozwadowska (1997). Schoorlemmer (1995) assigns a similar structure to Deverbal Nominals in Russian, which are claimed to be aspectually ambiguous (see also Pazelskaya & Tatevosov 2006, Tatevosov 2011).

- (28) *Deverbal Nominals, n-over-vP analysis*  
 $[_{nP} \ n \ [_{vP} \ v \ [_{\sqrt{P}} \ \checkmark \ (PFX) \ ]]]$

However, there are two problems with the analysis in (28). Firstly, the absence of Asp does not account for the absence of theme vowels in Polish DNs. Recall that the DNs *prezent-acja* ‘presentation’ and *po-praw-a* ‘correction’ lack theme vowels, while the corresponding VNs *prezent-owa-nie*<sup>1</sup> ‘presenting’ and *po-praw-i-a(j)-nie*<sup>1</sup> ‘correcting’ include the themes *-owa-* and *-i-*, respectively. Recall also that theme vowels are analysed as exponents of *v* in Svenonius (2004a), Jabłońska (2007), Caha & Ziková (2016) and Biskup (2019). Supposing that VNs and DNs both contain *v*, it is not clear why theme vowels should be present only in VNs.

The second argument against (28) comes from Referential VNs. Recall that derived nominals are often ambiguous between Referential and Argument Structure interpretations. This is illustrated for bare VNs in (29) (repeated from (4)) and for prefixed VNs in (30). In each pair of examples, the ASN reading is presented first, followed by the RN reading of the same nominal.<sup>9</sup>

- (29) a. czyt -a(j) -nie<sup>1</sup> tej książki przez Adama cały dzień, żeby...  
 read -v -n this.GEN book.GEN by Adam all day in order to  
 ‘The reading of this book by Adam all day in order to...’  
 b. Pierwsze czyt -a(j) -nie (\*tej książki ) jest ze Starego Testamentu.  
 first read -v -n this.GEN book.GEN is from Old Testament  
 ‘The first reading (\*of this book) is from the Old Testament.’
- (30) a. **roz-** wiąz -a -nie<sup>P</sup> tej sprawy przez detektywa w tydzień, żeby...  
 apart- tie -v -n this.GEN case.GEN by detective in week in order to  
 ‘The solving of this case by the detective...’ (telic/quantity)  
 b. Ta zagadka ma dwa **roz-** wiąz -a -nia (\*tej sprawy ).  
 This puzzle has two apart- tie -v -n.PL this.GEN case.GEN  
 ‘This puzzle has two solutions (\*of this case).’

Examples of this sort give rise to the following question: Do VNs retain the Asp layer when used as Referential Nominals? In other words: Does the *n*-over-AspP analysis sketched out in

<sup>9</sup> Secondary imperfective VNs are an exception to this generalisation: they only have AS readings to the exclusion of RN ones. On the assumption that the 2IMP suffix *-aj/-ywa* realises Asp[HOM], the presence of Asp[HOM] appears to be sufficient for the emergence of argument and event structure.

(21b) extend to the RN contexts? I suggest that the answer to this question is negative. There is no evidence for aspect in RNs. The nominals *czytanie* ‘reading’ in (29b) and *roz-wiąz-a-nie* ‘solution’ in (30b) do not even denote events, let alone allow aspectual modifiers or license quantity/homogeneity. At the same time, these RNs are formally identical to their ASN instantiations, which means that they incorporate verbalising suffixes. Drawing these two facts together, I conclude that Referential VNs should be assigned the following structure.

(31) *Referential VNs, n-over-vP analysis*

- [<sub>nP</sub> *n* [<sub>vP</sub> *v* [<sub>✓P</sub> ✓ (PFX) ]]]

The existence of Referential VNs entails that *v* is not sufficient for the emergence of Argument Structure. Similar conclusions have been drawn for English, Greek (Alexiadou 2009) and Hebrew (Borer 2013). The relevant examples in English include *dramat-is(e)-ation* and *verb-al-is(e)-ation*, which are ambiguous between RN and ASN readings, and where *-ise* is an exponent of the category-defining head *v* (cf. Harley 2009).

We now face the following problem: the structures assigned to DNs on their ASN reading (28) and to VNs on their RN reading (31) are identical. In both cases, *n* merges with the verbalising head *v* to the exclusion of any other functional projections. Is this a viable result?

To salvage this analysis, we could claim that the *n*-over-*vP* structure in (28)/(31) is ambiguous between ASN and RN readings. Perhaps there are different ‘flavours’ of *v*, an eventive and a non-eventive one. Or perhaps the Argument Structure associated with *v* and the root can be suppressed, giving rise to the RN reading (as in Harley 2009, but see Alexiadou 2009 for a rebuttal). A challenge for this approach is to explain the contrast between derived nominals and verbal clauses with respect to the optionality of Argument Structure and event entailments. Why is Argument Structure optional in derived nominals but obligatory in clausal contexts?

The alternative is to assume that ASN properties are inherited from functional projections other than *v*, such as Voice and Asp. On this view, the source of the ASN/RN ambiguity is structural: ASNs include the verbal extended projection while RNs do not. Compare the representation of Referential VNs (32a) with that of Argument Structure VNs (32b).

(32) *Referential VNs vs. Argument Structure VNs*

- a. [<sub>nP</sub> *n* [<sub>vP</sub> *v* [<sub>✓P</sub> ✓ (PFX) ]]]
- b. [<sub>nP</sub> *n* [<sub>VoiceP</sub> Voice [<sub>AspP</sub> Asp [<sub>vP</sub> *v* [<sub>✓P</sub> ✓ (PFX) ]]]]]]

By hypothesis, the projection of Voice in (32b) is responsible for licensing agentive *by*-phrases, implicit argument control and agent-related modifiers such as *intentional* and *deliberate* (cf. Roeper 1987, Kratzer 1993, Alexiadou 2009). The projection of Asp, in turn, is responsible for licensing telicity/quantity. The idea that telicity/quantity is linked to a low functional head in an articulated VP structure goes back to van Hout (1998), Kratzer (2004), Borer (2005), MacDonald (2008) and Travis (2010), among others. On this view, the internal argument (re-)merges in the specifier position of AspP, where it checks the [telic]/[Q] feature and receives structural case. This goes some way towards explaining why internal arguments are either missing or optional in RNs (33a) while being obligatory in ASNs (33b): the internal argument is required to license the projection of Asp in the latter case.

- (33) a. a critically-acclaimed dramatisation (of this novel) (\*in half a year) (\*in order to)  
       b. the dramatisation \*(of this novel) by the BBC in half a year in order to...

The hypothesis that Voice is necessary for the emergence of the ASN reading is defended in Alexiadou (2009). The view that Voice and Asp are both necessary, at least in the case of telic/quantity ASNs, has been expressed in van Hout & Roeper (1998), Alexiadou & Schäfer (2010) and Roy & Soare (2013), and argued at length in Borer (2013). In Borer's (2005, 2013) exo-skeletal model, the projections corresponding to Voice and Asp are E (for Event) and Asp<sub>Q</sub> (for quantity-Aspect), respectively. While E closes off the Davidsonian event variable and hosts the external argument, Asp<sub>Q</sub> gives rise to telicity/quantity. Internal arguments merge in Asp<sub>Q</sub>P in telic structures and in a 'functional shell' projection F<sup>s</sup> in atelic ones.

The account put forward in this paper is consistent with the ideas in Borer (2013). Transposing her structures onto mine, ATK nominals (34a) receive the analysis in (35a), while ING nominals (34b) are assigned the structure in (35b). The only difference between the two constructions concerns the value of aspect: ATK nominals are ambiguous between telic/quantity and atelic/homogeneous readings (subject to the licensing of [Q] by a quantity internal argument), while the nominaliser *-ing* is argued to block the emergence of telicity/quantity.

- (34)    a. *the examination of the patient by the doctor in / for ten minutes*  
           b. *the constant examining of the patient by the doctor \*in / for two hours*
- (35)    a.  $[_{nP} n \quad [\text{VoiceP} \text{ Voice } [\text{AspP DP } [\text{Asp'} \text{ Asp}[Q/\text{HOM}] \quad [\checkmark = V ]]]]$   
           b.  $[_{nP} n_{\text{ing}} \quad [\text{VoiceP} \text{ Voice } [\text{AspP DP } [\text{Asp'} \text{ Asp}[^*Q/\text{HOM}] \quad [\checkmark = V ]]]]$

An important feature of Borer's system is contextual categorisation. Rather than being verbalised by *v*, the root can be categorised contextually the verbal extended projection. I represent the output of this process as  $\checkmark = V$ . This means that verbalising heads can be absent from AS Nominals, as long as the functional projections Voice and Asp are present. Arguments in favour of contextual categorisation and against the existence of (productive) zero categorisers in English are presented in Borer (2013, 2014). For the purposes of this paper, I will simply assume that roots can be categorised in one of two ways: structurally, by merging with a verbalising head *v*, or contextually, by merging with the verbal extended projection.<sup>10</sup>

In light of this, I propose that the main difference between VNs and DNs in Polish concerns the manner of categorising the root. Compare the structure of VNs in (32b)/(36a) with the structure of DNs in (36b). In the former case, the root is categorised structurally by the presence of a verbalising head *v*, as is standard in Distributed Morphology. In the latter case, the root undergoes contextual categorisation by Voice and Asp. This approach is consistent with the presence of theme vowels in VNs (realising *v*) and their absence from DNs.<sup>11</sup>

<sup>10</sup> This is a simplification of Borer's (2013; 2014) ideas. In Borer's exo-skeletal model, roots are always categorised contextually, either by the extended functional projection or by a C-functor (roughly, a piece of derivational morphology). To give an example, C-functors like *-ation* and *-ing* project nominal structure while categorising the root as a verb. Other C-functors, such as *-ise* and *-ify*, project verbal structure while categorising the root as a noun or an adjective. This differs from Distributed Morphology, where roots themselves remain category-neutral even after merging with *v*, *n* or *a*. Since these details are orthogonal to my account, I do not explore them further here.

<sup>11</sup> This analysis raises the following question: if contextual categorisation is possible, then why is the presence of *v* obligatory in Polish verbs and VNs? I regard the obligatoriness of *v* as a property of roots in Slavic, which are morphologically 'bound'. Just as Hebrew roots never surface in isolation, Slavic roots may never appear as verbs without the accompanying theme vowel (which may exceptionally be realised as  $\emptyset$ ).

This gives rise to another question: Why is *v* allowed to be missing in DNs? Suppose that Polish roots carry a morphological feature which requires them to interact with a categorising head (either *v* or *n*) at Vocabulary Insertion. In the case of verbs and VNs, this requirement is satisfied by *v*: roots interact with *v* by conditioning the insertion of theme vowels into the verbalising head. In the case of DNs, the interaction requirement is satisfied by

(36) *Verbal Nominals vs. Deverbal Nominals*

- a. [<sub>nP</sub> *n* [<sub>VoiceP</sub> Voice [<sub>AspP</sub> DP [<sub>Asp'</sub> Asp[Q/HOM] [<sub>vP</sub> *v* [<sub>VP</sub> ✓ √ (PFX) ]]]]]]
- b. [<sub>nP</sub> *n* [<sub>VoiceP</sub> Voice [<sub>AspP</sub> DP [<sub>Asp'</sub> Asp[Q/HOM] [<sub>VP</sub> ✓ = V (PFX) ]]]]]]

The analysis in (36) departs from the original proposals in Schoorlemmer (1995) and Rozwadowska (1997, 2000) in a number of ways. Firstly, by decomposing the traditional VP into Voice, Asp, *v* and the root, we have reduced the ASN/RN alternation to structural ambiguity: Argument Structure Nominals contain Voice and Asp, Referential Nominals do not. Secondly, by severing *v* from Argument Structure and event entailments, we allow for the presence of verbalising suffixes in Referential VNs. Thirdly, by distinguishing between structural and contextual categorisation, we account for the lack of verbalising morphology in DNs.

What about the aspectual ambiguity of DNs? The standard assumption is that DNs are aspectually ambiguous because they lack the AspP layer, so that the source of the ambiguity is syntactic. However, I have argued that the projection of Asp is necessary for the emergence of the ASN reading, since Asp introduces the internal argument and licenses aspectual modifiers. This conclusion calls for an alternative account, which I present in the next section. The basic idea is that both VNs and DNs are syntactically specified as either [Q] or [HOM]. However, only in the former case is this distinction realised morphologically. DNs are underspecified for Asp[Q/HOM] at Vocabulary Insertion, which leaves these forms ambiguous on the surface.

In order to make this analysis work, we need to put the traditional view of aspectual prefixes and suffixes on its head. Why are bare stems atelic/homogenous? How do prefixes license telicity/quantity? I propose that, by default, theme vowels filter out [Q] structures at PF. In the absence of *v*, [Q] becomes available again, which is why DNs are aspectually ambiguous.

#### 4. *The Morphosyntax of Polish Verb Stems*

Consider the aspectual paradigm in Polish. With a few exceptions, bare stems are atelic/homogeneous (37a)/(38a) while prefixed stems are telic/quantity (37b)/(38b). Following the analysis in Łazarczyk (2010), I assume that 2IMP stems are atelic/homogenous (37c)/(38c).

- |      |   |      |   |
|------|---|------|---|
| (37) | a. bud -owa -ć <sup>I</sup><br>build -TH -INF<br>'to build'                               | (38) | a. rob -i -ć <sup>I</sup><br>make -TH -INF<br>'to do, make'                                     |
| b.   | <b>roz-</b> bud -owa -ć <sup>P</sup><br>apart- build -TH -INF<br>'to extend'              | b.   | <b>prze-</b> rob -i -ć <sup>P</sup><br>over- make -TH -INF<br>'to alter, make over'             |
| c.   | <b>roz-</b> bud -ow(a) -ywa -ć <sup>I</sup><br>apart- build -TH -2IMP -INF<br>'to extend' | c.   | <b>prze-</b> rab -i -a(j) -ć <sup>I</sup><br>over- make -TH -2IMP -INF<br>'to alter, make over' |

How do prefixes license telicity/quantity? One prominent hypothesis is that Slavic prefixes license the projection of Asp[Q] in the syntax (especially Borer 2005, Łazarczyk 2010; but see

*n*: the root conditions the insertion of *-acja*, *-unek*, *-aż*, *-(e)k* and  $\emptyset$  into the nominalising head. Crucially, *v* must be absent in order for *n* to interact with the root; otherwise, the relationship between *n* and the root would not be sufficiently local. Finally, the fully productive nominaliser *-niel-cie* is not root-conditioned. This means that the *v* head cannot be omitted from the structure of VNs without violating the interaction requirement on the root.

also Svenonius 2004b, Ramchand 2008, Biskup 2019 for related ideas). In the absence of a prefix, the value of Asp defaults to [HOM]. The main problem with this approach is that Slavic prefixes are neither sufficient nor necessary for telicity/quantity. They are not sufficient because they appear in secondary imperfective forms, as in (37c)-(38c) above. They are not necessary because there exists a small number bare stems which are telic/quantity in the absence of a prefix (39), and because semelfactive verbs suffixed with *-nq* are also quantity (40). Finally, some bare stems of mostly foreign origin are bi-aspectual, meaning that they can be interpreted as telic/quantity or atelic/homogenous depending on the context (41).

- |            |   |    |  |
|------------|---|----|--|
| (39)    a. | rzuc -i -ć <sup>P</sup><br>throw -v -INF<br>'to throw'        | b. | da -∅ -ć <sup>P</sup><br>give -v -INF<br>'to give'                 |
| (40)    a. | kop -nq -ć <sup>P</sup><br>kick -SML -INF<br>'to give a kick' | b. | szep -nq -ć <sup>P</sup><br>whisper -SML -INF<br>'to whisper once' |
| (41)    a. | koron -owa -ć <sup>P/I</sup><br>crown -v -INF<br>'to crown'   | b. | areszt -owa -ć <sup>P/I</sup><br>arrest -v -INF<br>'to arrest'     |

In what follows, I develop a DM analysis of the paradigm in (37)-(38), while also deriving the fact that Deverbal Nominals are aspectually ambiguous. The basic intuition behind the proposal is that, by default, *theme vowels block telicity/quantity*. In other words, [Q] might be licensed in the syntax, but it will be filtered out at PF. What Slavic prefixes do, in turn, is *bleed the operation that blocks telicity/quantity*. Two negatives make a positive, so prefixes give the impression of licensing [Q]. However, prefixes simply prevent [Q] from being filtered out at PF.

I implement this analysis using the DM mechanism of fusion (Halle & Marantz 1993, Siddiqi 2009) in conjunction with negative feature specifications (Siddiqi 2009, Haugen & Siddiqi 2016). Briefly, fusion is a post-syntactic operation which takes two adjacent terminal nodes and fuses them into a single terminal node. The fused terminal is realised by a single Vocabulary Item, which must discharge the combined features of the two input nodes.

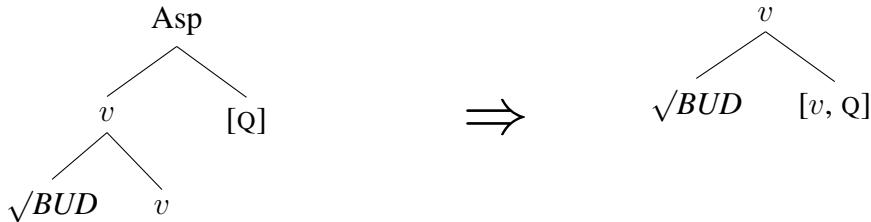
As for negative feature specifications, they allow us to specify Vocabulary Items not only for the features that they realise, but also for the features that they are incompatible with. To illustrate with an abstract example, a Vocabulary Item of the form  $\alpha \Leftrightarrow [X, \neg Y]$  can be inserted into terminal nodes [X] ( $\alpha$  is a perfect match) and [X, Z] ( $\alpha$  is underspecified), but not into [X, Y] or [X, Y, Z] (because  $\alpha$  is specified as  $\neg Y$ ).<sup>12</sup>

Let us apply these tools to the morphosyntax of Polish verbs. Starting with bare stems, I hypothesise that *v* and Asp undergo fusion in Polish (see also Caha & Ziková 2016 for the suggestion that *v* and Asp form a 'span' in Czech). Consider the derivation in (42). On the left, we see the (partial) head adjunction structure created by m(orphological)-merger from the output of syntax (Halle & Marantz 1993, Matushansky 2006, Harizanov & Gribanova 2019).

<sup>12</sup> The reviewer objects that negative VI specifications are an extremely powerful mechanism and that their use should be constrained in some way. However, Vocabulary Insertion is still constrained by the Subset Principle. The only effect of negative feature specifications is to block the insertion of exponents that the Subset Principle would otherwise predict to be eligible. In addition to that, Haugen & Siddiqi (2016) show that the  $\neg$  specification can be used to capture certain cases of syncretism that have traditionally been dealt with via impoverishment.

On the right, we see the result of fusion, which combines verbalising and aspectual features into a single terminal node.

(42)



I assume that the Vocabulary Items corresponding to theme vowels contain the negative specification  $\neg[Q]$  (43). This feature prevents the insertion of *-owa-* into the fused terminal in (42), causing the derivation to crash at PF. Suppose, however, that Asp bears the feature [HOM] instead. The node created by fusion is now  $[v, \text{HOM}]$ . The theme *-owa-* is eligible for insertion into that node, realising *v* and discharging [HOM] in accordance with the Subset Principle.

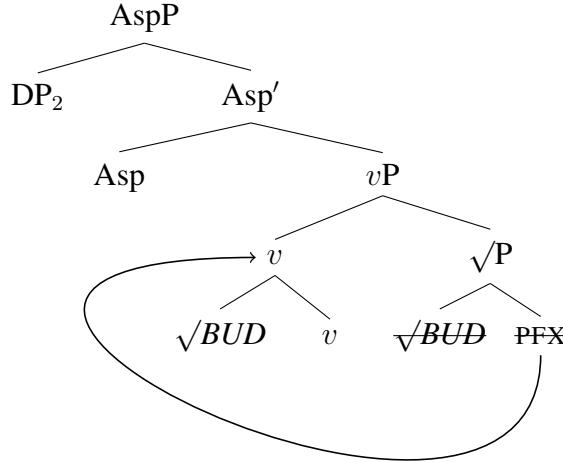
- |      |              |                   |  |
|------|--------------|-------------------|--|
| (43) | <i>-owa-</i> | $\Leftrightarrow$ | $[v, \neg Q] / \{\sqrt{BUD} \text{ 'build'}, \sqrt{PRAC} \text{ 'work'}, \dots\}$  |
|      | <i>-a-</i>   | $\Leftrightarrow$ | $[v, \neg Q] / \{\sqrt{PIS} \text{ 'write'}, \sqrt{LAM} \text{ 'break'}, \dots\}$  |
|      | <i>-aj-</i>  | $\Leftrightarrow$ | $[v, \neg Q] / \{\sqrt{CZYT} \text{ 'read'}, \sqrt{ŚPIEW} \text{ 'sing'}, \dots\}$ |
|      | <i>-i-</i>   | $\Leftrightarrow$ | $[v, \neg Q] / \{\sqrt{ROB} \text{ 'make'}, \sqrt{BRUD} \text{ 'dirt'}, \dots\}$   |
|      | $\dots$      |                   |  |

We thus derive the fact that bare stems such as *bud-owa-ć<sup>I</sup>* ‘to build’ are atelic/homogenous: quantity structures are filtered out at PF due to the  $\neg Q$  feature associated with theme vowels. We also derive the fact that the 2IMP suffix does not attach to bare stems: *v* and Asp are subject to fusion, which means that they are realised by a single Vocabulary Item. Crucially, this analysis assumes that the fusion of *v* and Asp is obligatory, taking place even if the resulting structure cannot be lexicalised (*pace* Siddiqi 2009). Only then can we attribute the lack of a telic/quantity reading for *bud-owa-ć* to a PF crash.

What about prefixed stems? I hypothesise that Slavic prefixes are clitics which block the fusion of *v* and Asp. They do this by adjoining to *v* at PF, following the morphological merger of the root with the verbalising head. This proposal is sketched out in (44) and (45) below. Support for this analysis comes from the phonological properties of prefixes, which are parsed outside of the prosodic domain of the verb stem (Booij & Rubach 1984; Pesetsky 1985; Matushansky 2002). Furthermore, Caha & Ziková (2016) present evidence from vowel length in Czech, which supports the hypothesis that Slavic prefixes are not simply root-adjoined.

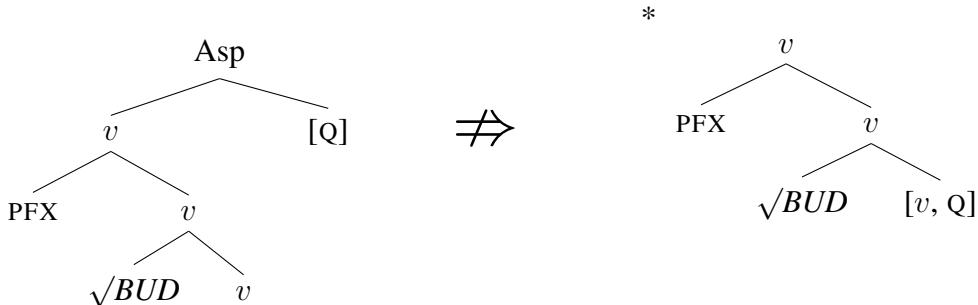
The reason that prefixes adjoin to *v* could be related to the fact that *v* is a phase head (Marantz 2007, Embick 2010). On this view, the prefix is initially ignored by PF operations because it lies outside of the main projection line of the verb (the prefix is either a resultative particle or some kind of adjunct). However, since Slavic disallows particle stranding, the prefix is adjoined to the phase head as a clitic. The post-syntactic adjunction of the prefix to *v* can be thought of as a last-resort repair strategy. See also Newell (2005, 2008) for a late-adjunction account of particle verbs in English and German congruent with the current proposal.

(44)



To recapitulate, I assume the following order of operations: i) m-merger of the root and *v*; ii) adjunction/cliticisation of the prefix to *v*; iii) m-merger of *v* and Asp. Putting (i)-(iii) together, we end up with the complex head on the left-hand side in (45). I further assume that fusion is restricted to structurally adjacent terminals, in which case the fusion of *v* and Asp is blocked by the intervening prefix. In other words, the structure on the right-hand side cannot be derived, leaving *v* and Asp as independent terminals.

(45)



The hypothesis that prefixes block the fusion of *v* and Asp yields the correct results. Since Vocabulary Insertion applies to *v* and Asp separately, the insertion of the theme vowel *-owa-* into *v* is compatible with the presence of the [Q] feature in Asp, which now receives a default  $\emptyset$  exponent (46a). In a similar vein, [HOM] must be realised separately from *v* in the absence of fusion. Assuming that the 2IMP suffixes *-aj/-ywa* are realisations of [HOM] (46b), we derive the fact that secondary imperfectives include *-aj/-ywa* while bare imperfectives do not.

- (46) a.  $\emptyset \Leftrightarrow [Q]$   
      b.  $-ywa \Leftrightarrow [HOM] / \{-owa-, -a-, -aj-, \dots\}$   
            $-aj \Leftrightarrow [HOM] \quad \text{otherwise}$

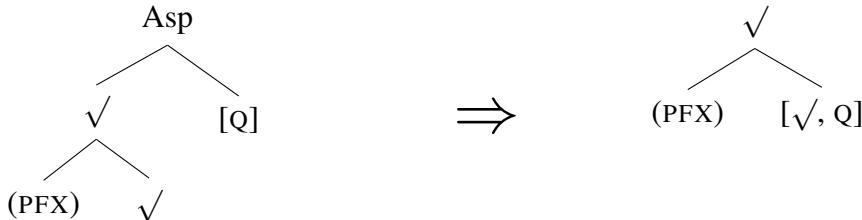
Now, consider the case of Deverbal Nominals again. I have argued that DNs have the structure in (47), repeated from (36b) for convenience. This structure is identical to that of Verbal Nominals except that DNs lack *v*, with the root categorised contextually by the verbal extended projection.

- (47)  $[_{nP} n [_{VoiceP} Voice [_{AspP} DP [_{Asp'} Asp[Q/HOM] [_{vP} \sqrt{=} V (PFX) ]]]]]]$

On the present analysis, the aspectual ambiguity of DNs follows from the absence of *v*. Specif-

ically, I assume that Asp fuses with the root in such cases, as illustrated in (48). Since theme vowels are missing, there is nothing to block [Q] and bare DNs can be telic/quantity. Similarly, since Asp fuses with the root, we do not expect to see a separate 2IMP suffix in the imperfective cases. Finally, any prefixes present in DNs do not cliticise to *v* but rather adjoin directly to the root (see Caha & Ziková 2016 for the distinction between ‘free’ and ‘bound’ prefixes in Czech, which have different phonological properties).

(48)



This analysis allows us to maintain that derived nominals project AspP (in accordance with van Hout & Roeper 1998 and Borer 2013, among others), while also being aspectually ambiguous. All we needed to say is that theme vowels block the expression of telicity/quantity at PF. Since DNs do not contain theme vowels, they are ambiguous between [Q] and [HOM]. In addition to derived nominals, the current proposal accounts for the morphosyntax of bare imperfectives, prefixed perfectives and secondary imperfectives. In the next section, I show that it can also be extended to semelfactives and bi-aspectual verbs.

## 5. Extensions

### 5.1. Quantity without Prefixation

Recall that prefixation is not always necessary for the emergence of telicity/quantity. One case is semelfactive verbs, which denote naturally atomic events and incorporate the suffix *-nq*.

- |   |   |
|---|---|
| (49) a. kop -nq -ć <sup>P</sup><br>kick -SML -INF<br>‘to give a kick’ | b. szep -nq -ć <sup>P</sup><br>whisper -SML -INF<br>‘to whisper once’ |
|---|---|

The semelfactive suffix *-nq* is in complementary distribution with both theme vowels (50a) and the 2IMP suffixes *-ajl/-ywa* (50b). The homogeneous counterpart of a semelfactive verb takes the form of a bare stem (50c). What these data suggest is that the semelfactive suffix is a portmanteau morph realising both *v* and [Q]. This hypothesis automatically explains its complementarity with theme vowels (which realise *v*) and the 2IMP suffix (which realises [HOM]).

- |   |   |  |
|---|---|--|
| (50) a. *kop -a -nq -ć<br>kick -v -SML -INF | b. *kop -n(q) -ywa -ć<br>kick -SML -2IMP -INF | c. kop -a -ć <sup>I</sup><br>kick -v -INF<br>‘to kick’ |
|---|---|--|

Assuming that semelfactivity is a ‘flavour’ of Asp[Q], we can assign the following entry to the suffix *-nq*. This entry presupposes that *v* and Asp undergo fusion in Polish.

- (51) -nq ⇔ [v, Q]

While the details of this analysis still need to be worked out, the distribution of *-nq* is consistent with the hypothesis that *v* and *Asp* are subject to fusion. The semelfactive suffix is a portmanteau morph which functions at once as a categoriser (in *v*) and as a quantity marker (in *Asp*).<sup>13</sup>

Another case of telicity/quantity without prefixation involves bi-aspectual verbs, which are ambiguous between [Q] and [HOM]. There are a few hundred such verbs in Polish and Russian (Gladney 1982). Many of them are foreign loans and almost all take the theme *-owa-* (52).

- |         |  |    |   |
|---------|--|----|---|
| (52) a. | koron -owa -ć <sup>P/I</sup><br>crown -v -INF<br>'to crown'    | c. | mian -owa -ć <sup>P/I</sup><br>appoint -v -INF<br>'to appoint'      |
| b.      | areszt -owa -ć <sup>P/I</sup><br>arrest -v -INF<br>'to arrest' | d. | desygn -owa -ć <sup>P/I</sup><br>designate -v -INF<br>'to nominate' |

Bi-aspectual verbs have a rather marginal status in the literature on Slavic aspect, but they can be easily incorporated into the present system. All we only need to assume is that there are two theme vowels *-owa-*: *-owa<sub>1</sub>-*, which blocks telicity/quantity, and *-owa<sub>2</sub>-*, which does not. The choice between them depends on the root, as schematised in (53).

- (53) a. *-owa<sub>1</sub>-* ⇔ [ *v*,  $\neg Q$  ] / \_{ { √BUD 'build', √PRAC 'work', ... } }  
 b. *-owa<sub>2</sub>-* ⇔ [ *v* ] / \_{ { √KORON 'crown', √ARESZT 'evolve', ... } }

To sum up, the evidence from semelfactives and biaspectual verbs provides some additional support for the analysis of Polish verb stems in terms of fusion and the  $\neg$  specification.

### 5.2. Other Differences between Verbal and Deverbal Nominals

In this subsection, I return briefly to some of the remaining differences between VNs and DNs. These concern their compatibility with superlexical prefixation, the negative particle *nie-* and the reflexive clitic *sie* (see Table 1 in Section 2.5).

Firstly, VNs but not DNs combine with the class of superlexical prefixes. Superlexical prefixes have adverbial and quantificational meanings and are often assumed to merge in or above the level of *AspP* (cf. Svenonius 2004b, Romanova 2006, Gribanova 2013, and references therein). An example of a superlexical prefix in Polish is the distributive *po-*, which can be paraphrased as *to VERB something one by one* or *to VERB each of something*. Crucially, this prefix appears freely in VNs, but it is ungrammatical in DNs (54a) vs. (54b). Note that *po-* attaches only to homogeneous stems, including both bare and secondary imperfectives, and that it licenses telicity/quantity.

<sup>13</sup> As it stands, my analysis predicts that prefixed semelfactives should not exist. This is because prefixes adjoin to *v*, blocking the fusion of *v* and *Asp* and preventing *-nq* from being inserted into [ *v*, *Q* ].

Unfortunately, this prediction is not borne out. Although they are not overwhelmingly common, prefixed semelfactives do exist. To capture this fact, we could stipulate that prefixes adjoin to *Asp[Q]* in quantity structures, and that adjunction to *v* takes place only in the absence of [ *Q* ]. I leave the exploration of this possibility for future work. For more discussion of semelfactives in Russian, Czech and Polish, see Markman (2008), Medová & Wiland (2018), Wiland (2019), and references therein.

- (54) a. **po-** **o-** bran -i -**a(j)** -nie<sup>P</sup> wszystkich miast  
          DIST- about- protect -TH -2IMP -n all.GEN cities.GEN  
          ‘protecting all cities one by one’ (telic/quantity)  
 b. \***po-** **o-** bron -a wszystkich miast  
          DIST- about- protect -FEM all.GEN cities.GEN

Turning to the negative particle *nie-*, we encounter a similar pattern. Negation via *nie-* is possible in VNs (55a) but it is ruled out in the case of DNs (55b).

- (55) a. nie- **o-** bron -ie -nie<sup>P</sup> tego miasta  
          NEG- about- protect -TH -n this.GEN city.GEN  
          ‘not protecting this city’ (telic/quantity)  
 b. \*nie- **o-** bron -a tego miasta  
          NEG- about- protect -FEM this.GEN city.GEN

The same asymmetry is found in the distribution of the reflexive clitic *się* in (56a) vs. (56b).

- (56) a. **o-** bron -ie -nie<sup>P</sup> się przez Ewe  
          about- protect -TH -n REFL by Eve  
          ‘Eva protecting herself’ (telic/quantity)  
 b. ??**o-** bron -a się przez Ewę  
          about- protect -FEM REFL by Eve

There are two ways of approaching these data: syntactic and morphophonological. On the syntactic approach, this evidence might be taken to indicate that VNs project more functional structure than DNs after all. Thus, while both VNs and DNs embed Voice and Asp, perhaps there are higher heads F<sub>1</sub>, F<sub>2</sub>, F<sub>3</sub>, etc. which project only in VNs and which are responsible for introducing distributivity, negation and reflexivity.

However, it is unlikely that superlexical prefixes and reflexive clitics are introduced above the level of VoiceP. For one thing, the reflexive clitic *się* operates in the domain of argument structure in (56): its primary function is to identify the internal argument (the protectee) with the external one (the protector). This suggests that *się* is either generated in the internal argument position or in VoiceP, but no higher than that (see Jabłońska 2007, Frąckowiak & Rivero 2008 and Frąckowiak 2015 for some relevant discussion in the context of Polish).

As for superlexical prefixes, Tatevosov (2015) argues that the distributive *po-* merges below Voice. The evidence comes from the subject-object asymmetry exhibited by this prefix. While the distributive *po-* readily applies to the internal argument (57a), its application to the external argument is infelicitous (57b). A natural explanation is that the object but not the subject fall in the scope of *po-*, with the distributive prefix situated below VoiceP. A similar subject/object asymmetry can be observed with the cumulative prefix *na-*. The cumulative *na-* quantifies over the internal argument, which is assigned genitive case as a result (58a). Quantification over the external argument is not possible, once again suggesting that *na-* merges below VoiceP (58b).

- (57) a. Rozbójnik po-otwierał<sup>P</sup> drzwi.  
          thief.NOM DIST-open doors.ACC  
          ‘The thief opened the doors one by one.’  
 b. ??Rozbójnicy po-otwierali<sup>P</sup> Sezam.  
          thieves.NOM DIST-open Sesame.ACC

'The thieves opened Sesame one by one.'

- (58) a. Rozbójnik na-otwierał skrzyni.  
          thief.NOM CUM-open chests.GEN  
          'The thief opened a lot of chests.'  
       b. \*Rozbójników na-otwierało skrzynię.  
          thieves.GEN CUM-open chest.ACC  
          Intended: 'A lot of thieves opened the chest.'

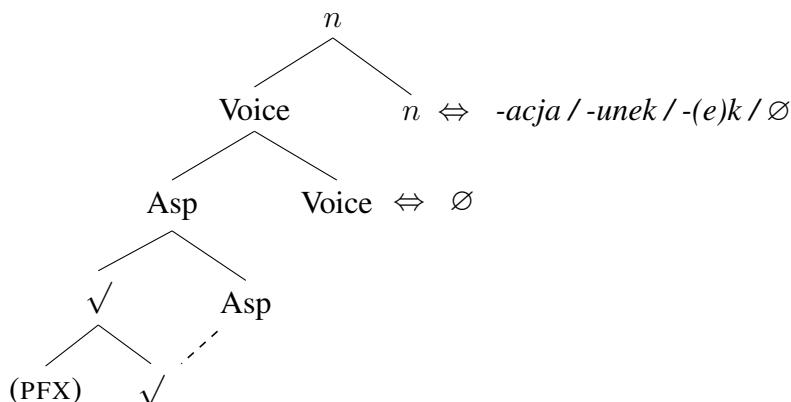
I conclude that the reflexive *się* and superlexical *na-* and *po-* are no higher than VoiceP. This means that the asymmetry between VNs and DNs cannot be captured in terms of the presence/absence of functional heads above the level of Voice and Asp. It might still be possible to account for (54) and (56) in terms of the presence/absence of *v*. Perhaps *v* plays a crucial role in introducing the reflexive clitic and/or licensing superlexical prefixes. However, it seems unlikely that a *v*-based explanation could be extended to the case of the negative particle in (55).

In view of these problems, I would like to make the tentative suggestion that the solution to (54)-(56) is morphophonological. Recall that the nominaliser *-nie/-cie* in VNs is inserted freely with all verb stems and roots. In contrast, DNs incorporate an idiosyncratic set of nominalising suffixes, including *-acja*, *-ek*, *-unek* and *-∅*. Which exponent is inserted into *n* depends on the identity of the root. This requires us to add the following Vocabulary Items to our list (see (18) in Section 2.4 for the corresponding nominals).

- (59)    -*acja*     $\Leftrightarrow$     *n* /     $\{\sqrt{PREZENT}$  'present',  $\sqrt{REZERW}$  'reserve', ... }  
       -*unek*     $\Leftrightarrow$     *n* /     $\{\sqrt{PAK}$  'pack',  $\sqrt{RAT}$  'rescue', ... }  
       -*(e)k*     $\Leftrightarrow$     *n* /     $\{\sqrt{ROB}$  'write',  $\sqrt{SYŁ}$  'send', ... }  
       ∅           $\Leftrightarrow$     *n* /     $\{\sqrt{BRON}$  'protect',  $\sqrt{PLAT}$  'pay', ... }

Suppose that the Vocabulary Items in (59) are insertable into *n* if and only if the relationship between *n* and the root is local. Suppose further that this locality requirement takes the form of structural adjacency (as in Borer 2013, but contra Embick 2010). Now consider the complex head in (60), where *v* is missing and the dashed line stands for the fusion of Asp with the root (cf. Section 4). Assuming that *∅* exponents get 'pruned' as soon as they are inserted, the null Voice head does not intervene between *n* and the root, allowing the insertion of *-acja* / *-unek* / *-(e)k* / *∅* into *n*.

(60)



For *n* and the root to be adjacent, no overt exponent may intervene between them. This excludes not only the adjunction of the superlexical prefixes *po-* and *na-* to Asp, but also the cliticisation of the reflexive pronoun *sie* into the complex head in (60), as well as the insertion of the negative particle *nie-*. As long as the nominaliser in (59) has no default exponent,<sup>14</sup> the ungrammaticality of (54b), (55b) and (56b) can be attributed to a PF crash: the superlexical prefix, reflexive pronoun and negative particle intervene structurally between *n* and the root, blocking Vocabulary Insertion into *n* and rendering the structure ineffable.

## 6. Conclusion

In this paper, I have investigated language-internal variation in the structure of derived nominals in Polish, particularly with respect to the presence/absence of verbalising morphology and aspectual distinctions. Adopting the hypothesis that Voice and Asp are jointly necessary for the emergence of event and argument structure (van Hout & Roeper 1998, Alexiadou 2009, Alexiadou & Schäfer 2010, Borer 2013, Roy & Soare 2013), I attempted to reconcile the presence of AspP in DNs with the aspectual ambiguity of these forms.

The solution was to rethink the interaction between aspectual prefixes and suffixes: prefixes do not license telicity/quantity but rather prevent [Q] from being filtered out at PF. This proposal was implemented within the theoretical framework of Distributed Morphology, making use of the  $\neg$  specification (Siddiqi 2009) and the fusion of *v* and Asp. The main idea was that the Vocabulary Items which correspond to theme vowels are specified as  $[v, \neg Q]$ . The insertion of themes into *v*+Asp blocks the presence of [Q] in bare stems. Since DNs lack theme vowels, telicity/quantity is not blocked, leaving these forms ambiguous between [Q] and [HOM].

This analysis resolves the tension between two hypotheses: (i) telicity/quantity is licensed by an inner-aspectual head Asp (Kratzer 2004, Borer 2005, MacDonald 2008, Travis 2010); and (ii) the same inner-aspectual head Asp is valued by prefixes in Polish (e.g. Borer 2005, Łazorczyk 2010, Corre 2015; cf. also Svenonius 2004b). The existence of aspectually ambiguous DNs (whether prefixed or not) makes it impossible to maintain both (i) and (ii). The strategy in this paper was to modify (ii), leading to a novel analysis of the morphosyntax of Polish verbs.

It remains to be seen to what extent the current proposal can be adapted to other Slavic languages, especially Russian (cf. Schoorlemmer 1995, Pazelskaya & Tatevosov 2006, Tatevosov 2011). Many questions remain open, and the preliminary proposals in Section 5 still need to be worked out in detail. But I think that the results achieved in this paper are promising enough to warrant further investigation. If nothing else, they demonstrate the power and the scope of a morphosyntactic approach to language variation in the domain of derived nominals and aspect.

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<sup>14</sup> Alternatively, the default exponent of *n* is *-nie/-cie*, but this suffix cannot be inserted into a structure which lacks *v*. See fn. 11 for some comments compatible with this analysis.

### Abbreviations

2IMP	secondary imperfective	NEG	negative clitic
ACC	accusative case	NOM	nominative case
ASN	Argument Structure Nominal	P	perfective stem
ATK	-ation and kin	PFX	prefix
CUM	cumulative prefix	PL	plural
DIST	distributive prefix	PST	past tense
DM	Distributed Morphology	Q	quantity
DN	Polish Deverbal Nominal	RN	Referential Nominal
FEM	feminine	REFL	reflexive clitic
GEN	genitive case	TH	theme vowel
HOM	homogeneous	SML	semelfactive
I	imperfective stem	VN	Polish Verbal Nominal
INF	infinitive	v	verbalising head
<i>n</i>	nominalising head		

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### References

- Alexiadou, A. (2009). On the role of syntactic locality in morphological processes: the case of (Greek) derived nominals. Giannakidou, A. & M. Rathert (eds.), *Quantification, Definiteness, and Nominalization*, Oxford: Oxford University Press, pp. 253–280.
- Alexiadou, A. (2017). Nominalization structures across languages. [Ms]. Paper presented at Queen Mary University of London, May 17, 2017.
- Alexiadou, A. & F. Schäfer (2010). On the syntax of episodic vs. dispositional -er nominals. Alexiadou, A. & M. Rathert (eds.), *The Syntax of Nominalizations across Languages and Frameworks*, Berlin: Mouton de Gruyter, pp. 9–38.
- Alexiadou, A., G. Iardachioia & E. Soare (2010). Number/aspect inextractions in the syntax of nominalizations: A Distributed Morphology approach. *Journal of Linguistics* 46, pp. 537–574.
- Arsenijević, B. (2006). *Inner Aspect and Telicity*. [PhD thesis]. Universität Leiden.
- Biskup, P. (2019). *Prepositions, Case and Verbal Prefixes: The Case of Slavic*. John Benjamins Publishing Company.
- Bloch-Trojnar, M. (2017). Aspectual constraints on the plural marking of argument supporting -nie/-cie nominals in Polish. Bloch-Trojnar, M. & A. Malicka-Kleparska (eds.), *Aspect and Valency in Nominals*, De Gruyter, pp. 83–108.
- Bohnemeyer, J. & M. Swift (2004). Event realization and default aspect. *Linguistics and Philosophy* 27.
- Booij, G. & J. Rubach (1984). Morphological and prosodic domains in Lexical Phonology. *Phonology Yearbook* 1, pp. 1–27.
- Borer, H. (2001). The forming, the formation and the form of nominals. [Ms]. Handout USC.
- Borer, H. (2005). *Structuring Sense. Volume 2: The Normal Course of Events*. Oxford: Oxford University Press.
- Borer, H. (2013). *Structuring Sense. Volume 3: Taking Form*. Oxford: Oxford University Press.
- Borer, H. (2014). The category of roots. Alexiadou, A., H. Borer, & F. Schäfer (eds.), *The Syntax of Roots and the Roots of Syntax*, Oxford: Oxford University Press.
- Borik, O. (2006). *Aspect and Reference Time*. Oxford: Oxford University Press.

- Caha, P. & M. Ziková (2016). Vowel length as evidence for a distinction between free and bound prefixes in Czech. *Acta Linguistica Hungarica* 63:3, pp. 331–377.
- Corre, E. (2015). Preverbs in Russian: situation or viewpoint aspect? *Recherches linguistiques de Vincennes* 43.
- Czaykowska-Higgins, E. (1998). Verbalizing suffixes and the structure of the Polish verb. Booij, G. & J. van Merle (eds.), *Yearbook of Morphology 1997*, Dordrecht: Kluver.
- Embick, D. (2010). *Localism versus globalism in morphology and phonology*. Cambridge, MA: MIT Press.
- Frąckowiak, E. (2015). *Understanding Situation and Viewpoint Aspect in Polish through Dative Anticausative Constructions and Factual Imperfectives*. [PhD thesis]. University of Ottawa.
- Frąckowiak, E. & M. L. Rivero (2008). Distinguishing between unintentional agents and unintentional causers. *Proceedings of the 2008 annual conference of the Canadian Linguistic Association*.
- Fu, J., T. Roeper & H. Borer (2001). The VP within process nominals: Evidence from adverbs and the VP anaphor do-so. *Natural Language and Linguistic Theory* 19:3, pp. 549–582.
- Gladney, F. (1982). Biaspectual verbs and the syntax of aspect in Russian. *The Slavic and East European Journal* 26:2, pp. 202–215.
- Gribanova, V. (2013). Verb-stranding verb phrase ellipsis and the structure of the Russian verbal complex. *Natural Language and Linguistic Theory* 31, pp. 91–136.
- Grimshaw, J. (1990). *Argument Structure*. Cambridge, MA: MIT Press.
- Halle, K. & A. Marantz (1993). Distributed Morphology and the pieces of inflection. Halle, K. & S. J. Keyser (eds.), *The view from building 20*, Cambridge, MA: MIT Press.
- Harizanov, B. & V. Gribanova (2019). Wither head movement? *Natural Language and Linguistic Theory* 37, pp. 461–522.
- Harley, H. (2009). The morphology of nominalization and the syntax of vP. Giannakidou, A. & M. Rathert (eds.), *Quantification, Definiteness, and Nominalization*, Oxford: Oxford University Press, pp. 321–343.
- Haugen, J. D. & D. Siddiqi (2016). Towards a restricted realization theory: Multimorphemic monolithicity, portmanteaux, and post-linearization spanning. Siddiqi, D. & H. Harley (eds.), *Morphological Metatheory*, John Benjamins Publishing Company, pp. 343–385.
- van Hout, A. (1998). *Event Semantics of Verb Frame Alternations: A Case Study of Dutch and Its Acquisition*. New York: Routledge.
- van Hout, A. & T. Roeper (1998). Events and aspectual structure in derivational morphology. Harley, H. (ed.), *Papers from the Upenn/MIT Roundtable on Argument Structure and Aspect*, Cambridge, MA: MIT Press, pp. 175–200.
- Jabłońska, P. (2007). *Radical Decomposition and Argument Structure*. [PhD thesis]. University of Tromsø.
- Jakobson, R. (1948). Russian conjugation. *Word* pp. 155–167.
- Kratzer, A. (1993). The event argument and the semantics of Voice. [Ms]. University of Massachusetts, Amherst.
- Kratzer, A. (2004). Telicity and the meaning of objective case. Guéron, J. & J. Lecarme (eds.), *The Syntax of Time*, Cambridge, MA: MIT Press, pp. 389–423.
- Laskowski, R. (1975). *Studia nad morfonologią współczesnego języka polskiego*. Wrocław: Zakład Narodowy imienia Ossolińskich.
- Łazorczyk, A. (2010). *Decomposing Slavic Aspect: The Role of Aspectual Morphology in Polish and Other Slavic Languages*. [PhD thesis]. University of South California.
- MacDonald, J. E. (2008). *The Syntactic Nature of Inner Aspect*. Amsterdam: John Benjamins Publishing Company.
- Marantz, A. (1997). No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. Dimitriadis, A., L. Siegel, C. Surek-Clark & A. Williams (eds.), *University of Pennsylvania working papers in linguistics*, Philadelphia: University of Pennsylvania, vol. 4, pp. 201–225.
- Marantz, A. (2007). Phases and words. Choe, S. H. (ed.), *Phases in the Theory of Grammar*, Seoul: Dong-In Publishing Co., pp. 191–222.
- Markman, V. (2008). On Slavic semelfactives and secondary imperfectives: Implications for the split ‘AspP’. *University of Pennsylvania Working Papers in Linguistics*, vol. 14.
- Matushansky, O. (2002). On formal identity of Russian prefixes and prepositions. *Phonological Answers (and their Corresponding Questions)* 42, pp. 217–253.
- Matushansky, O. (2006). Head movement in linguistic theory. *Linguistic Inquiry* 37:1, pp. 69–109.
- Medová, L. T. & B. Wiland (2018). Semelfactives are bigger than degree achievements: The nanosyntax of Czech and Polish semelfactive and degree achievement verb stems. *Natural Language and Linguistic Theory* 37, pp. 1463–1513.
- Newell, H. (2005). Bracketing paradoxes and particle verbs: a late adjunction analysis. *Proceedings of ConSOLE*

- XIII, pp. 249–272.
- Newell, H. (2008). *Aspects of the Morphology and Phonology of Phases*. [PhD thesis]. McGill University, Montréal.
- Pazelskaya, A. & S. Tatevosov (2006). Deverbal nouns, uninflected VPs, and aspectual architecture of Russian. *Formal Approaches to Slavic Linguistics 14. The Princeton Meeting 2005*, Ann Arbor: Michigan Slavic Publications, pp. 258–276.
- Pesetsky, D. (1985). Morphology and lexical form. *Linguistic Inquiry* 16, pp. 193–245.
- Puzynina, J. (1969). *Nazwy czynności we współczesnym języku polskim*. Warszawa: PWN.
- Ramchand, G. (2008). Perfectivity as aspectual definiteness: Time and the event in Russian. *Lingua* 118:11, pp. 1690–1715.
- Roeper, T. (1987). Implicit arguments and the head-complement relation. *Linguistic Inquiry* 18:2, pp. 267–310.
- Romanova, E. (2006). *Constructing Perfectivity in Russian*. [PhD thesis]. University of Tromsø.
- Roy, I. & E. Soare (2013). Event related nominalizations. Iordăchioaia, G., I. Roy & K. Takamine (eds.), *Categorization and Category Change*, Cambridge Scholars Publishing, Cambridge, pp. 121–152.
- Rozwadowska, B. (1997). *Towards a unified theory of nominalizations. External and internal eventualities*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- Rozwadowska, B. (2000). Aspectual properties of Polish nominalizations. *Journal of Slavic Linguistics* 8, pp. 239–261.
- Rubach, J. (1984). *Cyclic and Lexical Phonology: The Structure of Polish*. Dordrecht: Foris Publications.
- Schoorlemmer, M. (1995). *Participial Passive and Aspect in Russian*. Utrecht: OTS Publications.
- Siddiqi, D. (2009). *Syntax within the Word: Economy, Allomorphy, and Argument Selection in Distributed Morphology*. Amsterdam: John Benjamins Publishing Company.
- Svenonius, P. (2004a). Slavic prefixes and morphology: An introduction to the Nordlyd volume. *Nordlyd* 32:2.
- Svenonius, P. (2004b). Slavic prefixes inside and outside VP. *Nordlyd* 32:2, pp. 205–253.
- Tatevosov, S. (2011). Severing perfectivity from the verb. *Scando-Slavica* 57, pp. 216–244.
- Tatevosov, S. (2015). Severing imperfectivity from the verb. Zybatow, G., P. Biskup, M. Guhl, C. Hurtig, O. Mueller-Reichau & M. Yastrebowa (eds.), *Formal Description of Slavic Languages: Proceedings of FDSL 10, Leipzig 2013*, Frankfurt: Peter Lang, pp. 465–494.
- Travis, L. (2010). *Inner Aspect: The Articulation of VP*. Springer Netherlands.
- Wiland, B. (2019). *The spell-out algorithm and lexicalization patterns: Slavic verbs and complementizers*. Open Slavic Linguistics, Language Science Press.

# On the embeddability of cleft wh-questions in Japanese

Yuya Noguchi

Hiraiwa & Ishihara (2002, 2012) argue that the derivation of Japanese clefts involves movement of a focused element to FocP. Even though their analysis seems successful, I point out a hitherto unacknowledged fact that embedding a cleft wh-question degrades a sentence, which is hard to explain with their analysis if it is taken at its face value. Against this backdrop, this paper aims to elaborate on their analysis: I claim that the two focus-related features, [ $\pm$ exhaustivity] and [ $\pm$ sharing-presupposition], induce the focus movement in clefts. The paper further discusses ReportP-size clauses (e.g., Saito 2010) based on my proposal.

## 1. Introduction

Hiraiwa & Ishihara (2002, 2012) (H&I, henceforth) present the derivation of clefts in Japanese, such as the one in (1a) (see, e.g., Hoji 1987; Kuwabara 1996; Matsuda 1997, for early literature on Japanese clefts).<sup>1</sup> Specifically, they argue that (1a) is derived from a construction they refer to as an in-situ focus construction, such as in (1b) (where the capitalization means a phonological emphasis; see Section 2.1).<sup>2</sup> Following traditional terminology, I refer to constructions like (1b) as *no-da* sentences, given the presence of the complementizer *no* and the copula *da* in the sentence-final position.<sup>3</sup>

- (1) a. [Mai-ga *e<sub>i</sub>* kabin-o oita no]-wa hondana-ni<sub>i</sub> da.  
Mai-NOM vase-ACC put C-TOP bookself-on COP  
'It was on the bookshelf that Mai put a vase.'

<sup>1</sup> In Japanese there are two types of cleft-like sentences, which H&I refer to as clefts and pseudo-clefts (see also Hoji 1987; Kuroda 1999); in the former, a Case particle or a postposition is appended to an element in the focus position (see (1)), which is not the case in the latter, as in (i).

(i) [Ken-ga *e<sub>i</sub>* hon-o ageta no(/hito)]-wa Mai da.  
Ken-NOM book-ACC gave NMLZ/person-TOP Mai COP  
'The person who Ken gave a book was Mai.'

H&I present several diagnostics to distinguish the two constructions. One of them involves replacing the particle heading the presupposition clause, *no*, with an appropriate noun, such as *hito* 'person'; this replacement is possible in pseudo-clefts, as shown in (i), but not in clefts. This paper focuses only on clefts.

<sup>2</sup> Among previous studies that follow H&I's analysis are Nishigauchi & Fujii (2006), Takahashi (2006), and Hasegawa (2011).

<sup>3</sup> Following H&I, I translate *no-da* sentences with clefts.

- b. [CP Mai-ga HONDANA-ni kabin-o oita no] da.  
 Mai-NOM bookshelf-on vase-ACC put C COP  
 'It was on the bookshelf that Mai put a vase.'

As seen below, if we follow their proposal, there appears to be nothing that would make it impossible to form a cleft wh-question, where a wh-phrase is placed in the focus position of a cleft. In fact, it is possible to realize such a sentence as a matrix clause, as in (2a). However, as shown in (2b), a sentence is degraded when a cleft wh-question is embedded as a complement clause, which has previously gone unnoticed.

- (2) a. [Mai-ga *e<sub>i</sub>* kabin-o oita no]-wa doko-ni desu ka?  
 Mai-NOM vase-ACC put C-TOP where-on COP.POL Q  
 'Where was it that Mai put the vase?'  
 b. ?\* Ken-wa [[Mai-ga *e<sub>i</sub>* kabin-o oita no]-wa doko-ni (da) ka]  
 Ken-TOP Mai-NOM vase-ACC put C-TOP where-on COP Q  
 siranai.  
 know.not  
 'Ken does not know where it was that Mai put the vase.'

Against this background, this paper aims to refine H&I's analysis of clefts, so that it can account for why marginality arises when a cleft wh-question is embedded. More specifically, I elaborate on their analysis through observing focus properties of clefts and *no-da* sentences and reflecting these properties in their structure.<sup>4</sup>

This paper is organized as follows: Sections 2 provides an overview of H&I's analysis of Japanese clefts and shows that their analysis confronts a difficulty in capturing the degraded status caused by embedding a cleft wh-question. Section 3 discusses focus properties of the relevant constructions from two perspectives, namely exhaustivity and presupposition-sharing. Based on these observations and H&I's proposal, I claim that these properties are reflected in the syntactic structure, which gives an account for the marginality yielded by embedding a cleft wh-question. Section 4 presents one consequence of the proposal of this paper, regarding a Japanese complementizer *to*, which Saito (2010), among others, argues heads ReportP in the cartographic CP area. Section 5 concludes the paper, noting some open issues.

## 2. Previous research and an uncapturable data

This section first gives an overview of H&I's analysis of Japanese clefts. I then point out that if their analysis is taken at its face value, it is unclear why embedding a cleft wh-question degrades a whole sentence.

### 2.1. Previous research: H&I

H&I argue that each cleft in (3) is derived based on the *no-da* sentences in (4).<sup>5</sup> Notice that a

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<sup>4</sup> The goal of this paper is not to comprehensively discuss H&I's proposal but to discuss one particular issue. As a result, I will not be able to discuss here potential issues that arise from their analysis (see Sakamoto 2017 for one such issue).

<sup>5</sup> As pointed out in literature (e.g., Nishiyama et al. 1995; H&I), many speakers judge as marginal or

focus interpretation is assigned to the element in the position preceding the copula in (3), while in (4) it is realized only through prosodic prominence, which is represented by capitals.

- (3) a. ?[Ken-ga Mai-ni *e<sub>i</sub>* ageta no]-wa kono hon-oi da.  
Ken-NOM Mai-to gave C-TOP this book-ACC COP  
'It was this book that Ken gave to Mai.'
  - b. [Ken-ga *e<sub>i</sub>* hon-o ageta no]-wa Mai-ni da.  
Ken-NOM book-ACC gave C-TOP Mai-to COP  
'It was to Mai that Ken gave an book.'
- (4) a. [<sub>CP</sub> Ken-ga Mai-ni KONO HON-o ageta no] da.  
Ken-NOM Mai-to this book-ACC gave C COP  
'It was this book that Ken gave to Mai.'
  - b. [<sub>CP</sub> Ken-ga MAI-ni kono hon-o ageta no] da.  
Ken-NOM Mai-to this book-ACC gave C COP  
'It was to Mai that Ken gave this book.'

Adopting Rizzi's (1997) cartographic CP structure, which is shown in (5), H&I propose that the complementizer *no* and the copula *da* occupy the head of Fin(ite)P and Foc(us)P, respectively. Thus, the rough structure of (4b) is given in (6).

- (5) [ForceP Force [Top(ic)P Top [Foc(us)P Foc [(Top) [Fin(ite)P Fin [TP ... ]]]]]]
- (6) [FocP [FinP [TP Ken-ga MAI-ni kono hon-o ageta] no] da]  
Ken-NOM Mai-to this book-ACC gave C COP

According to H&I, a cleft is formed by moving a focused element in a *no-da* sentence to Spec,FocP and then moving the remnant FinP to Spec,Top(ic)P. For instance, the cleft in (3b) is derived from (6) through the process shown in (7).<sup>6</sup>

- (7) a. [TopP [FocP Mai-ni [FinP [TP Ken-ga *t<sub>i</sub>* kono hon-o ageta] no] da]]  
Mai-to Ken-NOM this book-ACC gave C COP
- b. [TopP [FinP Ken-ga *t<sub>i</sub>* kono hon-o ageta no]-wa [FocP Mai-ni *t<sub>j</sub>* da]]

That movement is involved in the derivation of a cleft is confirmed by the observation that a focus element in clefts is sensitive to islands, as shown in (8a), where a complex NP island is

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ungrammatical a cleft where a nominative or an accusative particle is attached to the focus phrase, as in (i) (the judgments are those of Hiraiwa & Ishihara 2012).

(i) a. [*e<sub>i</sub>* Mari-ni ringo-o ageta no]-wa Naoya(\*-ga)<sub>i</sub> da.  
Mari-to apple-ACC gave C-TOP Naoya-NOM COP  
'It was Naoya that gave an apple to Mari.'  
b. [Naoya-ga Mari-ni *e<sub>i</sub>* ageta no]-wa ringo(%-o)<sub>i</sub> da.  
Naoya-NOM Mari-to gave C-TOP apple-ACC COP  
'It was an apple that Naoya gave to Mari.' (Hiraiwa & Ishihara 2012: 144)

There are idiolectal differences in the grammaticality judgement of (i), with some speakers accepting (i) with the Case particles. To simplify the discussion, I will mainly use clefts with a focus phrase followed by *ni* 'to' (or the dative particle), which are generally judged as grammatical.

<sup>6</sup> Hiraiwa & Ishihara (2012) suggest in passing that the focus movement triggers the exhaustivity interpretation (see Section 3.1), just like clefts in other languages (see, e.g., É Kiss 1998). Below, I will provide an actual argument to that effect.

involved. Note also that such island-sensitivity is not observed in *no-da* sentences as shown by (8b), which suggests that movement is not involved in that construction.

- (8) a. \*[Ken-ga [[*e<sub>i</sub>* *e<sub>j</sub>* hon-o ageta] hito<sub>i</sub>]-o hihansita no]-wa  
           Ken-NOM book-ACC gave person-ACC criticized C-TOP  
           Mai-nij da.  
           Mai-to COP  
       ‘Lit. It was [to Mai]<sub>j</sub> that Ken criticized the person who gave an book *e<sub>j</sub>*.’
- b. [Ken-ga [[*e<sub>i</sub>* MAI-ni hon-o ageta] hito<sub>i</sub>]-o hihansita no] da.  
    Ken-NOM Mai-to book-ACC gave person-ACC criticized C COP  
       ‘Lit. It was to Mai that Ken criticized the person who gave a book (to her).’

It has been argued in other previous studies, on the other hand, that it is a null operator, rather than the focus element itself, that moves in clefts (e.g., Kuwabara 1996, Matsuda 1998, Koizumi 2000, Kizu 2005). Kizu (2005), for example, proposes the structure in (9), where a focused element XP is base-generated in the focus position and the null operator corresponding to it moves to Spec,CP in the presupposition clause.

- (9) [TopP [CP Op<sub>i</sub> [TP … *t<sub>i</sub>* …]] [TP (Subject) [VP … XP<sub>i</sub> … da]]]

H&I note that under such an operator-movement analysis, it is unclear how the Case particle/postposition on the base-generated focus phrase (i.e., XP in (9)) is licensed. Given that, they argue that their proposal should be preferred to the operator-movement analysis since it gives a straightforward account for that question: the Case particle or the postposition on the focus element is licensed in its original position before the focus movement applies.

## 2.2. An uncapturable data: embedding cleft wh-questions

Even though H&I’s proposal appears to be convincing, I show in this section that there is a case which their proposal cannot accommodate. More specifically, their analysis appears not to be able to explain the fact that an embedded cleft wh-question degrades a whole sentence, as shown in (2b), repeated here as (10).

- (10) ?\* Ken-wa [[Mai-ga *e<sub>i</sub>* kabin-o oita no]-wa doko-ni<sub>i</sub> (da) ka]  
           Ken-TOP Mai-NOM vase-ACC put C-TOP where-on COP Q  
           siranai.  
           know.not  
       ‘Ken does not know where it was that Mai put the vase.’ (= (2b))

Notice that it is not the case that realizing a cleft wh-question itself is impossible; in fact, a cleft wh-question, as well as a *no-da* sentence corresponding to it, can occur as a matrix clause, as in (11) ((11a) is the same example as (2a)).

- (11) a. [Mai-ga *e<sub>i</sub>* kabin-o *e<sub>i</sub>* oita no]-wa doko-ni<sub>i</sub> desu ka?  
           Mai-NOM vase-ACC put C-TOP where-on COP.POL Q  
           ‘Where was it that Mai put the vase?’ (= (2a))

- b. Mai-ga(/-wa) doko-ni kabin-o oita no desu ka?  
 Mai-NOM/-TOP where-on vase-ACC put C COP.POL Q  
 'Where was it that Mai put the vase?'

Also, it is possible to embed the *no-da* wh-question in (11b) as a complement clause, as in (12). This indicates that the marginality of (10) does not arise due to the impossibility of embedding (11b), whose structure is the basis for that of the embedded cleft in (10) in H&I's analysis.

- (12) Ken-wa [Mai-ga doko-ni kabin-o oita no (da) ka] {siranai /  
 Ken-TOP Mai-NOM where-on vase-ACC put C COP Q know.not  
 tazuneta}.  
 asked  
 'Ken {does not know / asked} where it was that Mai put the vase.'

Furthermore, a topic phrase followed by the topic particle *-wa* can appear within an embedded wh-interrogative clause, as shown in (13) (see, e.g., Saito 2010). This indicates that the marginality of (10) cannot be attributed to putting a topic phrase within the complement clause.

- (13) Ken-wa [Mai-wa nani-o tabeta ka] {siranai / tazuneta}.  
 Ken-TOP Mai-TOP what-ACC ate Q know.not asked  
 'Ken {does not know / asked} what Mai ate.'

These observations suggest that the cause for the degradedness of (10) should lie in the derivation of the embedded cleft. If we follow H&I's proposal regarding clefts and assume that the question particle *ka* heads ForceP (as also assumed by H&I; see also Saito 2010; Kuwabara 2013), the embedded clause in (10) is expected to be derived as in (14).

- (14) [ForceP [TopP [FinP Mai-ga *e<sub>i</sub>* kabin-o oita no]<sub>j-wa</sub> [FocP doko-ni<sub>i</sub> *t<sub>j</sub>* da]]] ka]  
 Mai-NOM vase-ACC put C-TOP where-on COP Q

There seems to be no problematic point in the derivation of (14) and thus it is difficult to account for the marginality of (10) if we strictly follow H&I's proposal. Given this background, in the next section I seek to account for why (10) is degraded.

### *3. Focus properties in the relevant constructions*

This section provides an account for the marginality caused by embedding a cleft wh-question, as in (10). Section 3.1 and 3.2 discuss focus properties of clefts and *no-da* sentences. In Section 3.3, I elaborate on H&I's proposal by reflecting in the syntactic structure the focus properties observed in Section 3.1 and 3.2, in order to account for the degraded status of (10).

#### *3.1. Exhaustivity*

This section considers what focus properties are observed in clefts and *no-da* sentences. First, I examine whether the focus phrase in the relevant constructions shows exhaustive interpretation (cf. É Kiss 1998). If a wh-question is interpreted as having the property of

exhaustivity, the addressee is expected to give exhaustive answers to the question, namely all the values which appropriately satisfy the wh-variable in the question.

One diagnostic for detecting exhaustivity is using a phrase corresponding to *for example* (Merchant 1998, Oguro 2017). The insertion of such a phrase indicates that the speaker does not require the addressee to give all the values which fill the wh-variable in the question. Notice that such a connotation induced by a phrase like *for example* is not compatible with the notion of exhaustivity. Therefore, if such a phrase can successfully occur in a wh-question, it would show that the wh-phrase does not have the property of exhaustivity. If such a phrase cannot occur in a wh-question, on the other hand, this would suggest that the wh-phrase has that property. In English, for instance, an ordinary wh-question and a cleft wh-question show a difference with respect to the compatibility with *for instance*, as exhibited below:

- (15) a. What, for instance, did John buy?  
       b. ??What, for instance, was it that John bought? (Oguro 2017: 120)

These data indicate that the exhaustivity property is present with a wh-phase in the focus position of a cleft (e.g., É Kiss 1998) but not with a wh-phrase in an ordinary question.

Let us now examine how the wh-phrase in a cleft and a *no-da* sentence behave with respect to the phrase *tatoeba* ‘for example’ (see Oguro 2017). The data are given below:

- (16) [Mai told Ken that her sister, Erika, traveled to many countries during the summer vacation. Ken asked Mai to which country, for example, Erika traveled.]  
       a. \*? [Erika-ga itta no]-wa tatoeba doko-ni desu ka?  
           Erika-NOM went C-TOP for.example where-to COP.POL Q  
           ‘Lit. To which country, for example, was it that Erika went?’  
       b. Erika-wa tatoeba doko-ni itta no desu ka?  
           Erika-TOP for.example where-to went C COP.POL Q  
           ‘Lit. To which country, for example, was it that Erika went?’
- (17) [to describe the situation of (16),]  
       ?? Ken-wa Mai-ni [Erika-ga(/-wa) tatoeba doko-ni itta no (da)  
           Ken-TOP Mai-to Erika-NOM/-TOP for.example where-to went C COP  
           ka] tazuneta.  
           Q asked  
       ‘Ken asked Mai where, for example, Erika went.’

(16) shows that *tatoeba* ‘for example’ cannot appear in a wh-cleft question (16a) while it can in a *no-da* wh-question (16b), while they appear as a matrix clause. This indicates that exhaustivity is a property of the wh-phrase in the focus position of a matrix cleft (16a) but not the wh-phrase in a matrix *no-da* wh-question (16b). On the other hand, (17) shows that inserting *tatoeba* in an embedded *no-da* wh-question gives rise to marginality, unlike its matrix counterpart as in (16b).<sup>7</sup> This fact suggests that a wh-phrase in a *no-da* wh-question behaves differently

<sup>7</sup> Note that (17) becomes acceptable when *no-da* is excluded from the embedded clause, as in (i), suggesting that inserting *tatoeba* ‘for example’ into an embedded question itself is not impossible and that it is plausible to ascribe the grammaticality difference between (17) and (i) to whether they have an exhaustive interpretation, as in the case of the matrix wh-questions in (16).

(i) Ken-wa Mai-ni [Erika-ga(/-wa) tatoeba doko-ni itta ka] tazuneta  
       Ken-TOP Mai-to Erika-NOM/-TOP for.example where-to went Q asked  
       ‘Ken asked Mai where, for example, Erika went.’

depending on whether that sentence is a matrix or an embedded clause; the wh-phrase has the exhaustivity property in the latter (17), but not in the former (16b).

### 3.2. Sharing a presupposition

Another focus property is related to the presupposition of wh-questions. Based on Tanomura's (1990) observation, Kuwabara (2013) argues that when a *no-da* wh-question (e.g., (18a)) is used, the speaker expects the addressee to share the presupposition of that sentence and, on the basis of this expectation, the speaker makes an assumption that the answer is already known to the addressee. On the other hand, he contends that an ordinary wh-question (i.e., a wh-question without *no-da*) (e.g., (18b)) does not make such an assumption and thus the speaker of such a question does not necessarily believe that the addressee knows the answer. Let us confirm this point by examining Kuwabara's example in (18).

- (18) [The speaker saw the addressee coming out of the store with a large shopping bag.]
- a. (Kimi-wa) nani-o katta no desu ka?  
you-TOP what-ACC bought C COP.POL Q  
'What was it that you bought?'
  - b. #(Kimi-wa) nani-o kai-masita ka?  
you-TOP what-ACC buy-POL.PAST Q  
'What did you buy?'

Considering the context in (18), it is obvious to the speaker of (18a,b) that the addressee knows what he bought, which leads the speaker to expect that the presupposition that 'the addressee bought something' is shared between him/her and the addressee, and thus to assume that the addressee knows the answer to the question. Such a situation makes the *no-da* wh-question in (18a) preferable to the ordinary wh-question in (18b).

He also indicates that this property accounts for the infelicity of the use of a *no-da* wh-question in the context of a quiz show (see also Oguro 2015), as exemplified in (19).

- (19) [On a quiz show, the MC asks a question to one of the contestants.]
- a. #Koronbusu-wa nannen-ni Amerika tairuku-o hakkensita no  
Columbus-TOP what.year-in America continent-ACC discovered C  
desu ka?  
COP.POL Q  
'In what year was it that Columbus discovered the American continents?'
  - b. Koronbusu-wa nannen-ni Amerika tairuku-o hakkensi-masita ka?  
Columbus-TOP what.year-in America continent-ACC discover-POL.PAST Q  
'In what year did Columbus discover the American continents?'

In a quiz show context such as in (19), it would be pragmatically unnatural for the MC to assume that the contestants already have answers for questions to be asked. This factor prevents the *no-da* wh-question in (19a) from being used in that context, because, according to Kuwabara (2013), the use of a *no-da* wh-question implies that the speaker has an assumption that the contestant knows the answer, and instead leads the MC to use the ordinary wh-question in (19b).

Kuwabara further corroborates this property by showing the fact that the addressee's response including *nothing* to a *no-da* wh-question is surprising to the speaker, while such an

effect is not obtained when the speaker uses an ordinary question, as shown in (20).

- (20) a. A: (Kimi-wa) nani-o katta no desu ka?  
           you-TOP what-ACC bought C COP.POL Q  
           ‘What was it that you bought?’  
     B: #Nanimo kawa-nakatta desu yo.  
           anything buy-NEG.PAST COP.POL SFP  
           ‘I bought nothing.’
- b. A: (Kimi-wa) nani-o kai-masita ka?  
           you-TOP what-ACC buy-POL.PAST Q  
           ‘What did you buy?’  
     B: Nanimo kawa-nakatta desu yo.  
           anything buy-NEG.PAST COP.POL SFP  
           ‘I bought nothing.’

This effect can be accounted for with Kuwabara’s argument: the speaker of the *no-da* wh-question in (20aA) feels surprised by the response in (20aB) since he/she assumes that the addressee knows the answer to that question, while this is not the case with the speaker of the ordinary wh-question in (20bA) since he/she does not need to have such an assumption.

Kuwabara (2013) claims that this property of wh-questions with *no* is reflected in the cartographic syntactic structure. Based on Kuno’s (1980) observation that *no* is necessary in yes-no questions to put a focus on an element other than the predicate, Kuwabara proposes that the presence of *no* serves as a signal that the optional Topic-Focus field in the CP area has been activated (Rizzi 1997), indicating the presence of FocP, the head of which he assumes licenses a focus in yes-no questions by c-commanding it. On the other hand, he observes that when a wh-question is uttered with *no*, which signals the existence of FocP, it does not play the same role as that in yes-no questions, but rather it indicates the speaker’s expectation that the addressee shares the presupposition of the wh-question, as described above. Given this observation, he ascribes that expectation by the speaker to the head of FocP, whose complement is interpreted as a presupposition (Rizzi 1997). I follow Kuwabara (2013) with respect to this reasoning and assume that the property of sharing a presupposition of a wh-question is brought about by the existence of FocP. The question to pose here, then, is whether cleft wh-questions show the same property. If this is the case, it is predicted that a cleft wh-question would be avoided in the context of (19) and the speaker would feel surprised when the response to that question includes *nothing* as in (20).<sup>8</sup> This prediction is borne out, as shown below:

- (21) [On a quiz show, the MC asks a question to one of the contestants.]  
      #[Koronbusu-ga Amerika tairuku-o hakkensita no]-wa nannen-ni  
          Columbus-NOM America continent-ACC discovered C-TOP what.year-in  
          desu ka?  
          COP.POL Q

<sup>8</sup> Another prediction is that a cleft wh-question will be felicitously used under the context of (18). However, such a cleft wh-question becomes marginal, as shown in (i).

(i) [under the context of (18),]  
      ?? [Kimi-ga katta no]-wa nani-o desu ka?  
          you-NOM bought C-TOP what-ACC COP.POL Q  
          ‘What was it that you bought?’

I suggest that the marginality of (i) comes from discourse/contextual reasons that are independent of the focus property of presupposition sharing. To investigate what those reasons would be is left for future work.

'In what year was it that Columbus discovered the American continent?'

- (22) A: [Kimi-ga katta no]-wa nani-o desu ka?  
       you-NOM bought C-TOP what-ACC COP.POL Q  
       'What was it that you bought?'  
     B: #Nanimo kawa-nakatta desu yo.  
       anything buy-NEG.PAST COP.POL SFP  
       'I bought nothing.'

This observation thus indicates that the speaker of a cleft wh-question assumes that the addressee knows the answer to that question.

What remains to be examined is whether the same property can be observed when a *no-da* wh-question is embedded as a complement clause. If so, it is expected that the situation of (19a) cannot be described with the *no-da* wh-question in (19a) used as a complement clause. (Note that the diagnostic used in (20) cannot be used here, since the relevant responding (i.e., *I bought nothing.*) is possible only to a matrix question.) This expectation is not borne out, however, as seen in (23).

- (23) [to describe the situation of (19a),]  
     ?Sono sikaisya-wa kaitoosya-ni [Koronbusu-ga(/-wa) nannen-ni Ameika  
       that MC-TOP contestant-to Columbus-NOM/-TOP what.year-in America  
       tairiku-o hakkensita no ka] tazuneta.  
       continent-ACC discovered C Q asked  
     'The MC asked the contestant in what year Columbus discovered the American continent.'

This data suggests that the property of presupposition sharing does not appear when a *no-da* wh-question is embedded, in contrast with a matrix *no-da* wh-question.

To recap, the observations regarding the focus properties in cleft wh-questions, on one hand, and matrix and embedded *no-da* wh-questions, on the other, are summarized in the table below.

	clefts wh-questions		<i>no-da</i> wh-questions	
	matrix	embedded	matrix	embedded
exhaustivity	✓	N/A	*	✓
sharing presupposition	✓	N/A	✓	*

Table 1: focus properties in cleft wh-questions and *no-da* wh-questions

### 3.3. Refinement of H&I's proposal

In order to formalize the focus properties in the relevant constructions, which I have observed in the last two sections, I assume that the head of FocP is equipped with the (at least) two features, [ $\pm$ exh(austivity)] and [ $\pm$ sh(aring)-p(resupposition)].<sup>9</sup> The former feature specifies

<sup>9</sup> To posit such discourse-related features does not seem unreasonable given the cartographic enterprise in the syntactic research (e.g., Cinque & Rizzi 2010, Rizzi & Cinque 2016). In addition, assuming two features on the head of FocP is not so implausible; in fact, É Kiss (1998) assumes that the head of FocP, which she argues is located above IP, has the two features [ $\pm$ exhaustive] and [ $\pm$ contrastive]. Another possible way of setting the two

whether a focused phrase has the property of exhaustivity, whereas the latter determines whether the speaker can expect the addressee to share a presupposition of a sentence. Based on Table 1 in the last section, the value of those features in each construction can be represented as below:<sup>10</sup>

- (24) a. matrix cleft wh-questions: [+exh], [+sh-p]
- b. matrix *no-da* wh-questions: [-exh], [+sh-p]
- c. embedded *no-da* wh-questions: [+exh](, [-sh-p])

Considering this observation, I refine H&I's analysis of clefts and claim that the focus movement in clefts, namely movement of a focus element to Spec,FocP, is induced by the head of FocP with the combination of [+exh] and [+sh-p], which plays a role of a strong feature of Chomsky (1995), where strong features cause overt movement.<sup>11</sup> This captures the fact that overt focus movement is induced in clefts but not in *no-da* sentences.

This claim also captures why embedding a cleft wh-question yields marginality (see (2b)/(10)), with a conjecture about the status of the feature [ $\pm$ sh-p]. The notion of presupposition sharing depends on the existence of a speaker and an addressee. Given that the notion of speakers and addresses is characterized with respect to root clauses and thus should not be involved in embedded clauses, it is then suggested that the [ $\pm$ sh-p] feature is necessarily valued as minus (i.e., [-sh-p]) when it appears within an embedded clause, or that it is not present in the head of FocP in an embedded clause. For expository purposes, I assume the latter option.<sup>12</sup> It then follows that the combination of [+exh] and [+sh-p] cannot be realized in an embedded clause, which is why cleft wh-questions cannot be realized as an embedded clause, given our claim that the featural combination of [+exh] and [+sh-p] induces focus movement.

#### 4. Consequence: complement clauses headed by to

This section discusses a consequence of the analysis presented in Section 3. It concerns the Japanese complementizer *to*, which is used in the example in (25).

- (25) Ken<sub>i</sub>-wa [Mai-ga kare<sub>i/j</sub>-no ie-ni kita to] itta.  
Ken-TOP Mai-NOM he-GEN house-to came C said  
'Ken said that Mai came to his house.'

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features in questions is to assume no +/- distinction and to capture the property of the head of FocP by whether [exh] and [sh-p] are present there, as a reviewer points out. Since it seems that the current discussion will be hardly affected whichever feature-setting is posited, I simply follow É Kiss (1998) and assume that each feature has the +/- distinction.

<sup>10</sup> In (24c), the feature [-sh-p] is parenthesized, since I assume that the feature [ $\pm$ sh-p] cannot appear within an embedded clause due to its discourse character, as discussed below.

<sup>11</sup> The present claim is based on É Kiss's (1998) proposal that the head of a functional projection that hosts an identificational focus is different among languages with respect to whether the two features [ $\pm$ exhaustive] and [ $\pm$ contrastive] are specified as + or - and whether the feature complex of them is strong or weak (i.e., induces focus movement in syntax or LF). Alternatively, as suggested by a reviewer, it is also possible to assume that the movement of the focus phrase is induced by the EPP feature on the head of FocP with [+exh] and [+sh-p], even though the association between those three features is unclear. The technical mechanism to capture the relationship between the focus movement and the combination of [+exh] and [+sh-p] is left open.

<sup>12</sup> I suggest that the head of FocP in an embedded *no-da* wh-question has [+exh], unlike that in a matrix one, because, if the head, which is not furnished with [ $\pm$ sh-p] as I assumed, had [-exh], there would be no motivation to posit FocP.

One might think that this complementizer is the counterpart of English *that*. Saito's works (2010, 2012, 2015), however, argue that this is not the case and that clauses headed by *to* function as report clauses, or paraphrases of a direct quote.<sup>13</sup> Below I introduce three properties of *to* which confirm this.

First, *to* can follow a complement interrogative clause headed by *ka*, yielding the complementizer sequence *ka-to*, as shown below:<sup>14</sup>

- (26) a. Mai-wa Keni-ni [karei-no imooto-ga tyooshoku-ni nani-o tabeta  
Mai-TOP Ken-to he-GEN sister-NOM breakfast-in what-ACC ate  
ka] tazuneta.  
Q asked  
'Mai asked Ken what his sister ate in the breakfast.'  
b. Mai-wa Keni-ni [karei-no imooto-ga tyooshoku-ni nani-o tabeta  
Mai-TOP Ken-to he-GEN sister-NOM breakfast-in what-ACC ate  
ka to] tazuneta.  
Q C asked  
'Lit. Mai asked Ken that what his sister ate in the breakfast.'

Note that the English *that* does not have this property, as indicated by the ungrammaticality of the translation of (26b). On the other hand, it is reasonable to assume that *to* possesses that property if we adopt Saito's argument that that complementizer takes as its complement a paraphrase of a direct quote, which obviously can be a question (e.g., *Mai asked to Ken, "What did your sister ate in the breakfast?"*).

Given *to*'s function of paraphrasing a direct quote, it is expected that it can take as its complement not only an interrogative clause but also other clause types, such as an imperative. This expectation is borne out, as shown in (27) (see also Kuno 1988; Fujita 2000). This fact thus further supports Saito's argument.

- (27) Mai-wa Ken-ni [kanozyo-i-no heya-o soojisi-ro to] itta.  
Mai-TOP Ken-to she-GEN room-ACC clean-IMP C said  
'Lit. Mai said to Ken that clean<sub>IMP</sub> her room.'

Furthermore, there is a selectional restriction between a matrix verb and a complement clause headed by *to*: a *to*-headed clause is selected only by verbs of "saying and thinking", or verbs which can select a direct quotation. For example, although the matrix verbs shown in (28) can take an interrogative clause headed by the question marker *ka*, *to* cannot follow *ka* in this case, because those matrix verbs are not verbs of saying and thinking.

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<sup>13</sup> Saito argues that *to* corresponds to Spanish complementizer *que*, illustrated by (i), through observing that the three properties discussed here are also shown by that Spanish complementizer (cf. Plann 1982, Rivero 1994).

(i) Te preguntan [que qué quires].  
you ask.3PL C what want.2SG  
'Lit. They ask you that what you want.'

<sup>14</sup> Given that *to* can also mark a direct quote, as shown in (i), in *to*-headed clauses in the relevant examples, I use an anaphorical item referring to an element in the matrix clause, to ensure that the complement clause is not a direct quote but a report clause.

(i) Ken-wa [“a, boku-no imooto-ga gakkoo-o yasunda yo” to] itta.  
Ken-TOP oh I-GEN sister-NOM school-ACC was.absent SFP C said  
'Ken said to Mary, "Oh, my sister was absent from school."

- (28) Mai-wa [kanozyoi-no imooto-ga doko-ni itta ka (\*to)] {tyoosasita / Mai-TOP she-GEN sister-NOM where-to went Q C investigated rikaisita / sitteiru}.  
understood know  
‘Mai {investigated / understood / knows} where her sister went.’

On the other hand, the complementizer sequence *ka-to* is possible in (26b), unlike (28), since the matrix verb *tazuneta* ‘asked’ is regarded as a verb of saying. This selectional property of *to* straightforwardly follows from Saito’s argument that *to* takes as its complement a paraphrase of a direct quote.

Based on these observations, I adopt Saito’s argument and his proposal of the cartographic CP structure of Japanese shown in (29), where *to* heads ReportP which takes ForceP as its complement.<sup>15</sup>

- (29) [ReportP [ForceP [TopP [FocP [FinP [TP ...] no] Top] da] ka] to]

Given the structure in (29), there does not appear to be a significant structural difference between the complement clause of (26a) and that of (26b), besides the existence or absence of the additional layer ReportP. It is then expected that the two sentences in (26) should not yield significant syntactic or semantic differences. I consider below whether this expectation is borne out.

Recall that a sentence is degraded when a cleft wh-question is embedded as a complement clause as shown below (see also (2b)/(10)).

- (30) ?\* Ken-wa Erika-ni [[Mai-ga ei kabin-o oita no]-wa doko-ni ka]  
Ken-TOP Erika-to Mai-NOM vase-ACC put C-TOP where-on Q  
tazuneta.  
asked  
‘Ken asked Erika where it was that Mai put a vase.’

Importantly, the grammaticality of (30) is ameliorated if the embedded cleft wh-question is followed by *to*; compare (31) with (30).

- (31) Ken-wa Erika-ni [[Mai-ga ei kabin-o oita no]-wa doko-ni ka to]  
Ken-TOP Erika-to Mai-NOM vase-ACC put C-TOP where-on Q C  
tazuneta.  
asked  
‘Lit. Ken asked that where it is that Mai put a vase.’

This contrast between (30) and (31) thus indicates that there is a significant difference between the structure of a ForceP-size embedded clause, such as in (26a) and (30), and that of a ReportP-size embedded clause, such as in (26b) and (31). I now examine what that structural difference could be.

In Section 3, I presented an account for the reason why a cleft wh-question cannot be embedded as a complement clause through observing focus properties in the relevant constructions and reflecting them in their structure on the basis of H&I’s proposal. Specifically,

<sup>15</sup> Saito’s original proposal does not contain FocP. I do not discuss this point and I adopt H&I’s proposal that FocP in Japanese is headed by the copula *da*, as reflected in (29).

assuming the two features [ $\pm$ exh(austivity)] and [ $\pm$ sh(aring)-p(resupposition)] on the head of FocP, I claimed that the focus movement in clefts is induced by the combination of [+exh] and [+sh-p]. It was also claimed that [+sh-p] cannot appear on the head of FocP within an embedded clause, since the feature [+sh-p] depends on the notion of the speaker and the addressee, which is a hallmark characteristic of root clauses. This means that the combination of [+exh] and [+sh-p], and thus cleft wh-questions, where a focus movement is required, cannot appear within an embedded clause.

If this explanation is taken into consideration, the fact that a cleft wh-question can be realized as an embedded clause headed by *to* as in (31) suggests that the combination of [+exh] and [+sh-p] can appear within a *to*-headed clause, unlike a genuine complement interrogative clause headed only by *ka*, as seen in (30). This reveals one aspect of the function of ReportP: unlike ForceP-size clauses, ReportP-size clauses have some properties of root clauses, including the notion of the speaker and the addressee, which is not surprising given the nature of such clauses. In other words, such clauses have mixed properties of embedded and root clauses.

Given the above observation, it is expected that a *no-da* wh-question followed by *to* would show properties induced by [+sh-p], which are observed in matrix *no-da* wh-questions. In other words, the head of FocP in an embedded *no-da* wh-question followed by *to* should have [-exh] and [+sh-p], just as in matrix *no-da* wh-questions (see (24)). This expectation is borne out: if *to* is added to the question maker *ka* in (17), then the sentence becomes completely grammatical, and furthermore, if *to* is inserted between the question particle *ka* and the matrix verb *tazuneta* ‘asked’ in (23), the sentence becomes odd, as shown below.

- (32) [to describe the situation of (16),]

Ken-wa Mai-ni [Erika-wa tatoeba doko-ni itta no ka to]  
 Ken-TOP Mai-to Erika-TOP for.example where-to went C Q C  
 tazuneta.  
 asked

‘Lit. Ken asked Mai that where, for example, Erika went.’

- (33) [to describe the situation of (19a),]

# Sono sikaisya-wa kaitoosya-ni [Koronbusu-ga(/-wa) nannen-ni Ameika  
 that MC-TOP contestant-to Columbus-NOM/-TOP what.year-in America  
 tairiku-o hakkensita no ka to] tazuneta.  
 continent-ACC discovered C Q C asked

‘Lit. The MC asked the contestant that in what year Columbus discovered the American continent.’

This observation thus indicates that the *no-da* wh-question followed by *to* in (32) and (33) carries [-exh] and [+sh-p] in the head of its FocP and thus can be analyzed on a par with matrix *no-da* wh-questions, such as (16b) and (19a) (see (24b)).

To recap, this section elucidated one characteristic of ReportP; it incorporates a property of root clauses, namely the notion of the speaker and the addressee, into an embedded clause, which enables [+sh-p] to appear within an embedded clause.

## 5. Conclusion

This paper aimed to account for why embedding a cleft wh-question degrades a whole sentence,

which appears to be difficult to explain on the basis of H&I's analysis of Japanese clefts, if the analysis is taken at its face value. Specifically, I elaborated on H&I's analysis of clefts, and claimed that there exist (at least) two features on the head of FocP, namely [+exh] and [+sh-p], and that the combination of the two features induces the focus movement in clefts. With this refinement, a cleft wh-question cannot be embedded because [+sh-p] cannot appear in embedded clauses due to its nature.<sup>16</sup> The paper further discussed a consequence of the current analysis, concerning a function of one Japanese complementizer, namely *to*.

There are several remaining issues in the proposed analysis, however. One of them has to do with another possible diagnostic for exhaustivity, namely adding a focus particle *sae* 'even' (see É Kiss 1998). If *sae* is a diagnostic for exhaustivity, it may be expected that this particle cannot be attached to a wh-phrase with [+exh], namely that in a matrix cleft and in an embedded *no-da* sentence (see (24)). This prediction is borne out in the former case (see Hiraiwa & Ishihara 2012), but not in the latter case, as shown below:

- (34) a. \*[Erika-ga itta no]-wa doko-ni-sae desu ka?  
           Erika-NOM went C-TOP where-to-even COP.POL Q  
           ‘Lit. Even where was it that Erika went?’  
   b. Ken-wa Mai-ni [Erika-ga doko-ni-sae itta no ka] tazuneta.  
       Ken-TOP Mai-to Erika-NOM where-to-even went C Q asked  
       ‘Lit. Ken asked Mai even where it was that Erika went.’

This observation indicates that two diagnostics for exhaustivity, namely inserting *tatoeba* 'for example' (see Section 3.1) and attaching *sae* 'even', show different results with respect to the exhaustivity of a wh-phrase within an embedded *no-da* wh-question. This raises an interesting question which I leave open here.

The data relevant to another issue are shown below:

- (18) [The speaker saw the addressee coming out of the store with a large shopping bag.]  
   a. (Kimi-wa) nani-o katta no desu ka?  
       you-TOP what-ACC bought C COP.POL Q  
       ‘What was it that you bought?’  
   b. #(Kimi-wa) nani-o kai-masita ka?  
       you-TOP what-ACC buy-POL.PAST Q  
       ‘What did you buy?’

<sup>16</sup> As a reviewer points out, if the current analysis is correct, it is expected that the marginality is observed when a cleft is embedded not only as a wh-question but another kind of embedded sentences, such as a complement clause headed by *koto* 'fact' like (i). One obstruction for testing this prediction, however, is the fact that using a topic phrase within such clauses makes the sentence fairly degraded, as shown in (i).

(i) Ken-wa [Mai{-ga/?\*-wa} hondana-ni kabin-o oita koto]-o oboeteiru.  
       Ken-Top Mai-Nom/-Top bookshelf-on vase-Acc put fact-Acc remember  
       ‘Ken remembers that Mai put a vase on the bookshelf.’

This fact indicates that in contrast with embedded questions, those embedded clauses cannot include TopP (see, e.g., Saito 2010), which makes it difficult to test the prediction given that TopP is necessary to derive clefts in H&I's analysis. To examine if the prediction is borne out is thus left as a future task.

- (35) [to describe the situation in (18), where the speaker is Ken and the addressee is Mai,]  
 Ken-wa Mai-ni [kanozoi-ga(/-wa) nani-o katta ?(no) ka to]  
 Ken-TOP Mai-to she-NOM/-TOP what-ACC bought C Q C  
 tazuneta.  
 asked  
 ‘Lit. Ken asked Mai that what it was that she bought.’

In Section 4, I argued that the head of FocP in an embedded clause headed by *to* can have [+sh-p] and hence an embedded *no-da* wh-question headed by *to* carries [-exh] and [+sh-p] in the head of its FocP, as does a matrix *no-da* wh-question (see (24)). It then seems to be predicted that to describe the situation in (18), the *to*-headed wh-question should preferably occur with *no-da*, rather than without it, just as in (18). This is not the case, however, as shown in (35); the ordinary wh-question (without *no-da*), as well as the *no-da* wh-question, can appear as a *to*-headed complement clause. To investigate this optionality more closely is left for future research.

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#### *Abbreviations*

ACC = accusative; C = complementizer; COP = copula; GEN = genitive; IMP = imperative morpheme; NEG = negation; NMLZ = nominalizer; NOM = nominative; PAST = past; PL = plural; POL = politeness marker; Q = question complementizer; SG = singular; SFP = sentence final particle; TOP = topic particle.

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#### *References*

- Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MIT Press, Cambridge, MA.
- Cinque, G. & L. Rizzi (2010). Cinque, The cartography of syntactic structures. Heine, B. & H. Narrog (eds.), *The Oxford Handbook of Linguistic Analysis*, Oxford University Press, New York, pp. 51-65.
- É. Kiss, K. (1998). Identificational focus versus information focus. *Language* 74:2, pp. 245-273.
- Fujita, Y. (2000). *Kokugo inyoo koobun no kenkyuu* [A study of quotative constructions in Japanese]. Izumi Shoin, Osaka.
- Hasegawa, N. (2011). On the cleft construction: is it simplex or complex?. *Scientific approaches to language* 10, pp. 13-32.
- Hiraiwa, K. & S. Ishihara. (2002). Missing links: cleft, sluicing, and “no da” construction in Japanese. Ionin, T., H. Ko & A. Nevins (eds.), *Proceedings of the 2nd HUMIT Student Conference in Language Research*, MIT Working Papers in Linguistics 43, MIT Working Papers in Linguistics, Cambridge, MA, pp. 35-54.
- Hiraiwa, K. & S. Ishihara. (2012). Syntactic metamorphosis: clefts, sluicing, and in-situ focus in Japanese. *Syntax* 15:2, pp. 142-180.

- Hoji, H. (1987). Japanese clefts and reconstruction/chain binding effects. Paper presented at the 6th West Coast Conference on Formal Linguistics, University of Arizona, March 20-22. [https://www.researchgate.net/publication/333812348\\_Japanese\\_Clefts\\_and\\_ReconstructionChain\\_Binding\\_Effects](https://www.researchgate.net/publication/333812348_Japanese_Clefts_and_ReconstructionChain_Binding_Effects)
- Kizu, M. (2005). *Cleft constructions in Japanese syntax*. Palgrave Macmillan, New York.
- Koizumi, M. (2000). String vacuous overt verb raising. *Journal of East Asian Linguistics* 9, pp. 227–285.
- Kuno, S. (1980). The scope of the question and negation in some verb-final languages. Kreiman, J. & A. E. Ojeda (eds.), *Papers from the Sixteenth Regional Meeting of the Chicago Linguistic Society*, Chicago Linguistic Society, Chicago, pp. 155–169.
- Kuno, S. (1988). Blended quasi-direct discourse in Japanese. Poser, W. (ed.), *Papers from the Second International Workshop on Japanese Syntax*, CSLI Publications, Stanford, CA, pp. 75–102
- Kuroda, S.-Y. (1999). Tokoro setu [Tokoro clauses]. Kuroda, S.-Y. & M. Nakamura (eds.), *Kotoba-no kaku-to syuuuen: nihongo-to eigo-no aida [Nucleus and periphery of language: between Japanese and English]*, Kuroshio Publishers, Tokyo, pp. 105–162.
- Kuwabara, K. (1996). Multiple wh-phrases in elliptical clauses and some aspects of clefts with multiple foci. Koizumi, M., M. Oishi & U. Sauerland (eds.), *Formal Approaches to Japanese Linguistics 2*, MIT Working Papers in Linguistics 29. Cambridge, MA: MIT Working Papers in Linguistics, Cambridge, MA, pp. 97–116.
- Kuwabara, K. (2013). Peripheral effects in Japanese questions and the fine structure of CP. *Lingua* 126, pp. 92–119.
- Matsuda, Y. (1998). A syntactic analysis of focus sentences in Japanese. Bruening, B. (ed.), *Proceedings of the 8th Student Conference in Linguistics*, MIT Working Papers in Linguistics 31. Cambridge, MA: MIT Working Papers, Cambridge, MA, pp. 291–310.
- Merchant, J. (1998). ‘Pseudosluicing’: elliptical clefts in Japanese and English. Alexiadou, A., N. Fuhrhop, P. Law & U. Kleinhenz (eds.), *ZAS Papers in Linguistics 10*, Berlin: Zentrum fuer Allgemeine Sprachwissenschaft, Berlin, pp. 88–112.
- Nishiguchi, T. & T. Fujii (2006). Short answers: ellipsis, connectivity, and island repair. Ms. Kobe Shoin Graduate School, and University of Maryland. <http://citeseerx.ist.psu.edu/viewdoc/download?jsessionid=66441A0EFE21BE53B401CC8F482CE884?doi=10.1.1.514.8422&rep=rep1&type=pdf>
- Nishiyama, K., J. Whitman & E.-Y. Yi (1995). Syntactic movement of overt wh-phrases in Japanese and Korean. Akatsuka, N., S. Iwasaki & S. Strauss (eds.), *Japanese/Korean Linguistics 5*, CSLI Publications, Stanford, CA, pp. 337–351.
- Oguro, T. (2015). WH-questions in Japanese and speech act phrase. *Linguistica Atlantica* 34:2, pp. 89–101.
- Oguro, T. (2017). The true nature of WH-the hell phrases. *Florida Linguistics Papers* 4:2, pp. 113–126.
- Plann, S. (1982). Indirect questions in Spanish. *Linguistic Inquiry* 13:2, pp. 297–312.
- Rivero, M.-L. (1994). On indirect questions, commands, and Spanish quotative *que*. *Linguistic Inquiry* 25:3, pp. 547–554.
- Rizzi, L. (1997). The fine structure of the left periphery. Haegeman, L. (ed.), *Elements of Grammar*, Kluwer Academic Publishers, Dordrecht, pp. 281–337.
- Rizzi, L. & G. Cinque (2016). Functional categories and syntactic theory. *Annual Review of Linguistics* 2, pp. 139–163.
- Saito, M. (2010). Sentence types and the Japanese right periphery. Ms. Nanzan University and University of Connecticut. [http://www.ic.nanzan-u.ac.jp/LINGUISTICS/staff/saito\\_mamoru/pdf/saito-2010-Frankfurt.pdf](http://www.ic.nanzan-u.ac.jp/LINGUISTICS/staff/saito_mamoru/pdf/saito-2010-Frankfurt.pdf)
- Saito, M. (2012). Sentence types and the Japanese right periphery. Grewendorf, G. & T. E. Zimmerman (eds.), *Discourse and grammar*, De Gruyter, Berlin, pp. 147–175.
- Saito, M. (2015). Cartography and selection: case studies in Japanese. Shlonsky, U. (ed.), *Beyond functional sequence: the cartography of syntactic structures*, Oxford University Press, New York, pp. 255–274.
- Sakamoto, Y. (2017). Escape from silent syntax. PhD dissertation, University of Connecticut.
- Takahashi, D. (2006). Apparent parasitic gaps and null arguments in Japanese. *Journal of East Asian Linguistics* 15, pp. 1–35.
- Tanomura, T. (1990). *Gendai nihongo no bunpoo I: ‘noda’ no imi to yoohoo [Modern Japanese grammar I: meanings and functions of ‘noda’]*. Izumi Shoin, Osaka.

# **Free choice disjunction of propositions in generic sentences**

Wenyue Hua

Disjunction is used to connect multiple options when there is insufficient information to determine which one is true. However, free choice disjunction defies this simple fact: when a disjunction acts as a free choice operator, all options are true. The usage of free choice disjunction is observed to usually co-occur with modals, pluralities, *etc.* This paper introduces a novel observation of sentences with free choice disjunction in English. Multiple data points are presented to demonstrate the semantic distribution. I propose that free choice reading in disjunctions depends on three factors: the sentence's genericity, scope of the disjunction and disjuncts being imperfect nominals.

## *1. Introduction*

Disjunction comes in handy when the speaker has insufficient information to determine the truth value of some proposition among its alternatives. Here is a simple example about the usage of disjunction. A speaker is unsure about where exactly his friend Andy went. But based on what he/she knows about the friend, Andy can only go to one of these two places: the university library or the cinema nearby. Then the speaker may say the following.

- (1) Andy went to the university library or the cinema nearby.

The disjunction conveys that the speaker only has partial knowledge about where Andy is. Based on this sentence, I cannot infer the truth value of either disjunct:

- (2) Andy went to the university library or the cinema nearby.  
     $\not\Rightarrow$  Andy went to the university library.  
     $\not\Rightarrow$  Andy went to the cinema nearby.

This reading can be referred to as the ignorance reading (Aloni 2005:1). Although it seems that this common usage of disjunction can establish a universal fact that disjuncts cannot be inferred as true from sentences involving disjunction, free choice disjunction defies it. This

reading can be referred to as free choice reading (FCR). Free choice disjunction is found to co-occur with existential modals (Kratzer & Shimoyama 2002; Aloni 2003, 2007; Simons 2005), pluralities (Klinedinst 2007; Eckardt 2007; Fox 2007) and controversially, generic quantifiers (Nickel 2008, 2010). Here are some examples.

- (3) Andy went to a seminar. There are two drinks available: orange juice and apple cider.  
 The host told him:  
 You may drink orange juice or apple cider.

This sentence tells Andy what he could drink. Based on this information, Andy knows that he is allowed to drink orange juice *and* also allowed to drink apple cider. Therefore there are two propositions that are inferred to be true from (3).

- (4) You may drink orange juice or apple cider.  
 $\Rightarrow$  You may drink orange juice.  
 $\Rightarrow$  You may drink apple cider.

The existential modal here is necessary, without which a common ignorance reading would be generated.

- (5) Peter drinks orange juice or apple cider everyday.  
 $\not\Rightarrow$  Peter drinks orange juice everyday.  
 $\not\Rightarrow$  Peter drinks drink apple cider everyday.

(4) involves an existential deontic modal: may. It is observed that free choice inference can be found in the context of existential modals such as “could” and “may”, but not in necessity statements involving universal modals such as “must” or in episodic statements (Horn 1972; Kamp 2013).

As noticed in Klinedinst (2007), FCR also occurs in sentences involving plural existentials. Here is an example.

- (6) In an art class, the Professor asked students to complete a small artwork about the life or work of Shakespeare. Some students directed a short movie or composed a song.

This last sentence involves a disjunction: there exists a plurality of students such that everyone of them either directed a short movie or composed a song. At least one student directed a short movie *and* at least one student composed a song. Therefore this sentence can be understood as “Some students directed a short movie and some students composed a song”. Klinedinst also showed that other than distributive predicates occurring in (6), collective predicates can also generate FCR.

- (7) Some students gathered in the hall or on the common.

“gather” is a collective predicate. It applies to sub-pluralities of the set of students in the range of the existential quantifier. Therefore this sentence indicates that there were a plurality of students that gathered in the hall *and* there was also a plurality of students that gathered on the common.

The other example of free choice disjunction is disjunction used in generic sentences. Nickel (2010) argued that generic quantifiers, which are in many cases treated as universal quantifiers, also exhibit conjunctive strengthening.

- (8) Elephants live in Africa or Asia.  
 $\Rightarrow$  Elephants live in Africa.  
 $\Rightarrow$  Elephants live in Asia.

Nickel interprets the semantics of genericity as a way of being normal with respect to some property. To say that “elephants live in Africa”, it is saying that there is a way of being an elephant that is normal with respect to its habitat, and all elephants that are normal in that way live in Africa; To say that “elephants live in Asia”, it means that there is a way of being an elephant that is normal with respect to its habitat, and all elephants that are normal in that way live in Asia. With respect to the existence of a way of being normal for that specific elephant, there is a universal quantifier that quantifies all elephants.

Although I did not provide the formal analysis of the generation of free choice disjunction in the examples, all of them can be observed to have an existential quantifier involved. However, in this paper, I will propose a novel type of sentence with free choice disjunction which does not require an existential quantifier explicitly or implicitly. The new observation adds up to the distribution of FCR presented above: if the disjuncts are semantically propositions in a non-episodic sentence, then a FCR can be generated. Here is a simple example.<sup>1</sup>

- (9) Playing chess or go is time consuming.

(9) can convey the usual disjunctive meaning, *i.e.* the speaker is unsure about whether it is playing chess or playing go that is time consuming, but knows that at least one of them is true. Rephrasing the sentence as “playing chess is time consuming or playing go is time consuming”, it unambiguously conveys the ignorance reading. But (9) has another reading: both playing chess and playing go are time consuming.<sup>2</sup> This generic sentence with gerund phrases as disjuncts can generate FCR. The paper will focus on analyzing the distribution of this new type of sentence and propose an analysis based on genericity and scope of the disjunction.

Here is the structure of the paper. Section 2 introduces all data points related to the phenomenon and demonstrates the data distribution. Section 3 discusses formalization of gerund phrases and generic sentences, which are prerequisites for a compositional analysis of the phenomenon. Section 4 discusses in detail how the ignorance reading and FCR, if derivable, can be composed and if not, why it cannot be derived. The last section concludes the paper.

## 2. Data Distribution

This section demonstrates the distribution of the new type of FCR. (Semi)-minimal pairs of sentences are provided to illustrate what are necessary to trigger FCR.

Let us first look at some data. Below are four scenarios. In each scenario, there are four different sentences with disjunction listed: the first sentence is a generic sentence containing gerund phrases as disjuncts; the second sentence is an episodic sentence which also contains gerund phrases as disjuncts; the third sentence is a generic sentence containing individual entities as disjuncts; the last sentence is an episodic sentence which also contains individual entities as disjuncts. Besides, the sentences in the four scenario are of different types of gerund phrases.

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<sup>1</sup> All the data points about this phenomenon have been tested by 3-5 native General American English speakers.

<sup>2</sup> Among native speakers, this reading is even more salient than the ignorance reading.

Contrasts can also be made across scenarios.

- (10) Some friends are discussing holding a party in the weekend. They are listing names of people they want to invite. Someone may say one of the following sentences:
- (a) Inviting Andy or Billy to the party is a good idea.
  - (b) Inviting Andy or Billy to the last party scared everyone.
  - (c) Andy or Billy has a good sense of humor at parties.
  - (d) Andy or Billy scared everyone last time.

Among the four sentences in scenario (10), only (10a) can generate a FCR: both inviting Andy to the party is a good idea and inviting Billy to the party is a good idea. In this specific case, the speaker is certain that both invitations would be good choices. Either event, whenever it takes place, would bring positive effect to the party. This sentence also has the ignorance reading available, *i.e.* the speaker is not certain which one of Andy and Billy to be invited would be a good idea. (10b), (10c) and (10d) only have the ignorance reading available. In (10b), the speaker does not have enough information to decide which one of the two events, “inviting Andy to the last party” or “inviting Billy to the last party”, scared everyone. However, it cannot be interpreted as both events scared everyone. (10c) also express similar ignorance about two possible options: the speaker knows at least one of Andy and Billy has a good sense of humor at parties and thereby should be invited, but the speaker forgets exactly which one of them. (10d) is a simple episodic sentence indicating that one of Andy and Billy scared everyone last time, which only has ignorance reading.

- (11) Some people are discussing whether people should drink tea or coffee often. Someone may say one of the following sentences:
- (a) Teenagers' drinking coffee or tea is harmful to their health.
  - (b) Teenagers' drinking coffee or tea caused yesterday's traffic accident.
  - (c) Coffee or tea contains much caffeine that is harmful for people's health.
  - (d) Coffee or tea was the reason Andy could not sleep last night.

The four data points in scenario (11) exhibit a similar pattern: (11a) has both FCR and the ignorance reading available. In FCR, the speaker knows that both drinking coffee and drinking tea is harmful to teenagers' health. This is a strong claim that for any teenager, when he/she drinks coffee, it hurts his/her health and when he/she drinks coffee, it hurts his/her health as well. Either option hurts people's health. This sentence also has the ignorance reading available. The rest of these sentences have only the ignorance reading available: in (11b), one of the two events: teenagers' drinking tea and teenagers' drinking coffee caused the traffic accident and the speaker does not know which one; in (11c), the speaker talks about the ingredient of coffee or tea which is harmful to people's health, though he/she does not know which one it is; in (11d), the speaker does not know whether it was coffee or tea that caused Andy's insomnia last night. However, it cannot convey the meaning that it was both coffee and tea or the combination of coffee and tea that caused Andy's insomnia last night.

- (12) Some graduate students are complaining about the workload of their courses. Some of them are from Linguistics and Philosophy departments. Someone may say one of the following sentences:
- (a) New students working on Linguistics or Philosophy need a lot of effort.

- (b) Working on Linguistics or Philosophy took the new students a lot of time yesterday.
- (c) Linguistics or Philosophy is difficult for new students.
- (d) Linguistics or Philosophy took the new students a lot of time yesterday.

The four data points again demonstrate the same pattern as (10) and (11). (12a) could be interpreted as both working on Linguistics and working on Philosophy are difficult for new students. Either option gives new students a headache. When some new student works on Linguistics, it is difficult for him/her; when some new student works on Philosophy, it is difficult for him/her. All other sentences have only the ignorance reading available.

However, there is one construction of gerund phrase where FCR cannot be generated. Below is an example.

- (13) Some people are discussing a dancer and her dancing. Someone may say one of the following sentences:
- (a) The dancing of ballet or flamenco has a big influence in the world.
  - (b) The dancing of ballet or flamenco affected her deeply.
  - (c) Ballet or flamenco has a big influence in the world.
  - (d) Ballet or flamenco affected her deeply.

None of the four sentences demonstrate the ability of generating a FCR and only the ignorance reading is available.

In the data points above, I try to cover a comprehensive set of different constructions of gerund phrases. Although Pullum & Zwicky (1999) list twenty-five distinct syntactic constructions that use *-ing*-inflected verbs, here I only cover four different types of gerund phrases based on (Abney 1987)'s classification of gerunds. Abney (1987) developed a detailed syntactic account of gerunds and classifies them into four types.

- (14) (a) Acc *-ing*: John being a spy  
 (b) PRO *-ing*: singing loudly  
 (c) Poss *-ing*: John's knowing the answer (Hamm & Van Lambalgen 2003)  
 (d) *ing* -of: the raking of the leaves (Grimm & McNally 2015)

In (10a), “inviting Andy or Billy” is of type PRO-*ing*; in (11a), “teenager’s drinking coffee or tea” is of type POSS-*ing*; in (12a), “New student working on Linguistics or Philosophy” is of type Acc *-ing*; in (13a), “the dancing of ballet or flamenco” is of type *ing* -of. The first three types are argued by Vendler (1967, 1968) to be imperfect nominals, on the contrary to (14d) which is identified to be a perfect nominal. According to Vendler and a summarization in Hamm & Van Lambalgen (2003:384), perfect nominals are nominalised forms which have lost their verbal characteristics and behaved like “real” nouns. They can be identified with specific events; while imperfect nominals do not denote specific events but “facts” or “results” in a vague philosophical sense. Thereby I conclude that to also have FCR available, the disjuncts must be imperfect nominals.

All FCR examples above contain gerund phrases that contain only one verb. There is no significant theoretical implication but only that native speakers tend to consider them as more coherent sentences. When the two disjuncts are two completely different phrases, FCR also occurs. Below are two examples.

- (15) Adding pressure or reducing the area of contacting surface increases intensity of pres-

sure.

- (16) Watching a movie or listening to music is a good way of relaxing.

(15) can be interpreted as both adding pressure and reducing the area of contacting surface increase intensity of pressure. (16) can be interpreted as both watching a movie and listening to music are good ways to relax. Sentences involving disjunction over completely different gerund phrases exhibit FCR as long as the disjuncts are salient alternatives of each other in a given context.

The data distribution exhibits a clear pattern: generic sentences with disjunction over imperfect gerund phrases have both FCR and the ignorance reading available. If a sentence involves a disjunction over gerund phrases but is episodic as in (10b), (11b), (12b) and (13b), free choice is not available. If a generic sentence contains disjunction over individual entities as in (10c), (11c), (12c) and (13c), no FCR is available either. If the sentence is neither generic nor does it contain imperfect gerund phrases as in (10d), (11d), (12d) and (13d), FCR is not available either. Based on the two minimal pairs, the data distribution can be summarized as below (a check represents FCR being available and a cross non-available).

	generic sentence	episodic sentence
imperfect gerund phrases	✓	✗
perfect gerund phrases	✗	✗
individual entities	✗	✗

Figure 1: Data Distribution

Based on the data distribution above, in order to derive FCR over this new type of sentences, the analysis must answer two questions: (1) why the disjuncts must be imperfect gerund phrases/verbal nominalizations and (2) why the sentences must be generic. In other words, what conditions do gerund phrases and genericity each provide, or the interaction between the two that render FCR derivable?

### 3. Formalization Background

In this section, I will briefly discuss the semantics of gerund phrases and the semantics of generic and episodic sentences. These analyses and formalization are prerequisites for a formal analysis of the main puzzle here.

#### 3.1. Gerund Phrases

The nature of gerund phrases has been widely debated since the early days of generative grammar (Lees Robert 1960; Chomsky 1970). While there has traditionally been agreement that the nominal gerund form as (14d) refers to events, there has been little consensus as to what sort of semantic object is denoted in imperfect gerund phrases.

In *Facts and events* (Vendler 1967), Z. Vendler argues that the imperfect gerund phrase designates a fact, which is distinct from a propositional entity. Zucchi (2013) disagrees with some

of the empirical claims put forth by Vendler, taking them to designate a state of affairs, which in turn is a primitive object in the subdomain of propositional entities. Portner (1992) brings forward the propositional analysis of imperfect gerund phrases in a system that defines propositions in terms of situations rather than possible worlds. A completely different perspective is taken by Hamm & van Lambalgen (2005) who work within their own particular event calculus. They argue that the gerund phrases denote fluents, which are primitive time-dependent properties. Grimm & McNally (2015, 2016) unify all verbal nominals as event, denoting either kind or token. There are many different theories on the semantic nature of imperfect gerund phrases and multiple formalizations such as propositions as a set of possible worlds or situations, event calculus based on fluents, *etc*, or “fact” Vendler (1967) which is not formally defined.

Despite the lack of consensus, I suggest that all the semantic objects suggested can be considered to be related to the notion of “event”, a temporal-spatial object. For example, the gerund phrase “inviting Andy or Billy” can be considered an event  $e$  such that  $(\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e)) \vee (\text{invite}(e) \wedge \text{THEME}(\text{Billy}, e))$ . However, as Vendler (1967) suggests that imperfect nominals are different from perfect nominals in that the former cannot be considered as specific events, I suggest that instead of events, the imperfect nominals denote a type of event or formally, an intensionalized event with respect to time. For example, “inviting Andy or Billy” can be formalized as below.<sup>3</sup>

$$(17) \quad \lambda t. \exists e[((\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e)) \vee (\text{invite}(e) \wedge \text{THEME}(\text{Billy}, e))) \wedge e \sqsubseteq t]$$

$t$  is a time interval and  $e \sqsubseteq t$  means  $e$  is an event that happens during the time interval  $t$ . Here I only adopt a simple idea of time interval from interval-based models of time. A complete picture about temporal logic can be found in Allen (1983).

Perfect nominals such as “the dancing of ballet or flamenco” then denote a specific event, which must have the value of the tense parameter fixed, even though the value is not specified in the phrase.

$$(18) \quad \exists t_0[\exists e[((\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e)) \vee (\text{invite}(e) \wedge \text{THEME}(\text{Billy}, e))) \wedge e \sqsubseteq t_0]]$$

This proposal conforms to the observation of Vendler such that there is a distinction between perfect nominals and imperfect nominals. From the perspective of type and token where phrases that do not denote specific events are considered types of events while those do denote specific events are considered event tokens. The value of the tense parameter is the parameter that determines whether sentences are event types or tokens.

Tense also differentiates the imperfect nominals from individual entities which can be considered as rigid designators (Kripke 1972) with respect to time since they refer to exactly the same object no matter what time are used in evaluation. It imposes the additional requirement that their interpretations be constant across different times. Constant symbols can then be used to identify an object in time. For instance, treating  $a$  as a name for “Aristotle”. Therefore they can be formalized as  $\lambda t.a$  where  $a$  is not parameterized by  $t$ .  $\lambda t.a$  is equivalent to just  $a$  by  $\alpha$ -equivalence in lambda calculus.

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<sup>3</sup> This paper adopts event semantics as the basic theoretical framework for the gerund phrases. Gerund phrases are a very heterogeneous set of phrases with diverse syntactic constructions, which is not the focus of the paper. Therefore although this paper aims at providing a compositional analysis for the phenomenon, I will not pay much attention to gerund phrase-internal semantics; instead, I will directly provide the lambda expression for those phrases without further decomposition.

### 3.2. Genericity and Episodicity

In this section, I will briefly introduce how generic sentences and episodic sentences are handled semantically. Generics express generalizations. It is generally agreed that a generic sentence involves a two-place operator  $GEN$  which functions as an adverb of quantification (Lewis 1975) such as “usually”, “always”, etc.  $GEN$  has a tripartite structure consisting of a quantifier  $Q$ , a restrictor  $R$  which picks out the domain of  $Q$ , and the scope  $S$ , which attribute properties to elements picked out by  $R$ . ( $S$  can also be called the matrix. I will use “matrix” to refer instead of “scope” in the rest of the paper in order to avoid ambiguity.) Below is an example.

- (19) Ravens are black.

This sentence can be formalized as:

- (20)  $GEN\ x[raven(x)][black(x)]$

where  $GEN$  here represents the quantifier  $Q$ ,  $raven$  is the restrictor and  $black$  is the matrix.

There are many different theories about what quantifier, if any,  $GEN$  should stand for. It is generally agreed that  $GEN$  is not simply equivalent to a universal quantifier since generic sentences do allow exceptions. For example, (19) is still true even if there are non-black ravens. Some theorists have argued that generic sentences involve quantification over relevant individuals (actual or possible), where context determines which individuals are relevant (Schubert & Pelletier 1987; Declerck 1986; Chierchia 1995; Lerner & Leslie 2016). As in (19),  $GEN$  represents a universal quantifier that quantifies over only normal or typical ravens. All such ravens are black. Although I can hardly say that any theory about generics is standard, I will nevertheless adopt this theory for its simplicity and coverage of the data points relevant to this project.

Episodic sentences, on the other hand, talk about specific instances. Instead of a universal quantifier, it is usually considered as an existential quantifier. Episodic sentences are generally considered to be associated with an episodic operator, which also has a tripartite structure. But instead of a universal quantifier, an episodic sentence involves an existential quantifier.

A large part of the project is about generic/episodic sentences with gerund phrases. Thereby it is essential to provide the formalization of generic sentences with them. Based on the formalization of gerund phrases where the time interval variable  $t$  is used, in order to quantify over all relevant events, the universal quantifier can quantify over variable  $t$ . Here is an example.

- (21) Inviting Andy to the party is a good idea.

The generic operator is provided by the predicate “is a good idea”, which is also parametrized by  $t$ , indicating that “ $x$  is a good idea in the time interval  $t$ ”.

- (22)  $\forall t[\exists e[(\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e)) \wedge e \sqsubseteq t] \rightarrow \text{is a good idea}(e, t)]$

### 3.3. Dynamic Semantics

If the formula above is interpreted under the framework of static semantics, then the event variable  $e$  in  $\text{is a good idea}(e, t)$  would be a free variable, which is unwanted. Instead of modifying the syntactic structure, I propose to use dynamic semantics (Groenendijk & Stokhof

1991; Muskens 1996) as a technical tool for interpretation. In dynamic semantics, proposition are treated as “context change potentials”: new sentences update the original context  $c$  to a new context by adding the “meaning” of new sentences. Both individual constants and the existential quantifier associated with indefinites, events, *etc.* can introduce referents to the original context for later propositions with an anaphora to pick up. Therefore binding can go beyond the scope.

Within the universal quantifier of (22), the existential quantifier introduces a referent  $e$  to the context  $c$  by adding a specific event referent  $e$  to the assignment functions  $g$  in  $c$ , where  $e$  is an “inviting Andy” event. The formula below explicates the simplified computation about how context is updated by formula (22) (Heim 1983).

$$\begin{aligned}
 (23) \quad & c[\phi \rightarrow \psi] \\
 &= c[\neg(\phi \wedge \neg\psi)] \\
 &= c - c[\phi \wedge \neg\psi] \\
 &= c - c[\phi][\neg\psi] \\
 &= c - (c[\phi] - c[\phi][\psi])
 \end{aligned}$$

where the proposition  $\phi$  is  $\exists e[\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e) \wedge e \sqsubseteq t]$  and the proposition  $\psi$  is **is a good idea**( $e, t$ ).

$c[\phi]$  can be calculated as  $c[\exists e[\text{invite}(e) \wedge \text{THEME}(\text{Andy}, e) \wedge e \sqsubseteq t]]$ , which is equivalent to  $= \{g^{e \rightarrow e} \mid g \in c, e \in [\text{invite}]^g, e \in [\text{THEME}(\text{Andy}, e)]^g, e \sqsubseteq t\}$ . Based on this computation, the proposition  $\psi$  is computed in the updated context  $c[\phi]$  where a referent  $e$  is available. With this new context where the reference  $e$  can be picked up, the main predicate **is a good idea** can have an argument referring to it.

Thereby even though the main predicate is out of the syntactic scope of the existential quantifier, the variable  $e$  as the argument of the main predicate is still bound. Therefore the interpretation of this formula is no longer problematic. With these formalizations, I can move forward to the main part of the analysis.

#### 4. Proposal

Sentences presented above that have FCR available all involve imperfect gerund phrases. Imperfect gerund phrases are a quite heterogeneous set of phrases with respect to syntactic constructions, as we already saw in the data points provided in section 2. Since the syntactic variation is not the focus of this paper and the different behaviors between imperfect nominals and perfect nominals can be seen as semantic (Vendler 1967), I will use gerund phrases of PRO-*ing* type throughout the analysis for the simplification of demonstration of the analysis.

Here is a sentence with FCR adapted from (11a).

$$(24) \quad \text{Drinking coffee or tea hurts people's health.}$$

The sentence has two readings: the ignorance reading and FCR. The intuitive interpretation of the two readings can be understood as below: in ignorance reading, what is at issue in the sentence is whether it is drinking coffee or drinking tea that hurts people’s health; in FCR, what the speaker is not sure about, though not at issue in the sentence, is whether it is drinking coffee or drinking tea happening in each relevant event or scenario related to the sentence.

Here is another example where the distinction is more salient and pragmatically natural.

- (25) Inviting Andy or Billy to the party is a good idea.

Again, there are two readings: for ignorance reading, what is focused is whether inviting Andy or inviting Billy is a good idea; for FCR, the speaker is sure about both situations but what he/she is not sure about, though not the focus of the sentence again, is which event will actually happen. A natural continuation of (25) can be “but I don’t know which one to invite”.

The two readings are essentially generated by different issues that the speaker is uncertain about, while the uncertainty comes from the normal meaning of disjunction, as presented at the very beginning of the paper. The uncertain issue conveyed by the ignorance reading is about the whole sentence: which one of the two objects satisfies the main predicate of the entire sentence; while in FCR, the uncertain issue is about which of the two options mentioned will actually happen in each relevant scenario or event. Intuitively, the two different “uncertainties” can be seen as two different scopes of the disjunction: in ignorance reading, the disjunction scopes over the whole sentence, a wider scope, while in FCR, it scopes over only the two gerund phrases, a narrower scope.

But then why is it the case that some sentences, ones whose disjuncts are not imperfect nominals, cannot generate FCR but only ignorance reading? I propose that it is either because there is only one scope the disjunction can take, *i.e.* the wider scope, or because two scopes generate the same meaning. For generic sentences with perfect nominals or individual entities as disjuncts, I will show that narrow scope of disjunction causes type mismatch and only wide scope disjunction can be generated. For episodic sentences, I will show that a narrow scope disjunction, if applicable, generate the same meaning which is equivalent to the wide scope disjunction.

#### 4.1. Generic Sentences with Imperfect Nominals

This section discusses how the ignorance reading and FCR are generated. The formulas that characterize the two readings are presented first, which should be relatively direct and uncontroversial. Based on the formula, the details about how they are generated compositionally will be discussed.

The example sentence below has both readings available.

- (26) Drinking coffee or tea hurts people’s health.

When the ignorance reading is generated, the formula for it is

$$(27) \quad \begin{aligned} & \forall t[R(t) \rightarrow \\ & \exists e[\text{drink}(e) \wedge \text{THEME(coffee}, e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \\ & \text{THEME(people's health}, e_2) \wedge e_2 \sqsubseteq t] \\ & \vee \exists e[\text{drink}(e) \wedge \text{THEME(tea}, e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \\ & \text{THEME(people's health}, e_2) \wedge e_2 \sqsubseteq t]] \end{aligned}$$

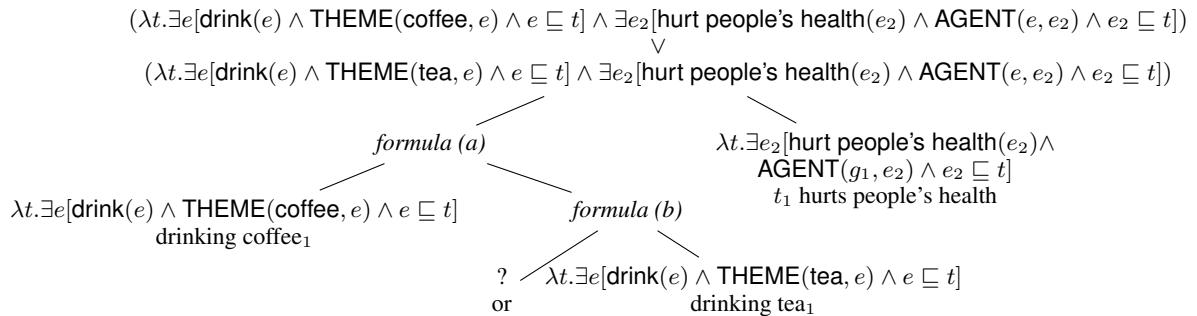
$R(t)$  selects all time intervals relevant to the conversation, which include intervals when drinking tea or drinking coffee occurs and also excludes time where special situations occur such as the time interval where medicines that alleviate the side effect of coffee or tea are invented and widely used by people, *etc.* In other words, this sentence can be reinterpreted as “With regard to

normal time intervals when drinking coffee or drinking tea occurs, either drinking coffee hurts people's health or drinking tea hurts people's health".

To interpret this sentence correctly, there is one technical requirement for the referents to work correctly: dynamic semantics. Since the scope of existential closure does not include the other existential closure, for the second event to refer back to the previous event, a dynamic interpretation is necessary:  $\exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t]$  and  $\exists e[\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t]$  each introduces a referent by the existential quantifier  $\exists e$ , and then the predicate part of the sentence can pick up the referent even out of the syntactic scope of the existential quantifier.

Formally, the matrix clause of the formula is a conjunction of two propositions and the types of which are both  $i \rightarrow t$ , where  $i$  is the type for time interval and  $t$  is truth value. As commonly implemented in syntactic and semantic analysis, the subject of the sentence is moved up. But instead of using predicate abstraction which applies the predicate to the subject, a simple conjunction is used to connect the moved out constituent with the remaining part. Both the gerund phrase and the main predicate of the sentence are treated equally as predicates of the event. The event variable is introduced by the gerund phrase and dynamic semantics enables the trace  $t_1$ , left by the moved out gerund phrase, to refer back to it. Assuming some operator generating the wide scope reading of disjunction, below is a simple tree illustrating how the matrix clause is composed.

(28)



In this tree, “ $t_1$  hurts people's health” has one referent unspecified:  $t_1$ , which is the trace left by “drinking coffee or drinking tea”. “drinking coffee” and “drinking tea” each introduces a referent  $e$  picked up by the anaphora  $g_1$ . Indeed, the wide scope reading of this sentence is treated equivalent as “Drinking coffee, it hurts people's health; or, drinking tea, it hurts people's health.”

But how exactly is the wide scope disjunction generated? As analyzed above, a wide scope or a narrow scope should be generated by different scopes that disjunction operator takes. The tree above leaves one question mark for the definition of “or” and several positions whose lambda expressions are not specified. Disjunction, as a propositional operator, is usually defined as  $\lambda f. \lambda g. g \vee f$  where  $f$  and  $g$  are two propositions. When a disjunction connects two entities, it is usually defined as  $(x \sqcup y) = \lambda x. \lambda y. \lambda P. P(x) \vee P(y)$  where  $x$  and  $y$  are two entities. Taking different types of arguments enables different “scopes” of the disjunction: when the arguments for disjunction are propositions, it is defined as directly scoping over the two arguments it takes; when the arguments are not propositions, it is defined as  $\sqcup$  which scopes over  $P(x)$  and  $P(y)$ , which are the results of function application of the predicate  $P$  and the arguments  $x, y$ , instead of  $x, y$  themselves. In the first case, disjunction can be seen as taking a narrow scope since it

scopes over its arguments; in the second case, disjunction defined as  $\sqcup$  can be seen as taking a wide scope, though it can only take “wide” scope here since  $x, y$  are not of proposition type but only  $P(x)$  and  $P(y)$  are. But what if  $x, y$  are of proposition type while the disjunction still takes a wide scope? A polymorphic version of  $\sqcup$  can do the job. When both  $x$  and  $y$  are of proposition type,

- (29) narrow-scope disjunction:  $\lambda x. \lambda y. y \vee x$   
wide-scope disjunction:  $\lambda x. \lambda y. \lambda P. P(y) \vee P(x)$

However, this definition of disjunction cannot be applied directly due to type mismatch. In (28), both the arguments of the disjunction and the predicate of the sentence are treated as propositions in composition. The referent for  $g_1$  is of type  $e$ , which refers to the event entity introduced in the argument of the disjunction. Therefore, some modification of the definition above is required. Instead of using function application, a conjunction is used.

- (30) narrow-scope disjunction:  $\lambda x. \lambda y. y \vee x$   
wide-scope disjunction:  $\lambda x. \lambda y. \lambda P. (x \wedge P) \vee (y \wedge P)$

Since the proposition type here is  $i \rightarrow t$ , the intensionalized disjunction definition is presented below, which is going to be the definition used in the composition.

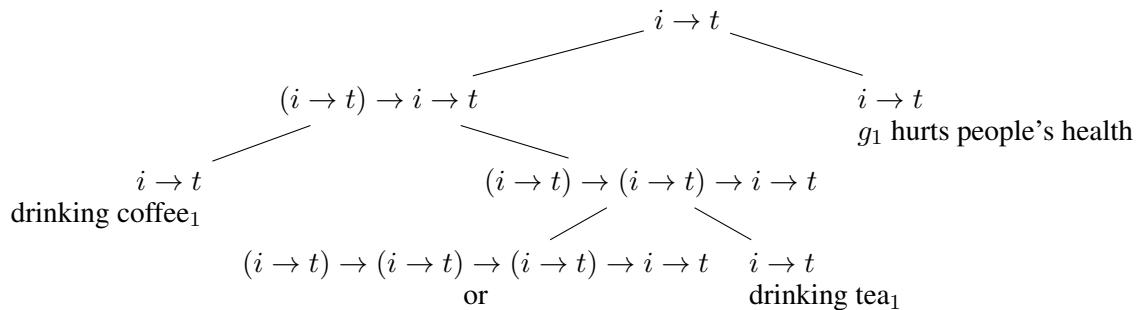
- (31) narrow-scope disjunction:  $\llbracket \text{or} \rrbracket = \lambda f. \lambda g. \lambda t. f(t) \vee g(t)$   
wide-scope disjunction:  $\llbracket \text{or} \rrbracket = \lambda f. \lambda g. \lambda P. \lambda t. (f(t) \wedge P(t)) \vee (g(t) \wedge P(t))$

With the definition of wide scope disjunction give, the lambda expression *formula (a)* and *formula (b)* can now be computed:

$$\begin{aligned} \text{formula (b)} &= \lambda g. \lambda P. (g(t) \wedge P(t)) \vee (\lambda t. \exists e [\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t] \wedge P(t)) \\ \text{formula (a)} &= \lambda P. (\lambda t. \exists e [\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \wedge P(t)) \vee (\lambda t. \exists e [\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t] \wedge P(t)) \end{aligned}$$

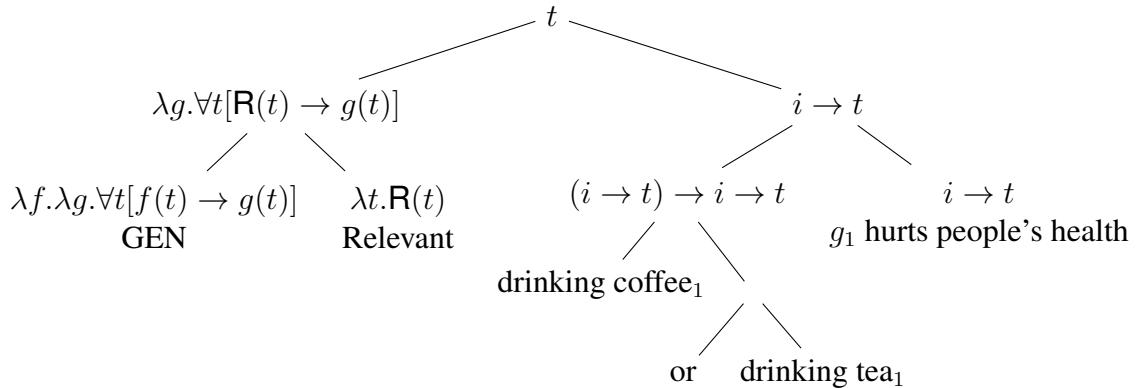
With all the definitions and computation introduced, below is the complete type tree for the sentence.

- (32)



The generic operator is introduced by the sentence which implicitly takes relevant context as the restrictor.

(33)



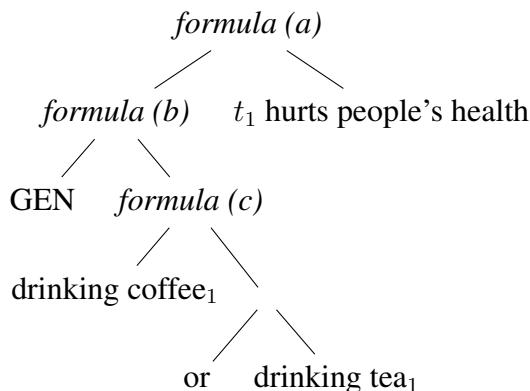
The lambda expression generated by the tree (33) is (34), which characterises ignorance reading:

$$(34) \quad \forall t[R(t) \rightarrow (\exists e[\text{drink}(e) \wedge \text{THEME(coffee}, e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME(people's health}, e_2) \wedge e_2 \sqsubseteq t]) \vee (\exists e[\text{drink}(e) \wedge \text{THEME(tea}, e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME(people's health}, e_2) \wedge e_2 \sqsubseteq t])]$$

(34) can be interpreted as “it is either the case that for all relevant time intervals, drinking coffee hurts people’s health or that for all relevant time intervals, drinking tea hurts people’s health”. It expresses the ignorance of the speaker who does not have enough information to determine whether it is drinking tea or coffee that hurts people’s health.

As we can see above, to generate ignorance reading, the two verbal nominalization compose with the predicate of the sentence first by the wide-scope disjunction, and then compose with the generic quantifier. However, to generate FCR reading, the opposite order of composition is taken: the disjunction takes a narrow scope which generates a lambda expression of type  $i \rightarrow t$ , instead of  $(i \rightarrow t) \rightarrow i \rightarrow t$ , and then combines with the generic quantifier which is driven by type. This order of composition generates FCR. Below is a simplified tree for this reading.

(35)



Based on the narrow scope disjunction defined in (31), formula(c) can be computed easily as below.

$$(36) \quad \lambda t. \exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \vee \exists e[\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t]$$

Since its type is  $i \rightarrow t$ , which cannot compose with another expression of type  $i \rightarrow t$ ,  $\llbracket t_1 \text{ hurts people's health} \rrbracket$ , it has to compose with the generic operator first. Then formula (b) can be computed as below.

$$(37) \quad \lambda g. \forall t [\exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \vee \exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \rightarrow g(t)]$$

The final lambda expression generated by the sentence is presented below.

$$(38) \quad \forall t [(\exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \vee \exists e[\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t]) \rightarrow \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME}(\text{people's health}, e_2) \wedge e_2 \sqsubseteq t]]$$

This formula should be interpreted as “for all time intervals when a drinking coffee or a drinking tea event happens, such an event hurts people’s health”. Same as above, dynamic semantics is required to correctly interpret the referents where the disjunction functions as a union of sets of assignment functions.

By first order logic deduction, formula in (38) is equivalent to (39) presented below.

$$(39) \quad \begin{aligned} \forall t [\exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t] \rightarrow \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME}(\text{people's health}, e_2) \wedge e_2 \sqsubseteq t]] \wedge \\ \forall t [\exists e[\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t] \rightarrow \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME}(\text{people's health}, e_2) \wedge e_2 \sqsubseteq t]] \end{aligned}$$

It explicitly expresses the conjunctive reading: in all time intervals  $t$ , if there is a drinking coffee event in  $t$ , then this event hurts people’s health and if there is a drinking tea event in  $t$ , then this event hurts people’s health. The deduction from (38) to (39) requires a few steps. Below are the deduction steps.

$$(40) \quad \begin{aligned} \text{Let } p &= \lambda t. \exists e[\text{drink}(e) \wedge \text{THEME}(\text{coffee}, e) \wedge e \sqsubseteq t], q = \lambda t. \exists e[\text{drink}(e) \wedge \text{THEME}(\text{tea}, e) \wedge e \sqsubseteq t] \text{ and } r = \lambda t. \exists e_2[\text{hurt}(e_2) \wedge \text{AGENT}(e, e_2) \wedge \text{THEME}(\text{people's health}, e_2) \wedge e_2 \sqsubseteq t] \\ &\forall t [p(t) \vee q(t) \rightarrow r(t)] \\ &= \forall t [p(t) \rightarrow r(t) \wedge q(t) \rightarrow r(t)] \\ &= \forall t [p(t) \rightarrow r(t)] \wedge \forall t [q(t) \rightarrow r(t)] \end{aligned}$$

This subsection discusses how the ignorance reading and FCR are generated by different scopes of disjunction. In ignorance reading, the gerund phrase composes with the main predicate first which together becomes the matrix clause in the universally quantified sentence; in FCR, the gerund phrase composes with the generic operator first and thereby the verbal nominalization becomes the restrictor of the sentence. Whether the disjunction locates in the restrictor or the matrix clause after completing the composition determines whether the meaning generated characterizes an ignorance reading or FCR. In conclusion, in order for FCR to be generated in a generic sentence, there are two requirements.

- (41)    (a) the disjunction can take narrow scope
- (b) the result of narrow scope disjunction composing with its disjuncts is of type  $i \rightarrow t$ , so that it can compose with the generic operator.

#### 4.2. Generic Sentence with Disjunction over Nouns or Perfect Nominals

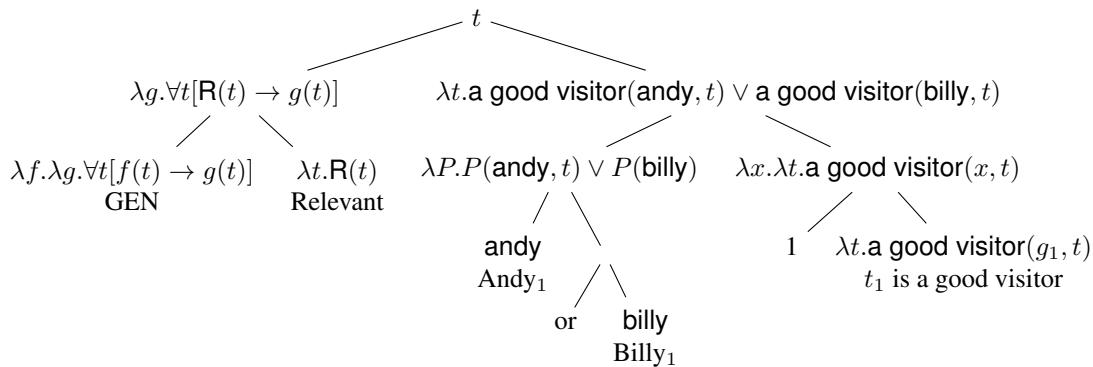
Based on the setup above, it is not difficult to see why sentences with disjunction over nouns or perfect nominals cannot generate FCR but only the ignorance reading. Let us first take a look at disjunction over nouns. The narrow scope of disjunction can only apply when the disjuncts are of proposition type. However, proper nouns and common nouns are not of proposition type and thereby disjunction can only take “wide scope”.

$$(42) \quad [\text{Andy or Billy}] = \lambda P.P(\text{Andy}) \vee P(\text{Billy})$$

$$(43) \quad [\text{coffee or tea}] = \lambda P.P(\text{coffee}) \vee P(\text{tea})$$

Since only wide scope disjunction is available, only the ignorance reading can be generated. Below is one simple tree for the sentence “Andy or Billy is a good visitor”.

(44)



The final formula composed is below. Only the ignorance reading can be generated compositionally here since there is only one scope the disjunction could take and the disjunction occurs in the matrix clause.

$$(45) \quad \forall t[R(t) \rightarrow \text{a good visitor}(andy, t) \vee \text{a good visitor}(billy, t)]$$

This formula can be interpreted as “in all relevant time intervals, either Andy is a good visitor or Billy is a good visitor”. This formula correctly expresses the ignorance of the speaker.

For perfect nominals, the disjuncts are of proposition type. Therefore technically the disjunction can take narrow scope.

$$(46) \quad \text{narrow scope: } [\text{the dancing of ballet or flamenco}] = \exists t_0[\exists e[((\text{dance}(e) \wedge \text{THEME}(\text{ballet}, e)) \vee (\text{dance}(e) \wedge \text{THEME}(\text{flamenco}, e))) \wedge e \sqsubseteq t_0]]$$

However, this formula is of type  $t$  because  $t_0$  specifies a fixed time or time interval. Due to type, it cannot compose with the generic operator which requires an expression of type  $i \rightarrow t$ , which is presented below.

$$(47) \quad * \lambda f. \lambda g. \forall t[f(t) \rightarrow g(t)](\exists t_0[\exists e[((\text{dance}(e) \wedge \text{THEME}(\text{ballet}, e)) \vee (\text{dance}(e) \wedge \text{THEME}(\text{flamenco}, e))) \wedge e \sqsubseteq t_0]])$$

Therefore the disjunction has to take wide scope.

- (48)  $\forall t[R(t) \rightarrow (\exists t_0[\exists e[(\text{dance}(e) \wedge \text{THEME(ballet, }e))]] \wedge \exists e_2[\text{has a big influence in the world}(e_2) \wedge \text{AGENT}(e, e_2) \wedge e_2 \sqsubseteq t]) \vee (\exists t_0[\exists e[(\text{dance}(e) \wedge \text{THEME(flamenco, }e))]] \wedge \exists e_2[\text{has a big influence in the world}(e_2) \wedge \text{AGENT}(e, e_2) \wedge e_2 \sqsubseteq t])]$

Based on a similar interpretation process as (45), this formula represents the ignorance reading: for all relevant time intervals, either the dancing of ballet or the dancing of flamenco has a big influence in the world.

These two example sentences can only generate the ignorance reading because they do not satisfy the two requirements mentioned in (41) simultaneously. For the sentence “Andy or Billy is a good visitor”, the disjunction can only take wide scope because entities are not of propositional type. For sentence “The dancing of ballet or flamenco has a big influence in the world”, the disjunction can take wide scope because the proposition is not of type  $i \rightarrow t$  but  $t$ .

#### 4.3. Episodic Sentence

This section discusses why episodic sentence cannot generate FCR, whether the disjuncts are gerund phrases or nouns. Generic sentences can generate FCR when the disjunction connecting two imperfect gerund phrases occurs in the restrictor position of the sentence. Based on the first order logic deduction in (40), a universal quantifier is necessary for the generation of conjunctive meaning. For episodic sentences, however, the implicit operator introduced is an existential quantifier, rather than a universal quantifier.

Let us first focus on sentences with disjunction scoping over gerund phrases. An existential quantifier cannot generate conjunction wherever the disjunction is placed, either in the restrictor clause or in the matrix clause: When the disjunction is placed as part of the matrix clause, the whole sentence expresses an ignorance reading since it is equivalent to a formula with disjunction in out-most scope ( $R, p, q, r$  are all propositions of type  $i \rightarrow t$ ).

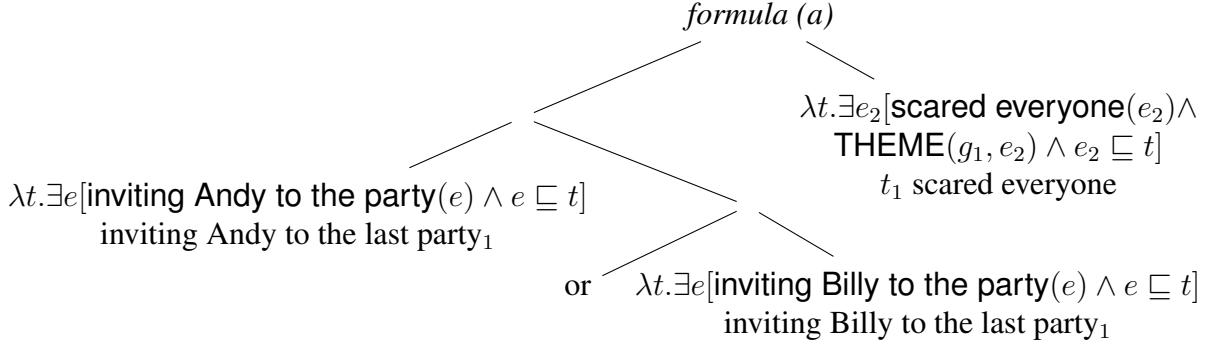
$$\begin{aligned} (49) \quad & \exists t[R(t) \wedge ((p(t) \vee q(t)) \wedge r(t))] \\ & = \exists t[R(t) \wedge ((p(t) \wedge r(t)) \vee (q(t) \wedge r(t)))] \\ & = \exists t[(R(t) \wedge (p(t) \wedge r(t))) \vee (R(t) \wedge (q(t) \wedge r(t)))] \\ & = \exists t[R(t) \wedge (p(t) \wedge r(t))] \vee \exists t[R(t) \wedge (q(t) \wedge r(t))] \end{aligned}$$

But even though the disjunction occurs in the “restrictor” position of the whole sentence, it remains a disjunction at the end of the deduction. Indeed, (50) is “almost” equivalent to (49).

$$\begin{aligned} (50) \quad & \exists t[(p(t) \vee q(t)) \wedge r(t)] \\ & = \exists t[(p(t) \wedge r(t)) \vee (q(t) \wedge r(t))] \\ & = \exists t[p(t) \wedge r(t)] \vee \exists t[q(t) \wedge r(t)] \end{aligned}$$

Although disjunction can take either narrow scope or wide scope as shown above, no FCR can be generated. Here is one concrete example: “Inviting Andy or Billy to the last party scared everyone”. When the disjunction takes wide scope, the matrix clause is calculated as below.

(51)

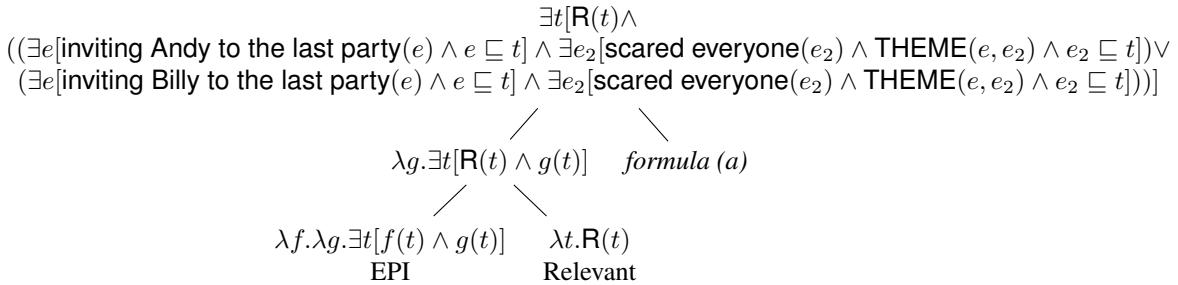


Based on definition (31), *formula (a)* can be calculated based on the same procedure as (32).

$$(52) \quad \lambda t.(\exists e[\text{inviting Andy to the last party}(e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{scared everyone}(e_2) \wedge \text{THEME}(e, e_2) \wedge e_2 \sqsubseteq t]) \vee (\exists e[\text{inviting Billy to the last party}(e) \wedge e \sqsubseteq t] \wedge \exists e_2[\text{scared everyone}(e_2) \wedge \text{THEME}(e, e_2) \wedge e_2 \sqsubseteq t])$$

Composing *formula (a)* together with the episodic operator, the complete tree for the sentence is presented as below:

(53)



Based on deduction (50), the calculated formula above can be interpreted as “there exists a time interval before the current time when Andy was invited to the last party, which event scared everyone, or when Billy was invited to the last party, which event scared everyone.” The ignorance reading is generated.

When the disjunction takes narrow scope, the semantic formula for the sentence “inviting Andy to the last party or inviting Billy to the last party” is  $\lambda t. \exists e[\text{inviting Andy to the last party}(e) \wedge e \sqsubseteq t] \vee \exists e[\text{inviting Billy to the last party}(e) \wedge e \sqsubseteq t]$ . After composing with the existential quantifier, the formula becomes  $\lambda g. \exists t[\exists e[\text{inviting Andy to the last party}(e) \wedge e \sqsubseteq t] \vee \exists e[\text{inviting Billy to the last party}(e) \wedge e \sqsubseteq t] \wedge g(t)]$ . After composing with the predicate of the sentence, the final lambda expression obtained is:

$$(54) \quad \exists t_0[\exists e[\text{inviting Andy to the last party}(e) \wedge e \sqsubseteq t_0] \vee \exists e[\text{inviting Billy to the last party}(e) \wedge e \sqsubseteq t_0] \wedge \exists e_2[\text{scared everyone}(e_2) \wedge \text{THEME}(e_2, e) \wedge e_2 \sqsubseteq t_0]]$$

Based on deduction (50), (54) is “almost” equivalent to:

- (55)  $\exists t_0[\exists e[\text{inviting Andy to the last party}(e) \wedge e \sqsubseteq t_0] \wedge \exists e_2[\text{scared everyone}(e_2) \wedge \text{THEME}(e_2, e) \wedge e_2 \sqsubseteq t_0]] \vee \exists t_0[\exists e[\text{inviting Billy to the last party}(e) \wedge e \sqsubseteq t_0] \wedge \exists e_2[\text{scared everyone}(e_2) \wedge \text{THEME}(e_2, e) \wedge e_2 \sqsubseteq t_0]]$

Again, the ignorance reading is generated.

Now let us turn to episodic sentences with disjuncts being nouns. As argued above, when the disjuncts are proper names or common nouns, the disjunction can only take wide scope. Without much detailed calculation since the calculation process is similar to that presented in section 4.2 and the calculation above, I conclude that only the ignorance reading can be generated.

#### 4.4. Section Summary

Based on the three subsections above, I can draw the following conclusion: in order for a FCR to be generated, the sentence has to satisfy three requirements simultaneously.

- (56) (a) the sentence is generic  
 (b) the disjunction can take narrow scope  
 (c) the result of narrow scope disjunction composing with its disjuncts is of type  $i \rightarrow t$ , so that it can compose with the generic operator.

Sentences with disjuncts being imperfect gerund phrases satisfy the three requirements simultaneously and thereby can generate FCR. When the disjuncts are individual entities, requirement (b) cannot be satisfied. When the disjuncts are perfect gerund phrases, requirement (c) cannot be satisfied. When the sentence is episodic, requirement (a) cannot be satisfied.

#### 5. Conclusion

This paper aimed at explaining why generic disjunctive sentences with imperfect gerund phrases can generate FCR and section 4.4 summarized three conditions for FCR to be deduced. Now I can answer the two questions raised in the end of section 2: (1) why the disjuncts must be imperfect gerund phrases/verbal nominalizations and (2) why the sentences must be generic. In other words, what conditions do gerund phrases and genericity each provide, or what is the interaction between the two that render FCR derivable?

For question (1), the disjuncts have to be imperfect gerund phrases/verbal nominalizations because first, they are semantically propositions and thereby disjunction can take narrow scope; second, imperfect nominals are of type  $i \rightarrow t$  instead of  $t$  and thereby can compose with a generic operator. For question (2), the sentence has to be generic since only in universally quantified sentences, disjunction in restrictor clause can be deduced as a conjunction based on first order logic deduction; while in episodic sentences, disjunction remains a disjunction and no conjunction can be logically derived.

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### *Abbreviations*

FCR free choice reading

GEN generic

EPI episodic

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### *References*

- Abney, S. P. (1987). *The English noun phrase in its sentential aspect*. [PhD thesis]. Massachusetts Institute of Technology.
- Allen, J. F. (1983). Maintaining knowledge about temporal intervals. *Communications of the ACM* 26:11, pp. 832–843.
- Aloni, M. (2003). Free choice in modal contexts. Weisgerber, M. (ed.), *Proceedings of Sinn und Bedeutung*, vol. 7, pp. 25–37.
- Aloni, M. (2005). Expressing ignorance or indifference. ten Cate, B. & H. Zeevat (eds.), *Proceedings of the Sixth International Tbilisi Symposium on Logic, Language, and Computation (LNCS)*, Berlin: Springer, pp. 1–20.
- Aloni, M. (2007). Free choice, modals, and imperatives. *Natural Language Semantics* 15:1, pp. 65–94.
- Chierchia, G. (1995). Three individual level predicates as inherent generic. Gregory N. Carlson, F. J. (ed.), *The generic book*, Chicago: University of Chicago Press, pp. 176–223.
- Chomsky, N. (1970). Remarks on nominalization. Jacobs, R. & P. Rosenbaum (eds.), *Readings in English Transformational Grammar*, Waltham: Ginn, pp. 184–221.
- Declerck, R. (1986). The manifold interpretations of generic sentences. *Lingua* 68:2-3, pp. 149–188.
- Eckardt, R. (2007). Licensing *or*. Sauerland, U. & P. Stateva (eds.), *Presupposition and implicature in compositional semantics*, Basingstoke: Palgrave-Macmillan, pp. 34–70.
- Fox, D. (2007). Free choice and the theory of scalar implicatures. *Presupposition and implicature in compositional semantics*, Basingstoke: Palgrave-Macmillan, pp. 71–120.
- Grimm, S. & L. McNally (2015). The-ing dynasty: Rebuilding the semantics of nominalizations. *Semantics and Linguistic Theory*, vol. 25, pp. 82–102.
- Grimm, S. & L. McNally (2016). The +VPing as anaphoric event-type reference. Kim, K., P. Umbal, T. Block, Q. Chan, T. Cheng, K. Finney, M. Katz, S. Nickel-Thompson & L. Shorten (eds.), *33rd West Coast Conference on Formal Linguistics; 2015 Mar 27-29; Burnaby, Canada.*, Somerville: Cascadilla Proceedings Project, pp. 167–175.
- Groenendijk, J. & M. Stokhof (1991). Dynamic predicate logic. *Linguistics and philosophy* pp. 39–100.
- Hamm, F. & M. van Lambalgen (2005). *The proper treatment of events*. Malden, Massachusetts: Blackwell Publishing.

- Hamm, F. & M. Van Lambalgen (2003). Event calculus, nominalisation, and the progressive. *Linguistics and Philosophy* 26:4, pp. 381–458.
- Heim, I. (1983). On the projection problem for presuppositions. Portner, P. H. & B. H. Partee (eds.), *Formal semantics – the essential readings*, Oxford: Blackwell, pp. 249–260.
- Horn, L. R. (1972). *On the semantic properties of logical operators in English*. [PhD thesis]. University of California, Los Angeles.
- Kamp, H. (2013). Free choice permission. von Heusinger, K. & A. ter Meulen (eds.), *Meaning and the Dynamics of Interpretation*, Leiden: Brill, pp. 169–184.
- Klinedinst, N. W. (2007). *Plurality and possibility*. [PhD thesis]. University of California, Los Angeles.
- Kratzer, A. & J. Shimoyama (2002). Indeterminate pronouns: The view from Japanese. Otsu, Y. (ed.), *Proceedings of the 3rd Tokyo Conference on Psycholinguistics*, Tokyo: Hituzi Syobo, pp. 1–25.
- Kripke, S. A. (1972). Naming and necessity. *Semantics of natural language*, Dordrecht: Springer, pp. 253–355.
- Lees Robert, B. (1960). *The grammar of English nominalizations*. The Hague-Paris: Mouton.
- Lerner, A. & S.-J. Leslie (2016). Generic generalizations. *Stanford Encyclopedia of Philosophy* pp. 366–403.
- Lewis, D. (1975). Adverbs of quantification. Keenan, E. L. (ed.), *Formal semantics of natural language*, Cambridge: Cambridge University Press, pp. 3–15.
- Muskens, R. (1996). Combining Montague semantics and discourse representation. *Linguistics and philosophy* 19:2, pp. 143–186.
- Nickel, B. (2008). Generics and the ways of normality. *Linguistics and Philosophy* 31:6, pp. 629–648.
- Nickel, B. (2010). Generically free choice. *Linguistics and philosophy* 33:6, pp. 479–512.
- Portner, P. (1992). *Situation Theory and the Semantics of Propositional Expressions*. [PhD thesis]. University of Massachusetts at Amherst.
- Pullum, G. K. & A. M. Zwicky (1999). Gerund participles and head-complement inflection conditions. Collins, P. & D. Lee (eds.), *The Clause in English: In Honour of Rodney Huddleston*, Amsterdam: John Benjamins, pp. 251–271.
- Schubert, L. K. & F. J. Pelletier (1987). Problems in the representation of the logical form of generics, plurals, and mass nouns. Lepore, E. (ed.), *New directions in semantics*, London: Academic Press, pp. 385–451.
- Simons, M. (2005). Dividing things up: The semantics of or and the modal/or interaction. *Natural Language Semantics* 13:3, pp. 271–316.
- Vendler, Z. (1967). *Facts and events*. Ithaca: Cornell University Press.
- Vendler, Z. (1968). *Adjectives and nominalizations*. The Hague: Mouton.
- Zucchi, A. (2013). *The language of propositions and events: Issues in the syntax and the semantics of nominalization*, vol. 51. Springer Science & Business Media.

# **Existential modals and negation in Russian**

## Evidence for universal functional hierarchy

Petr Rossaykin

In this paper I discuss the interaction of sentential negation with the Russian modal verb *moč* ‘can, may’ on root vs epistemic reading. More specifically, I observe that negative concord items and the genitive of negation are not licensed when negated *moč* has an epistemic interpretation. I also discuss other (mostly morphological) differences dependent on the interpretation of *moč* and argue that they all are in line with the assumption that *moč* may occupy different positions in the clausal spine. While root *moč* is either a lexical verb or low *Mod<sub>abil/perm</sub>* head, epistemic *moč* resides in the high *Mod<sub>epist</sub>* head.

### *I. Introduction*

The claim that modal markers can differ with respect to their grammaticalization depending on the modality type had been on record at least since Plank (1981:58-59). On the basis of German facts, he proposes the hierarchy in (1), where  $\leq$  stand for an equal or lower degree of formal grammaticalization. Bybee et al. (1994:241-242) confirm this hierarchy observing that cross-linguistically epistemic modality employs bound markers significantly more often than non-epistemic modality, which shows that epistemic modality is generally more grammaticalized. A detailed discussion can be found in van der Auwera & Plungian (1998).

- (1) participant-internal  $\leq$  participant-external  $\leq$  epistemic modality

Next, Cinque (1999) analyzes cross-linguistic data and comes to the conclusion that functional heads (corresponding to the markers of grammatical meaning) are arranged in a rigid universal hierarchy (see also Rizzi & Cinque 2016). I adopt the version of the hierarchy presented in Cinque (2001:47-48). The relevant part of it (with the addition of NegP) is presented in (2)<sup>1</sup>.

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<sup>1</sup> Neg differs from other heads with respect to its position and actual presence in the hierarchy: Cinque (1999:121-126) suggests that Neg is not necessarily projected as a part of the hierarchy and can be optionally

- (2) ModP<sub>epist</sub> > TP > NegP > AspP<sub>perfect</sub> > ModP<sub>ability/permission</sub>

The order in (2) can be exemplified by Turkish.

- (3) oku-yá-ma-m  
read-ABIL-NEG-1SG  
'I am unable / not permitted to read.' (Kornfilt 1997:375, (1299))
- (4) okú-ma-yabil-ir-im  
read-NEG-ABIL-AOR-1SG  
'I might not read; it is possible that I shall not read.' (Kornfilt 1997:375, (1300))

Russian (like English) does not exhibit morphologically distinct marking of different modal meanings. One existential modal verb *moč* 'can, may, might' covers all flavours of modality: dynamic (participant-internal ability; (5)), circumstantial (participant-external ability; (6)), deontic (7), epistemic (8), teleological (9), etc.

- (5) Petja možet probežat' 20 kilometrov  
Petya can run.INF 20 kilometers  
'Petya can run 20 kilometers.' [dynamic; internal ability]
- (6) Petja možet vzyat' taksi  
Petya can take.INF taxi  
'Petya can take a taxi.' [circumstantial; external ability]
- (7) Petja možet sidet' ryadom s prezidentom  
Petya can sit.INF near with president  
'Petya can (is allowed to) sit near the president.' [deontic]
- (8) Petja možet zabyt' pozvonit'  
Petya might forget.INF call.INF  
'Petya might forget to call / It is possible that Petya will forget to call.' [epistemic]
- (9) a. Context: Petya needs to reach some place quickly, the speaker suggests an option (possibly without knowing for sure whether Petya actually has such an opportunity)  
b. Petja možet vzjat' taksi  
Petya might take.INF taxi  
'Petya may take a taxi.' (in order to reach the place) [teleological]

However, different meanings of *moč* trigger a number of contrasts concerning scope, locality, case-marking, availability of certain morphological forms, etc. In this paper I focus on root (more specifically ability) and epistemic meanings of *moč* and show that those contrasts are due to the different degree of grammaticalization and different positions in the clausal spine, as expected by linguistic typology and predicted by Cinque's hierarchy.

My account is compatible with Hacquard's (2006, 2010) proposal that modals acquire different meanings (flavours) dependent on the binder of the event argument. My goal is to argue for different positions of root and epistemic *moč* and I will remain agnostic as to whether the meaning of a modal in a given position is determined by the rigid syntactic hierarchy itself (Cinque) or by an event binder available in this position (Hacquard).

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merged in different positions, some other scholars argue for either single or multiple, but fixed position of Neg. I address this issue in Section 5.

The remainder of the paper is organized as follows: in Section 2 I present the licensing contrasts conditioned by the interpretation of *moč*. In particular, I observe that when *moč* is negated, negative concord items (NCIs) and the genitive of negation (GoN) fail to be licensed if *moč* is interpreted epistemically. Section 3 provides the empirical and theoretical background on Russian NCIs and GoN and their licensing. In Section 4 I return to *moč* and address the issue whether it is a lexical or auxiliary verb (i.e. functional head). I consider a bi-clausal analysis under which root *moč* is a lexical control verb and epistemic *moč* is a lexical raising verb. I reject this analysis and provide arguments for the auxiliary status of *moč*. Furthermore, I show that it has different syntactic and morphological properties dependent on meaning (modal flavour). In Section 5 I argue that *moč* on epistemic and root readings occupies different positions in the clausal spine. I show how this assumption can explain licensing contrasts presented in Section 2 and further differences between root and epistemic *moč* discussed in Section 4. In Section 6 I briefly argue against the theory of polarity-induced scopal effects between modality and negation. Section 7 concludes.

## 2. *The Puzzle: Licensing contrasts*

### 2.1. Negative pronouns

Russian is a strict negative concord (NC) language: negative pronouns (*ni*-series formed by a wh-word and the negative element *ni*: *nikto* 'nobody', *ničto* 'nothing', *nikogda* 'never', etc.) have to be licensed by clausemate negation. Russian *ni*-pronouns differ from NPIs like English *any* in that they are not licensed in other contexts (e.g., downward entailing or non-veridical) and are not licensed from the matrix clause (Zeeijlstra 2004). In the following discussion I will refer to them as NCIs.

The crucial contrast is the following: NCIs are licensed when negation precedes root *moč* (10), but prohibited when epistemic *moč* is negated (11).

- (10) iz-za bolezni Petja ne možet ničego delat'  
because.of illness Petya NEG can nothing do.INF  
'Because of illness Petya cannot do anything.' [root]
- (11) a. Context: 'Why do you think that Petya is busy right now? He has been doing nothing for the whole week. Do you think anything has changed today?'  
b. ??Petja ne možet ničego delat'  
Petya NEG might nothing do.INF  
Intended: 'It is not possible that Petya is doing anything.' [epistemic]

The same is observed with NCIs in subject position.

- (12) iz-za šuma nikto ne možet spat'  
because.of noise nobody NEG can sleep.INF  
'Because of noise nobody can sleep.' [root]
- (13) a. Context: 'Don't worry, they all swim very well!'  
b. ??nikto ne možet utonut'  
nobody NEG might drown.INF  
Intended: 'It is not possible that anybody will drown.' [epistemic]

Similar sentences with non-NCI arguments are perfectly grammatical with negated epistemic modals.

- (14) Petja ne možet delat' uroki  
Petya NEG might do.INF homework  
'It is not possible that Petya is doing homework.' [epistemic]
- (15) Petja ne možet utonut'  
Petya NEG might drown.INF  
'It is not possible that Petya will drown.' [epistemic]

For subjects, the licensing pattern is reversed when the negative marker follows *moč*. An NCI-subject becomes acceptable with an epistemic reading of *moč* (although not perfect, this can be due to the fact that the order *moč ne* 'can/might NEG' is much rarer in Russian in general) and ungrammatical with root reading.

- (16) etogo 1% nikto možet ne zmetit'  
this.GEN 1% nobody might NEG notice.INF  
'It is possible that nobody will notice this 1%.' (Kholodilova 2015:386, (29))
- (17) ??nikto možet ne dyšat'  
nobody can NEG breathe.INF  
Intended: 'Everybody is able not to breathe.'<sup>2</sup> (Kholodilova 2015:391, (42b))

Finally, an NCI-object is grammatical with both meanings of *moč* followed by negation.

- (18) Petja možet ničego ne znat'  
Petya might nothing NEG know.INF  
'It is possible that Petya knows nothing.' [epistemic]
- (19) Petja možet ničego ne jest' celyj den'  
Petya can nothing NEG eat.INF whole day  
'Petya can eat nothing for the whole day.' [root]

## 2.2. Genitive of negation

A similar licensing contrast is observed with the genitive of negation. GoN is licensed in the object position of transitive verbs alternating with the accusative and the subject position of unaccusative verbs alternating with the nominative (see Harves 2013 among others). When *moč* is negated, the acceptability of GoN degrades given *moč* is interpreted epistemically.

- (20) Petja ne mog najti kluč-ej  
Petya NEG can/might.PST find.INF key-GEN.PL  
1. 'Petya was not able to find (the) keys.' [root]  
2. ??'It is not possible that Petya (is the one who) found (the) keys.' [epistemic]

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<sup>2</sup> One might wonder why I try to assign the interpretation of a universal quantifier to *nikto* 'nobody' in (17). This question is discussed in Section 3.

- (21) iz-za šoka svidetel' ne mog vspomnit' podrobnost-ej  
 because.of shock eyewitness NEG can.PST remember.INF detail-GEN.PL  
 'An eyewitness could not remember (the) details because of shock.' [root]
- (22) a. Context: 'I don't believe that. They put us down as idiots.'  
 b. ??svidetel' ne mog vnezapno vspomnit' podrobnost-ej spustja  
 eyewitness NEG might.PST suddenly remember.INF details-GEN.PL after  
 desyat' let  
 10 years  
 'It is not possible that an eyewitness suddenly remembered (the) details after 10  
 years.' [epistemic]

It should be noted that the data seems to be less consistent in the case of GoN in comparison to NCIs. It has been argued that definiteness (Bailyn 1997), specificity (Babyonyshov & Brun 2002), referentiality (Pereltsvaig 1999) or existential commitment (Kagan 2013) may influence the availability of GoN. For example, in (23) the root reading was judged to be less acceptable which may be due to the presence of the determiner *takoj* 'such'. On the other hand, the epistemic reading is better compatible with the absence of definiteness, existential commitment, etc. which makes it preferred in (23).

- (23) Petja ne mog podnjat' takoj štangi  
 Petya NEG can/might.PST lift.INF such barbell  
 1. ??'Petya was not able to lift such a barbell.' [root]  
 2. 'It is not possible that Petya lifted such a barbell.' [epistemic]

All in all, the fact that epistemic reading is marginal in (20) and (22) needs explanation.

The final pieces of data are provided in (24) and (25). The grammaticality judgements tend to be reversed in comparison to those for object licensing in (20): GoN-subject is not perfect with epistemic *moč* and marginally acceptable with root *moč*.

- (24) a. Context: 'The light is off, there is complete darkness and silence in the flat.'  
 b. ?Peti ne možet byt' doma  
 Petya.GEN NEG might be.INF at.home  
 'It is not possible that Petya is at home.' [epistemic]
- (25) ??iz-za bolezni Peti ne možet byt' na rabote  
 because.of illness Petya.GEN NEG can be.INF at work  
 'Because of illness Petya is unable to be at work.' [root]

The data discussed in this section is summarized in two tables. Table 1 is for the more standard *ne moč* (NEG > MOD) and Table 2 for the rare *moč ne* (MOD > NEG). The latter is less relevant for us, so I do not provide examples for GoN with *moč ne* for space reasons (the object is grammatical with both modal meanings and the subject contrast is similar to the one between (24) and (25), but sharper, i.e. a genitive subject with root *moč* followed by negated infinitive is outright ungrammatical).

Table 1: Licensing of NCI and GoN arguments with *ne moč*

		Epistemic	Root
NCI	Subject Object	?? (13) ?? (11)	OK (12) OK (10)
GoN	Subject Object	? (24) ?? (20.2)	?? (25) OK (20.1)

Table 2: Licensing of NCI and GoN arguments with *moč ne*

		Epistemic	Root
NCI	Subject Object	OK (16) OK (18)	?? (17) OK (19)
GoN	Subject Object	?	*

In the next section I provide some additional relevant details on NCIs and GoN and introduce theoretical accounts to their licensing.

### 3. Licensing of NCIs and GoN: Theory

#### 3.1. Licensing of NCIs

I have already mentioned that *ni*-pronouns have much stricter licensing conditions than NPIs like English *any* or *ever*. It has been observed that licensing of the latter is sensitive to different kinds of semantic properties, e.g. downward entailing or non-veridical contexts (Giannakidou 2006; Chierchia 2013). In contrast to this, NCIs (like Russian *ni*-pronouns) have been argued to be licensed syntactically by Agree (Zeilstra 2004, 2008). According to Zeijlstra the only possible licenser of *ni*-pronouns is a c-commanding bearer of an interpretable negation feature [iNeg] located in the same clause. I exemplify Zeijlstra's theory with Czech which is also a strict NC language (actually with the same *ni*-series).

- (26) nikdo nevolá  
 n-body NEG-calls  
 ‘Nobody is calling.’ (Zeilstra 2004:252, (23))
- (27) [NegP Op<sub>¬[iNEG]</sub> [vP nikdo<sub>[iNEG]</sub> [v nevolá<sub>[iNEG]</sub> ]]] (Zeilstra 2004:252, (24))

In this paper I adopt a variant of theory different from Zeijlstra's in a number of respects. Firstly, I assume that there is no abstract negation which c-commands the NCI and bears [iNeg] as suggested by (27). Instead, the negative marker *ne* is the actual negator and thus bears [iNeg]. Next, I argue that NCIs (at least of the Slavic type) are not licensed by Agree in the scope of negation, but move to SpecNegP as has been advocated for by Brown (1999) and Abels (2002, 2005) for Russian and by Bošković (2009) for Serbo-Croatian.

The first point is supported by (28). If there had to be an abstract negator c-commanding NCIs, an epistemic adverb would also be in its scope which is not the case. This means that an

NCI can linearly precede its licenser (semantic negation) in PF thus making it superfluous to void *ne* of negative force and posit an abstract negation.

- (28) nikto, navernoje, ne prišel  
 nobody probably NEG came  
 ‘Probably, nobody came.’

Given that the introduction of abstract negation inevitably makes us deal with its distribution, it is preferable not to posit it at all given the absence of independent evidence.<sup>3</sup>

Next, (29)-(31) suggest that NCIs have to move in order to be licensed. If an NCI appears in the second argument of a conjunction or disjunction and movement is impossible, the sentence is rendered ungrammatical. This is not the case for the weak NPI *kakoj-libo* ‘any’ which just needs to be in the scope of negation in order to be licensed.

- (29) ja ne našel tam nikakix deneg i/ili dragocennostej  
 1SG NEG found there no money and/or jewels  
 ‘I haven’t found any money or jewels there.’
- (30) \*ja ne našel tam deneg i/ili nikakix dragocennostej  
 1SG NEG found there money and/or no jewels  
 Intended: ‘I haven’t found money or any jewels there.’
- (31) ja ne našel tam deneg i/ili kakix-libo dragocennostej  
 1SG NEG found there money and/or what-NPI jewels  
 ‘I haven’t found money or any jewels there.’

A more detailed argument in favour of the Spec-Head agreement theory of NCI licensing can be found in Abels (2002, 2005), Bošković (2009), Rossaykin (2020). The assumptions that the negative marker *ne* is interpretable and *ni*-pronouns are licensed in SpecNegP suggest that the latter actually *outscope* negation and thus are universal quantifiers as argued by Abels (2002, 2005) and Giannakidou (2006). I will discuss one piece of evidence for universal quantification, namely *almost*-modification (32).

- (32) počti nikto ne prišel  
 almost nobody NEG came  
 ‘Almost nobody came.’

As observed by Zeijlstra (2004:239) the semantics of (31) can be either [*almost* >  $\forall$  >  $\neg$ ] or [*almost* >  $\neg$  >  $\exists$ ]. Penka (2011) elaborates on the topic by arguing that if we analyze *almost* as an operator evaluating scalar alternatives, *almost*-modification is perfectly compatible with the existential semantics of NCIs. More specifically, *almost* denies the propositional content of the prejacent and asserts that some close scalar alternative is true. In the case of (32) this means that ‘nobody came’ is false and some close alternative, say ‘4 people did not come’, is true. This results in the assertion ‘Some people, but less than 4, came.’ which is perfectly compatible with the uttered ‘Almost nobody came.’

However, this kind of semantics yields non-existent interpretations in negated sentence without NCIs, e.g. (33).

---

<sup>3</sup> The arguments suggested by Zeijlstra (2004:245-246) in support of the abstract negator and *ne*’s lack of negative force are criticized by Rossaykin (2020) in more detail and I will not discuss them here for space reasons.

- (33) Petja ne rešil počti 10 zadanij  
 Petya NEG solved almost 10 tasks
1. ‘There are almost 10 tasks such that Petya didn’t solve them.’ [ $\exists$  almost 10 >  $\neg$ ]
  2. ‘It is not the case that Petya solved almost 10 tasks.’ [ $\neg$  >  $\exists$  almost 10]

Crucially, the semantics suggested by Penka will result in neither the first, nor the second interpretation, but rather the following:

- (34) a. Denied p: ‘Petya did not solve 10 tasks.’ (= asserted q: ‘Petya solved 10 tasks’) and
- b. Asserted alternative: (say) ‘Petya did not solve 13 tasks.’
- c. Results in: ‘Petya solved less than 13 tasks.’

(34) resembles the second interpretation of (33) but makes a stronger statement (cf. *It is not the case that Petya solved almost 10 tasks, he solved just 5.* incompatible with the inevitable assertion in (34) that Petya did solve 10 tasks). Neither the Russian sentence in (33) nor its English equivalent *Petya did not solve almost 10 tasks* seem to have the semantics provided in (34). The point is that once we allow for negation to intervene between *almost* and a quantifier as in [ $\text{almost} > \neg > \exists$ ] this will consistently predict non-existent interpretations in numerous if not all cases other than NCI licensing.

In this section I have briefly provided evidence for the obligatory movement and universal quantification of NCIs (see more detailed discussion in Abels 2005; Rossaykin 2020). I thus conclude it by adopting the analysis of NCIs as non-negative universal quantifiers licensed in SpecNegP.

### 3.2. Licensing of GoN

As far as GoN is concerned, its distribution is restricted to the position of the underlying direct object (either the direct object of transitives or the subject of unaccusatives) suggesting that the *v* head is somehow relevant for its licensing. Abels (2005) proposes that GoN is licensed by the  $v_{GoN}$  head which is licensed by Neg. The latter licensing fails in case any intervener appears due to Relativized Minimality (Rizzi 1990). Possible interveners are structural Case assigners:  $v_{ACC}$ ,  $v_{GoN}$ ,  $T_{NOM}$  and  $T_{NULL}$ . The following sentences exemplify the intervention phenomena. In (35)  $v_{[-Case]}$  is not a Case assigner, so no intervention effects are observed. In (36) a dative-cased object intervenes. However, dative is not a structural case (at least, under this account), hence there is no intervention. In (37) and (38)  $T_{NOM}$  and  $v_{ACC}$  intervene respectively (intervention is indicated by # and boldface).

- (35) Nataša ne [ $v_P v_{[-Case]}$ ] xotela [ $v_P v_{GoN}$  čitat’ knig ]]  
 Nataša NEG wanted read.INF books.GEN.PL  
 ‘Natasha did not want to read any books.’ (Abels 2005:37, (51))
- (36) ja ne poobeščala Nataše  $v_{GoN}$  čitat’ knig  
 I NEG promised Nataša.DAT read.INF books.GEN.PL  
 ‘I did not promise to Natasha to read any books.’ (Abels 2005:37, (52))

- (37) \*Ivan ne [<sub>VP</sub>  $v_{[-Case]}$ ] skazal čto [<sub>TP</sub> on #**T** [<sub>VP</sub>  $v_{GoN}$  čitaet žurnal-a ]]]  
 Ivan NEG said that he reads journal-GEN  
 Intended: 'Ivan did not say that he reads a/the journal.' (Abels 2005:38, (54))
- (38) \*ja ne [<sub>VP</sub> ugovorila Natašu [<sub>VP</sub>  $v_{GoN}$  čitat' knig ]]  
 I NEG persuaded Nataša.ACC read books.GEN.PL  
 Intended: 'I did not persuade Natasha to read (the) books.' (Abels 2005:38, (55))

In the following discussion I will stick to the theories of NCI and GoN licensing introduced and advocated for in this section.

#### 4. Mono- vs bi-clausality

##### 4.1. An attempt of biclausal analysis

It is possible to analyze *moč* as either a lexical or an auxiliary verb. The former analysis is assumed by Gerasimova (2015) and (for epistemic *moč*) Letuchiy & Viklova (2020). In this section I show that a biclausal analysis is problematic given the data presented in Section 2.

Gerasimova (2015) observes the differences in licensing of NCI-objects in Russian infinitival clauses and comes to the conclusion that the availability of licensing from the matrix clause depends on the amount of functional structure above the infinitive. NCI-objects are licensed in VP-infinitives, licensed in but cannot move out of TP infinitives (one boundary) and cannot be licensed in CP-infinitives (two boundaries). The ban on movement out of TP is not a peculiarity of NCIs, but is observed with other kinds of objects, as exemplified in (39).

- (39) \*roditeli ej<sub>i</sub> [<sub>VP</sub> zastavili Petju [<sub>TP</sub> PRO [<sub>VP</sub> sdelat' podarok t<sub>i</sub> ]]]  
 parents her made Petya.ACC make.INF present  
 Intended: 'Parents made Petya make her a present.' (Gerasimova 2015:55, (20))

Applying these observations to my data one can come up with the structures for root and epistemic *moč* in (40) and (41) respectively. Licensing boundaries are indicated by # and boldface.

- (40) Petja ne [<sub>VP</sub> možet<sub>root</sub> [<sub>VP</sub> ničego delat' ]]  
 Petya NEG can nothing do.INF  
 'Petya cannot do anything'.

- (41) ??Petja ne [<sub>VP</sub> možet<sub>epist</sub> [<sub>CP</sub> # [<sub>TP</sub> # [<sub>VP</sub> ničego delat' ]]]]

Note that under such an analysis epistemic *moč* should be a raising verb in order to account for the ungrammaticality of NCI-subjects (43). This assumption is actually not unwelcome, since epistemic *moč* does not assign a theta-role to its subject (Letuchiy & Viklova 2020:45-46). Moreover, the constraint prohibiting movement in (43) may be different from (39) and (41), because here we are dealing with A-movement (raising to subject) rather than scrambling.<sup>4</sup>

- (42) nikto ne [<sub>VP</sub> možet<sub>root</sub> [<sub>VP</sub> spat' ]]  
 nobody NEG can sleep.INF  
 'Nobody can sleep.'

<sup>4</sup> In the following examples irrelevant traces may be omitted.

- (43) ??nikto<sub>i</sub> ne [VP možet<sub>epist</sub> [CP # [TP t<sub>i</sub> # [VP t<sub>i</sub> utonut' ]]]]  
 nobody NEG might drown.INF  
 Intended: 'It is not possible that anybody will drown'

The GoN data seems to receive an explanation under this account as well. In (44) the subject is base-generated in the matrix clause and thus cannot be licensed by  $v_{GoN}$  in the embedded clause (if vP is present there at all). In (45) the subject is base-generated in the position of underlying object of the embedded clause thus satisfying the licensing condition. Unlike the negative pronoun in (43) it can move out of CP undergoing raising to subject, presumably because it is not a (universal) quantifier (see Section 5). Note, however that T in (45) and (47) is not actually a Null Case assigner, because it is a raising construction (Chomsky & Lasnik 1993), hence there should be no intervention under Abels' theory. On the other hand, such sentences are not unquestionably ungrammatical as can be seen in (45) and the previously discussed (23).

- (44) ??iz-za bolezni Peti<sub>j</sub> ne [VP t<sub>j</sub> [VP možet<sub>root</sub> [vP  $v_{GoN}$  [VP byt' na rabote ]]]]  
 because.of illness Petya.GEN NEG can be at work  
 'Because of illness Petya is unable to be at work.'
- (45) ?Peti<sub>j</sub> ne [VP možet<sub>epist</sub> [CP [TP t<sub>j</sub> #?T [vP  $v_{GoN}$  [VP t<sub>j</sub> byt' doma ]]]]  
 Petya.GEN NEG might be at.home  
 'It is not possible that Petya is at home.'
- (46) Petja ne [VP mog<sub>root</sub> [VP najti kluč-ej ]]  
 Petya NEG can.PST find.INF keys-GEN.PL  
 'Petya was not able to find (the) keys.'
- (47) ??Petja ne [VP mog<sub>epist</sub> [CP [TP t<sub>i</sub> #?T [vP najti kluč-ej ]]]]  
 Petya NEG might.PST find.INF keys-GEN.PL  
 'It is not possible that Petya (is the one who) found (the) keys.'

So far, the biclausal theory has appeared to account for the licensing contrasts perfectly (given the initial stipulation about the different amount of structure embedded by the instances of *moč* with different meanings). The first problem occurs when we consider the sentences with the reversed order of *moč* and *ne*. Again, the ungrammaticality of the subject with the root verb is accounted for straightforwardly (48). It is base-generated higher than Neg and cannot move to SpecNegP in order to be licensed under Spec-Head agreement. The NCI-subject in (49) is base-generated and licensed in the embedded clause. However, as was observed previously, it should not be able to raise to the main clause across two barriers (TP and CP), otherwise it would be licensable in (43).

- (48) ??nikto [VP možet<sub>root</sub> [VP ne dyšat' ]]  
 nobody can NEG breathe.INF  
 Intended: 'Everybody is able not to breathe.'
- (49) etogo 1% nikto<sub>i</sub> [VP možet<sub>epist</sub> [CP # [TP t<sub>i</sub> # ne [VP t<sub>i</sub> [VP zmetit' ]]]]]  
 this.GEN 1% nobody might NEG notice.INF  
 'It is possible that nobody will notice this 1%.'

In the next section I provide independent arguments against the biclausal analysis.

#### 4.2. Monoclausality

Kholodilova (2015) presents evidence showing that *moč* is highly grammaticalized in Russian. I will start the discussion with the phenomena which are observed regardless of the meaning of *moč* and then move on to the differences between root and epistemic *moč*.

Firstly, *moč* lacks imperative and nominalization forms, the converb form (verbal modifier; (50)) is very archaic and almost unattested in contemporary texts. The frequency of the participle form is also observed to be decreasing (analytical construction with a relative pronoun is used instead).

- (50) ne mogši napisat' dvux strok bez pogrešen'ja, vzjalis' o pravilax i  
 NEG can.CONV write.INF 2 lines without flaw started about rules and  
 vkuse gorovit'  
 taste talk  
 'They started to talk about rules and taste not being able to write 2 lines without a flaw.'  
 (M.V. Milonov, 'To Lucasium', 1812)

The infinitive is rarely used as a free-standing form (e.g. as a subject, (51)) and is very marginal in embedding constructions (52). A finite clause is used instead (53).

- (51) samoe užasnoe – xotet' i ne moč  
 most terrible – want.INF and NEG can.INF  
 'To want but not to can is the most terrible.' (Kholodilova 2015:379)
- (52) \*on xočet moč prygnut' s parašutom  
 he wants can.INF jump.INF with parachute  
 Intended: 'He wants to be able to jump with a parachute.' (Kholodilova 2015:379)
- (53) ocenivaju ja kvartiry tak, čto-by ja mogla bystro ix prodat'  
 assess 1SG flats so that-SUBJ 1SG can.PST.FEM quickly 3PL sell  
 'I assess the flats in such a way, that I can sell them quickly.' (Kholodilova 2015:381)

Another form not discussed by Kholodilova is the impersonal passive formed with the reflexive particle *-s'a*. It is available to both transitive and intransitive verbs, the latter is exemplified in (54). Table 3 shows that this form is extremely rare for *moč*, although in principle possible.

- (54) mne dumajet-sa, čto vy ošibajetes'  
 1SG.DAT thinks-REFL that 2PL mistake.REFL  
 'I think that you are mistaken.' (Lit.: '(To) me thinks that you are mistaken.')

*Table 3: Reflexive impersonal of selected verbs in the Russian National Corpus*

Verb	<i>xotet'</i> ‘want’	<i>verit'</i> ‘believe’	<i>dumat'</i> ‘think’	<i>sumet'</i> ‘manage to’	<i>moč</i> ‘can, may’
Occurrences with reflexive <i>-s'a</i>	82 053	2 981	6 622	3	75
Occurrences without reflexive	512 566	69 383	262 348	22 657	993 747
Ratio	0.16	0.043	0.025	0.0001	< 0.0001

The systemic unavailability of derived forms shows that *moč* is not a lexical verb in both meanings. Now let us consider the differences conditioned by the meaning of *moč* not yet discussed.

Ramchand & Svenonius (2014) report that in Norwegian only root modals can be placed under perfect aspect. In Russian perfective marking is available only to root *moč* (55).

- (55) Petja s-možet prijti  
 Petya PFV-can come  
 1. ‘Petya will be able / will manage to come.’ [root]  
 2. \*‘It will be(come) possible that Petya will come.’ [epistemic]

Next, Chvany (1996) points out that root *moč* can have certain pronominal phrases (e.g. *eto* ‘this’, *čto* ‘what’, *vsyo* ‘all’) as its direct object, although such examples are not frequent. This actually shows that root *moč* preserves some traits of a lexical verb.

- (56) ja mog vsyo  
 1SG can.PST all  
 1. ‘I was able to do anything.’ [root]  
 2. ??‘I could have done anything.’ (e.g. I do not remember my actions) [epistemic]

The final difference to discuss is observed with the case of a nominal predicate. Depending on the structure, the object of nominal predication (or secondary predication) can be either in nominative or instrumental case or both, see the paradigm below. Bailyn (2012) argues that instrumental case is assigned by the Pred head. When Pred assigns no case, nominative (“sameness” case) appears as a result of Multiple Agree (Hiraiwa 2001:69) with T. It is thus a strong diagnostic for monoclausality. Crucially, nominative is grammatical in nominal predictions with epistemic *moč* (58).

- (57) on byl soldat / soldat-om  
 3SG be.PST soldier / soldier-INSTR  
 ‘He was a solider.’ (Bailyn 2012:185, (24c))
- (58) on mog<sub>epist</sub> byt’ soldat / soldat-om  
 3SG might.PST be.INF soldier / soldier-INSTR  
 ‘He might be a soldier.’
- (59) on mog<sub>root</sub> byt’ ??soldat / soldat-om  
 3SG can.PST be.INF soldier / soldier-INSTR  
 ‘He could be a soldier.’ (e.g. he knew how to shoot) (Kholodilova 2015:393, (45b))
- (60) on xotel byt’ \*soldat / soldat-om  
 3SG want.PST be.INF soldier / soldier-INSTR  
 ‘He wanted to be a soldier.’

Note that nominative case would be impossible under a raising analysis, because lower T is not a case assigner and higher T is not local enough to assign the case to the nominal predicate in the embedded clause, which is shown in the example with a raising verb *kazat’sja* ‘to seem’.

- (61) on<sub>i</sub> T<sub>NOM</sub> [VP kazalsja mne [TP t<sub>i</sub> T<sub>[−Case]</sub> \*drug / drug-om ]]  
 3SG seemed 1SG.DAT friend / friend-INSTR  
 ‘He seemed to me to be a friend.’

The remaining question is why (59) is ungrammatical with nominative, given that root *moč* is a functional head and the construction is monoclausal. The difference between (58) and (59) is accounted for in Section 5.2 where I spell out my analysis of root and epistemic *moč* as (distinct) functional heads and argue that it predicts the licensing and other contrasts between two instances of *moč* discussed so far. In Section 5.1 I re-introduce the hierarchy (2) with a more detailed discussion of the position of negation.

## 5. Analysis

### 5.1. Back to the hierarchy

Root *moč* exhibits the properties of both a lexical (e.g. ability to have pronominal object) and an auxiliary verb (e.g. impoverished derivational morphology). From the typological point of view it is expected to be less grammaticalized (see Section 1). In the following discussion I will identify it as Mod/V. As far as epistemic *moč* is concerned, it was shown that it should be exclusively an auxiliary. Thus, I argue for the hierarchy in (2) repeated in (62) with the addition of actual Russian affixes and auxiliaries ( $\text{ModP}_{\text{abil/perm}}$  can possibly be split in two distinct heads).

$$(62) \quad \text{ModP}_{\text{epist}} \text{ } moč > \text{TP } byt' > \text{NegP } ne > \text{AspP } s- > \text{ModP}_{\text{abil/perm}} \text{ } moč$$

*NegP* is absent from the original hierarchy put forward by Cinque (1999:106) and given the data presented in previous sections a comment on its position is needed. In (62) *NegP* marks, so to say, the standard position of verbal negation. Negation in this position is what is grammaticalized in every language and called “standard negation” (Payne 1985; Miestamo 2005). There is a debate on whether there should be a single projection of negation whose position is fixed, multiple projections or it can be located at different levels of clause structure. E.g. Zanuttini (1997) and Poletto (2008) among others argue for numerous projections of negation in the universal hierarchy with the highest one (presumably corresponding to Russian *ne*) located above T. In (62) I assume T > Neg (Pollock 1989; Belletti 1990; Zeijlstra 2004) but the relative order of T and Neg is not crucial for my analysis.

Now, why can negation linearly precede epistemic *moč* and outscope it (14), (15)? There can be at least two explanations. The first one is that, contra (62), there is indeed no fixed position of verbal negation (*NegP*) and it can be merged at different levels of the clause structure. The second one is that negation located above epistemic *moč* is something else rather than “standard negation”, e.g. constituent or focus negation. This can easily be true, because in Russian negative markers are highly syncretic and the marker of constituent negation has the same phonological form *ne* (for discussion of the syncretism of negative markers in different languages see De Clercq 2018).

Crucially, my analysis of modals is compatible with both options (and any other option allowing for negation to appear above  $\text{Mod}_{\text{epist}}$ ). My point is to argue for two distinct positions of root and epistemic modals with the position of negation being used as a diagnostic. When negation is located “unusually” high, it fails to act as a licenser for the reasons discussed in Section 3 and applied to the data in Section 5.2.

In what follows I will assume that the second option is the case, i.e. that there is a dedicated

position for verbal negation in the hierarchy (62).<sup>5</sup> When *ne* ‘not’ occurs elsewhere (e.g. negates epistemic *moč*) it is actually a marker of constituent negation (NotP).

### 5.2. Explaining the data

In this section I will show how the data discussed so far can be accounted for assuming the hierarchy in (62). I will start with the differences between root and epistemic *moč* discussed in Section 4.2 and then move on to the key contrasts introduced in Section 2.

First, let us consider the difference in case marking in nominal predication. The structures for (58) and (59) are presented below. The ungrammaticality of nominative in (64) can be due to the lexical verb *byt'* ‘to be’ obligatory assigning lexical instrumental case to its complement.<sup>6</sup>

- |      |  |             |
|------|--|-------------|
| (63) | a. on [Mod <sub>ep</sub> mog [TP <i>byt'</i> <sub>[NOM]</sub> [Pred <sub>P</sub> Pred <sub>[-Case]</sub> soldat ]]]] | [epistemic] |
|      | b. on [Mod <sub>ep</sub> mog [TP T <sub>[NOM]</sub> [VP <i>byt'</i> <sub>[INSTR]</sub> soldatom ]]]]                 | [epistemic] |
| (64) | on [TP T <sub>[NOM]</sub> [Mod <sub>P/VP</sub> mog [VP <i>byt'</i> <sub>[INSTR]</sub> soldatom / *soldat ]]]]        | [root]      |

Now let us return to the contrasts presented in Section 2. The scope of quantifiers is known to be constrained (Wurmbrand 2018). For example, unlike indefinites, universal quantifiers cannot bind donkey pronouns (Abels 2005; Giannakidou 2006). Von Fintel & Iatridou (2003) observe that in English universal quantifiers cannot outscope epistemic modals. This is also the case in Russian (65). The fact that the universal quantifier is interpreted below negation and the modal actually presents another argument against the raising analysis of epistemic *moč*.

- |      |  |                 |
|------|--|-----------------|
| (65) | Petja ne mog rešit' každuju zadaču<br>Petya NEG might.PST solve.INF every task |                 |
|      | 1. ‘It is not possible that Petya solved every task.’                          | [¬ > ◊ > T > ∀] |
|      | 2. ??‘Every task was not possible for Petya to solve it.’                      | [∀ > ¬ > ◊ > T] |

Returning to *ni*-phrases, Progovac (1994:69) reaches the conclusion that TP is the local domain for them in Serbo-Croatian. This is what we would expect given that *ni*-phrases are universal quantifiers. Now, if *ni*-phrases need to move in order to be licensed by negation (Section 3.1), but cannot scope higher than TP, licensing should fail once negation is located not in its standard position between T and Asp (62), but above Mod<sub>epist</sub>.

- |      |   |                            |
|------|---|----------------------------|
| (66) | Petja ne mog rešit' ničego<br>Petya NEG can.PST solve.INF nothing |                            |
|      | 1. ‘Petya was not able to solve anything.’                        | [T > ∀ > ¬ > ◊; root]      |
|      | 2. *‘Everything was not possible for Petya to solve.’             | [∀ > ¬ > ◊ > T; epistemic] |

The structures for the two interpretations of (66) are presented in (67).

- |      |  |             |
|------|--|-------------|
| (67) | a. Petja [TP #T [NegP ne [Mod <sub>P/VP</sub> mog [VP rešit' ničego ]]]] | [root]      |
|      | b. *Petja [NotP ne [Mod <sub>ep</sub> mog [TP #T [VP rešit' ničego ]]]]  | [epistemic] |

<sup>5</sup> Cf. the negative marker *-mal-me* in Turkish which is spelled out as a part of verbal morphology (3), (4) and is used exclusively for verbal negation (Kornfilt 1997:123-128)

<sup>6</sup> Bailyn (2012:193) adopts the Morphological Pred Rule: ‘Overt morphology in Pred<sup>0</sup> absorbs Instrumental case’. This will require a different analysis for (63)-(64). I leave this issue for future work.

Next, if case-assigning T is indeed an intervener for GoN licensing (Section 3.2), the contrast with GoN-objects (20) receives a parallel explanation (68).

- (68) a. Petja [TP #T [NegP ne [ModP/VP mog [vP  $v_{GoN}$  [VP najti kluč-ej ]]]]]  
           Petya           NEG           can.PST                           find.INF key-GEN.PL  
           ‘Petya was not able to find (the) keys.’
- b. ??Petja [NotP ne [ModP<sub>ep</sub> mog [TP #T [vP  $v_{GoN}$  [VP najti klučej ]]]]]]

The reversed licensing pattern observed with NCI-subjects and the word order *moč ne* also follows from the structure I argue for. (69) is a single clause with *moč* base-generated in Mod<sub>epist</sub> above T and Neg. Neg is in its standard position and nothing prevents the licensing of the NCI-subject. (70) can be ungrammatical for two reasons: either the subject is base-generated higher than NegP as an argument of lexical *moč* and cannot move to SpecNegP or the subject is base-generated lower than Neg, but becomes frozen after moving to SpecNegP and checking [uNeg] (Rizzi 2006). For this reason it cannot move to SpecTP in order to check Case.<sup>7</sup> The freezing proposal is based on the fact that no scope-taking elements can intervene between NCI ( $\forall$ ) and negation ( $\neg$ ) in LF (Abels 2005), i.e. NCIs are always interpreted in SpecNegP.

In (70) I present the structure for (17) assuming the first option (biclausal structure and base-generation of the subject in the matrix clause above NegP).

- (69) etogo 1% nikto<sub>i</sub> [ModP<sub>ep</sub> možet [TP t<sub>i</sub> #T [NegP t<sub>i</sub> ne [vP t<sub>i</sub> [VP zametit’ ]]]]]  
           this.GEN 1% nobody           might                           NEG                           notice.INF  
           ‘It is possible that nobody notice this 1%.’
- (70) ??nikto [ModP/VP možet [VP ne dyšat’ ]]  
           nobody           can           NEG breathe.INF  
           Intended: ‘Everybody is able not to breathe.’

I will finish the discussion of my analysis with GoN-subject examples. (71) is predicted to be degraded because of a Case-assigner (the T head) intervening between negation and  $v_{GoN}$ .

- (71) ?Peti<sub>j</sub> ne [ModP<sub>ep</sub> možet [TP #T [vP  $v_{GoN}$  [VP t<sub>j</sub> byt’ doma ]]]]  
           Petya.GEN NEG           might                                   be.INF at.home  
           ‘It is not possible that Petya is at home’

The marginality of GoN-subjects with root *moč* (both *ne moč* and *moč ne*) is a problematic case (see (25) repeated below as (73)). If root *moč* was a functional head, nothing would prohibit the licensing of the GoN-subject base-generated inside the VP of the lexical verb (72).

- (72) [NegP ne [ModP možet<sub>root</sub> [vP  $v_{GoN}$  [VP NP.Gen V ]]]]

Contrary to (72) we see that GoN-subjects are hardly grammatical with root *moč* (73). This prompts the analysis of the latter as a lexical verb.  $v_{GoN}$  in the embedded clause cannot assign genitive to the subject base-generated in the matrix clause as an argument of lexical *moč*.

<sup>7</sup> The freezing proposal may seem to be incompatible with the hierarchy in (62) because of T > Neg. For example, one can expect that (69) should also be ungrammatical given that an NCI is frozen before reaching T and checking its Case. However, in (69) and other grammatical instances of subject NCI licensing Neg is immediately dominated by T. On the other hand, in (70) there are several heads between T and Neg (at least Asp and Mod<sub>abil/perm</sub>). I suppose that this difference may matter if one assumes the freezing approach

- (73) ??iz-za bolezni Petij ne [<sub>vP</sub> t<sub>j</sub> [<sub>vP</sub> možet [<sub>vP</sub> v<sub>GoN</sub> [<sub>vP</sub> byt' na rabote]]]]]  
 because.of illness Petya.GEN NEG can be.INF at work  
 'Because of illness Petya is unable to be at work.'

On the other hand, we have observed that root *moč* is different from ‘normal’ lexical verbs in many respects. I thus have to conclude that root *moč* is still in transition from a lexical V to functional Mod<sub>abil</sub> while the epistemic variant can only be a functional head located higher in the structure.

### 6. Polarity effects

In this section I am going to discuss briefly an alternative approach to scopal effects observed between modals and negation proposed by Iatridou & Zeijlstra (2013) and Homer (2015) and show that it is not compatible with the presented data.

On the basis of a cross-linguistic study of universal deontic modals, Iatridou & Zeijlstra (2013:529) argue that (a) modals that outscope negation are positive polarity items (PPIs); (b) all modals originate in a position lower than I<sup>0</sup>; and (c) modals undergo reconstruction unless reconstruction leads to a PPI-licensing violation. As has been shown in this paper, those claims are far too strong. In Russian both root and epistemic *moč* allow for both scopes with respect to negation. No PPI or NPI effects are observed. Next, it was shown that epistemic *moč* is base-generated above T (at least, there is no evidence for the contrary). Finally, *moč* and negation always exhibit surface scope, no movement or reconstruction effects are attested.

Iatridou & Zeijlstra (2013) also present a puzzle concerning English *may*: deontic *may* scopes under negation and epistemic *may* scopes over negation.

- (74) a. He may not go to the movies. deontic, neg > may  
 b. He may not have left earlier in the day. epistemic, may > neg

This contrast seems to support the hierarchy in (62). However, Iatridou & Zeijlstra (2013:563) claim that ‘if *may* scopes over negation because it is generated higher than negation, this is also a property of epistemic *may* and not of epistemic modals in general, as there are certainly such modals that scope under negation and so cannot have been generated higher than it.’

The fact that a certain modal can appear within the scope of negation is not very informative per se. There are epistemic modals outscoped by negation, but this does not necessarily have any consequences for the hierarchy. When one assumes a fixed position for (standard) verbal negation, e.g. T > Neg > Asp > Mod<sub>abil/perm</sub> as in (62), this does not exclude other instances of negation, e.g. focus/contrastive/constituent negation. In many languages ‘a negator can be moved from its standard position to the focused constituent’ (Dahl 2010:31). Russian is a case in point. Virtually any constituent can be negated by simply adding *ne* ‘not’ to it (75).

- (75) a. v sledujuščij raz ja ne pridu  
 in next time I NEG come.NPST.3SG  
 ‘Next time I will not come.’ (unmarked focus) (Dahl 2010:31)  
 b. v sledujuščij raz pridu ne ja  
 in next time come.NPST.3SG NEG I  
 ‘Next time it will not be me who comes’ (focus on subject) (Dahl 2010:31)

In Section 5.1 I suggested that when Russian epistemic *moč* is in the scope of negation (*ne moč*) it may be an instance of focus/constituent negation similar to (75). This type of negation seems to be less simple and uniform in English in comparison to Russian, cf. translation of (75b). So one cannot bring English epistemic *may* in the scope of negation as straightforwardly, as in Russian. There is standard verbal negation in (74), and epistemic *may* naturally outscopes it, just like *moč* in Russian given the word order *moč ne*.

One may point out that there are epistemic modals in English which are outscoped by verbal negation, namely *have to* (76) and *can't* (77). However, these two are different from *may*. The former is less grammaticalized than *may* or *can*. It may preserve some traits of lexical verbs, e.g. project its own Neg just like lexical verbs (cf. \**doesn't may*). As for *can't*, it is idiosyncratic. It appears only in the negative form, cf. (77a), otherwise it is not interpreted epistemically.

- (76) He doesn't have to have fallen.  
 (Maybe somebody pushed him.) (Iatridou & Zeijlstra 2013:562, (105b))
- (77) a. He arrived very early. This means that he may/\*can have left early.  
 b. He usually sleeps until noon.  
 This means that he can't have left early. (Iatridou & Zeijlstra 2013:563, (113))

Finally, it should be noted that Iatridou & Zeijlstra (2013) observe PPI and NPI effects only among universal modals (except for English *can't*). Since those effects are probably driven by semantic/pragmatic mechanisms independent of the clause structure, the two theories do not oppose each other. I suppose that the polarity theory of modals should be built upon the theory of fine-grained clause structure.

## 7. Conclusion

In this paper I discussed the correspondences between different meanings of Russian existential modal verb *moč* ‘can, may’ and syntactic structure. I observed that the negative concord items (*ni*-pronouns) and underlying objects marked with genitive are not licensed when the negative marker *ne* precedes *moč* in epistemic meaning. Conversely, NCI-subjects and GoN-subjects are not licensed when the negative marker follows root *moč*. Firstly, I discussed the biclausal analysis under which epistemic *moč* is a raising verb embedding CP infinitives and root *moč* is a subject control verb embedding VP infinitives. I showed that this analysis cannot account for the full range of contrasts observed. Moreover, there is independent morphological and syntactic evidence to treat two instances of *moč* as functional heads rather than lexical verbs. While root *moč* exhibits the properties of both lexical verb and auxiliary, epistemic *moč* is definitely an auxiliary (functional head). The observed difference in the degree of grammaticalization is attested cross-linguistically.

Next, I showed that the Russian data fits with the fine-grained universal hierarchy of functional heads (Cinque 1999, 2001; Rizzi & Cinque 2016). Epistemic *moč* corresponds to the high *Mod<sub>epist</sub>* head, while root *moč* is tentatively on its way from lexical V to the low *Mod<sub>abil</sub>*. The observed scope and licensing phenomena follow from the clause structure (*Mod<sub>epist</sub>* > T > Neg > *Mod<sub>abil</sub>*). NCIs have to move to SpecNegP in order to be licensed and this condition is satisfied when negation is merged in its standard position. However, when epistemic *moč* is negated, the negative marker is merged unusually high (I assume that it may be fo-

cus/contrastive/constituent negation rather than standard verbal negation fixed in the hierarchy). Being universal quantifiers NCIs cannot escape T domain in order to be licensed in Spec-NegP located above ModP<sub>epist</sub> which renders ungrammaticality. The degraded grammaticality of GoN-arguments in the similar structures is supposedly the consequence of an intervening Case licenser (T head).

I used the licensing properties of negation as a diagnostic for the different positions of modals in the clause structure which is my major point. The assumption about the fixed position of the verbal Neg head is preliminary and not crucial for the analysis of modals. Further work is also needed for a better understanding of the interaction of Case- and Neg-licensing.

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### Abbreviations

1, 2, 3	first, second, third person	NEG	negation
ABIL	abilitative	NPI	negative polarity item
ACC	accusative	NPST	non-past tense
AOR	aorist	PFV	perfective
CONV	converb	PL	plural
DAT	dative	PST	past tense
FEM	feminine	REFL	reflexive
GEN	genitive	SG	singular
INF	infinitive	SUBJ	subjunctive
INSTR	instrumental		

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### References

- Abels, K. (2002). Expletive (?) negation. Toman, J. (ed.), *Formal Approaches to Slavic Linguistics 10: The Second Ann Arbor Meeting*, Michigan Slavic Publications, MI, vol. 10, pp. 1–20.
- Abels, K. (2005). “Expletive negation” in Russian: A conspiracy theory. *Journal of Slavic linguistics* 13:1, pp. 5–74.
- Babyonyshев, M. & D. Brun (2002). Specificity matters: A new look at the new genitive of negation in Russian. Toman, J. (ed.), *Formal Approaches to Slavic Linguistics: The Second Ann Arbor Meeting 2001*, Michigan Slavic Publications, MI, pp. 47–66.
- Bailyn, J. F. (1997). Genitive of negation is obligatory. Wayles, B. (ed.), *Formal Approaches to Slavic Linguistics 4: the Cornell Meeting*, Michigan Slavic Publications, MI, vol. 4, pp. 84–114.

- Bailyn, J. F. (2012). *The Syntax of Russian*. Cambridge Syntax Guides, Cambridge University Press, New York.
- Belletti, A. (1990). *Generalized Verb Movement: Aspects of Verb Syntax*. Rosenberg & Sellier, Torino.
- Bošković, Ž. (2009). Licensing negative constituents and negative concord. Schardl, A., M. Walkow & M. Abdurrahman (eds.), *NELS 38: Proceedings of the 38th annual meeting of the North East Linguistic Society*, GLSA, Amherst, MA, vol. 38, pp. 125–139.
- Brown, S. (1999). *The Syntax of Negation in Russian: a Minimalist Approach*. CSLI Publications, Stanford.
- Bybee, J. L., R. D. Perkins & W. Pagliuca (1994). *The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World*. University of Chicago Press, Chicago.
- Chierchia, G. (2013). *Logic in Grammar: Polarity, Free Choice, and Intervention*, vol. 2 of *Oxford Studies in Semantics and Pragmatics*. Oxford University Press, Oxford.
- Chomsky, N. & H. Lasnik (1993). Principles and parameters theory. Jacobs, J., A. von Stechow, W. Sternefeld & T. Venneman (eds.), *Syntax. An International Handbook of Contemporary Research*, Walter de Gruyter, Berlin, pp. 506–569.
- Chvany, C. V. (1996). A continuum of lexical transitivity: Slightly-transitive verbs. Yokoyama, O. T. & E. Klenin (eds.), *Selected Essays of Catherine V. Chvany*, Slavica Publishers, Columbus, pp. 161–171.
- Cinque, G. (1999). *Adverbs and Functional Heads: A Cross-Linguistic Perspective*. Oxford Studies in Comparative Syntax, Oxford University Press on Demand, New York.
- Cinque, G. (2001). A note on mood, modality, tense and aspect affixes in Turkish. *The verb in Turkish* 44, pp. 47–59.
- Dahl, Ö. (2010). Typology of negation. Horn, L. (ed.), *The Expression of Negation*, De Gruyter Mouton, Berlin & New York, pp. 9–38.
- De Clercq, K. (2018). Syncretisms and the morphosyntax of negation. Baunaz, L., K. D. Clercq, L. Haegeman & E. Lander (eds.), *Exploring Nanosyntax*, Oxford University Press, New York, pp. 180–204.
- Gerasimova, A. (2015). Licenzirovanie otricatelnyx mestoimenij čerez granicu infinitivnogo oborota v russkom jazyke [Licensing of negative pronouns across the boundary of infinitival phrase in Russian language]. Lytkova, E. A., A. V. Zimmerling & M. B. Konoshenko (eds.), *Tipologija morfosintaksičeskix parametrov. Materialy meždunarodnoj konferencii TMP-2015 [Typology of morphosyntactic parameters 2014. Proceedings of the international conference TMP-2015]*, MSPU, Moscow, pp. 47–61.
- Giannakidou, A. (2006). N-words and negative concord. Everaert, M. & H. van Riemsdijk (eds.), *Blackwell Companion to Syntax*, Blackwell, Malden, MA, vol. 3, pp. 327–391.
- Hacquard, V. (2006). *Aspects of modality*. [PhD thesis]. Massachusetts Institute of Technology, URL <https://dspace.mit.edu/handle/1721.1/37421>.
- Hacquard, V. (2010). On the event relativity of modal auxiliaries. *Natural Language Semantics* 18:1, pp. 79–114.
- Harves, S. (2013). The genitive of negation in Russian. *Language and Linguistics Compass* 7:12, pp. 647–662.
- Hiraiwa, K. (2001). Multiple agree and the defective intervention constraint in Japanese. Lance, N., A. Costa, J. Martin-Gonzalez, O. Matushansky & A. Szczegielniak (eds.), *MITWPL 40, HUMIT 2000: Proceedings of the First Harvard-MIT Student Conference in Language Research*, MIT Dept. of Linguistics, Cambridge, MA, vol. 40, pp. 67–80.
- Homer, V. (2015). Neg-raising and positive polarity: The view from modals. *Semantics and Pragmatics* 8:4, pp. 1–88.
- Iatridou, S. & H. Zeijlstra (2013). Negation, polarity, and deontic modals. *Linguistic Inquiry* 44:4, pp. 529–568.
- Kagan, O. (2013). *Semantics of Genitive Objects in Russian: A Study of Genitive of Negation and Intensional Genitive case*, vol. 89 of *Studies in natural language and linguistic theory*. Springer, Dordrecht.
- Kholodilova, M. (2015). Grammatikalizacija russkix modal'nyx glagolov [Grammaticalization of Russian modal verbs]. *Acta Linguistica Petropolitana. Trudy Instituta lingvisticheskikh issledovanij* 11:1, pp. 369–399.
- Kornfilt, J. (1997). *Turkish*. Descriptive Grammars, Routledge, London and New York.
- Letuchiy, A. B. & A. V. Viklova (2020). Podjom i smežnyje javlenija v russkom jazyke (preimushchestvenno na matriale mestoimenij) [Raising and similar phenomena in Russian (mainly based on the behaviour of pronouns)]. *Voprosy Jazykoznanija* 2, pp. 31–60.
- Miestamo, M. (2005). *Standard Negation: The Negation of Declarative Verbal Main Clauses in a Typological Perspective*, vol. 31 of *Empirical Approaches to Language Typology*. Walter de Gruyter, Berlin.
- Milonov, M. V. (1812). K Lukasiju [To Lucasium]. *Sanktpeterburgskij vestnik* 1:1, pp. 51–57.
- Payne, J. R. (1985). Negation. Shopen, T. (ed.), *Language Typology and Syntactic Description. Vol. 1: Clause Structure*, Cambridge University Press, Cambridge.
- Pereltsvaig, A. (1999). The genitive of negation and aspect in Russian. *McGill Working Papers in Linguistics*

- 14:1/2, pp. 111–140.
- Plank, F. (1981). Modalitätsausdruck zwischen Autonomie und Auxiliarität. Rosengren, I. (ed.), *Sprache und Pragmatik. Lunder Symposium 1980*, Cwk Gleerup, Oxford, pp. 57–71.
- Poletto, C. (2008). On negative doubling. Cognola, F. & D. Pescarini (eds.), *Quaderni di lavoro ASIt. La negazione: variazione dialettale ed evoluzione diacronica*, ASIt, Padova, vol. 8, pp. 57–84.
- Pollock, J.-Y. (1989). Verb movement, universal grammar, and the structure of IP. *Linguistic Inquiry* 20:3, pp. 365–424.
- Progovac, L. (1994). *Positive and negative polarity: A Binding approach*, vol. 68 of *Cambridge Studies in Linguistics*. Cambridge University Press, Cambridge.
- Ramchand, G. & P. Svenonius (2014). Deriving the functional hierarchy. *Language Sciences* 46, pp. 152–174.
- Rizzi, L. (1990). *Relativized Minimality*. Linguistic Inquiry Monographs, MIT Press, Cambridge, MA.
- Rizzi, L. (2006). On the form of chains: Criterial positions and ECP effects. Cheng, L. L.-S. & N. Corver (eds.), *Wh-movement: Moving on*, MIT Press, Cambridge, MA, pp. 97–134.
- Rizzi, L. & G. Cinque (2016). Functional categories and syntactic theory. *Annual Review of Linguistics* 2, pp. 139–163.
- Rossyaykin, P. (2020). Russian ni-pronouns are non-negative universal quantifiers. Talk presented at the 15th Annual Meeting of the Slavic Linguistic Society, online, September 4–6.
- The Russian National Corpus (2020). Accessed: 2020-11-11. URL: <https://ruscorpora.ru/new/en/index.html>.
- van der Auwera, J. & V. A. Plungian (1998). Modality's semantic map. *Linguistic typology* 2:1, pp. 79–124.
- von Fintel, K. & S. Iatridou (2003). Epistemic containment. *Linguistic Inquiry* 34:2, pp. 173–198.
- Wurmbrand, S. (2018). The cost of raising quantifiers. *Glossa: a journal of general linguistics* 3(1):19, pp. 1–40.
- Zanuttini, R. (1997). *Negation and Clausal Structure: A Comparative Study of Romance Languages*. Oxford University Press, New York.
- Zeijlstra, H. (2004). *Sentential Negation and Negative Concord*. LOT, Utrecht.
- Zeijlstra, H. (2008). Negative concord is syntactic agreement. [Ms]. University of Amsterdam.

# (Non-)specificity and Case in Gorwaa<sup>1</sup>

## The *-oo/-h)ee* suffix

Elisabeth J. Kerr

This paper presents results of a corpus study on the South-Cushitic language Gorwaa which investigated the ‘enigmatic’ *-oo/-h)ee* suffix (Mous & Qorro 2010:47, Harvey 2018). Various contexts in which this nominal suffix occurs are identified, including negation, polar questions, universal quantification, adverbials, the object of comparison, and locatives. I characterise these as non-specific contexts and frame-setting topics. I compare these contexts to those in which the augment (nominal pre-prefix) is dropped in Bantu languages and, based on the empirical similarities, I discuss whether analyses of the Bantu augment can account for the Gorwaa cases. One analysis proposes that the suffix marks (non-)specificity, which I show is not fully satisfactory. Instead, I propose that what truly conditions the appearance of the suffix is the syntactic position of the nominal with respect to the verb phrase.

## 1. Introduction

South-Cushitic languages are a branch of Cushitic (Afroasiatic) languages spoken in East Africa (Tosco 2000). A recent corpus by Harvey (2017) compiles years of conversation and elicitation sessions with Gorwaa speakers in Tanzania, presenting a rich linguistic and cultural resource. In this paper, I investigate one suffix, *-oo/-h)ee*, that has been previously labelled as TOP (topic) and background (Mous 1993), although the terms have been described as ‘not particularly satisfactory’, with the suffix occurring in ‘several, seemingly disparate morphosyntactic environments’ (Harvey 2018:179). I use the Gorwaa corpus to investigate the distribution of the *-oo/-h)ee* suffix in Gorwaa, based primarily on the work by Mous & Qorro (2010) on the cognate suffix *-o/-h)oo* in Iraqw, a closely related South-Cushitic language. I consider semantic properties that unify the contexts in which the suffix appears, and find that there are two fundamentally different context types: non-specific contexts, and frame-setting topics. I discuss how these con-

<sup>1</sup> In the interests of academic integrity, the author (who is also an editor of these proceedings) was not involved in the editing of this paper and was not given access to editorial files and correspondence related to this submission.

texts parallel those of augment drop in Bantu, and therefore consider analyses of augment drop and their application to South Cushitic. I argue that the primary purpose of the suffix is in fact syntactic, namely that it licenses nominals. In section §2 I lay out some background on the Gorwaa language, the corpus, and South-Cushitic morphosyntax; §3 presents the contexts in which the suffix was found; section §4 considers these contexts, compares them to Bantu augment drop, discusses an analysis in terms of non-specificity and how topicality challenges this, and instead proposes an analysis in terms of nominal licensing; section §5 discusses some implications and directions for further work, and section §6 concludes.

## 2. *Background*

### 2.1. *Gorwaa*

Gorwaa (ISO 639-3: gow) is an endangered Afroasiatic language spoken in Tanzania (Harvey 2018, 2019). It is closely related to Iraqw, Alagwa, and Burunge; I use the term ‘South-Cushitic’ to refer to these four languages, following Hetzron (1980) and Tosco (2000). Before Harvey (2018)’s ELDP Gorwaa corpus, there was little information about the Gorwaa language (Tosco 2000:113). This means that there are still significant unknowns about various aspects of Gorwaa grammar, which I will not be able to solve in this single paper.

### 2.2. *Methodology*

The data from this paper come from a corpus collected by Andrew Harvey and deposited in the ELAR archive (Harvey 2017). The corpus study was conducted using a FLEX file dated to February 2018. Changes that have been made in later versions of the corpus are additional glossing/interlinearisation and the addition of new material collected by researchers in Tanzania.

A few conventions of the corpus should be laid out here. Firstly, the symbol ~ is used to express morphemes that are not segmentable, such as the level pitch accent (LPA). I use the orthography from the corpus, which is the one used by the Gorwaa Language Committee. Two characters to note are </>, which represents the pharyngeal fricative [ɸ], and <'>, which represents the glottal stop [?].

Some additional data was collected by Andrew Harvey in 2019 specifically for the investigation of the *-oo/-h)ee* suffix, which I discuss in this paper. Alongside each example I provide the form uid (unique identifier), which is given in [YYYYMMDD id] format, e.g. [20151021 249.1] is line id 249.1, recorded on the 21st October 2015. This form id allows the reader to look up the form in the ELDP corpus (which is available open-access),<sup>2</sup> and also to trace the utterance back to the original audio/video file, if desired.

### 2.3. *South-Cushitic morphosyntax and the -oo/-h)ee suffix*

Following Harvey (2018)’s work in the nominal domain of Gorwaa, I will investigate a particular nominal suffix, namely the *-oo/-h)ee* suffix (which I will refer to in short as ‘the suffix’). This suffix, and its Iraqw cognate *-o/-h)oo*, has been the subject of debate in previous litera-

<sup>2</sup> See <https://elar.soas.ac.uk/Collection/MPI1014224>.

ture on South-Cushitic. It has been proposed that it is a background marker (Mous 1993), topic marker (Harvey 2018), and scope marker (Mous & Qorro 2010), although Harvey notes that none of these descriptions is ‘particularly satisfactory’, with the suffix ‘occur[ring] in several, seemingly disparate morphosyntactic environments’ (Harvey 2018:179). While Mous & Qorro (2010) give a detailed account of the contexts in which the Iraqw suffix appears and propose a syntactic analysis that is compatible with the analysis I will develop in this paper, the Gorwaa suffix is less well-described than its Iraqw counterpart, and Mous & Qorro (2010) do not formalise their notion of scope marking. This paper therefore investigates how the Gorwaa data compare with the Iraqw data, showing a great deal of empirical overlap, and then turns to a formal analysis, ultimately showing how the semantic and syntactic facts captured in Mous & Qorro (2010)’s analysis can be seen from a different theoretical perspective by comparing the empirical distribution of the suffix to that of augment drop in Bantu.

Before delving into the data, it is worth giving a brief overview of Gorwaa syntax, although the reader is referred to Harvey (2018) for more detail. I use the glossing abbreviations and translations from the Gorwaa corpus; the abbreviations are detailed at the end of this paper.

South-Cushitic languages have been described as verb-final (Mous 2005), although Gorwaa has also been termed nonconfigurational (Harvey 2018). There is little discussion in the literature as to whether South-Cushitic languages have abstract Case, with previous discussion focussed on morphological case, which is marked on nominals in East Cushitic but not South Cushitic (Sasse 1984; Tosco 2000).

There is a verbal form called the selector which is core to each clause (Mous 2005). The selector is considered by Harvey (2018:139) to be an auxiliary to which various affixes cliticise; if there are no affixes it is glossed as AUX and pronounced as *a*. Selectors in Cushitic have also been described as preverbal clitic clusters; they are syntactically independent from the verb as adverbials and objects may intervene (Kießling 2000). Mood, aspect, voice, argument alignment and adverbial case can all be marked on the Gorwaa selector (Harvey 2018). For instance, the examples below (from Harvey 2018:88) show different selector forms for the argument *garmá* ‘boy’ as the 3rd person agent of a transitive clause (glossed as A) and the sole argument of an intransitive clause (glossed as S). In these examples the selector also encodes the female patient of the transitive clause (glossed P.F) and the imperfective aspect of the intransitive verb (IMPRF).

- (1) *garma baahaa ngina taáhh* [20160921i.1]

<i>garmá</i>	<i>baahaár</i>	<b>ng-a-∅-na</b>	<i>taáhh</i>
boy.L.MO	hyaena.L.FR	A.3-P.F-AUX-IMPRF	hit.M.PST
‘The boy hit the hyaena.’			

- (2) *garma ina /akuút* [20160921i.23]

<i>garmá</i>	<b>i-∅-na</b>	<i>/akuút</i>
boy.L.MO	S.3-AUX-IMPRF	jump.M.PST
‘The boy jumped.’		

The following example shows that the selector is syntactically independent from the verb, as a constituent (here, a direct object) may intervene.

- (3) *aní a sleér diíf* [201609271222-228.26]

<i>aní</i>	<i>∅-∅</i>	<b>sleér</b>	<i>diíf</i>
PRO.1SG	S.P-AUX	cow.L.FR	hit.1SG
‘I hit the cow.’			

### 3. Contexts

I will first present an overview of the contexts in which the *-oo/-h)ee* suffix was found in the Gorwaa corpus, before discussing how these contexts can be unified. The suffix has two allo-morphs, *-oo* and *-(h)ee*. Although these come from different sources historically, synchronically the choice between the two is purely determined by phonological factors (Harvey 2018).

I compare these contexts to those from Mous & Qorro (2010)'s study of Iraqw, finding a large degree of overlap. We will see that the suffix appears in Gorwaa in the contexts summarised in Table 1 below.

Context	Example
Constituent negation	(4), (6)
Polar questions	(9), (10), (11)
After universal quantification	(12), (13), (14)
Adverbials derived from nouns	(16), (17)
Locatives	(20), (21)
Verbal nouns	(25), (26)
Object of comparison	(27), (28), (29)

Table 1: Empirical overview of the Gorwaa *-oo/-h)ee* suffix

One thing to note is that the suffix is not obligatory in all of these contexts — I will return to this point when developing an analysis of the suffix in section §4. First, I will turn to the empirical overview.

#### 3.1. Negation

The *-oo/-h)ee* suffix (glossed as X in this paper) appears on constituent negation of nominals. For instance, in (4) below, the consultants are performing a picture-naming task, where one consultant has a picture of a type of animal, and the other asks questions to determine which animal it is. Example (5) shows a parallel example in Iraqw, showing that the *-o* suffix (glossed by the authors as PRED for predication) behaves like the *-oo/-h)ee* suffix in Gorwaa.

- (4) niingaheeká sleeme [20151021 249.1]  
 niingá-ó-hee-eká                    sleeme  
 species.of.bird-L.MO-X-NEG also  
 [...] though it is not a niingá [type of bird].'
- (5) inós a        garmaa-w-o-ká                    Iraqw (Mous & Qorro 2010:48)  
 3SG COP boy-M-PRED-NEG  
 'He is not a boy.'

Another example is given below. *tsir/oo* was unglossed in the version of the corpus I used, but based on other examples I suggest that the root for 'bird' is *tsir/i*, the *-oo* is the suffix, followed by the negation marker *-ká*.

- (6) a tsir/ooká garí [20151021 354.1]  
 Ø tsir/i-r'-**oo-ká** ga-r'-í  
 AUX bird-L.FR-X-NEG thing-L.FR-DEM1  
 'This is not a bird.'

We can compare this negative example with the affirmative counterpart in (7). This shows that the *-oo/-h)ee* suffix does not appear for affirmative copular clauses.

- (7) garí a tsir/i ge i iwít a gawá xa'an'i sihhít [20151021 419.1]  
 ga-r'-í Ø tsir/i-r' ge i-Ø iwít-Ø Ø gawá xa'anó-ó  
 thing-L.FR-DEM1 AUX bird-L.FR EMPH S.3-AUX sit.F-PRES AUX on tree-L.MO  
 i-Ø sihhít-Ø  
 S.3-AUX stand.F-PRES  
 'This is a bird, it is sitting on the tree.'

Finally, we can note that the order of the suffixes is linker-*oo/-h)ee*-NEG.

### 3.2. Polar questions

The *-oo/-h)ee* suffix appears on polar questions (marked by a pitch accent), both in neutral (9, 10) and biased (11) contexts.<sup>3</sup>

- (9) a /Orundiye?  
 Ø /Orundi-**ee**-~^~  
 AUX /Orundi-X~Q  
 'Is it /Orundi?'
- (10) ar pembetaturoô?  
 ar pembetatuúr-**oo**-~^~  
 ANA.F triangle-X~Q  
 'Is it a triangle?'
- (11) a tiyekée?  
 Ø tí=eká=**ee**-~^~  
 AUX DEM.F=NEG=X~Q  
 'Is it not this?'

Example (11) above is also interesting in having a demonstrative but no noun, showing that a demonstrative can stand alone in Gorwaa. For example (10), there is no linker glossed, but I

<sup>3</sup> Although *noun-linker-suffix-negation~Q* pattern in example (11) seems to be the most common pattern, there is one example of multiple *-oo/-h)ee* suffixes for a similarly biased polar question, again from the picture naming task. I do not have an account of why there are multiple suffixes here.

- (8) a sakariookee sakarí? [20151021 435.1]  
 Ø sakari-r'=**oo**=eká=**oo**~^~ sakari-r' ~^~  
 AUX guineafowl-L.FR=X=NEG=X~Q guineafowl-L.FR-EMPH  
 'Is it not a guinea fowl?'

assume that there is the feminine r-type linker *r'*, while for (9) the lack of linker is likely due to the fact that there is a proper name.

### 3.3. Universal quantification

The suffix is obligatory after *umó*, translated as the universal quantifier ‘every’.

- (12) *Context: ‘There was nothing of being a soldier they didn’t know’*  
*umó garoo Keengereesa iimi kan xuu’* [20151202 68.1]  
 umó ga-r'-oo Keengereesa-r' iimi-r' t-ng-a-∅-n  
 every thing-L.FR-X English-L.FR people-L.FR MP-A.3-P.F-AUX-EXPECT  
 xu'út'+SImprs~LPA~  
 know-SUBJ  
 ‘Everything - people knew English.’

As shown in (13), the marker =*qó* can cliticise onto the quantifier, which I gloss as EMPH for emphatic marker to draw a parallel with its cognate found in Iraqw (Elders & Mous 1991; Mous & Qorro 2010). I will return to this point in section §4, as it has been taken as evidence against *umó* acting as a universal quantifier.

- (13) baaari umoqó /ayitoo ngin nuunuu [20131108 9.1]  
 baaari-r' umó=qó /ayi-tá-oo ng-a-∅ nuunuu'-LPA  
 bees-L.FR every=EMPH flower-L.FT-X A.3-P.F-AUX suck.F-SUBJ  
 ‘Bees suck every flower.’

The affix is also required after the universal quantifier *sleeme* ‘all’, as expected, although it appears on the quantifier itself.

- (14) imir /umitá wa alé aweerisee e gawá isa sleemeroo [20150818 101.1]  
 imir /umi-tá u-a alé aweerisee e gawá isa-tá  
 from hump(of\_cow)-L.FT back-? ? INTERJ on neck-L.FT  
 sleeme-r'-textbfoo  
 all-L.FR-X  
 ‘From the hump down onto all the neck.’

The data also contains instances of *sleeme* which do not have the suffix. These were originally glossed as ‘all’ but are more accurately translated as ‘also’, as below.

- (15) nee sleeme ana araán masó [20131027 94.1]  
 nee sleeme ∅-∅-na ár-aán~'~ masó  
 and also S.P-AUX-IMPRF see-1.PL-PST matters  
 ‘And also we saw other things.’

### 3.4. Adverbials

The suffix appears on time and place adverbials, which are typically sentence-initial but can also appear sentence-finally, as in Iraqw (Mous & Qorro 2010). Later, I will argue that these are

adjuncts functioning as frame-setting topics, i.e. topics that limit the domain of the predication to which the main verb applies (Chafe 1976), again as in Iraqw (Mous & Qorro 2010).

Mous & Qorro (2010) show that Iraqw distinguishes the meanings ‘the day of today’ and the adverbial ‘today’ by means of the suffix (absent on the former, present on the latter). Although the adverbial use is far more frequent in the Gorwaa corpus data, there is evidence that the same distinction is made in Gorwaa. For example, in the elicited example in (16) and (17) we see that the suffix (and the linker) are obligatory for an adverbial use, and in (18) we see that no suffix is used when the speaker is referring to a particular morning.

- (16) matlatlee\*(roo) ya ta /a/amiín [20160927 6.1]  
 matlatlee(-r-**oo**) ya t-∅ -m-/aá/-íñ-<sup>^</sup>  
 morning(-L.FR-X) thus MP-AUX EXT-cry-EXT-PST  
 ‘In the morning there was crying.’
- (17) xweera\*(woo) ya ti doogaán [20160927 7.1]  
 xweera~'~**-oo** ya ti doog-aán~'  
 evening-L.N∅-X thus REC meet-1.PL-PST  
 ‘In the evening we are meeting.’
- (18) a qo matlatlee hee ... [20151202 103.1]  
 ∅=qo matlatlee hee-ó ...  
 AUX=EMPH morning person-L.MO ...  
 ‘That very morning the person is taken out of that place.’

### 3.5. Locatives

The suffix can be used on locatives, although there is variation. In the copular example (19) below, there is no suffix, whereas the suffix is found on the noun of the prepositional phrase in (20), where the PP functions as a frame-setting topic.

- (19) desi nee gamta bará qaaymoo [20160927 19.1]  
 desi-r' nee gamta-ó t-∅ bará qaaymoo-r'  
 girl-L.FR and boy-L.MO MP-AUX in field-L.FR  
 ‘The girl and the boy are in the field.’
- (20) bará kambirqahee heé uúr a isa'nee isa' [20151202 36.1]  
 bará kambi-r'-qá'-**hee** hee-ó uúr ∅ isa'-ó nee isa'-ó  
 in camp-L.FR-DEM3-X person-L.MO big AUX so.and.so-L.MO and so.and.so-L.MO  
 ‘In that camp the big men were so-and-so and so-and-so.’

The following elicited minimal pair shows that the suffix can be used for regions, while a PP without the suffix can be interpreted as people (or also names of towns). This may be to do with a non-specific interpretation of the suffix, if a town can be considered a specific place and the area the general region around it.

- (21) bará Gorwaawoo iringeéd i deer [20191203 1]  
 bará Gorwaa-**oo** iringeéd i=∅ deer  
 in Gorwaa-X sin S.3=AUX be.present  
 ‘There is sin in Gorwaaland.’
- (22) bará Gorwaa iringeéd i deer [20191203 2]  
 bará Gorwaa iringeéd i=∅ deer  
 in Gorwaa sin S.3=AUX be.present  
 ‘There is sin in Gorwaa people.’

Mous & Qorro (2010) report that nouns after the preposition *ay* ‘to’ do not take the *-o* suffix in Iraqw, and the same holds for *ay* in Gorwaa (if it is not followed by a preposition like *bará*). This gives evidence for a difference in grammatical status of these cognate items between prepositions and nouns (note that Mous & Qorro 2010 analyse Iraqw *bara* ‘in’ as a ‘locative noun while Harvey 2018 uses the label ‘preposition’ for *bara* ‘in’ in Gorwaa).

### 3.6. Conditionals

We may predict that the suffix occurs on conditionals given that it has otherwise been seen in non-veridical, downward-entailing environments. Mous & Qorro (2010) show that conditionals in Iraqw may appear with or without the suffix, arguing that when it appears it strengthens the conditional. What we find for Gorwaa is that the suffix may occur on nouns that follow *abar* ‘if’, as in (23), but these are not really part of the conditional, and instead can be captured as frame-setting topics.

- (23) abar gadiyedee a harindakáng awu un haris [20191203.58]  
 abar gadiyéed-ee ∅=∅ harinda=káng awu ∅=u=∅=n  
 if work-X S.P=AUX be.suitable.2.PRES=NEG bull A.P=P.M=AUX=EXPECT  
 haris  
 bring.1.PRES.SUBJ  
 ‘As for work, if you are not fit, you bring a bull.’

Here, *abar gadiyedee* ‘as for work’ sets the frame for the main clause, and hence is a frame-setting topic. Given that adverbials and locatives can also appear sentence-initially as frame-setting topics, that seems to be the determining factor for the presence of the *-oo/-h)ee* suffix rather than the conditional environment itself. True conditionals are formed in two ways: (i) *bar* ‘if’ in sentence-initial position, and (ii) *bar* ‘if’ immediately preceding the selector (which may cliticise onto it; Harvey 2018:157–8). The *-oo/-h)ee* suffix is not found on the nominals of this type, as shown in the example below, where the noun *firimbi* ‘whistle’ appears without the suffix.

- (24) Context: ‘it was Beo those days, it was Beo, the whistle was blown,’ [20151202 50.1]  
 firimbi barka taáhh  
 firimbír bar-t-ng-a-∅ taáhh  
 whistle.L.FR if-MP-A.3-P.F-AUX beat.PST  
 ‘If the whistle was blown.’

### 3.7. Verbal nouns

Gorwaa has verbal nouns, composed of a verbal stem, a linker, and the suffix. For example, in (25) below the verbal noun appears after the main verb (recall that Gorwaa is considered verb-final); example (26) shows the verbal noun (with an incorporated object) fronted to sentence-initial position.

- (25) ana daayumiít huriingwoo [20150727 19.1]  
 Ø-Ø m-daayuút-iít-~'~ huriingw-ó-**oo**  
 S.P-AUX EXT-fear.1-EXT-PST cooking-L.MO-X  
 'I fear cooking.'
- (26) ma'aáy wahaangwoo a aleslawaká [20150727 58.1]  
 ma'aay~'~ wahaangw-ó-**oo** Ø-a-Ø alesláw-aká  
 water-L.NØ drinking-L.MO-X A.P-P.F-AUX be\_able.1-NEG.PRES  
 'I cannot drink water (lit. 'drinking water, I cannot').'

These verbal nouns are not instances of noun incorporation, where the noun is preverbal and does not take the linker or *-oo/-h)ee* suffix (Harvey 2018). The literal translation of (26) suggests that the verbal noun functions as a frame-setting topic; this will be important for our later analysis, where I argue that these verbal nouns are outside of the main clause verbal domain, as Mous & Qorro (2010) argue for parallel cases in Iraqw.

### 3.8. Object of comparison

Mous & Qorro (2010) discuss cases in Iraqw where the *-o* suffix is added onto the object of comparison. We see this pattern in a set of elicitation data investigating Gorwaa comparatives.

- (27) inós ka tleer ta garmawoo [20160927 m.1]  
 inós t-ng-a-Ø tleer ta garma-ó-**oo**  
 PRO.3SG MP-A.3-P.F-AUX long ? boy-L.MO-X  
 'She is tall compared to the boy.'

Note that noun phrases modified by an adjective take the suffix on the adjective, not the noun, suggesting that it attaches to the NP, not the N (there is little data elsewhere in the corpus with adjectival modifiers in contexts where we expect the suffix).

- (28) inós ka tleer ta garmá uuree [20160927 5.1]  
 inós t-ng-u-Ø tleer ta garma-ó úr=**ee**  
 PRO.3SG MP-A.3-P.M-AUX long ? boy-L.MO big-X  
 'He is tall compared to the tall boy.'

While we previously saw the suffix in non-referential contexts such as negation, it also appears on the object of comparison with a demonstrative.<sup>4</sup>

<sup>4</sup> In the February 2018 database, the *-ee* suffix here was glossed as IMP.SG.O. This is an auto-glossing error; such a verbal suffix could not appear in this nominal context (Andrew Harvey, p.c.), and so I have changed the gloss to X to indicate the *-oo/-h)ee* suffix.

- (29) inós ka tleer ta garmaqee [20160927 2.1]  
 inós t-n̩g-a-∅ tleér ta garma-ó-qá'-ee  
 PRO.3SG MP-A.3-P.F-AUX long ? boy-L.MO-DEM3-X  
 ‘She is tall compared to that boy.’

The fact that the suffix can occur with the definite demonstrative *-qá'* is surprising if it contributes non-specific interpretation, as will be discussed later.<sup>5</sup> Although cases of the *-oo/-h)ee* suffix with this demonstrative are rare — out of 434 occurrences of *-qá'* in the database, 15 (= 3%) appear to contain *-oo/-h)ee* — the co-occurrence shows that the suffix is compatible with referential contexts.

### 3.9. Summary

In this section we have seen examples showing that the Gorwaa *-oo/-h)ee* suffix appears in the contexts summarised in Table 1 above. A large number of these contexts are non-veridical/downward-entailing environments, such as negation and polar questions. These are non-referential contexts that can be characterised in terms of non-specificity, a notion which may explain the cases in which the presence of the marker varies pragmatically (e.g. in the case of regions).<sup>6</sup> It appears that adverbials, locatives, and even verbal nouns can function as sentence-initial or sentence-final frame-setting topics, which are marked by the suffix.

I will now consider possible analyses of these data, highlighting empirical similarity with the phenomenon of Bantu augment drop, which is better-studied than the South-Cushitic suffixation pattern and has an interesting overlap in contexts.

## 4. Discussion

### 4.1. Augment drop in Bantu

Many Eastern Bantu (Niger-Congo) languages have a nominal prefix called the augment (also called ‘initial vowel’ and ‘pre-prefix’; Van de Velde 2019; Halpert to appear). This prefix occurs before the noun class prefix (the noun class prefix is a gender prefix, see e.g. Carstens 2008). For example, the Runyankore-Rukiga noun *omupiira* ‘ball’ is composed of the augment *o-*, the class 3 prefix *mu-*, and the noun root *-piira* ‘ball’. In some scenarios, the augment can be dropped (*∅-mu-piira*). In this section I show that the phenomenon of augment drop is an interesting parallel to the Gorwaa *-oo/-h)ee* suffix.

As Asiimwe (2014) discusses in her doctoral dissertation on Runyankore-Rukiga, augment drop is obligatory in a variety of contexts, and is optional elsewhere. For example, in the negation context in (30), augment drop is obligatory. An overview of contexts is given in (31).

<sup>5</sup> I thank Jurriaan Wiegertjes for bringing such examples to my attention.

<sup>6</sup> Note that I limit the discussion of this paper to the *-oo/-h)ee* suffix, but Mous & Qorro (2010) discuss a verbal counterpart *-a* which appears in irrealis contexts. It may be the case that such a suffix appears in the verbal domain in Gorwaa.

- (30) Tinaareeba mutu Taylor (1985:89), as cited in Asiimwe (2014:123)  
 Ti-n-aa-reeb-a                     $\emptyset$ -mu-ntu  
 NEG-1SG-PST.RM-see-FV  $\emptyset$ -1-person  
 ‘I saw nobody.’

(31) **Contexts in which the augment is dropped in Runyankore-Rukiga**

- (a) object nouns after negative verbs,
- (b) after *bulilibara* ‘every’,
- (c) in interrogatives with the question word *ki*,
- (d) after the prepositions *omu/aha* ‘inside’/‘at’,
- (e) on adjectives as complements to main verbs,
- (f) nouns following the absolute pronoun,
- (g) vocative nouns

(Asiimwe 2014:120–4)

We see that these contexts, especially the first four, overlap with those in which Gorwaa nominals must take the *-oo/-h(e)e* suffix. Furthermore, the contexts which match the Gorwaa are also those in which augment drop is found most robustly across most Bantu languages (Halpert to appear). As Halpert discusses, augment drop in Bantu is most likely in nonspecific and indefinite environments, such as negation, with other contexts such as vocatives more variable crosslinguistically (Asiimwe 2014; Halpert to appear).

Having seen that there is empirical overlap between Gorwaa suffixation and Bantu augment drop, we can consider whether the existing analyses for Bantu can be applied to Gorwaa. I will discuss two analyses: a featural analysis proposed by Asiimwe (2014) for Runyankore-Rukiga, and a nominal licensing analysis proposed by Halpert (2012, 2015) for Zulu. The purpose of the following discussion is to test whether these analyses extend to Gorwaa, rather than to evaluate them for Runyankore-Rukiga and Zulu.

#### 4.2. (*Non-*)specificity

In Asiimwe (2014)’s treatment of the Runyankore-Rukiga augment, she shows that augment drop is syntactically obligatory in contexts such as negation and that it varies in other contexts dependent on the pragmatic context. Using different information structural contexts, Asiimwe shows that specificity is an important pragmatic factor conditioning the presence of the augment, where specificity is understood as referential specificity, i.e. the speaker has a particular referent in mind, as opposed to a quantificational use of an indefinite (Karttunen 1968; Fodor & Sag 1982; Lyons 1999). Asiimwe therefore proposes that the augment is a D (determiner) element with a [+specific] feature.

If we take such an analysis for Gorwaa, the proposal would be that the Gorwaa *-oo/-h(e)e* suffix has a [−specific] feature, given that it appears in the environments in which the Runyankore-Rukiga augment is lost, like an ‘anti-augment’. This analysis captures the fact that a large number of the contexts reviewed in section §3 above are non-specific, non-veridical and downward-entailing environments, and as such we can expect them to pattern together across languages.

The fact that the Gorwaa *-oo/-h)ee* suffix appears after the linker could be taken as evidence that it is a determiner, if we follow Harvey (2018)'s analysis of the linker as in D; otherwise, its ability to follow demonstratives (e.g. (25)) also situate it (minimally) around the D domain. According to Harvey (2018)'s analysis, the linker is a D head marking referentiality. The fact that the linker and the *-oo/-h)ee* suffix may appear in non-specific contexts such as negation, where the noun cannot be referential, argues against this analysis of the linker. I leave the question of whether the linker has any semantic import (or whether it is simply conditioned by the phonology and syntactic structure) to further study.

Although Asiimwe (2014)'s featural analysis would capture some of the pattern in Gorwaa, non-specific determiners are incredibly rare crosslinguistically. In a typological sample of 185 languages, Becker (2019) found only 5 instances of non-specific determiners. This means that proposing a non-specific suffix in Gorwaa is more unusual from a typological perspective than proposing a specific suffix in Bantu, and so the burden of proof is on the Gorwaa researcher to justify this. Furthermore, Becker (2019) proposes an implication that a language with a non-specific marker must also have a specific marker. If this implication holds, we predict that Gorwaa would also have such a specific suffix. I will briefly discuss this, although it is a point that warrants a more extensive study of Gorwaa information structure in order to answer more thoroughly.

A candidate for a specific suffix in Gorwaa is the marker *-ko*, which is called an indefinite marker by Harvey (2018). Based on the following data we can see that *-ko* is used in indefinite contexts (32) and introduces new discourse referents (33).

- (32) xaano{-Ø|ko} i bará qaaymoo [20191203 28]  
 xaano-ó{-Ø|**ko**}      i=Ø      bará      qaaymoo-r'  
 tree-L.MO{-Ø|INDEF} S.3=AUX in field-L.FR  
 'The tree is in the field.' (without *-ko*);  
 'Some tree is in the field.' (with *-ko*)

- (33) Garma ina hardáh ay dír xa'anoko ur. Tsoowoo nguna óh.  
 Xa'ano{kolØ} nguna tsaát. [20191203.25, 26]  
 garma i=Ø=na      hardáh      ay di-r'      xa'anó-**ko**  
 boy      S.3=AUX=IMPRF arrive.M.PST to place-L.FR tree-L.MO-INDEF  
 ur      tsoowoo ng=u=Ø=na      óh      xa'ano-ó{-ko|Ø}  
 big.N axe      A.3=P.M=AUX=IMPRF seize.M.PST tree{-INDEF|Ø}  
 ng=u=Ø=na      tsaát  
 A.3=P.M=AUX=IMPRF cut.M.PST  
 'The boy arrived at some big tree<sub>i</sub>. He grabbed an axe. He cut some tree{\*<sub>i</sub>|<sub>v\_i</sub>}.'

While further investigation should identify whether *-ko* is properly treated as a general indefinite marker or a specific marker (for example in applying the tests in Becker 2019 and Haspelmath 1997), one important point to note from these data is that the *-ko* suffix does not take the linker, unlike the suffix *-oo/-h)ee*. This suggests that the *-ko* suffix, which is clearly an indefinite marker of some kind, is not simply a counterpart to the *-oo/-h)ee* suffix.<sup>7</sup>

<sup>7</sup> An anonymous reviewer points out that, if the linker is purely phonologically conditioned, its presence or absence does not have any bearing on whether *-ko* and *-oo/-h)ee* are related. However, I believe it is likely that the linker tells us something about the structure of the nominal, although I leave the details of this open for further research.

Another argument against treating *-oo/-h)ee* as a counterpart of *-ko* is that the two suffixes may occur together, as in the examples below. This shows that the markers are not in direct competition with each other, which we may predict if we treated *-oo/-hee* as carrying a [–specific] feature and *-ko* as specified for [+specific].<sup>8</sup>

- (34) ana hi’imiít wa ló bará ayaheeko [20160927 47.1]

Ø-Ø-na	-m-hi’iít’~^~	wa ló bará aya-ó- <b>ee-ko</b>
S.P-AUX-IMPRF	EXT-travel.1-PST	? ? in land-L.MO-X-INDEF
'I travelled very much in a certain land.'		

- (35) ana hi’imiít wa ló bará ayakowoo [20160927 46.1]

Ø-Ø-na	-m-hi’iít’~^~	wa ló bará aya-ó- <b>ko-oo</b>
S.P-AUX-IMPRF	EXT-travel.1-PST	? ? in land-L.MO-INDEF-X
'I travelled very much in a certain land.'		

Furthermore, we have seen in example (26) from section §3.8 above that *-oo/-h)ee* may co-occur (albeit infrequently) with the specific demonstrative *-qá*, which provides additional evidence against the analysis of *-oo/-h)ee* in terms of a non-specific feature.

The most convincing reason not to take this featural analysis, however, is the fact that the Gorwaa suffix occurs in other environments such as adverbs, as seen in section §3 above, where the adverbial expressions function as frame-setting topics. Topicality is linked to specificity (see e.g. Heim 1982; Portner & Yabushita 2001; Portner 2002; Von Heusinger 2019), and so the fact that the same marker would be used for *non*-specificity in addition to topicality is surprising if the marker really is contributing a non-specific feature. Note that the same semantic incompatibility is reached if we think of anti-givenness or non-referentiality rather than specificity, as these terms are all closely linked. Instead of pursuing this featural analysis, I therefore suggest that the marker has a primarily syntactic function, following Halpert (2012, 2015)'s analysis of Zulu augment drop, which I will turn to now.

#### 4.3. Case

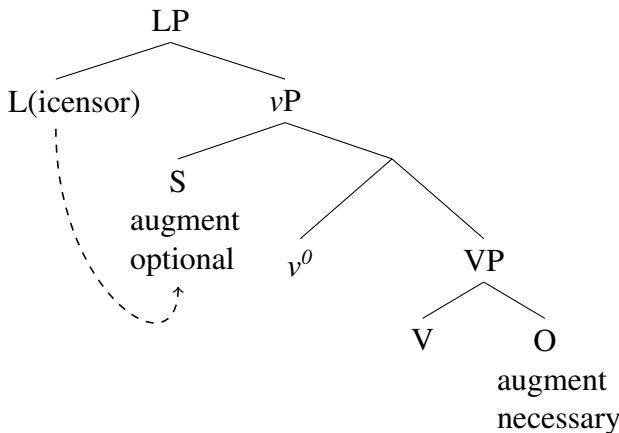
In Halpert (2012)'s dissertation on Zulu, she writes that 'it is difficult to understand the Zulu augment as making any particular semantic contribution: [...] the augment can mark definiteness, indefiniteness, specificity, nonspecificity, high- or low-scope' (Halpert 2012:225). Instead of directly relating the augment to specificity and definiteness as Asiimwe (2014) does, Halpert argues that the Zulu augment is involved in argument licensing, following the generative syntax notion that all nominals must be licensed in order for the derivation to be licit. This stems from the Case Filter (Chomsky 1981), later subsumed under the Activity Condition (Chomsky 2001). For Bantu, invoking abstract Case is significant as there is ongoing debate as to whether Case Theory applies to Bantu languages (Baker 2008; Diercks 2012; Halpert 2012; Van der Wal 2015) and to African languages more generally (König 2008).

Crucial to Halpert's analysis is the position of the nominal with respect to the vP. She posits a 'Licensor Phrase', LP, that sits between vP and TP. The licensor head L probes downwards

<sup>8</sup> As the translations for (34) and (35) do not differ, the question of whether the difference in the order of the two suffixes has an interpretative effect is something I also leave for further investigation.

to license the first nominal in *vP*, and so those nominals can appear without the augment, while other nominals are intrinsically licensed by the augment, as illustrated below.<sup>9</sup>

(36) **Nominal licensing in Zulu**



adapted from Halpert (2012:166)

Although Halpert (2012) focuses her discussion on arguments, oblique adjuncts are noted to be licensed in the same way as these augmentless nominals (Halpert 2012:172). In contrast, lower nominals that are complements to *V* or nominals that have moved outside of the *vP* require an augment in order to be licensed, as Halpert argues that *V* does not assign Case in Zulu.

The parallel for Gorwaa would be that the *-oo/-h)ee* suffix tells us something about the position of the nominal with respect to the verb phrase — a nominal marked by the suffix has moved from its base position within the *VP*. The exact nature of the licensing likely differs from Zulu, as Halpert suggests that languages can vary in terms of whether *L* and *V* act as Case assigners. An interesting piece of evidence about the position of Gorwaa nouns marked by the suffix comes from verbal nouns, which look at first sight as if they are complements to the verb within the verb phrase, but in fact are outside the *VP*. Consider the example below, repeated from section §3 above.

(37) ana da'ayumiít huriingwoo

[20150727 19.1]

$\emptyset$ - $\emptyset$	m-daayuút-iít-~'~	huriingw-6- <b>oo</b>
S.P-AUX	EXT-fear-EXT-PST	cooking-L.MO-X
'I fear cooking.'		

Here, the selector *ana* does not show agreement with the verbal noun *huriingwoo* ‘cooking’, which is marked by the *-oo/-h)ee* suffix. Instead, the selector behaves intransitively, marked as a speech act participant as the sole argument of an intransitive clause (as indicated by the gloss S.P), meaning that the verbal noun *huriingwoo* is not functioning as the syntactic object (i.e. the complement) of the verb. We therefore have evidence that the verbal noun is outside the *VP*, supporting an analysis of *-oo/-h)ee* as a Case suffix marking nominals outside of the *VP*.

For the other environments in which the *-oo/-h)ee* suffix appears, we can say that it appears on adjuncts that are not licensed by a head within or adjacent to the *vP* (and so the suffix is spelled out as an intrinsic licensor, like the Zulu augment rather than an anti-augment). This

<sup>9</sup> Carstens & Mletshe (2016) argue against Halpert that focus, not nominal licensing, conditions augment drop in Zulu and Xhosa. I present Halpert’s account as Pietraszko (2020) has argued convincingly against this rebuttal.

explains its appearance on sentence-initial and sentence-final adverbials and PPs that function as frame-setting topics, which can be analysed as sentential adjuncts; Mous & Qorro (2010) draw the same conclusions for Iraqw. For the comparison cases, it is unclear exactly what the syntax of the comparative construction is, with *ta* unglossed in the corpus. It could be that *ta garamawoo* in (27) is an adjunct, and can felicitously be left out. This analysis also makes the prediction that negated nominals and nominals in polar questions have moved outside of the verb phrase. A full analysis requires study of Gorwaa syntax more broadly, but key parts are the position of negation (e.g. in a NegP) and the existence of a Q operator which may trigger movement of the nominal in polar questions.

Universal quantification is an area that needs further study in Gorwaa. It could be that nominals following the quantifier *umó* are outside of the vP due to Quantifier Raising and therefore have to be licensed by the suffix *-oo/-h)ee*, although much more information (e.g. scope-taking patterns and behaviour of other quantifiers) is required in order to draw up an appropriate analysis. Furthermore, Mous & Qorro (2010) raise the question of whether Iraqw *umúu* ‘every’ is actually a quantifier. As we have already seen, an enclitic *=qo* can intervene between *umó* and the noun in Gorwaa. The same is true in Iraqw, which Mous & Qorro (2010) suggest is evidence in favour of a bipartite structure. However, the authors acknowledge that further tests need to be done. Note that South-Cushitic is not alone in having an emphatic clitic on the universal quantifier; the same phenomenon is found for example in Passamaquoddy (Algonquian), where the prenominal quantifier *psi* can occur with the emphatic clitic *=te* (Bruening 2008). This is not taken by Bruening as evidence against the quantifier forming a constituent with the NP that follows it. However, a potential difference between Passamaquoddy *psite* and Gorwaa *umoqo* is that the former can occur alone, whereas to my knowledge the Gorwaa quantifier cannot.

The basic proposal is therefore that Gorwaa nominals marked by *-oo/-h)ee* can be treated like nominals in Zulu, where the suffix is a form of licensing for nominals that appear in certain syntactic environments and is not needed in others where alternative nominal licensing mechanisms are used. I suggest that the selector and the verb are otherwise responsible for licensing Gorwaa nominals. Mous & Qorro (2010) similarly conclude for Iraqw that the verb and the selector mark subject and object relations, while the *-o/-h)oo* suffix marks adjuncts. Thinking of this in generative terms, whether the selector can be equated to the LP that Halpert (2012) proposes for Zulu remains to be seen as this relies on further study of the Gorwaa verbal domain. The South-Cushitic selector is always preverbal and can express tense (Mous 2005), which I take as evidence that it must be at or local to T. However, the Gorwaa selector need not be in the exact same position as the LP if we adopt Halpert’s stance whereby different heads act as licensors across different languages (Halpert 2012); a similar parametrization of phase heads has been proposed elsewhere in the generative syntax literature (see e.g. Chomsky 2008; Frascarelli 2008).

#### 4.4. Implications

Although there are still many questions about the *-oo/-h)ee* suffix in Gorwaa and how it relates to referentiality and adjunct/argumenthood, meaning that further data collection and analysis of the existing corpus is required in order to draw up a more formalised analysis, this study has raised a few important points.

Firstly, I show that the ‘seemingly disparate morphosyntactic contexts’ (Harvey 2018:179)

the suffix occurs in are in fact a set of contexts which pattern together in other languages like the Bantu languages and can be understood through the concepts of (non-)specificity and Case. Secondly, I argue against Harvey (2018)'s claim that the linker is always referential, as I have shown that linkers appear with *-oo/-h)ee* in non-referential contexts such as negation. I suggest that the linker is not a marker of referentiality, but is required for a combination of prosodic and syntactic reasons. Thirdly, I argue that the *-oo/-h)ee* suffix marks adjuncts and is attached only to nominals that are outside of the vP and/or cannot be licensed by the selector and the verb, which reflects Mous & Qorro (2010)'s analysis of the cognate suffix in the related language Iraqw. Finally, I suggest some small revisions to the glossing and analysis of certain Gorwaa items. For instance, I advocated for *sleemeroo* as being 'all', composed of *sleeme*+linker+*-oo* as opposed to being monomorphemic.

An important point is that the present study is the first at-length treatment of the *-oo/-h)ee* suffix in Gorwaa and has shown large degrees of similarity between it and its Iraqw counterpart. While I have discussed a generative analysis of the marker, Mous & Qorro (2010)'s functional analysis similarly conclude that the marker 'establish[es] a predication within a sentence as an adjunct', marking the scope of an operation and only appearing on nouns outside the verb phrase (Mous & Qorro 2010:78). Furthermore, the discussion in this paper about the Gorwaa selector allows us to put South-Cushitic languages into the type of '[languages where the selectors] define the left border of a syntactic unit such as the verbal piece in Somali' (Mous 2005:303), therefore contributing to the comparative picture on the syntax of South-Cushitic languages.

Finally, pointing out the empirical similarities between the environments in which the Gorwaa *-oo/-h)ee* suffix occurs and those in which the Bantu augment is dropped situate Gorwaa within a crosslinguistic picture of nominal syntax. Other relevant cases in which (non-)specificity has been shown to be marked in environments such as negation and universal quantification include differential object marking (DOM) patterns in Spanish and Turkish (Enç 1991), where the presence of an accusative case morpheme on an object is shown to vary with (non-)specificity. It has been argued that these effects should be considered in terms of abstract Case, with specificity a secondary effect (Ormazabal & Romero 2013). This is similar to treating Bantu augment drop and Gorwaa suffixation as syntactic reflexes of nominal licensing. Although language-specific descriptions are needed given degrees of variation, meaning that these debates are not solved, we see that phenomena in different languages pattern together empirically in terms of (non-)specific and topical environments, and are therefore not disparate morphosyntactic contexts, rather contexts which can be characterised syntactically in terms of restrictions on nominal licensing.

### 5. Conclusion

In conclusion, I have used a recent corpus of primarily naturalistic language to investigate the distribution of the *-oo/-h)ee* nominal suffix in Gorwaa. I showed that this suffix appears in a variety of morphosyntactic contexts that can be understood in terms of (non-)specificity and topicality. I compared these to the environments in which augment drop occurs in Bantu and found an interesting degree of overlap. While many of the contexts can be unified by non-specificity, I argued that the marker has a syntactic function at its core, namely to license nominals that are outside of the vP and/or cannot be licensed by the selector and the verb. This generative account of the Gorwaa suffix echoes the conclusions of Mous & Qorro (2010)'s functional account of its

Iraqw counterpart and shows the close similarity between these two language varieties. Further study on Gorwaa should investigate the syntactic structure of the vP (e.g. whether the selector is a phase head above *v*, and whether *V* is a Case assigner), quantification, and consider related markers in the language such as the (possibly specific) indefinite suffix *-ko*, in order to draw up a more formalised account of the Gorwaa *-oo/-h)ee* suffix and Gorwaa syntax as a whole.

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First and foremost I would like to thank Andrew Harvey for many enlightening discussions of Gorwaa both in London and in Leiden (or, at least, virtually). The extensive Gorwaa data on which this paper based has been made available through the Gorwaa Language Committee in Tanzania. I also benefitted greatly from comments on this paper by the anonymous reviewers and by audience members at the ConSOLE28 conference. Finally, I would like to thank Maarten Mous, Jenneke van der Wal, and Lutz Marten for additional helpful comments. All mistakes are, of course, my own.

### *Abbreviations*

1, 2, 3	1st/2nd/3rd person	LPA	level pitch accent
A	agent of transitive clause	M	masculine gender
AUX	auxiliary	MP	mediopassive voice
COP	copula (=AUX)	NEG	negation
DEM1	demonstrative, 1st degree deixis	P	patient of transitive clause (e.g. P.F), speech act participant (e.g. A.P)
DEM2	demonstrative, 2nd degree deixis	PRED	predication (= X)
DEM3	demonstrative, 3rd degree deixis	PRO	pronoun
EMP	emphasis marker (assumed)	PST	past tense
EMPH	emphasis marker	RM	relative marker
EXPECT	expectative	REC	reciprocal
EXT	verbal extension	S	sole argument of intransitive clause
F	feminine gender	SG	singular number
FV	final vowel (Bantu verb ending)	SUBJ	subjunctive mood
IMPRF	imperfective aspect	Q	question marker
INDEF	indefinite marker	X	the <i>-oo/-h)ee</i> suffix (topic of paper)
INTERJ	interjection	'	rising pitch accent
L.FR	feminine r-type linker	'	falling pitch accent
L.FT	feminine t-type linker	^	rising-falling pitch accent
L.MO	masculine o-type linker	?	unknown (not glossed in corpus)
L.NØ	neuter Ø-type linker		

### References

- Asiumwe, A. (2014). *Definiteness and specificity in Runyankore-Rukiga*. [PhD thesis]. Stellenbosch University.
- Baker, M. C. (2008). *The syntax of agreement and concord*. Cambridge University Press, Cambridge.
- Becker, L. (2019). *Articles in the worlds languages*. [PhD thesis]. Universität Leipzig.
- Bruening, B. (2008). Quantification in Passamaquoddy. Matthewson, L. (ed.), *Quantification: A Cross-linguistic Perspective*, Emerald, Bingley, pp. 67–103.
- Carstens, V. (2008). DP in Bantu and Romance. Cat, C. D. & K. Demuth (eds.), *The Bantu-Romance Connection: A comparative investigation of verbal agreement, DPs, and information structure*, John Benjamins, Amsterdam, pp. 131–165.
- Carstens, V. & L. Mletshe (2016). Negative concord and nominal licensing in Xhosa and Zulu. *Natural Language & Linguistic Theory* 34:3, pp. 761–804.
- Chafe, W. (1976). Givenness, contrastiveness, definiteness, subjects, topics, and point of view. Li, C. N. (ed.), *Subject and topic*, Academic Press, New York, pp. 25–55.
- Chomsky, N. (1981). *Lectures on Government and Binding*. Foris, Dordrecht.
- Chomsky, N. (2001). Derivation by phase. Kenstowicz, M. (ed.), *Ken Hale: A life in language*, MIT Press, Cambridge, MA., pp. 1–52.
- Chomsky, N. (2008). On phases. Robert Freidin, C. P. O. & M. L. Zubizarreta (eds.), *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, Cambridge, MA: MIT press, vol. 45, pp. 133–166.
- Diercks, M. (2012). Parameterizing case: Evidence from Bantu. *Syntax* 15:3, pp. 253–286.
- Elders, S. & M. Mous (1991). The adverbial qo in Iraqw. Claudi, U. & D. Mendel (eds.), *Ägypten im afro-orientalischen Kontext: Aufsätze zur Archäologie, Geschichte und Sprache eines unbegrenzten Raumes (Afrikanische Arbeitspapiere, special issue)*, Institut für Afrikanistik, Cologne, pp. 125–38.
- Engç, M. (1991). The semantics of specificity. *Linguistic Inquiry* pp. 1–25.
- Fodor, J. D. & I. A. Sag (1982). Referential and quantificational indefinites. *Linguistics and philosophy* 5:3, pp. 355–398.
- Frascarelli, M. (2008). Introduction. Frascarelli, M. (ed.), *Phases of interpretation*, Walter de Gruyter, Berlin/Boston, vol. 91, pp. 1–16.
- Halpert, C. (2012). *Argument licensing and agreement in Zulu*. [PhD thesis]. Massachusetts Institute of Technology.
- Halpert, C. (2015). *Argument licensing and agreement*. Oxford University Press, Oxford.
- Halpert, C. (to appear). The augment. Kula, N., L. Marten, E. Hurst & J. Zeller (eds.), *The Oxford Handbook of Bantu Linguistics*, Oxford University Press, Oxford. URL: [<https://tinyurl.com/y3xw5x6q>]. Accessed 2020-06.
- Harvey, A. (2017). Gorwaa: An archive of language and cultural material from the Gorwaa people of Babati (Manyara region, Tanzania). SOAS, Endangered Languages Archive. URL: [<https://elar.soas.ac.uk/Collection/MPI1014224>]. Accessed 2018-02.
- Harvey, A. D. (2018). *The Gorwaa Noun: Toward a description of the Gorwaa language*. [PhD thesis]. SOAS University of London.
- Harvey, A. D. (2019). Gorwaa (Tanzania) language contexts. *Language Documentation and Description* pp. 127–168.
- Haspelmath, M. (1997). *Indefinite pronouns*. Oxford University Press, Oxford.
- Heim, I. (1982). *The semantics of definite and indefinite noun phrases*. [PhD thesis]. University of Massachusetts.
- Hetzron, R. (1980). The limits of Cushitic. *Sprache und Geschichte in Afrika* pp. 7–126.
- Karttunen, L. (1968). *What do referential indices refer to?* Rand Corporation, Santa Monica, CA.
- Kießling, R. (2000). Some salient features of Southern Cushitic (Common West Rift). *Lingua Posnaniensis* 42, pp. 69–89.
- König, C. (2008). *Case in Africa*. Oxford University Press, Oxford.
- Lyons, C. (1999). *Definiteness*. Cambridge University Press, Cambridge.
- Mous, M. (1993). *A grammar of Iraqw*. Helmut Buske Verlag, Hamburg.
- Mous, M. (2005). Selectors in Cushitic. *Typological studies in language* 64, pp. 303–325.
- Mous, M. & M. Qorro (2010). The syntactic function of a scope marking suffix in Iraqw. *Journal of African languages and linguistics* 31:1, pp. 47–78.
- Ormazabal, J. & J. Romero (2013). Differential object marking, Case and Agreement. *Borealis* 2:2, pp. 221–239.
- Pietraszko, A. (2020). The coming apart of case and focus in Bantu. *Natural Language & Linguistic Theory* pp. 1–21.

- Portner, P. (2002). Topicality and (non-) specificity in Mandarin. *Journal of Semantics* 19:3, pp. 275–287.
- Portner, P. & K. Yabushita (2001). Specific indefinites and the information structure theory of topics. *Journal of Semantics* 18:3, pp. 271–297.
- Sasse, H.-J. (1984). Case in Cushitic, Semitic and Berber. Bynon, J. (ed.), *Current progress in Afro-Asiatic linguistics*, John Benjamins, Amsterdam, vol. 28, pp. 111–126.
- Tosco, M. (2000). Cushitic overview. *Journal of Ethiopian Studies* 33:2, pp. 87–121.
- Van de Velde, M. (2019). Nominal morphology and syntax. de Velde, M. V., K. Bostoen, D. Nurse & G. Philippson (eds.), *The Bantu Languages*, Routledge, New York, pp. 237–269.
- Von Heusinger, K. (2019). Indefiniteness and specificity. *The Oxford Handbook of Reference*, Oxford University Press, Oxford, pp. 145–167.
- Van der Wal, J. (2015). Evidence for abstract Case in Bantu. *Lingua* 165, pp. 109–132.

# Lexical ambiguity & n-words

## A perspective from a set theory

Yu Nakajima

This paper focuses mainly on the properties of n-words and aims to maintain that Herburger's (2001) lexical ambiguity hypothesis can be motivated theoretically. In so doing, I discuss a typology of negative constituents and contend that they can be categorized into three different types such as arguments, adjuncts, and predicates. Under the typological view, I propose that set-theoretic operations produce two ordered pairs from the ingredients of n-words, which can straightforwardly explain their puzzling distribution.

### 1. Introduction

It has been observed in the literature that four kinds of negative elements are present in natural languages: negative concord items (NCIs), negative polarity items (NPIs), negative quantifiers (NQs), and n-words. The reasoning behind such distinction is that these negative expressions behave differently from one another.<sup>1</sup> For example, n-words and NQs can appear in preverbal position without sentential negation, whereas NCIs and NPIs are incapable of tolerating such a context. See the following contrast.<sup>2</sup>

- |   |  |
|---|--|
| (1) a. <b>Nadie</b> vino.<br>n-body came<br>'Nobody came.'                          | (Spanish n-word; Herburger 2001: 289)                  |
| b. <b>Nobody</b> came.  | (English NQ; Haspelmath 1997: 201)                     |
|   |  |
| (2) a. * <b>Daremo</b> kita.<br>NCI <sub>person</sub> came<br>'(Int.) Nobody came.' | (Japanese NCI; Kuno 2007: 5, with minor modifications) |

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<sup>1</sup> It is well known that NCIs and n-words are similar to each other in some respects such as whether the negative concord reading is involved; it is for this reason that the two elements are occasionally categorized into the same term (e.g. strong/weak NCIs) (see e.g. Kuno 2007). In this paper, I use the different terms for the two items, for they show several distinctive properties (see Kuno 2007 for much relevant data).

<sup>2</sup> I borrow the terms like NCI<sub>person</sub> from Kuno (2007).

- b. \***kooi bhii** aayaa. (Hindi NPI; Lahiri 1998: 60, boldface added)  
anyone came  
‘Anyone came.’

In (1), n-words and NQs appear preverbally and express the negative meaning by themselves; (2) shows that NCIs and NPIs occurring in the same syntactic context fail to do so.

Though n-words and NQs are similar to each other with respect to negativity in preverbal position, they differ in terms of whether negative concord is involved.<sup>3</sup> This is shown below.

- (3) a. **No** vino **nadie**. (Spanish; Herburger 2001: 289, boldface added)  
not came n-body  
‘Nobody came.’  
b. I didn’t say *nothing*. (standard English; Haegeman & Zanuttini 1996: 117)

As the English translation indicates, (3a) expresses single negation in spite of the fact that the two negative elements co-occur in the sentence; the same situation as (3a) leads to double negation in (3b). This shows that n-words can produce the negative concord reading, while NQs cannot.

In the same way, NCIs exhibit a different property from NPIs as to the (im)possibility of occurring in a fragment answer, as illustrated in (4).

- (4) a. Q: Nani-o mita no? (Japanese)  
what-ACC saw Q  
‘What did you see?’  
A: **Nanimo**.  
NCI<sub>thing</sub>  
‘Nothing.’  
b. Q: What did you see?  
A: \***Anything**.  
(Watanabe 2004: 564, with minor modifications)

The contrast between (4a) and (4b) shows that NCIs can be used as a short answer, while NPIs fail to appear in such a context.

In this way, the four kinds of negative elements are different from one another in several respects such as whether they can appear in preverbal position, can yield the negative concord reading, and can be used as a fragment answer.<sup>4</sup>

Among the four negative elements, I would like to pay attention to the properties of n-words, which as we will see below, exhibit rather a puzzling distribution. Specifically, I deal largely with Herburger’s (2001) lexical ambiguity hypothesis and attempt to show that it gains a piece of theoretical support from a set-theoretic perspective.

This paper is organized as follows. Section 2 introduces backgrounds on n-words. Section 3 deals with a problem concerning a lexical ambiguity hypothesis of Herburger (2001). Section 4 discusses a typology of negative elements and argues that Herburger’s (2001) hypothesis can be supported by a principled basis. Section 5 concludes the discussion.

<sup>3</sup> Negative concord refers to phenomena in which, when (more than) two negative constituents co-occur in the same sentences, they do not give rise to double negation, but instead produce single negation.

<sup>4</sup> This section only provides a brief discussion of the data; I will return to the relevant discussion in section 4.

## 2. Backgrounds

It has been pointed out in the literature (e.g. Herburger 2001; Kuno 2007) that n-words in Italian and Spanish exhibit both properties of NPIs and NQs. Namely, n-words can express single negative force in combination with a negation marker, can appear in non-negative contexts with being interpreted as an indefinite, and can be licensed by sentential negation in a higher clause.<sup>5</sup> *nessuno* and *niente* in Italian illustrate such an NPI-hood.

- (5) **non** ho invitato **nessuno**.

NEG has invited anyone  
 ‘I did not invite anyone.’

(Acquaviva 1999: 138, boldface and grosses added)

- (6) a. è venuto **nessuno**?

is came anyone  
 ‘has anyone come?’

- b. chi ha detto **niente**?  
 who has said anything  
 ‘who said anything?’

(Acquaviva 1999: 139, boldface and grosses added)

- (7) non credo che verrà **nessuno**.

NEG believe that will-come anyone  
 ‘I don’t think that anyone will come.’

(Acquaviva 1999: 138, boldface and grosses added)

Also, n-words can occur in preverbal position, and can be used as a short answer. The NQ-hood is validated by a Spanish n-word *nadie*.

- (8) **Nadie** vino.

n-body came  
 ‘Nobody came.’

(Herburger 2001: 289)

- (9) Q: A quién viste?

whom saw-2SG  
 ‘Who did you see?’

A: A **nadie**.

n-body  
 ‘Nobody.’

(Herburger 2001: 300)

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<sup>5</sup> As noted in Acquaviva (1999), n-words occurring in embedded clauses have some restrictions (e.g. the higher clausal verbs must be epistemic or volitional). I would like to thank a reviewer for bringing my attention to this.

In this way, n-words can be used as both NPIs and NQs (see e.g. Herburger 2001 for much data). Then, the hybrid property led Herburger (2001) to propose a lexical ambiguity hypothesis. This is given in (10).<sup>6</sup>

(10) A Lexical Ambiguity Hypothesis:

N-words exhibit both properties of NPIs and NQs, because they are lexically ambiguous expressions between them.

This hypothesis is attractive, because it can straightforwardly capture the duality of n-words. In addition, it can also simply explain ambiguous interpretations in sentences like (11) (Herburger 2001).

(11) Dudo que **nadie** lo sepa.

doubt.1SG that n-body it know.SBJ

'I doubt that nobody knows it/I doubt that anybody knows it.'

(Herburger 2001: 307)

Since it is possible for both NPIs and NQs to appear in the embedded clause in (11), the double meaning of *nadie* is trivial under (10).

In this way, the lexical ambiguity hypothesis can account for the puzzling behavior of n-words in a straightforward fashion.<sup>7</sup>

### 3. Issues

Attractive as Herburger's (2001) proposal is, it faces a non-trivial issue: there is no theoretical backbone in the lexical ambiguity hypothesis. In this respect, Kuno (2007) notes the following.<sup>8</sup>

"It should be noted, however, that positing a lexical ambiguity is more a description of the puzzle raised by weak NCIs than a solution to it." (Kuno 2007: 88)

This mentions that just reducing the duality of n-words to a lexical ambiguity is insufficient for understanding the nature of n-words; it merely restates the facts.

Given the problem, what is required in the lexical ambiguous hypothesis is a principled basis: it must be supported by some theoretical reasons. Below, I will disclose the reasoning behind the dual character of n-words.

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<sup>6</sup> It is noteworthy that there are two different hypotheses on n-words: (i) an NPI-based hypothesis (e.g. Laka 1990), and (ii) an NQ-based hypothesis (e.g. Zanuttini 1991). The former proposes that the properties of n-words originate from NPIs, while the latter argues that they are reducible to the nature of NQs. I do not take them up in detail, because our prime concern here is the lexical ambiguity hypothesis. Readers are referred to Kuno (2007) for some issues related to the two hypotheses.

<sup>7</sup> As a reviewer notices, what is predicted from (10) is that n-words can appear as NQs in postverbal position without a negation marker, which is in general judged to be unacceptable. However, Herburger (2001) argues that such unacceptability is derived from a pragmatic factor and observes that postverbal n-words can be interpreted as NQs in Spanish. See Herburger (2001) for relevant data. See also Zeijlstra (2004).

<sup>8</sup> In his term, weak NCIs stand for n-words.

#### 4. Proposals

We saw that there are four kinds of negative elements in natural languages: NCIs, NPIs, NQs, and n-words. Based on several pieces of the earlier research (e.g. Giannakidou 2006; Herburger 2001; Kuno 2007; Lahiri 1998; Vallduví 1994; Zanuttini 1991), I summarize their behavioral difference as in (12).

(12)

	NCIs	NPIs	NQs	N-words
Ability to express single negative force in combination with sentential negation	✓	✓	*	✓
Ability to appear without clause-mate sentential negation	*	✓	✓	✓
Ability to be exempt from a preverbal-postverbal asymmetry <sup>9</sup>	✓	*	✓	*
Ability to be used as an elliptical answer	✓	*	✓	✓

This table shows that these negative constituents are different from one another. To capture the nature of n-words, I begin with the discussion on the types of the four negative elements.

First, I take up NCIs. It has been occasionally observed in the literature (see e.g. Aoyagi & Ishii 1994; Kawashima & Kitahara 1992) that Japanese NCIs can co-occur with Case-marked arguments. This is shown in (13).

(13) a. **Gakusei-ga daremo ko-nak-atta.**

student-NOM NCI<sub>person</sub> come-NEG-PST  
'No students came.'

b. **John-ga nanimo kudamono-o kawa-nak-atta.**

John-NOM NCI<sub>thing</sub> fruits-ACC buy-NEG-PST  
'John did not buy any fruits.'

(adapted from Kawashima &amp; Kitahara 1992: 144)

This fact is rather puzzling, because predicates can take no more than one subject/object, given argument structures; the occurrence of NCIs in sentences like (13) led Kawashima & Kitahara (1992) to propose that they are adjuncts (see also Aoyagi & Ishii 1994). Following this view, I assume that NCIs are categorized into adjunct-like elements.<sup>10</sup>

The adjunct-hood of NCIs gains support from the fact that they do not behave like nouns. This is shown in (14) and (15), where (Japanese) NCIs cannot be modified by adjectives (Hirose & Suzuki 2009) and relative clauses (Masakazu Kuno, p.c.).<sup>11</sup>

<sup>9</sup> This property means that the occurrence of a given negative phrase is conditioned by the preverbal-postverbal position. An example will be taken up later.

<sup>10</sup> A reviewer claims that the ability of Japanese NCIs to co-occur with Case-marked arguments can be derived from attributive function. This is interesting, but it should be noted that the two elements do not have to be adjacent to each other (see e.g. Aoyagi & Ishii 1994). Here, I assume following Aoyagi & Ishii (1994) that Japanese NCIs are not just an adjunct but a kind of floating quantifier.

<sup>11</sup> A reviewer points out that the impossibility of modifying Japanese NCIs by adjectives and relative clauses comes from the general property that argument pronouns cannot be modified by them (i.e. Japanese NCIs include indeterminate pronouns). It should be noted here that Japanese existential quantifiers, which are also produced by the indeterminate system, can be modified by adjectives (Hirose & Suzuki 2009) and relative clauses, unlike NCIs. This is shown in (i) and (ii), where the judgment of (ii) is mine.

- (14) a. **Nanimo** mie-nai.

anything visible-NEG

'I cannot see anything.'

- b. \*Aoziroi **nanimo** mie-nai.

pale anything visible-NEG

(Hirose & Suzuki 2009: 390-391, boldface added)

- (15) a. John-ga **nanimo** tabe-nak-atta.

John-NOM NCI<sub>thing</sub> eat-NEG-PST

'John did not eat anything.'

- b. \*John-ga [Mary-ga tsukutta] **nanimo** tabe-nak-atta.

John-NOM Mary-NOM cooked NCI<sub>thing</sub> eat-NEG-PST

Next, I turn to NQs and NPIs. Note that both of them show just the opposite behavior to NCIs, as given below.<sup>12, 13</sup>

- (16) Inability to co-occur with arguments:

- a. \*Nobody the students came.

- b. \*John did not buy anything the books.

- (17) Ability to be modified by adjectives:

- a. There's nothing new here.

- b. Was there anything interesting in the secret compartments?

((a) from SPOK: ABC News: This Week, 2019; (b) from FIC: Look both ways, 2017)

- (18) Ability to be modified by relative clauses:

- a. There is nothing that I would not do for Cristiano Ronaldo.

- b. Is there anything that viewers haven't seen before?

((a) from SPOK: NBC News: Today, 2019; (b) from MAG: Vanity Fair, 2019)

Here, I take the facts as evidence to suggest that both NQs and NPIs are arguments (i.e. since NQs and NPIs are arguments (or nouns), they can be modified by adjectives and relative clauses, but cannot be concurrent with another arguments).

Now we obtain (19).<sup>14</sup>

- 
- (i) Omosiroi **nanika-o** mituke-ta-rasii-ne.  
interesting something-ACC find-PST-seem-PRT  
'It seems that he found something interesting.'

(Hirose & Suzuki 2009: 390, boldface added)

- (ii) John-ga [Mary-ga kare-ni nokosita] **nanika-o** sagasiteita.  
John-NOM Mary-NOM him-for left something-ACC looked-for  
'John looked for something that Mary left for him.'

I therefore claim that the properties of NCIs in (14b) and (15b) should be attributed to their adjunct-hood.

<sup>12</sup> I owe the judgments of (16a) and (16b) to several speakers.

<sup>13</sup> The data cited in (17) and (18) are from the Corpus of Contemporary American English.

<sup>14</sup> A reviewer claims that the adjunct-hood of NCIs cannot be supported cross-linguistically, because Russian NCIs behave just like (English) NQs and NPIs. I would like to thank them for providing the following data.

(i) ja ne videl nikogo (\*studentov).

1SG NEG saw NCI<sub>person</sub> students

'I didn't see anybody.'

(19)

Negative elements	Types
NCIs	Adjuncts
NQs / NPIs	Arguments
N-words	?

Then, what is the type of n-words? We saw in (12) that n-words behave differently from other three negative constituents, which are either arguments or adjuncts. Here, I assume that the behavioral difference reflects the non-argument/adjunct-hood of n-words: if n-words are either arguments or adjuncts, they would show exactly the same behavior as (at least) one of the other three negative constituents. Given the typology in (19), we are now left only with the possibility that n-words are predicate-like elements. If this view is on the right track, n-words involve the functional nature. Notice that functions are defined as a set of ordered pairs (see e.g. Heim & Kratzer 1998). Now we need the following.

- (20) a. Ingredients of ordered pairs  
 b. Operations that make ordered pairs

I claim that Hungarian provides us with (20a). It is observed in the language that there arises a preverbal-postverbal asymmetry when NCIs are combined with a particle *sem*, which is made up of a combination of focus and negative materials (Surányi 2006). This is illustrated in (21), where a preverbal *senki + sem* expression can appear without sentential negation, whereas it requires the negation marker when occurring in postverbal position.

- (21) a. **Senki sem (\*nem)** jött el. (Hungarian)  
 NCI<sub>person</sub> SEM NEG came PREF  
 'Nobody came along.'  
 b. **\*(Nem) jött el senki sem.**  
 NEG came PREF NCI<sub>person</sub> SEM  
 'Nobody came along.'

(Surányi 2006, as cited in Kuno 2007: 75)

As is well known, n-words exhibit the same preverbal-postverbal asymmetry as Hungarian NCI + *sem* expressions, as shown below.

- (22) a. **Nadie (\*no) ha venido.** (Spanish)  
 nobody NEG has came

---

(ii) ja ne videl ničego interesnogo.

1SG NEG saw NCI<sub>thing</sub> interesting.GEN

'I didn't see anything interesting.'

(iii) ja ne videl ničego, čto moglo by menja zainteresovat'.

1SG NEG saw NCI<sub>thing</sub>, that could SBJ me.ACC make.interested

'I didn't see anything, that could make me interested.'

Considering the above examples, it would be premature to conclude that NCIs are adjuncts across all languages, though at present, it is unclear why there arises such behavioral difference between Russian and Japanese NCIs. This issue must be left to future research.

- b. \*(No) ha venido **naide**.  
 NEG has come nobody  
 ‘Nobody has come.’

(Franco & Landa 2006: 34, boldface added)

This fact led Kuno (2007) to argue that n-words are made by adding *sem* (i.e. focus + negation) to the ingredients of NCIs. Then, the next question is: what constitutes NCIs? In this respect, he pays attention to the morphology of NCIs, and notices that Slavic plays an important role in clarifying their makeup, because the language shows transparent morphological structures. See the following table.

(23) Russian:

	<i>wh</i>	NCIs
Person	kto	ni-kto
Thing	čto	ni-čto
Place	gde	ni-gde
Time	kogda	ni-kogda

(based on Haspelmath 1997: 273)

(23) suggests that Russian NCIs are made up of *ni* and an interrogative pronoun. According to Haspelmath (1997), a prefix *ni* is derived from combining a negative element *ne* with a focus element *i*. Then, such a morphological fact as (23) led Kuno (2007) to claim that NCIs consist of an indefinite, focus, and negation. Now the ingredients of n-words can be represented as in (24) (cf. Kuno 2007).<sup>15</sup>

(24) The ingredients of n-words (Kuno 2007):

{foc, neg, indef} + {foc, neg}

As for (20b), I use the Cartesian product:  $A \times B = \text{def}\{\langle x, y \rangle \mid x \text{ is a member of } A \text{ and } y \text{ is a member of } B\}$ .<sup>16</sup> Note that the operation produces two distinct sets, since  $A \times B$  is distinguished from  $B \times A$ . The resulting sets are given in (25), where  $A$  is {foc, neg, indef} and  $B$  {foc, neg}.

- (25) a.  $A \times B = \{\langle \text{foc, foc} \rangle, \langle \text{foc, neg} \rangle, \langle \text{neg, foc} \rangle, \langle \text{neg, neg} \rangle, \langle \text{indef, foc} \rangle, \langle \text{indef, neg} \rangle\}$   
 b.  $B \times A = \{\langle \text{foc, foc} \rangle, \langle \text{foc, neg} \rangle, \langle \text{foc, indef} \rangle, \langle \text{neg, foc} \rangle, \langle \text{neg, neg} \rangle, \langle \text{neg, indef} \rangle\}$

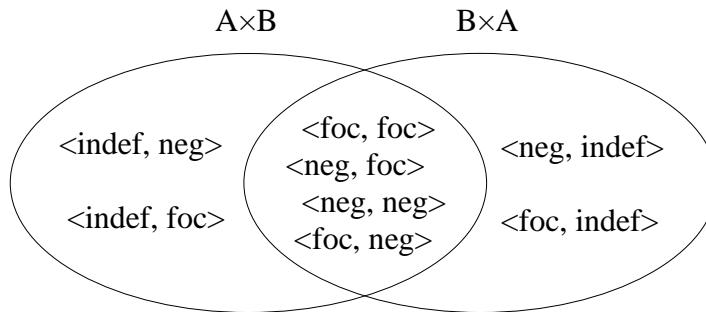
The Venn diagram is illustrated below.

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<sup>15</sup> The fact that not all n-words are as transparent as the Hungarian examples might lead one to argue that (24) cannot obtain support from the cross-linguistic perspective. In this respect, it is important to point out that (formal) features relevant to semantic interpretation are sent to the LF component of grammar, so that they receive no morphological realization (Watanabe 2004). Given this, (24) would be compatible with the absence of the rich morphological structure in (Spanish and Italian) n-words, since negation and focus participate in the semantics of sentences.

<sup>16</sup> This is adapted from Partee et al. (1990: 28).

(26)



From (25), I next extract the set difference to narrow down the over-generated ordered pairs:  $A-B = \{x \mid x \text{ is a member of } A \text{ and } x \text{ is not a member of } B\}$ .<sup>17</sup> In this case as well, two different sets are generated, since the return value of  $A-B$  is distinct from that of  $B-A$ . The results are shown in (27).

- (27) a. (25a) – (25b) = {<indef, neg>, <indef, foc>}  
 b. (25b) – (25a) = {<neg, indef>, <foc, indef>}

Given the ordering in (27b), we can take <neg, indef> as an indefinite within the scope domain of negation and <foc, indef> as an NPI of the type found in Dutch (e.g. *ook maar + iemand*; Rullmann 1996).<sup>18</sup> What this means is that (27b) is equivalent to the set of NQs and NPIs, which is just n-words.

On the other hand, there appears to be nothing corresponding to the set of <indef, neg> and <indef, foc> in natural languages; here I simply look upon (27a) as an over-generated set in the Cartesian product that has no linguistic entity.<sup>19</sup> We are thus left only with the possibility to take (27b), the set consisting of NQs and NPIs.

<sup>17</sup> This is adapted from Partee et al. (1990: 15).

<sup>18</sup> The following data show the polarity sensitivity of a Dutch indefinite preceded by a focus element.

- (i) Hij heeft met (**\*ook maar**) **een student** gesproken.  
 he has with (even<sub>NPI</sub>) a student spoken  
 'He has spoken with a student.'
- (ii) Hij verdient meer dan **ook maar IEMAND** gedacht had.  
 he earns more than even<sub>NPI</sub> anyone/someone thought had  
 'He's earning more than anyone has thought.'
- (iii) Heb je met **ook maar IEMAND** gesproken?  
 have you with even<sub>NPI</sub> anyone/someone spoken  
 'Did you speak with anyone?'
- (iv) Als hij met **ook maar EEN student** heeft gesproken, weet hij dat dit niet kan.  
 if he with even<sub>NPI</sub> one student has spoken knows he that this not can  
 'If he has spoken with any student, he knows that this is impossible.'

(Rullmann 1996: 338, boldface added)

<sup>19</sup> The ordering in (27a) would lead us to assume that <indef, neg> is an indefinite which takes wide scope with respect to negation and <indef, foc> is a Hindi NPI (e.g. *koi + bhii*; Lahiri 1998). If the interpretation of indefinites taking scope over negation is (roughly) equivalent to that of indefinites taking scope under negation (Kuno 2007), we could judge (27a) to be the set of NPIs and indefinites. I leave it to future research to find out whether there exists such a hybrid element in natural languages.

In this way, the two set-theoretic operations provide us with the dual nature of n-words.<sup>20</sup> Now we can conclude that the lexical ambiguity hypothesis is not just a description of the facts, because it can be supported by a theoretical backbone.

### *5. Conclusion*

This paper took up the duality of n-words and argued that Herburger's (2001) lexical ambiguity hypothesis is the best to capture their puzzling distribution. In so doing, it was demonstrated that the Cartesian product and the set difference produce the set of <neg, indef> and <foc, indef> from the ingredients of n-words. I then argued that it corresponds to NQs and NPIs and presents a theoretical basis to the dual character of n-words.

### *Acknowledgements*

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### *Abbreviations*

1SG	first person singular
2SG	second person singular
ACC	accusative
NEG	negation
NOM	nominative
PREF	prefix
PST	past
PRT	particle
SBJ	subject
SEM	scalar particle
TOP	topic
Q	question

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### *References*

Acquaviva, P. (1999). Negation and operator dependencies: Evidence from Italian. *Lingua* 108:2-3, pp. 137-174.

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<sup>20</sup> As a reviewer notices, independent motivations for the Cartesian product and the set difference should be spelled out. This must be left to future research, but what I would like to capture in the presented analysis is that linguistic phenomena can be dealt with by set theory; given the standard assumption that a set-theoretic operation Merge is responsible for structure building (cf. Chomsky 1995), it is reasonable to pursue the possibility that other set-theoretic operations are also available for the faculty of language.

- Aoyagi, H. & T. Ishii (1994). On NPI licensing in Japanese. Akatsuka, N. (eds.), *Proceedings of Japanese/Korean Linguistics 4*, CSLI, Stanford, pp. 295-311.
- Chomsky, N. (1995). *The minimalist program*. MIT Press, Cambridge, MA.
- Davies, M. (2008-). *The Corpus of Contemporary American English (COCA): 600 million words, 1990-present*. Available online at <https://www.english-corpora.org/coca/>. [Accessed 24 October 2020]
- Franco, J. & A. Landa (2006). Preverbal n-words and anti-agreement effects. Sagarra, N. & A. J. Toribio (eds.), *Proceedings of the 9th Hispanic Linguistics Symposium*, Cascadilla Proceedings Project, Somerville, MA, pp. 34-42.
- Giannakidou, A. (2006). N-words and negative concord. Everaert, M. & H. van Riemsdijk (eds.), *The Blackwell Companion to Syntax*, Blackwell, Oxford, vol. 3, pp. 327–391.
- Haegeman, L. & R. Zanuttini (1996). Negative concord in West Flemish. Belletti, A. & L. Rizzi (eds.), *Parameters and Functional Heads*, Oxford University Press, Oxford, pp. 117-179.
- Haspelmath, M. (1997). *Indefinite pronouns*. Oxford University Press, Oxford.
- Heim, I. & A. Kratzer (1998). *Semantics in generative grammar*. Blackwell, Oxford.
- Herburger, E. (2001). The negative concord puzzle revised. *Natural Language Semantics* 9:3, pp. 289-333.
- Hirose, T. & T. Suzuki (2009). Quantified phrases without NP. Schardl, A., M. Walkow & M. Abdurrahman (eds.), *Proceedings of NELS 38*, GLSA, Amherst, MA, pp. 385-396.
- Kawashima, R. & H. Kitahara (1992). Licensing of negative polarity items and checking theory: A comparative study of English and Japanese. Stvan, L.S. & el al. (eds.), *Proceeding of the Formal Linguistic Society of Mid-America 3*, Indiana University Linguistics Club, Bloomington, Indiana, pp. 139-154.
- Kuno, M. (2007). *Negative concord and negative polarity: Variations and relations*. [PhD thesis], Harvard University.
- Lahiri, U. (1998). Focus and negative polarity in Hindi. *Natural Language Semantics* 6:1, pp. 57-123.
- Laka, I. (1990). *Negation in syntax: On the nature of functional categories and projections*. [PhD thesis], MIT.
- Partee, H. B., A. ter Meulen & R. E. Wall (1990). *Mathematical methods in linguistics*. Kluwer Academic Publishers, Dordrecht.
- Rullmann, H. (1996). Two types of negative polarity items. Kusumoto, K. (eds.), *Proceeding of NELS 26*, GLSA, Amherst, MA, pp. 335-350.
- Surányi, B. (2006). Quantification and focus in negative concord. *Lingua* 116:3, pp. 272-313.
- Vallduví, E. (1994). Polarity items, n-words and minimizers in Catalan and Spanish. *Probus* 6:2-3, pp. 263-294.
- Watanabe, A. (2004). The genesis of negative concord: Syntax and morphology of negative doubling. *Linguistic Inquiry* 35:4, pp. 559-612.
- Zanuttini, R. (1991). *Syntactic properties of sentential negation: A comparative study of Romance languages*. [PhD thesis], University of Pennsylvania.
- Zeijlstra, H. (2004). *Sentential negation and negative concord*. [PhD thesis], University of Amsterdam.

# Dissimilation and phonological conspiracy in Tenyidie tone

Savio M. Meyase

I propose an analysis for tonal alternations at the prefix–stem boundary in Tenyidie, where Mid tones in prefixes and stems dissimilate. I argue that this alternation is driven by the Obligatory Contour Principle (OCP). Sequences of Mid tones are seen elsewhere. I claim that this asymmetry can be solved with recourse to prosodic phonology (Nespor & Vogel 1986/2007), by assuming that stems and suffixes form a prosodic unit where Mid tones fuse to avoid OCP-Mid. But OCP-Mid also triggers dissimilation across the prefix–stem environment due to prosodic boundaries. This is an example of phonological conspiracy (Kisseberth 2011).

## 1. *Introduction*

Tenyidie, also known by the exonym Angami (ISO 639-3:njm), is a Tibeto-Burman language spoken in the state of Nagaland in north-east India. This paper analyses the case of dissimilation of Mid-toned stems with certain Mid-toned prefixes in the language. Sequences of Mid tones are however seen with other seemingly Mid-toned prefixes and also in the root–suffix environments. In this paper, I will show that this difference is because of two reasons, (i) phonological tonelessness of some prefixes, leading to non-dissimilation, and (ii) the prosodic structure, leading to the distinction between the prefix–root and the root–suffix environments. I will show my workings in the framework of Optimality Theory (OT) (Prince & Smolensky 1993/2008; McCarthy & Prince 1993).

Section 2 of this paper exposes the dissimilation data as well as cases where the same is not observed. Section 3 first displays the process of Mid tone dissimilation in the language and then goes on to show why this dissimilation is not seen in other cases by invoking the notion of the prosodic word. Section 4 concludes the paper.

## 2. The data

Tenyidie is a tonal language which employs four level tones, exemplified in (1). All the data in this paper are from my own fieldwork.

(1)	EXTRA HIGH	dă	'to chop'	zĕ	'to wrap'
	HIGH	dá	'to pack'	zé	'to pierce'
	MID	dā	'to blame'	zē	'to sell'
	LOW	dà	'to paste'	zè	'to sleep'

In the following subsections, I present the structure of a word in Tenyidie, followed by the prefix data regarding the dissimilation in question. This is followed by prefix data that does not show this dissimilation pattern. And finally follows the data concerning no dissimilation, i.e. sequences of Mid tones, with suffixation.

### 2.1. Prefixation

There are only six prefixal forms in Tenyidie, namely, /kē–, mē–, pē–, rō–, tē–, t<sup>h</sup>e–/, all surfacing with a Mid tone. Roots in the language are fairly simple with only one open syllable of the CV or CrV structure. And any non-compound word in Tenyidie maximally only has three syllables, meaning a maximum of two prefixes are permitted. If this word is trisyllabic, then it is predictable that the first syllable is /kē/ and the second syllable is one of the other five prefixes. There are no words starting with /kēkē–/ or any word formation process that leads to such a structure. Table 1 illustrates this structure.

Trisyllabic		
Disyllabic		Monosyllabic
	(ke)	
ke	me	CV
	pe	CrV
	rō	
	te	
	t <sup>h</sup> e	

Table 1: Structure of a word in Tenyidie

Some of these prefixes seem to have no semantic function. The ones that do are /kē–/ and /pē–/, which in some words appear without any semantic function like the rest. There are two kinds of the /kē–/ form prefixes — one, which universally converts a predicative verbal to an attributive verbal; the other, which denotes reciprocal activity. The prefix /pē–/ is a causative marker, and is not as productive.

The following prefixation data in this subsection are the main data regarding this paper. Dissimilation of Mid tones is seen in prefixation where a monosyllabic stem bearing a Mid tone becomes a High tone when it is affixed with any prefix having the same tone. However, there are no tone changes observed when the same Mid-toned prefix is affixed to a stem bearing any

other tone than a Mid tone. In (2), the attributival prefix /kē-/ triggers a High tone on the Mid toned-stem in (c).

(2) Prefixation of the attributival morpheme /kē-/:

- a. ní → kēní (happy)
- b. ví → kēví (good)
- c. zí → **kēzí (early)**
- d. sì → kēsì (cold)

The same tonal observation is also seen in the prefixation of the causative prefix /pē-/ to verbal bases in (3).

(3) Prefixation of the causative morpheme /pē-/:

- a. krá → pēkrá (white)
- b. ví → pēví (good)
- c. zí → **pēzí (early)**
- d. sì → pēsì (cold)

The data in (4) show other examples of the tone change with the attributive prefix /kē-/ and the causative prefix /pē-/.

- (4)
- a. cié → kēcié (wet)
  - b. liō → kēlió (fat)
  - c. krā → kēkrá (many)
  - d. lē → kēlé (hot)
  
  - e. cié → pēcié (wet)
  - f. liō → pēlió (fat)
  - g. krā → pēkrá (many)
  - h. krí → pēkrí (different)
  - i. zé → pēzé (to melt)

The prefixes /mē-, tē-, t<sup>h</sup>ē-/ do not have any semantic effect on them, but there are nouns in the language which depend unpredictably on one — and only one — of them for a full word status. I will call them ‘supporting prefixes’, as that is their only function. Supporting prefixes disappear when the nouns are preceded by a possessive.<sup>1</sup> This is illustrated in (5). These nouns are never seen on their own without the prefix or a possessor.<sup>2</sup>

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<sup>1</sup>There prefixes cannot be determiners, as determiners follow the noun as seen later in (13), and not precede them.

<sup>2</sup>The possessor prefix would probably involve including a higher prosodic order than the ones discussed in the paper, and so is beyond the purview of this paper.

- |     |    |                                 |   |                       |                                 |                                |
|-----|----|---------------------------------|---|-----------------------|---------------------------------|--------------------------------|
| (5) | a. | mēní<br>‘trousers’              | → | ā-ní<br>‘my trousers’ | puō-ní<br>‘his/her<br>trousers’ | ú-ní<br>‘one’s<br>trousers’    |
|     | b. | tēfő<br>‘dog’                   | → | ā-fő<br>‘my dog’      | ūkō-fő<br>‘their dog’           | Ābà-fő<br>‘Aba’s dog’          |
|     | c. | t <sup>h</sup> ēvə<br>‘chicken’ | → | ā-və<br>‘my chicken’  | ñ-və<br>‘your<br>chicken’       | Jōhn-və<br>‘John’s<br>chicken’ |

Just like /kē–/ and /pē–/, the prefixation of the supporting prefixes /mē–, tē–, t<sup>h</sup>ē–/ also results in the same tonal behaviour, albeit to nominal stems this time. They change the Mid tone of nominals to High, but keep the other tones unchanged (6).

- (6) Prefixation of the supporting prefixes /mē-, tē-, t<sup>h</sup>ē-/ :

  - a. -ní → mēní (trousers)
  - b. -k<sup>h</sup>ō → mēk<sup>h</sup>ó (basket)
  - c. -k<sup>h</sup>ū → mēk<sup>h</sup>ú (plate)
  
  - d. -fō → tēfō (dog)
  - e. -pfí → tēpfí (monkey)
  - f. -hiē → tēhié (cup)
  - g. -r<sup>h</sup>i → tēr<sup>h</sup>i (louse)
  
  - h. -ziē → t<sup>h</sup>ēziē (blood)
  - i. -muó → t<sup>h</sup>ēmuó (meat)
  - j. -bā → t<sup>h</sup>ēbá (seat)
  - k. -zō → t<sup>h</sup>ēzó (bed)
  - l. -zā → t<sup>h</sup>ēzá (name)
  - m. -ruō → t<sup>h</sup>ēruó (luck)
  - n. -vè → t<sup>h</sup>ēvè (chicken)
  - o. -miē → t<sup>h</sup>ēmiē (person)

However, this happens only when the stem is monosyllabic. When the stem is disyllabic (i.e. when there is an intervening prefix), no tone change is observed upon the same prefixation. Only /kē–/ prefixes to polysyllabic bases. Examples of prefixation on disyllabic words are given in (7).

- (7) a. mēsā → kēmēsā (clean)  
      b. mēriē → kēmēriē (red)  
      c. mēhē → kēmēhē (yellow)  
      d. pējō → kēpējō (green)  
      e. mēnē → kēmēnē (soft)  
      f. mētī → kēmētī (hard)

There is another exception. These nominal stems do not change tones when they follow a

Mid-toned possessor prefix found in (5). Examples of such cases with Mid toned stems are /ā-k<sup>h</sup>ō/ ‘my basket’, /puō-hiē/ ‘his/her cup’, /ūkō-zā/ ‘their names’.

## 2.2. *Mid-tone sequences*

As mentioned before, the form ‘kē–’ is also a reciprocal prefix. This prefixation is productive but does not show similar dissimilation patterns as the homophonous attributival prefix (8).

- (8)    -biē → kēbiē    (‘touch’) → ‘to touch each other’  
      -kiē → kēkiē    (‘call’) → ‘to call each other’  
      -ŋū → kēŋū    (‘see’) → ‘to see each other’  
      -tē → kētē    (‘catch’) → ‘to catch each other’

All the forms /kē–, pē–, mē–, rō–, tē–, t<sup>h</sup>ē–/ appear in the language as prefixes having neither derivational nor inflectional functions. Sequences of Mid tones are also seen with these ‘empty’ prefixes. The data in (9) are some words which surface with Mid-tone sequences in the prefix–stem environment, where the prefix does not play an attributive, causative, supporting or reciprocal function.

- (9)    Prefixed stem with Mid-tone sequences:

- a.    kēlē                  ‘to pinch’
- b.    mētī                  ‘hard’
- c.    rōkrā                  ‘to remember’
- d.    t<sup>h</sup>ērī                  ‘poison; poisonous’
- e.    kēmēnā                  ‘flirtatious’

As a consequence of the word structure given in Table 1, only Mid tones are found in non-word-final syllables, because those are prefixes; while word-final syllables, i.e. roots, may have any of the tones of the language. There are some exceptions with this structure in very few words, but they are most likely newer words, like ‘paper’ /lēʃō/ and ‘rubber’ /rābō/. Set (10) — along with (9) — shows this distribution of tones in polysyllabic words.

- (10)    Mid tones on all non-final syllables:

- |                          |                  |                             |                    |
|--------------------------|------------------|-----------------------------|--------------------|
| a.    kēbvō              | ‘to disturb’     | g.    tē <sup>h</sup> ì     | ‘louse’            |
| b.    kēvá               | ‘ginger’         | h.    pēkrié                | ‘ice/snow’         |
| c.    kēvō               | ‘bamboo’         | i.    pēl <sup>h</sup> ì    | ‘to asphyxiate’    |
| d.    rōzā               | ‘to get injured’ | j.    kēt <sup>h</sup> ēguō | ‘satisfied’        |
| e.    rōvà               | ‘leech’          | k.    kēmēkō                | ‘conceited’        |
| f.    tēk <sup>h</sup> ū | ‘tiger’          | l.    kētēmō                | ‘playing innocent’ |

## 2.3. *Suffixation: more Mid-tone sequences*

Unlike the prefix–stem boundary, sequences of Mid tones are actually quite common in the root–suffix boundary. This is shown in (11) where a non-alternating Mid-toned suffix can follow a Mid-toned stem with no tone change observed. No dissimilation of Mid tones like the ones in

prefixation is observed in suffixation.

(11) No tone change in non-alternating suffixes.

- a. zé ciē ‘to wrap’ + IMP
- zé ciē ‘to pierce’ + IMP
- zē ciē** ‘to sell’ + IMP
- zè ciē ‘to sleep’ + IMP
  
- b. sǐ kō ‘wood’ + PL
- (puō) sí kō ‘(its) seed’ + PL
- (niē) p<sup>h</sup>ī kō ‘(your) leg’ + PL
- (niē) m<sup>h</sup>i kō ‘(your) eye’ + PL

In fact, Mid-tone sequences are even seen to be actively created in the root–suffix boundary when a Mid-toned stem is followed by an underspecified quirky alternating suffix (12), in (c).

(12) Quirky alternating suffixes

- a. zé liè ‘to wrap’ + IRR
- b. zé liè ‘to pierce’ + IRR
- c. **zē liē** ‘to sell’ + IRR
- d. zè liē ‘to sleep’ + IRR

An additional case of Mid-tone sequences arises when a quirky alternating suffix is added to a root with the so-called ‘fifth tone’. Although this tone is realised as High (13)(c), it behaves as a Mid tone (d), in the sense that it results in a Mid tone on a quirky alternating suffix. This can be contrasted with ‘regular’ High tones which produce a Low tone on the quirky alternating suffix (b).

(13) Quirky alternating suffixes repreated with the fifth tone in (c).

	<i>n.</i>	DEF.SG		<i>v.</i>	IRR
a.	sǐ	–ù	(wood)	zé	-liè (to wrap)
b.	kēví	–ù	(good)	zé	-liè (to pierce)
c.	pé	<b>–ū</b>	(bridge)		
d.	pērā	–ū	(bird)	zē	-liē (to sell)
e.	t <sup>h</sup> ēmiè	–ū	(person)	zè	-liē (to sleep)

Meyase (2014) proposes to analyse the fifth tone as a High tone followed by a floating Mid tone, H⟨M⟩.<sup>3</sup> I am assuming here that this is the case and that /pé/ is actually underlyingly /pē<sup>h</sup>/ . As such, the data in (13)(c) again contains a sequence of a floating Mid tone and the Mid tone of the suffix, as H⟨M⟩-M, without changing any of the Mid tones. /bá<sup>h</sup>/ ‘bell’ and /có<sup>h</sup>/ ‘branch’ are other such examples.

The derivation of a High tone from a Mid tone in (2) and (4), in fact seems to create the fifth tone rather than the regular High tone. This is seen in (14)(b) when a quirky alternating suffix is affixed to a derived High. The suffix becomes a Mid instead of the expected Low. The High tone in (14)(a) is the regular High tone.

<sup>3</sup>For a more detailed explanation and evidence of this analysis, see Meyase (Meyase 2014)

- (14) Difference between /kēví/ and /kēzí/ in (2):

- a. /kēví –u/ → [kēví–ù]  
—where the base stem is /ví/ with a High tone.
- b. /kēzí –u/ → [kēzí–ū]  
—where the base stem is /zí/ with a Mid tone.

#### 2.4. *Interim summary*

The attributive prefix /kē–/, the causative prefix /pē–/, and the supporting prefixes /mē–, tē–, t<sup>h</sup>ē–/ all with Mid tones have a dissimilatory effect on all roots with Mid tones raising the latter to a High tone. However, this dissimilatory effect is not seen with other prefixes, leading to cases of Mid-tone sequences. And in fact, sequences of Mid tones are found across root–suffix boundaries. This is the asymmetry that I would like to analyse with recourse to the prosodic structure. The analysis of the creation of Mid-tone sequences in the quirky alternating suffixes involves delving into the sub-tonic features of tones (Meyase 2014), therefore I will consider that to be beyond the scope of this paper. It is included here to show, as will be seen later, that floating tones are found in the language.

### 3. *Analysis*

#### 3.1. *Mid-tone dissimilation triggered by prefixes*

Let us recall the main tone change concerned with this paper from (2), (3) and (6), where prefixation changes a Mid-toned root to a High tone.

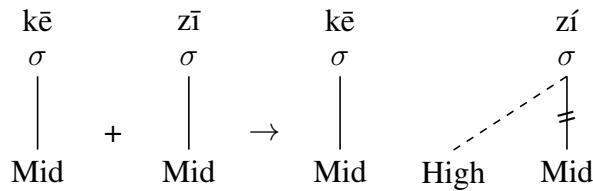
- (15)      kē–           +    zí                 →    kēzí  
           PREFIX            early.PRED            early.ATTR

This tone change does not happen to roots with tones other than Mid. I will argue that the tone change observed in (15) is due to the dissimilation of the Mid tones in the language, which triggers the second Mid tone to change to High. More specifically, there is an active OCP (Leben 1970; Goldsmith 1976; McCarthy 1986; Odden 1986) of Mid tones that penalises the sequence of the Mid tones (16). In order to counter the OCP, a High tone is epenthised between the Mid tones. The epenthised High tone then displaces the Mid tone in the root and the root gets the High tone.

- (16)      OCP(Mid):    Assign a violation for every pair of adjacent Mid tones.

The process of Mid-tone dissimilation is laid out in (17) making use of autosegmental representations. Here OCP(Mid) triggers the epenthesis of an intervening High tone; this tone is then associated to the root. The Mid tone in the root is displaced and remains floating.

- (17) Tone epenthesis due to OCP(Mid):



This is achieved in OT by ranking OCP(Mid) over the two constraints DEP(High) and \*FLOAT(Mid) (18). DEP(High) prohibits the epenthesis of a High tone; and \*FLOAT(Mid) prohibits Mid tones to stay unassociated to any of the tone bearing units.

- (18) OCP(Mid)  $\gg$  DEP(High), \*FLOAT(Mid)

This ranking eliminates the candidate faithful to the input as it violates the OCP despite satisfying the other constraints, shown in Tableau 1.

$k\bar{e}$ $z\bar{i}$                Mid    Mid	OCP(Mid)	DEP(High)	*FLOAT(Mid)
a. $k\bar{e}$ $z\bar{i}$                Mid    Mid	*!		
b. $k\bar{e}$ $z\bar{i}$                        Mid    High    Mid		*	*

Tableau 1: OT evaluation of /k̄e + z̄i/

A possible candidate for the output is the candidate where the epenthised High completely replaces the stem Mid tone by deleting the latter tone. On the surface, it is phonetically the same as the intended winner with the Mid-High sequence on /k̄ež̄i/. However, this candidate would then also be exactly the same as an underived Mid-High word which would not trigger a Mid tone on a quirky alternating suffix as is seen in (14). For this, we need the Mid tone in the input stem to remain visible to the suffix and not be deleted entirely, i.e., remain floating. We can eliminate this candidate by introducing MAX(Mid) and ranking it higher than \*FLOAT(Mid). The faithfulness constraint MAX(Mid) prohibits the Mid tone to be deleted. Introducing this ranking also penalises any other candidate that deletes Mid tones.

The language is seen to allow floating Mid tones, as is the case of the so-called phonological fifth tone, which is a High tone with a floating Mid tone. But there is no evidence for a floating High tone in the language (or indeed of the Extra High or the Low). This tells us that it is better in the language to have a floating Mid tone than a floating High tone. That is, \*FLOAT(Mid) is lower ranked than \*FLOAT(High). We get the ranking in (19) following the discussion in the last two paragraphs.

- (19) MAX(Mid), \*FLOAT(High)  $\gg$  \*FLOAT(Mid)

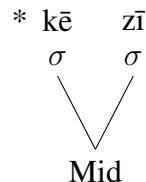
The reason for the epenthesis of the High tone can be explained by the property of the tone to be unmarked. Since the analysis calls for the dissimilation of Mid tones with OCP(Mid), we can safely rule out the epenthesis of another Mid tone as it only creates more OCP(Mid) violations.

As for the other two tones, *viz.* Extra High and Low, one can assume that since they are the phonetic extremes of the pitch range in the language, they are more marked than the High tone. There is also evidence from the tonology of the language. The overall data of tone change collected reveals that in any tone change observed in the language, from any of the four tones, the resultant tone in any process is always a Mid or a High. That is, no tone ever changes to an Extra High or a Low in any given case. Therefore the epenthesis of an Extra High or a Low is more expensive than the epenthesis of a High or a Mid. This can be expressed with constraints as in (20).

- (20) DEP(Extra High), DEP(Low)  $\gg$  DEP(High), DEP(Mid)

One other way of solving the OCP problem here is to fuse the Mid tones together into one such that (21) is a possible winner in the evaluation. Fusion of Mid tones is excluded in Tenyidie by the highly ranked constraint UNIFORMITY.<sup>4</sup> UNIFORMITY is an anti-fusion markedness constraint which prevents multiple correspondents on an output element if it weren't already there in the input (McCarthy & Prince 1995).

- (21) Unwanted fusion of Mid tones in the prefix–stem boundary:



Using the constraints in (18), (19), (20) and UNIFORMITY in Tableau 2, we eliminate candidates with the complete deletion of the Mid tone (b and c), the epenthesis of Low (e), and also show how the ranking favours a floating Mid tone over a floating High tone (d and f). The epenthesis of Extra High is also prohibited in the same way as the epenthesis of Low is done.

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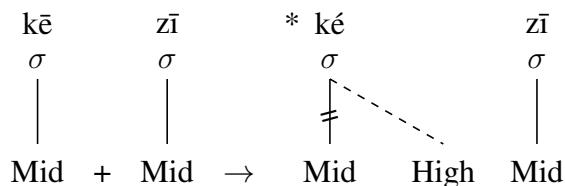
<sup>4</sup>The solution in (21) is not the final one as will be seen later that it is not needed since there is a prosodic boundary in between the two tones.

$k\bar{e}$ Mid	$z\bar{i}$ Mid	$OCP(Mid)$	$MAX(Mid)$	$*FLOAT(High)$	$DEP(ExHi, Low)$	$UNIFORMITY$	$DEP(High)$	$*FLOAT(Mid)$
a.	$k\bar{e}$ Mid	$z\bar{i}$ Mid		*				
b.	$k\bar{e}$ Mid	$z\bar{i}$		*				
c.	$k\bar{e}$ Mid	$z\bar{i}$ High		*			*	
d.	$k\bar{e}$ Mid	$z\bar{i}$ High			*		*	
e.	$k\bar{e}$ Mid	$z\bar{i}$ Low				*		
f.	$k\bar{e}$ Mid	$z\bar{i}$					*	
g.	$k\bar{e}$ Mid	$z\bar{i}$ High					*	*

Tableau 2: OT evaluation of /kē + zī/

Another possible candidate is the output in (22). This candidate involves the re-association of the epenthetic High tone to the prefix instead of the root.

(22) Ungrammatical possible output.



In order to eliminate this candidate, we refer to the prosodic structure of the words. I propose that the prosodic word ( $\omega$ ) in the language is made up of the root and suffixes that follow it. A high ranking constraint  $\text{ALIGN-L}(\text{Root}, \text{Prosodic Word})$  defined in (23) takes care of this structure. Prefixes form a prosodic unit higher to the prosodic word. The constraint  $\text{PARSE}(\text{Syllable})$  given in (24) ensures that prefixes are incorporated into a higher prosodic structure instead of them floating outside the prosodic word.

- (23) ALIGN-L(Root, Prosodic Word): Assign a violation mark for every lexical root whose left edge does not coincide with the left edge of a prosodic word.  
(McCarthy & Prince 1993:p. 34)

(24) PARSE(Syllable): Assign a violation mark for every syllable node that is not incorporated into a higher prosodic structure.

Finally, the IDENT constraint in (25) ensures that any prefix to the leftmost side of the stem retains its tone.

- (25) IDENT(Tone)<sub>( $\omega$ -Max)</sub>:

Assign a violation mark for every output TBU that lies at the left edge of a maximal prosodic word and whose input correspondent is associated to a different tone.

Making these three constraints highly ranked, we get Tableau 3, which successfully eliminates the candidate in (22). The constraint  $\text{IDENT}(\text{Tone})_{(\omega\text{-Max})}$  eliminates candidate (d) because the prefix /ke–/, which here is the TBU at the left edge of the maximal prosodic word, is not faithful to its input tone.

$k\bar{e}$ $z\bar{i}$                Mid    Mid	$ALIGN_L$	$P_{PARSE}(\sigma)$	$IDENT(T)_{(\omega, \text{Max})}$	$OCP(Mid)$	$D_{EP}(High)$	$*FLOAT(Mid)$
a. $(k\bar{e} \quad z\bar{i})_\omega$                Mid    Mid	*	!		*		
b. $k\bar{e} \quad (z\bar{i})_\omega$                Mid    Mid		*		*		
c. $(k\bar{e} \quad (z\bar{i})_\omega)_\omega$                Mid    Mid				*		
d. $(k\bar{e} \quad \quad (z\bar{i})_\omega)_\omega$                Mid    High    Mid			*		*	
e. $(k\bar{e} \quad \quad (z\bar{i})_\omega)_\omega$                Mid    High    Mid					*	

Tableau 3: OT evaluation of /k̄e + z̄i/

### 3.2. Non-dissimilatory prefixes

As seen in Section 2.2, not all prefixes trigger a dissimilatory tone change on a Mid toned stem even though the prefix appears to have a Mid tone. Also, in (7) (for example, [m̄ehé] → [k̄em̄ehé] (yellow)), the attributive prefix /k̄e-/ , which triggers a High tone on all monosyllabic Mid-toned stems, fails to trigger the same effect to stems of two syllables. This is addressed by assuming that while attributive /k̄e-/ , causative /p̄e-/ and the supporting prefixes come with a Mid tone specified to them, all the other prefixes including the non-attributive /ke-/ and the non-causative /pe-/ , are not specified any tone on them. They simply surface with a Mid tone phonetically. Therefore, since they are toneless, there is no violation of OCP whatsoever in words like [k̄el̄e] ‘to pinch’ and [m̄et̄i] ‘hard’ in (9) because such words are basically /kel̄e/ and /met̄i/ phonologically, without any tone in the first syllable.<sup>5</sup> This kind of tone is seen also in Yoruba (Akinlabi & Liberman 2000), where a mid tone in that language is actually the phonological absence of tone. The difference with Yoruba is that in Tenyidie, there are both kinds of mid tones — a phonologically Mid tone as well as a phonologically unspecified tone surfacing phonetically as Mid.

<sup>5</sup>Like consonants and vowels, since the tone is overtly produced, it is assumed that it has a phonological unit associated to it unless proved otherwise. So by default, the stems are left as presumed phonologically toned.

As mentioned earlier, /ke-/ is the only prefix that can be prefixed to a disyllabic stem. The only possible issue now is when this is an attributive /kē-/ with a specified Mid tone (since all other forms are toneless). This prefix will never be prefixed over the supporting prefixes /mē-, tē-, t<sup>h</sup>ē-/ (which are all specified for tone) because these are all affixed to nominal stems and remain nouns, while /kē-/ attributivises verbals. There are no instances in the language of a causativised verbal that is then attributivised. That is, there are no instances of /kē-/ prefixing to /pē-/ (with an underlying tone) in turn prefixing a root. But there are words like [kēmēsā] ‘clean.ATTR’ which can be decomposed into /kē + mesā/, where the prefix /me-/ in /mesā/ ‘clean.PRED’ is not a supporting suffix (cf. the interim summary in Section 2.4), and therefore toneless.

Having made these claims, the data in (7) with the attributive prefix should be phonologically represented as a trisyllabic word with an initial Mid tone, a toneless TBU, and a final unpredictable tone, for example, [kēmēsā] is phonologically /kēmesā/. In this case, even though the prefix has a Mid tone, the following stem does not have a Mid tone initial syllable, because it is a toneless prefix. Therefore OCP(Mid) is vacuously satisfied, resulting in a surface phonetic sequence of Mid tones. Words like [kēmēnā] ‘flirtatious’ in (9) are simply /kemenā/ with just one tone specified on the final syllable.

The following examples illustrates surface Mid-tone sequences, which are phonologically not such sequences.

- (26) Disyllabic words with Mid-tone sequence as a consequence of toneless prefixes:

ke	lē
$\sigma$	$\sigma$
Mid	

- (27) Trisyllabic words attributivised by /kē-/:

kē	me	sā
$\sigma$	$\sigma$	$\sigma$
Mid	Ex-High	

- (28) All other trisyllabic words:

ke	me	nā
$\sigma$	$\sigma$	$\sigma$
Mid		

### 3.3. Suffixation

In this paper, the issue with suffixes is the presence of Mid-tone sequences in the root–suffix environment despite the OCP(Mid) constraint, which triggers the tone dissimilation in prefixes and stems, as discussed in the previous section. I will address this issue by positing that the

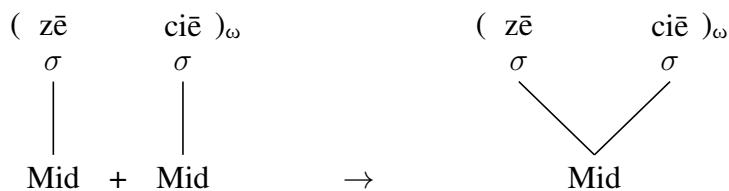
reason behind this mismatch is the prosodic structure which intervenes in the tonal changes, thereby resulting in other tonal patterns.

In Section 2, I proposed that fusion of tones is prohibited by the constraint UNIFORMITY, thereby eliminating candidates that fuse tones, like (21). I now reanalyse this approach by saying that Mid tones can indeed fuse, but only when they are in the same prosodic unit. The prohibition to tone spreading will therefore need a more specific constraint.

The prosodic structure I proposed earlier in this paper is that the root and the suffix form a prosodic word ( $\omega$ ) to the exclusion of the prefix. By assuming such a structure I can now say that the OCP(Mid) is solved in the prosodic word by the fusion of Mid tones within that domain. While on the other hand, the same OCP(Mid) is the trigger of the tone epenthesis in the prefix–root boundary. The reason for the epenthesis of the High tone in such a context is because fusion across the prosodic boundary is banned.

For instance, in (11), /zē ciē/ is a Mid-toned stem followed by a (fully tone-specified) Mid-toned suffix. Both of them are inside the prosodic word, therefore the Mid tones in them fuse into one Mid tone, as shown in (29).

- (29) Fusion of Mid tones within the Prosodic Word due to OCP(Mid):



The premise here is that Mid tones would rather fuse into one tone in order to avoid the OCP(Mid). However, in the prefix–root environment, this fusion is blocked by the initial boundary of the prosodic word which lies between the prefix and the root. Such a blocking can be captured by the constraint CRISPEDGE(Prosodic Word), defined in (30), which demands a tone in the prosodic word to remain within the prosodic word.

- (30) CRISPEDGE(Prosodic Word): Assign a violation mark for every prosodic word dominating an element that is linked to a prosodic category external to that prosodic word. (Itô & Mester 1999; Pater 2001)

Now, since the OCP(Mid) is still active, the phonology resorts to epenthising a High tone (as was the case in Tableau 1) instead of fusing the tones across the prosodic word because of the constraint in (30). At this point, it should be noted that the first reaction of Mid tones towards OCP(Mid) is fusion with each other. Dissimilation takes a back seat with regards to preference, happening only when fusion is disallowed.

Tableau 4 shows how this is worked out with the string /pē + zī + ciē/ (CAUS + early + IMP), a chain of prefix, root and suffix all of which are underlyingly specified with a Mid tone each (the root is underlined for clarity).

$p\bar{e}$ Mid	$\underline{z}\bar{i}$ Mid	$ci\bar{e}$ Mid	$IDENT(T)_{(\omega, Max)}$	$OCP(Mid)$	$CRISPEDGE(\omega)$	$D_{EP}(High)$	$*FLOAT(Mid)$
a.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid Mid Mid			*!*			
b.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid Mid			*!			
c.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid High Mid		*!			*	*
d.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid High Mid					*	
e.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid High Mid				*!	*	*
f.	$(p\bar{e} \quad (\underline{z}\bar{i} \quad ci\bar{e})_\omega)_\omega$ Mid				*!		

Tableau 4: OT re-evaluation of /p̄ + z̄ + cī/

In Tableau 4, prosodic words are built into the outputs. The ALIGN, PARSE and FLOAT(High) constraints are assumed to be highly ranked and therefore not included in the tableau, as are candidates that violate them, which include candidates with incorrect prosodic structure. The most faithful candidate to the input (a) violates the OCP twice as there are two succession of a Mid tones. Candidate (b) fuses the tones within the minimal prosodic word, which reduces the violation count of the OCP but is still eliminated since the OCP is still violated once. To repair the OCP a High tone is inserted in (c) and (d) between the first Mid tone and the fused Mid tones. Because of the highly ranked FLOAT(High) constraint, this High tone is associated to the prefix syllable in (c), but this violates IDENT as in Tableau 3. Candidate (d), on the other hand, associates the High tone to the root syllable. Both candidates (e) and (f) involve fusion of tones across the prosodic boundary, which are promptly eliminated by CRISPEDGE. Candidate (d) emerges as the winner with the epenthised High tone realised on the root.

The analysis of the data in this paper is an example of ‘phonological conspiracy’ (Kisseberth 2011) where multiple processes work together to avoid a single marked structure. The marked

structure here is sequences of Mid tones, which is penalised by OCP(Mid). This sequence of Mid tones is avoided within a prosodic word by fusing the Mid tones, as in (29). At the same time, the process of epenthesis is also triggered by the constraint OCP(Mid) as fusion of Mid tones wouldn't be possible across the prosodic boundary. So here, fusion and epenthesis conspire together to avoid sequences of Mid tones.

As opposed to the order of exposition in this paper, fusion of Mid tones is the first reaction to OCP(Mid). It is only when fusion is banned that the OCP triggers a dissimilation by the epenthesis of a High tone.

#### 4. Summary and conclusion

In this paper, I have presented data showing tone change upon prefixation in Tenyidie. The tone change in the data appears irregular because sometimes with certain prefixes, Mid tones in the prefix–stem domain dissimilate by changing the stem tone to a High tone; while other times, with other prefixes that appear with a Mid tone, these do not trigger any tone change on Mid-toned stems.

I have argued that the driving force behind the tone change seen with prefixation in Tenyidie is the OCP of Mid tones.

Prefixes in the language come either specified with a Mid tone or otherwise toneless. Pre-specified Mid-toned prefixes trigger the observed dissimilation on roots. Toneless prefixes are only realised phonetically as Mid tones and therefore can appear right next to phonological Mid tones on the surface. This explains the apparent non-triggering of Mid tone dissimilation, because under this assumption of toneless prefixes, there is no underlying sequence of Mid tones. The surface Mid-tone sequence is just phonetic in nature. The implication of this analysis to the tone system of Tenyidie is that, apart from the five tones that can appear in a syllable in the language, there is also the possibility that a syllable is toneless. This renders the total number of tone options for a syllable in Tenyidie to be six (excluding cases of underspecification reported in Meyase 2014).

This data also separates the prosodic or phonological word from the morpho-syntactic word in the language where the prefixes are seemingly closer to the root than the suffixes, as prefixing a root in the language entails change of word class while suffixation chiefly marks the tense, aspect and mood.

The dual action tone epenthesis and as well tone fusion both triggered by the constraint OCP(Mid) shown in this paper is an example of conspiracy in linguistics. Here, epenthesis and fusion conspire to avoid a single restriction.

### Abbreviations

List of abbreviations and symbols used in the paper:

OCP	Obligatory Contour Principle
ATTR	attributive
DEF	definite
IMP	imperative
IRR	irrealis
PL	plural
PRED	predicative
SG	singular
$\omega$	prosodic word
$\sigma$	syllable

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### References

- Akinlabi, A. & M. Liberman (2000). The tonal phonology of yoruba clitics. Gerlach, B. & J. Grijzenhout (eds.), *Clitics in phonology, morphology and syntax*, John Benjamins, Philadelphia, pp. 31–62.
- Goldsmith, J. A. (1976). *Autosegmental Phonology*. Indiana University Linguistics Club.
- Itô, J. & A. Mester (1999). Realignment. Kager, R., H. van der Hulst & W. Zonneveld (eds.), *The Prosody-Morphology Interface*, Cambridge University Press, Cambridge, pp. 188–217.
- Kisseberth, C. W. (2011). Conspiracies. van Oostendorp, M., C. J. Ewen, E. Hume & K. Rice (eds.), *The Blackwell Companion to Phonology*, Wiley-Blackwell, chap. 70, pp. 1–22.
- Leben, W. (1970). *Suprasegmental phonology*. Doctoral dissertation, Massachusetts Institute of Technology.
- McCarthy, J. (1986). OCP effects: Gemination and antigemination. *Linguistic Inquiry*, 17, pp. 207–264.
- McCarthy, J. & A. Prince (1993). *Prosodic morphology I: Constraint interaction and satisfaction*. Technical Report #3, Rutgers University Center for Cognitive Science. [ROA-590].
- McCarthy, J. & A. Prince (1995). Faithfulness and reduplicative identity. Jill Beckman, S. U. & L. W. Dickey (eds.), *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, pp. 249–384.
- Meyase, S. M. (2014). Four versus five: The number of tones in Tenyidie. *Proceedings of the 4th International Symposium on Tonal Aspects of Languages (TAL-2014)*, pp. 19–22.
- Nespor, M. & I. Vogel (1986/2007). *Prosodic Phonology*. De Gruyter, Mouton.
- Odden, D. (1986). On the role of the obligatory contour principle in phonological theory. *Language*, 62 (2), pp. 353–382.
- Pater, J. (2001). Austronesian nasal substitution revisited. Lombardi, L. (ed.), *Segmental Phonology in Optimality Theory: Constraints and Representations*, Cambridge University Press, pp. 159–182.
- Prince, A. & P. Smolensky (1993/2008). *Optimality Theory: Constraint Interaction in Generative Grammar*. Wiley.