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Verb Raising Asymmetries in Richly Agreeing Languages: Evidence from Saami

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1 Introduction

There is a broad consensus in the literature that there is a correlation between the existence of rich agreement and verb raising. One school of thought has pursued the idea that the correlation suggests that morphology drives syntax (e.g. Rohrbacher, 1999). Another school holds that the syntax generates abstract structures that may be targeted for Vocabulary Insertion (Halle and Marantz, 1993); in a verb raising language the syntax is complex enough to accommodate both tense and agreement affixes (Bobaljik, 1995, Bobaljik and Thráinsson, 1998). Thus, while differing in key regards, the two analyses concur that the presence of rich agreement signifies that verbs raise (see Bobaljik, 2002):

(1) If a language has sufficiently rich inflection, then it also has verb raising.

However, this paper questions (1), on the basis of a comparison of two closely related Finno-Ugric languages, namely South and North Saami.[1] While verbs in both languages have rich inflection, raising asymmetries are nevertheless found, contrary to the predictions of (1).

The paper is organized as follows. Section 2 provides a background discussion about the relation between verbal inflection and syntax. Here we also present the basic properties of South and North Saami, arriving at the inevitable conclusion that only North Saami qualifies as a verb raising language. Section 3 proposes a reconsideration of Bobaljik and Thráinsson's Split IP Parameter, rephrased in terms of Biberauer and Roberts's (2008) notion rich tense, along with elements from Iatridou's (2000) treatment of counterfactual conditionals. Hence, we shall claim that verb raising asymmetries are syntactically motivated. Section 4 provides further evidence for the structural distinction between raising and lowering languages. In particular, we show that the more complex syntactic structure of North Saami facilitates the existence of a derived object position, that is not available in the lowering language South Saami, on a par with the predictions of Bobaljik and Thráinsson (1998). Finally, section 5 provides some concluding remarks and summarizes the major points made.

2 Inflection and Verb Raising

The study of verb raising asymmetries has been on the agenda in generative syntax at least since the 1970s (Emonds, 1978). While the dichotomy is uncontroversial, its underlying motivation is still a matter of debate. In 1980s, the idea emerged that verb raising is triggered by inflectional morphology, the so-called Rich Agreement Hypothesis (RAH) (see, among several others, Platzack, 1988, and Rohrbacher, 1999):

(2) The Rich Agreement Hypothesis (RAH)
Rich Agreement causes V-to-I movement.

To illustrate the issue, consider the Icelandic and Swedish paradigms below. While Icelandic (3) makes overt distinctions between different persons, numbers and tenses, only a temporal distinction is manifested in Swedish (4):

(3) Icelandic kaupa 'buy'

	Present	Past
1s	kaup-*i*	keyp-*ti*
2s	kaup-*ir*	keyp-*ti-r*
3s	kaup-*ir*	keyp-*ti*
1p	kaup-*um*	keyp-*tu-m*
2p	kaup-*ið*	keyp-*tu-ð*
3p	kaup-*a*	keyp-*tu*

(4) Swedish köpa 'buy'

	Present	Past
1s	köp-*er*	köp-*te*
2s	köp-*er*	köp-*te*
3s	köp-*er*	köp-*te*
1p	köp-*er*	köp-*te*
2p	köp-*er*	köp-*te*
3p	köp-*er*	köp-*te*

According to, (2), the morphological richness of Icelandic forces the verb to raise to Infl. Conversely, because Swedish has no agreement distinctions, there is no incitement for the verb to move out the VP. Hence the contrast between (5a) and (5b):

(5) a. Icelandic
að hann *keypti* ekki [$_{VP}$ t_V bókina].
that he bought not the.book
'... that he didn't buy the book.' (Platzack, 1986:209)

b Swedish
att han inte [$_{VP}$ *köpte* boken].
that he not bought the.book
'... that he didn't buy the book.'

Notwithstanding the success of (2), rich agreement has proven difficult to define. One of the most well-crafted characterizations is that of Rohrbacher (1999:116-117):

(6) Rich Agreement:

"A privative feature such as [1st] or [2nd] is distinctively marked if and only if the forms bearing this feature are distinct from the forms lacking this feature. Accordingly, a language has V to I raising if its regular verbs distinguish the forms for first and second person in at least one number of one tense from each other, as well as from the forms for 'third' person in that tense/number combination and from the form for the infinitive." (Rohrbacher, 1999:116-117)

(6) correctly characterizes Icelandic agreement is rich, while Swedish, having no agreement at all, qualifies as weak.

An alternative view to the relation between verb raising asymmetries is Bobaljik and Thráinsson's (1998) Split IP Parameter. The hypothesis is that UG provides a choice whether Infl materializes in a split Pollockian manner, where both T and Agr project; or whether T and Agr are bundled into a single head, along the lines of Chomsky (1986):

(7) The Split IP Parameter

a T and Agr project: [2]

$...[_{AgrP} ... Agr [_{TP} ... T [_{VP} ... V ...]]]...$

b. T and Agr are bundled into a single head (I):

$...[_{IP} ... I_{[Agr,T]} [_{VP} ... V ...]]]...$

Languages opting for the Pollockian-style Infl, (7a), are forced to raise the verb in order to satisfy requirements of feature checking. Verb raising assembles the terminal nodes of the extended projection into a single complex head, which serves as the locus for Vocabulary Insertion (VI) at PF. Since the head is complex, VI can result in the manifestation of distinct exponents for both tense and agreement, where each terminal node is matched with a discrete vocabulary item. However, if a language has a bundled IP, (7b), the syntactic features relating to V and I can be checked without invoking movement, since VP is the complement of I. The combination of I and the verb takes place post-syntactically through Affix Lowering, motivated by for instance Lasnik's (1994) Stray Affix Filter. Because the resulting complex head consists of a single functional head, VI can result in the occurrence of one tense exponent or one agreement exponent, but not two discrete items for tense and agreement. From this follows that complex inflectional morphology can appear in verb raising contexts. It is important be aware, however, that "rich agreement" is not a prerequisite for raising in this approach.

2.1 Saami: the inflectional paradigms

We now begin our survey by considering the verbal paradigms of South Saami (8) (for instance, Bergsland, 1994 and Hasselbrink, 1981) and North Saami (9) (see among others, Nickel, 1994, Svonni and Vinka, 2002).

(8) South Saami: gæljodh 'shout.Inf'

	Present	Past
1s	gæljoe-m	gæljoe-ji-m
2s	gæljoe-h	gæljoe-ji-h
3s	gylje	gæljoe-ji
1d	gæljoe-n	gæljoe-ji-men
2d	gæljo-den	gæljoe-ji-den
3d	gæljoe-jægan	gæljoe-ji-gan
1p	gæljo-be	gæljoe-ji-mh
2p	gæljo-de	gæljoe-ji-dh
3p	gæljoe-h	gæljoe-ji-n

(9) North Saami: gilljut 'shout.Inf'

	Present	Past
1s	gilju-n	gilljo-n
2s	gilju-t	gilljo-t
3s	gillju	gilju-i
1d	gilljo	gilju-i-me
2d	gillju-beahtti	gilju-i-de
3d	gillju-ba	gilju-i-ga
1p	gillju-t	gilju-i-met
2p	gillju-behtet	gilju-i-det
3p	gilljo-t	gilljo

The languages have three numbers, singular, plural and dual, three persons and two tenses. Rohrbacher's (1999:116-117) characterization of rich agreement, (6), indisputably defines agreement in South and North Saami as rich. Also Bobaljik and Thráinsson's approach to verbal inflection predicts the languages to be of the Split-IP variety, because the of presence of discrete tense and agreement affixes. In short, both the morpho- and the syntactico-centric theories uniformly predict South and North Saami to be verb raising languages.

While the syntactic prediction for North Saami will be shown to be correct, closer examination reveals that South Saami displays the characteristics of an affix lowering language.

2.2 Verb raising asymmetries

Using the standard methodology of measuring where the verb appears in relation to a fixed item that marks the left edge of the VP, we can probe whether the verb surfaces within the VP, or evacuates it. Such fixed items are represented by floating quantifiers (FQs) and VP-adjoined adverbs (Bobaljik, 2001, Emonds, 1978, Pollock, 1989, Sportiche, 1988).

Beginning with South Saami, it is important to highlight the fact that the relative order between the verb and the object is relatively free. While the OV order is the most common, VO is also fully possible.[3] With these basic facts in mind, consider (10). As the examples show, the FQ gaajhkesh 'all' must appear to the left of the finite verb, regardless of whether the object is postverbal (10a), or preverbal (10b).[4]

(10) a Mijjieh (*gaajkesh*) byöpmedimh (**gaajkesh*) bearkoem (**gaajkesh*).
we.Nom (all) eat.Pst.1p (*all) meat.Acc (*all)
'We all ate meat.'

b Mijjieh (*gaajkesh*) bearkoem (*gaajkesh*) byöpmedimh (**gaajkesh*).
we.Nom (all) meat.Acc (all) eat.Pst.1p (*all)
'We all ate meat.'

This pattern is replicated in contexts of adverb placement as well. As shown in (11), an adverb like daamhtaj 'often' must appear to the left of the finite verb:[5]

(11) a Mijjieh (*daamhtaj*) byöpmedibie (*daamhtaj) bearkoem (??daamhtaj).
we.Nom (often) eat.Prs.1p (*often) meat.Acc (??often)
'We often eat meat.'
b Mijjieh (*daamhtaj*) bearkoem (*daamhtaj*) byöpmedibie (??*daamhtaj*).
we.Nom (often) meat.Acc (often) eat.Prs.1p (??often)
'We often eat meat.'

The distribution of FQ and VP-adjoined adverbs in South Saami more or less parallels the well-known English facts. Thus, (10) and (11) provide evidence that the South Saami verb remains in-situ. This in turn challenges the various hypotheses that rich agreement is reserved for verb raising contexts.

We now turn our attention to North Saami. Unlike South Saami, objects in this language follows the finite verb (although, see section 4). Quite strikingly, and in contrast to South Saami, (12a) shows that the North Saami FQ buohkat 'all' not only can, but must, appear to the right of the finite verb. Likewise, a VP-adjoined adverb like dávjá 'often' necessarily follows the finite verb, (12b):

(12) a Sii (**buohkat*) borret (*buohkat*) bierggu.
they.Nom (*all) eat.Prs.3p (all) meat.Acc
'They all eat meat.'
b Mon (**dávjá*) boran (*dávjá*) bierggu.
I.Nom (*often) eat.Prs.1s (often) meat.Acc
'I often eat meat.'

In other words, North Saami exhibits the expected correlation between verb raising and inflectional complexity.

To summarize, our initial findings show that South Saami and North Saami establish the relation between the verb and inflectional domain by means of different strategies. South Saami behaves on a par with English, where the verb remains in-situ within the VP, a fact which was first noticed in Torkelsson (2006). North Saami, on the other hand, has the same profile as well-documented verb raising languages, such as French and Icelandic. These facts warrant a serious questioning of the link between syntax and agreement.

3 The Split IP: A Reconsideration

In this section we will fundamentally agree with Bobaljik and Thráinsson (1998) that verb raising asymmetries reflect structural distinctions. However, concurring with Biberauer and Roberts (2008), we also claim that agreement (including Agr) is not at stake. Biberauer and Roberts (2008) point out that rich agreement has been invoked in analyses of both verb movement and pro-drop (for instance, Jaeggli, 1982). However, in this context the notion of rich agreement is highly contradictory. In Italian-style languages agreement is rich is enough to license both verb-raising and pro-drop, which is also true for North Saami:

(13) (Mon) boran dávjá bierggu.
I.Nom eat.Prs.1s often meat.Acc
'I often eat meat.'

On the other hand, French agreement is rich enough to trigger verb raising, but not pro-drop. This paradox is further emphasized by South Saami, where agreement fails to trigger verb-raising, but is strong enough to license pro-drop:

(14) (Manne) bearkoem byöpmedem.
I.Nom meat.Acc eat.Prs.1s
'I often eat meat.'

Biberauer and Roberts's (2008) conclusion that verb-raising and pro-drop cannot uniformly boil down to rich agreement is in unison with Bobaljik and Thráinsson (1998), for whom verb-raising is a consequence of syntactic complexity and therefore correctly predict verb movement in the absence of agreement.

However, Biberauer and Roberts (2008) do not entirely give up on the idea that there is a correlation between verb raising and morphosyntax. Comparing Romance and Germanic languages, they call attention to the fact that languages like French and Italian have a richer inventory of tenses, than English and Swedish:

(15)

	French	Italian	English	Swedish
Simple Prs/Pst:	parle	parlo	speak(s)	talar
Conditional:	parlerais	parlerei	n/a	n/a

Indeed, a similar contrast is also found between the Saami languages under consideration: only North Saami accommodates a synthetic, Romance-style conditional. On the other hand, South Sami does not, similarly to English and Swedish:

(16)

	North Saami	South Saami	
Simple Prs/Pst:	lohka	jeahta	'say.Prs.3s'
Conditional:	logašii	n/a	'say.Cnd.3s'

Biberauer and Roberts (2008) argue that Romance verbs merge pre-syntactically with a T node. This, they claim, provides the source for the synthetic tense, and forces the verb to raise to the canonical T position. Although their analysis accounts for the occurrence of rich tense phenomena, the analysis also implies that the inflectional domain in the relevant languages is single-layered. I will pursue the idea that core cases of morphological complexity is the result of operations in the narrow syntax, in the sense of Distributed Morphology (Bobaljik and Thráinsson, 1998, Embick and Noyer, 2001, Halle and Marantz, 1993). In motivating an analysis along these lines, let us consider some details of Iatridou's (2000) analysis of counterfactual conditionals.

An important ingredient in Iatridou (2000) involves the fact that counterfactual conditionals involve two discrete morphemes, for instance a future and a past tense affix as in Romance. A curious phenomenon is the fact that the past tense does not receive a temporal interpretation. That is, in spite of the presence of a past tense marker, the following sentence do not refer to an event that occurred prior to the utterance:

(17) North Saami
Jos don divo-š-i-t biilla, de dat doaimmaš-ii-Ø.
if you.Nom repair-Cnd-Pst-2s car.Acc, then it work-Cnd-Pst-3s
'If you repaired the car, then it would work.'

Iatridou (2000) proposes that the past tense be analyzed in terms of an Exclusion Feature (ExclF), (18), which may range over times or worlds. The temporal interpretation arises when the features ranges over times, excluding the utterance time, (18a). The non-temporal, counterfactual interpretation occurs when the Exclusion Feature ranges over worlds, (18b).

(18) T(x) excludes C(x)
a The topic time excludes the utterance time.
b The topic worlds exclude the utterance world

Crucially, when the past tense co-occurs with a modal or aspectual element, the non-temporal reading emerges. This state of affairs suggests that synthetic conditionals consists of two layers of tense specifications (Iatridou, 2000).

I propose that the insights of Iatridou (2000) and Biberauer and Roberts (2008) should be captured by a re-interpretation of Bobaljik and Thráinsson's Split IP. Dispensing with Agr, assume that *v*P is the complement of a head that encodes

modality/aspectuality. Borrowing from Johnson (1991), I refer to the relevant projection as μP. [6] Hence, verb raising languages have the complex inflectional domain shown in (19a).[7] Lowering languages, on the other hand, have the structure shown in (19b):

(19) a ...[$_{TP}$ ... T [$_{\mu P}$ ... μ [$_{\nu P}$ ... ν...]] ...
b ...[$_{TP}$ ... T [$_{\nu P}$ ... ν...] ...

In a conditional clause, μ is specified for [future] and T for [Past]. In exactly this syntactic context, [Past] is forced to range over worlds (18b), barring the temporal interpretation. Along these lines, a conditional clause in a "richly" tensed language like North Saami or French, would involve a derivation, where the verb raises cyclically through μ to T.

(20) ...[$_{TP}$ ... divo-ν-μ-T [$_{\mu P}$ ... t_{μ} [$_{\nu P}$ ... t_{ν} ...]] ...

At PF, Vocabulary Insertion operates on the complex head, where vocabulary items compete for insertion into the terminal nodes. In the case of North Saami, Vocabulary Insertion applies as shown in (21):

(21) $I_{[Fut]} \leftrightarrow$ š / ___ $T_{[Pst]}$
$T_{[Pst]} \leftrightarrow$ i

The theory we are pursuing differs from Biberauer and Roberts in at least two fundamental aspects. Firstly, they assume that rich tenses are formed pre-syntactically. For us, the "rich tense" is encoded in the extended projection of the clause. Secondly, while Biberauer and Roberts' account correctly produces complex items in terms of internal word structure, our theory draws on Bobaljik and Thráinsson and assumes that the syntax of "rich tense" is complex. This means that we should be able to replicate one of the important claims of the Split IP Parameter, namely the idea that complex syntax facilitates the existence of a νP-external object position. The next section will be devoted to this question.

4 Non-canonical Word Orders

As we mentioned in section 2, the unmarked object position in South Saami is preverbal, (22a), although postverbal objects are freely allowed. In contrast, the word order in North Saami is more rigid and requires objects to be postverbal, which follows from the fact that the verb raises out of the νP. However, an important proviso applies, namely if the object receives focus stress, then it may precede the verb also in North Saami, (22b).

(22) a Manne *dam gærjam* lohkim. South Saami
I.Nom the.Acc book.Acc read.Pst.1s
'I read the book.'

b *Mon **girjji/√GIRJJI* lohken. North Saami
I.Nom book.Acc read.Pst.1s
'I read the book.'

In fact, this extends to adverbs. While a neutrally stressed adverb is illicit in the preverbal position, a contrastively stressed one is at least marginally possible:

(23) Mon (**dávjá*)/(√*DÁVJÁ*) boran bierggu.
I.Nom (*often) eat.Prs.1s (often) meat.Acc
'I often eat meat.'

Granted that North Saami has a complex inflectional domain, these facts follow straightforwardly. Indeed, Bobaljik and Thráinsson (1998) discuss a phenomenon similar to (23) in Icelandic (see also Angantýsson, 2007, Thráinsson, 2010). The idea is that the head μ may host a focus features [Foc] that probes for an appropriate goal that appears the edge of the *v*P. This triggers raising of the object (or an adverb) to μP, as shown in (24).

(24) $[_{TP}$ mon T $[_{\mu P}$ *GIRJJI* ... lohk-*v*-μ $[_{vP}$ t_{girjji} t_{mon} t_{v} $[_{VP}$ t_{lohk} t_{girjji}]]]]

The verb, however, cannot have raised all the way to T, but only to the intermediate position μ. Bobaljik and Thráinsson (1998) argues that once the verb has moved to the intermediate head, T may lower to the complex head μ. I assume that this follows from Fox and Pesetsky's (2004) Order Preservation, which states that if an item has raised to the edge of a phase, and thus precedes other relevant material in that phase, the established order may not be altered in the following stages of the derivation. Thus, if the object has been probed by a feature on *v*, and has raised to a specifier of *v*, (25a), then the object must precede the verb at the subsequent stages of the derivation, (25b). If the verbal complex were to raise to T, as in (25c), the order established in (25a) is not preserved, and hence the derivation crashes:

(25) a $[_{vP}$ *GIRJJI* mon lohk-*v* $[_{VP}$ t_{lohk} $t_{GIRJJI}]]$.
O < *v*

b $[_{TP}$ mon T $[_{\mu P}$ *GIRJJI* lohk-v-μ $[_{vP}$ t_{GIRJJI} t_{mon} $t_{lohk\text{-}v}$ $[_{VP}$ t_{V} $t_{girjji}]]$
O < *v*

c [$_{TP}$ mon lohk-v-μ–T [$_{μP}$ *GIRJJI* $t_{μ}$ [$_{vP}$ t_{GIRJJI} t_{mon} $t_{lohk\text{-}v}$ [$_{VP}$ t_{V} t_{girjji}]]
*V < O

This issue never arises in South Saami, because there is no *v*P-external position available for the object, that is located below the Spec, TP.

5 Conclusions

In this paper we have provided evidence that shows that South and North Saami exhibit verb raising asymmetries, of the kind familiar from comparative studies of numerous languages (Bobaljik and Thráinsson, 1998, Emonds, 1978, Holmberg and Platzack, 1995, Pollock, 1989, Travis, 1984). The existence of such asymmetries are not surprising in themselves, but once we add the ingredient of the Rich Agreement Hypothesis into the picture, it is remarkable to notice that in terms of inflectional complexities, the languages are more or less identical. Hence, inflectional morphology does not provide any cues, as to whether verb raising is expected or not.

However, once the distinction between the lowering property of South Saami and the raising property of North Saami has been clarified, the languages exhibit further contrasts that predicted by Bobaljik and Thráinsson's (1998) Split IP Parameter. We have proposed that North Saami has a complex inflectional domain, which opens up for focalized objects to appear in non-canonical positions. This option is not available in South Saami, which follows from Bobaljik and Thráinsson's claim that Affix Lowering is reserved for languages where Infl consists of a single functional projection. Thus, we agree with Bobaljik and Thráinsson that raising is a sign of syntactic complexity. However, we have also agreed with Biberauer and Roberts (2008) that the notion of Rich Tense is what motivates the whether a language has a split Pollockian inflectional domain or not.

Notes

[1] The Saami languages are spoken in an area that ranges from central Sweden and Norway in the south, stretching northward over the Scandinavian Peninsula and northern Finland, to the eastern tip of the Kola Peninsula. North Saami (northern Sweden, Norway, Finland) is by far the largest language, with some 25 000 native speakers. South Saami (central Sweden and Norway) has approximately 700 native speakers.

[2] I abstract away from the distinction between AgrS and AgrO projections.

[3] There are good reasons to believe that the South Saami *v*P is right-headed. I assumed that postverbal objects are extraposed DPs that are adjoined to *v*P. The inflectional domain, on the other hand, is uncontroversially left headed.

[4] I assume without further discussion that the sequence O-Adv-V arises from scrambling of the object to an outer specifier of *v*P.

[5] The relative acceptability of clause-final adverbs is however contingent on the presence of a clear intonational break that sets the adverb apart from the rest of the clause.

[6] Johnson's μP is invoked for verb raising, although without the synactico-semantic implications of *rich tense*.

[7] A highly relevant question is where a language like Icelandic fits in within the *Rich Tense* approach. On a par with English and Swedish, this language lacks Romance-style rich tense, but it is one of the primary verb raising languages in the literature. Technically, one could argue that Icelandic μ is always realized by a null affix. Another possibility, which might be linked to transitive expletive constructions, would be that Icelandic has a functional projection above T, along the lines of Bobaljik and Thráinsson (1998) and Thráinsson (2010). However, if our approach is on the right track, that projection could not be Agr.

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Putting Contrast Theory to the Test

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1 Introduction

Although the task of defining the impact of the linguistic input to the child acquiring her first language has garnered considerable attention in the literature, a consensus has yet to be reached. For many (Chomsky, 1965; Pinker, 1988; Morgan et al., 1995), linguistic input is "too inconsistent and incomplete to determine the acquisition of a grammar" (MacWhinney, 2004, p.883). Chomsky (1980) argues that the language-learning child faces a considerable problem, as her target grammar is "hopelessly underdetermined by the fragmentary evidence available," and thus "there can be little doubt that highly restrictive universal principles" must exist to guide acquisition (p.232). Framed under the Argument from the Poverty of the Stimulus, Chomsky argues that children do not receive adequate evidence in the form of adult utterances (termed *positive evidence*) to choose the correct grammar from an infinite number of incorrect ones. Along with such paucity of input is the unavailability of negative evidence; parents fail to consistently inform their children that their utterances deviate from the target grammar, and, even if they do so, children do not take advantage of the corrective potential such information holds. Empirical evidence reported by Brown and Hanlon (1970) has been taken to support such claims; however, subsequent research focusing on the patterns of discourse between adult and child (Hirsh-Pasek, et al., 1984; Bohannon and Stanowicz, 1988; Demetras, Post & Snow, 1986; Morgan & Travis, 1989) has revealed that negative input is both available to the child and serves as corrective. Saxton (1997) remedies the flaws associated with these studies in his Contrast Theory, under which the corrective power of negative evidence lies in the unique discourse context created when a child's error and the correct adult alternative are immediately juxtaposed. Whether such input facilitates development of all grammatical structures remains an open question. This study will examine whether either negative evidence or negative input, coded as separate categories by Saxton, are available as a potentially corrective sources of information for a single child, Gail of the Manchester CHILDES corpora, with respect to her errors involving the accusative case for 3rd person singular pronouns in the subject position. Such errors are both highly salient and prevalent in early child speech and thus are prime candidates for adult correction.

2 Background to Saxton's Approach

2.1 The redefinition of negative evidence

Perhaps the most widely (mis)cited study of negative evidence is Brown and Hanlon (1970). From corpora of spontaneous mother-child dialogue, the authors code whether the adult response to a child utterance was positive (i.e., *yes, that's right*), indicating approval, or negative (i.e., *no, don't say that*), indicating disapproval, and found that positive/negative responses did not correlate with the syntactic well-formedness of the child's utterance. They concluded that explicit approval or disapproval is not a force propelling the child from mature to immature forms (p.48). Brown and Hanlon's findings, however, have been taken to support the notion that negative evidence of any type is not available to the child (Pinker, 1988). This, however, is a gross over-application of their results, which simply rule out the availability of a single type of negative input.

In reaction to this study, several subsequent researchers attempted to revive the notion of negative evidence, under the idea that adult speech contains "differential response rates;" that is, certain types of adult responses follow ungrammatical child utterances more often than they follow grammatical child utterances. The child is said to be aware of this statistical difference and use it to reach her target grammar. In reaction to Marcus' (1993) criticisms of such work, Saxton (1995, 1997) developed Contrast Theory, under which negative evidence is defined as any adult response "directly contingent on a child grammatical error…characterized by an immediate contrast between the child error and a correct alternative" (Saxton, 2000, p.4). (1) and (2) are examples of negative evidence under Contrast Theory:

(1) Child: *He was the baddest one
Adult: Yeah, he seems like the worst
(2) Child: *But I won't have many left (referring to a pot of chocolate mousse)
Adult: You don't have much left (Saxton, 1995)

Under Saxton's definition of negative evidence, it is possible for adult utterances differing only in their position in the discourse to be interpreted as either positive or negative evidence. Thus if the utterance *Yeah, he seems like the worst* in (1) was not contingent on child error, it would be considered positive evidence. In (1) however, *worst* is contingent on the child's erroneous overgeneralization of the superlative (*baddest*), and is thus a form of negative evidence.

In order for the adult responses to serve as corrective, the child must recognize that an adult utterance presents a relevant point of contrast to his own (Saxton, 1995). Consider the following data:

(3) Child: *__Her's__ going to a party
Mother: __She's__ going to a party, is she?
(Gail, Manchester corpus, session 22b)

Under Contrast Theory, the adult's use of the nominative pronoun *she* likely surprises the child, since it is likely she has until now been assuming that her conversational participant was referring to a single person within their shared, defined conversational context. As Saxton (1997) outlines, "the child's faith in the interchangeability of the two forms may be shaken," leading her to "perceive his own selection as ill-favored" (p.156). Because children take their interlocutor's forms as the standard, the child is moved to shift her grammar to produce forms that match those found in the adult reply. This recognition on the part of the child avoids the criticisms of Marcus (1993); under Contrast Theory, the child is not, as Marcus suggests, required to come pre-equipped with knowledge of the adult grammar in order to identify her own utterances as ungrammatical. Saxton's theory *does* require the child to have both *her* and *she* as grammatical subject pronoun options in her grammar; that is, she must recognize that both the overgeneralized *her* and the correct *she* fulfill identical grammatical functions, and she must at some point converge on the latter as the one consistent with adult speech.

The idea that both the grammatical and ungrammatical forms must exist in the child's grammar points to the conclusion Saxton (2000) makes: using a longitudinal corpus of spontaneous speech from Eve (Brown, 1973), Saxton compares the effects of negative input with two non-corrective courses. Results revealed Eve's speech to contain more grammatical forms following negative evidence than following either of the two non-corrective sources. Crucially, however, this pattern was confined to the later stages of Eve's development, beyond the point where 50% of forms in Eve's speech are grammatical. 50% represents a period in development where corrective input may exert its strongest effect, as the child is wavering between correct and erroneous forms. These results support the view that negative input may facilitate the child's retreat from an overly grammar, but reveals that it cannot be a necessary component of the acquisition of grammatical forms – it is not required for the initial acquisition of constructions. However, it is at this point premature to rule out negative input as one of several factors that influences the child's retreat from overgeneralization.

An additional, and to my knowledge, novel aspect of Saxton's work is the clear distinction he makes between negative evidence and negative feedback. He defines negative feedback as an adult utterance "directly contingent on a child grammatical error" providing a "non-specific indication that something is amiss in the preceding child utterance" (2005, p.5). The following adult response is considered negative feedback:

(4) Child: *Why is our car the only?
Adult: The what? (Saxton, 1995)

According to Saxton, negative feedback is a vague signal to the child that his previous utterance is in some way degenerate. This leads Saxton to propose the 'Prompt Hypothesis" under which a discourse as in (4) can prompt the child to recall ungrammatical forms in cases where grammatical errors continue.

3 Pronoun Case Errors

One grammatical category that has not been examined in light of Saxton's Contrast Theory is the use of 3rd person accusative case pronouns in subject position. It has been noted by developmental psycholinguists for over 40 years that in the early stages of language development, children often makes pronoun case-marking errors (Huxley, 1970; Brown, 1973; Rispoli, 1994; Schutze & Wexler, 1996). Prototypical errors are found in utterances where an accusative pronoun, such as *him*, occurs where a nominative pronoun, such as *he*, is obligatory in the adult grammar. This phenomena, as seen in (5)-(8) is known as overextension of the accusative form (Rispoli, 1994;1998):

(5) Child: *Me goed ± me for I
(Jem 2;4; Aldridge, 1989, p.195)
(6) Child: *Her haves some tea ± her for she
(Hannah 2;7; Aldridge, 1989, p.178)
(7) Child: *Him can't see ± him for he
(Nina 2;1; Vainikka, 1994, p.295)
(8) Child: *Then us taked off all our clothes ± us for we
(Douglas 3;4; Huxley, 1970, p.164)

Like most errors in child speech, mistakes with case marking are subject to considerable individual variation. Even when matched for age, gender, and socioeconomic status, measurement of case-marking errors can vary as much as 40%, as reported by Croker, et al. (2001) between, among others, Anne and Gail of the Manchester corpora (Theakston, Lieven, Pine, & Rowland, 2000).

Because of their frequency in child speech (Rispoli, 1998 finds, for example, the mean overextension of *her* for *she* to be 52%), considerable analysis has been afforded to these errors. Their high frequency makes them suitable for the present purposes; because only 1 subject will be analyzed, it is possible that less frequent errors may not be represented in the available sample.

4 Experimental Design

4.1 Research question

Is negative evidence as defined by Saxton's Contrast Theory available to the language-learning child as a potential source of corrective information for her errors with pronoun case-marking in the subject position?

4.2 Methods

4.2.1 Participant

Data for this analysis was taken from Gail's transcripts of the Manchester corpora (Theakston, Lieven, Pine, & Rowland, 2000) of the CHILDES database (MacWhinney, 2000). Gail was audiotaped in her home for 1 hour on 2 separate occasions in every 3 week period, for 1 year. She engaged in normal play activities with her mother. Gail was chosen as a subject for 2 reasons. Firstly, the timeline of Theakston et al.'s (2000) study encompassed the period over which Gail was likely to be producing case-marking errors (1;11.27- 2;11.12). Secondly, previous research (Croker, et al., 2001) has found Gail to make these errors at a consistently high rate across the sample.

4.2.2 Data Collection

Each of Gail's 67 corpora was searched using CLAN, a computer program designed specifically to analyze data transcribed in the format of CHILDES. The 3rd person singular and 1st person plural pronouns were searched for in their contracted and bare forms, yielding 13 words of interest: *he, he's, him, him's, she, she's, her, her's, we, we're, we've, us, us's*. Crucially, the key words were searched for in the subject position only, as it is not of interest to what extent the child was using the correct case for pronouns in the object position. Errors involving the 1st person singular *me* in subject position were not considered because the immediately contingent adult response would likely not model the correct alternative. That is, if the child were to utter *Me ate the candy*, it is not likely the adult will respond with *I ate the candy* in the context of a conversation. The probable response would contain the 2nd person pronoun *you* in subject position. When a key word was located in the transcript, it, along with the immediately contingent adult response, were considered for further analysis. Child utterances coded partially unintelligible on the CHILDES transcript were excluded from the error-coding procedure. For qualifying child utterances, all instances of child case-marking errors were coded, regardless of other possible errors in the utterance. In coding, it was sometimes necessary to infer Gail's communicative intentions from the surrounding discourse to distinguish between possessive or pronominal use of *her* in subject position.

4.2.3 Coding

Adult responses to Gail's pronoun case errors were coded for 3 categories of input: negative evidence, negative feedback, and adult move-ons. This differs slightly from Saxton's (2000) coding procedure, under which positive input (i.e., the adults correct use of pronominal nominative case in subject position) and non error-contingent clarification requests were included as response categories. Here, non-error contingent adult responses were not differentiated, and responses were coded as negative evidence or negative feedback, if they modeled the correct alternative to the adult error. At times, the model form was separated from the child error by discourse marker such as *oh right* or *well*. The adult utterance immediately following such markers, if modeling the correct alternative, was coded as negative evidence/feedback. At time, the child repeated her error before the adult had an opportunity to respond. The adult response was considered contingent upon the child's second utterance only.

5 Results

The corpora contained 259 instances of the 3rd person pronoun masculine pronoun *he* (in base and contracted form), 42 instances of the 3rd person feminine pronoun *she* (in base and contracted form), and 83 instances of the 1st person pronoun *we* (in base and contracted form). Note that these are all found in the subject position. Of the 259 *he* instances, 11 were the accusative *him*; of the 42 *she* instances, 21 were the accusative *her;* and of the 83 *we* instances, 0 were the accusative *us*. This resulted in error rates of 4.4%, 47.72%, and 0%, respectively. These results are summarized in Table 1:

Table 1: % Case-marking errors for Gail

	Subject Position		
Case	He	She	We
Nominative	250	23	83
Accusative	11	21	0
% Accusative	4.2	47.7	0

The following are examples of Gail's errors:

(9) Child: *Him stand up (session 20a)
(10) Child: *Her's going to a party (session 22b)
(11) Child: *Her having wee (session 9a)
(12) Child: *Him driving (session 1b)

Gail's speech contained 32 (11 *him*; 21 *her)* instances of accusative case pronouns in the subject position, thus affording 32 instances after which adult

negative feedback, negative evidence, or move-on was possible. The following table summarizes the quality of adult responses to these errors:

Table 2: Adult responses to case-marking errors for Gail

	Him/Him's	**Her/Her's**
Negative Evidence	5	4
Negative Feedback	0	0
Move-on	5	13
% Negative	45.5	19.0
Overall % Negative	28.1	

An example of both negative evidence (13) and move-on (14) from Gail's corpora is provided below:

(13) Child: *Him's want to be a monster
Adult: Oh
Adult: He's a scary old bear, isn't he? (session 22a)
(14) Child: *Her's got a tie thing
Adult: A tie thing?
Adult: Yeah (session 23b)

There were no error-contingent responses that could be considered negative feedback.[1]

6 Discussion

The most notable aspect of these results is that negative evidence as defined by Saxton is readily available to the child under consideration. For nearly 30% of her pronoun case-marking errors, Gail's interlocutor immediately provided the alternative characteristic of the adult grammar. When this result is compared with the recent research centered on a discourse-based interpretation of negative evidence, it becomes apparent that a considerable degree of variability exists in the level of corrective input available to children. Saxton (2000) found that, overall, 56.1% of Eve's errors were responded to with some form of negative input. Bohannon & Stanowicz (1988) repot a figure of 34% for all kinds of grammatical error, while Farrar (1992) reports 22% across 7 morphosyntactic categories. Morgan, Bonamo, & Travis (1995) demonstrate that for Adam, Eve, and Sarah, article errors are recast at a rate of roughly 49%, while wh-questions are recast on about 11% of occasions. It appears as though Gail's interlocutor provides less negative input than has been reported in the literature, but because errors with 3rd person singular pronoun case-marking have yet to be examined in

this regard, it is not possible to judge qualitatively whether Gail's interlocutor is conservative or robust in the amount she reformulates her daughter's mistakes.

An additional interesting aspect of these results is the complete lack of negative feedback available to Gail. It appears that negative feedback is thus not one of the cues Gail makes use of in order to retreat from an overly general grammar, against Saxton's Prompt Hypothesis. Saxton is not entirely clear on the nature of the input he considers to be negative feedback, but treating it as equal to clarification requests (which encompass any request for clarification or confirmation in which the adult signals that the previous child utterance was misapprehended or inappropriate) is fitting. There are surely several different reasons an adult may seek further information about a child's presumably erroneous utterance; the adult may not have understood the conceptual message the child intended to convey, the pronunciation of the utterance may have been unclear, or the child may simply have uttered something the adult did not expect, given the context of the conversation. The multiple reasons for which negative feedback is required, coupled with the trouble the child is invariably presented with in classifying parental clarifications as such, makes this form of negative input unlikely to serve as a robust cue. However, despite the fact that Saxton advances the Prompt Hypothesis, he would likely not be perturbed by the fact that negative feedback is not available to Gail, as he does not suggest that either negative feedback or negative evidence is a necessary component of language acquisition.

These results are interesting not only for what they reveal about Saxton's hypothesis, but for what they reveal about a number of different aspects of Gail's speech. It is immediately apparent that the rate of overextension of *her* for *she* is much greater than that of *him* for *he*, 47.7% to 4.2%, respectively. This differential rate, however, can in part be attributed to Gail's sparing use of *she*, which results in a higher proportion of *her* errors than would be the case if *she* were produced in similar quantities to *he*. Despite this, it appears that Gail's relatively robust overextension of *her* is a pattern exhibited across various children. Vainikka's (1994) examination of Nina revealed the rate at which she overextends *her* is far greater than the rate at which she overextends *him*. Schutze (1997, p.13) reports that Nina produces 13 overextensions of *him* and 391 correct production so *he*, an error rate of approximately 3%. In contrast, Nina produces 141 extensions of *her*, and 15 correct productions of *she*, translating into an error rate of 90%. Rispoli (1994) reports similar trends. This asymmetry has been explained in Rispoli (1998), who suggests that children acquire the pronouns of English in isolated morphological paradigms. The form *her* is special, as it is used for both the 3rd person singular accusative and genitive cases. In the terminology of Pinker (1984), the phonological form *her* fills 2 'cells' (accusative and genitive) of the pronoun paradigm. It may be that the over-represented nature of *her* impacts the rate at which it is overextended. Although this appears to explain Gail's results, it doesn't explain why errors

involving *her* are much less susceptible to correction, relative to *him* (45.5% to 19.0%). One might expect, contrary to these results, that the errors with *her* in the subject position, being much less common and thus considerably more salient, to be more susceptible to adult correction. It is possible that the salience of an error is not a factor in the adult's (presumably unconscious) decision to model the correct alternative, perhaps because the adult simply does not monitor the child's error to this level of detail. This is an interesting direction for future work; because Saxton's negative evidence is not provided every time a child makes an error, the child must access statistical criteria in order for such feedback to serve as corrective. Thus, if one accepts that the adult does not monitor the frequency of the child error, as is suggested by the increased rate of correction after the more common error, then it appears that the child must be able to statistically monitor utterances in his input to a greater extent, relative to his adult interlocutor.

The nature of the construction containing the adult's error-contingent response is also of considerable interest. Saxton does not provide appendices with examples of utterances he codes as negative input. In Gail's corpora, the contingent adult responses were never a verbatim repetition of the child's utterances, with the ungrammatical word corrected being the sole difference. Thus, contained within Gail's corpora were dialogues such as (15) but never (16) or even (17):

(15) Child: ***Her's** not got any clothes on
Adult: She can't go to sleep without clothes on
(16) Child: ***Her's** not got any clothes on
Adult: **She's** not got any clothes on
(17) Child: ***Her's** not got any clothes on
Adult: She doesn't have any clothes on

This begs the question: to what extent are young children able to single out the relevant point of contrast between her and her interlocutor's utterances? As previously mentioned, in order for the child to be cognizant of the contrast, she must already be using *he* and *him*, *she* and *her* in the subject position. The contingent response will then not only model the correct alternative, but also push the child to reject his overextended use of the accusative pronoun. What is clear from this study is that the child must have both the nominative and accusative forms in her grammar in order to extract the contrast of erroneous and correct form from among the additional lexical, syntactic, and semantic variation in the contingent adult response.

7 Future Directions

It is clear that even from this preliminary study, one that tracks a single grammatical category for a single child, Saxton's negative evidence is in fact an available source of corrective information. Although it is difficult to say at what point negative evidence can be considered a 'robust' cue, a nearly 30% availability of error-contingent modeling is worthy of future systematic investigation. Future directions with respect to this study are many. It would be fruitful to examine Gail's responses to the negative evidence. Would she be more likely to use the correct adult alternative immediately after hearing it, or would negative evidence result in a longer-term effect? It would also be interesting to examine more children and their interlocutors in light of these results. Would other interlocutors pattern like Gail's mother in the amount they 'correct' children's errors with pronoun case-marking? And would other children pattern like Gail, producing many more errors with the 3rd person feminine pronoun? And, perhaps more importantly, at what point does negative evidence become available in the child's input, and at what point does the child make use of it?

8 Conclusion

Most nativist theories of language acquisition have considered conversational contingencies between adult and child inconsequential because, under these approaches, the corrective information they potentially contain is either too difficult to access or is ignored. That Gail's interlocutor does provide negative evidence in the form of immediate and correct responses to her overextensions of accusative case pronouns in the subject position points to the somewhat overlooked possibility that it is precisely in the conversational context that parental responses can cue the language-learning child that a specific part of his previous utterance was erroneous. This preliminary study adds to the growing literature that emphasizes the importance of the nature of input in the child's acquisition of a language; although negative evidence as defined by Saxton is not necessary for language acquisition, because it occurs contingent on pronoun case errors nearly 30% of the time, it can be concluded that, as Gail is monitoring the progression of her conversations, she is aware of this type of input. To what extent she makes use of it, and to what extent it varies across children and grammatical categories, has yet to be conclusively determined.

Notes

[1] Note that the total number of responses in Table 2 does not equal the total number of child errors in Table 1. This is because Gail, in 5 instances, spoke before her mother was able to intervene, creating two consecutive child errors. In these instances, the mother's response was

considered in the overall calculation of error rate, as this measurement should represent the discourse observed.

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The Sense of Three Perception Verbs in Mandarin

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1 Introduction

In language use, words tend to have multiple meanings and many of the meanings rely on the interpretation from the context and construction in which the word occurs. Oftentimes, the meanings and uses of a word will extend beyond its original domain through the cognitive domain general processes, including chunking, categorization and rich memory storage. (Bybee 2010) This paper will analyze and present the distinguished senses of three perception verbs *kan* 'look', *ting* 'listen to', and *jian* 'see' (will be referred to by the lemma KAN, TING and JIAN respectively in the following discussion). It will also attempt to address the constructions and functions that contribute to the extension of the senses.

2 Theoretical background

I worked within the context of usage-based linguistics (Bybee 2010), which investigates the usage and contexts of words and constructions in order to determined their meaning or function. Specifically, I will examine the grammatical elements and constructions that co-occur with the verbs and the senses that correlate with them.

I will be applying the notions of frame semantics (Fillmore 1976, 1982) and conceptual prominence (e.g. Langacker 1987, 1982) to the analysis of perception verbs. These theories account for various meaning extensions, by accounting for the participants of the perception frame or scenario and how they can be profiled (i.e. conceptually emphasized) by being positioned further up in the iconic structure (e.g. the object vs. subject slot) (Langacker 1987, 1990, 1991 provide a detailed discussion on profiling). The major participants of the perception event include the CONCEPTUALIZER, which is usually a human cognizer that perceives something, the PERCEPT, the object of a perception, a possible INSTRUMENT (e.g. the eyes or a device such as a camera), a possible REFERENCE OBJECT or LOCATION (e.g. looking past someone or something), as well as MANNER, TIME and LOCATION of the entire event. It is also evident that an occasional CONSTRUAL is involved in the uses, for example, when something is seen or interpreted in a particular way. In some of

these cases, there is a PERSPECTIVE as well, as in seeing something from a particular perspective, view, or school of thought. It is these participants that can be profiled, resulting in a variety of syntactic patterns and leading to potential meaning extentions. Because of the preferred clause structure of Mandarin (cf. Tao & Thompson 1994 for a detailed discussion of preferred clause structure of Mandarin), not all of these profiled items will appear in every example examined in this study, therefore they are not included through out the coding, but will be noticed and cited when they are of interest.

In picturing the domains of senses of the perception verbs, another concept relevant to the current study is prototype effect. Prototype effects derive from graded category membership, consisting a range of features that have been revealed in experimental settings, using natural and cultural categories. Graded membership can come about in an examplar model by the interaction of two categorization dimensions – similarity and frequency. Given that linguistics objects are not like natural objects that share characteristics, the frequency of occurrence might significantly influence categorization in language (Bybee 2010: 79). In this study, the senses that have the highest frequency appearing in the examples will be recognized as the prototypical usage of the word, as well as the domain in which the prototypical senses are located.

3 Methodology

The study is aimed at investigating the senses of the perception verbs, both within and beyond the domain of their literal meanings. The interaction of syntactic and pragmatic elements concurring with each verb will also be analyzed, hopefully to answer the question of how the senses of perception verbs extend in their context.

To provide a potential cross-linguistic comparison between English and Chinese, I tried to find out the parallels of the English perception verbs look, see, listen and hear in Chinese. It is apparently difficult to find a word in a different language with exactly the same semantic field, in spite of that, the Chinese verbs with the most overlap semantic fields with the listed English perception verbs are: KAN, JIAN, TING, *wen* ‘hear’. However, while *wen* ‘hear’ is an ordinary verb in classic Chinese, it is not as commonly used independently in the meaning of hear in modern Chinese. It is most of the time used as a morpheme which can not fully serve the function of a verb. The meaning of hear is usually achieved by a compound word with TING and a verbal complement, which will be touched upon in the following sections. Therefore, *wen* is not discussed in this study. On the other hand, although JIAN behaves as both a verb and a verbal complement, the two functions will be analyzed separately. Considering the reasons listed above, I decided to look at KAN and TING as the representation of visual perception verbs and auditory perception verbs, at the

same time, JIAN will be analyzed both as the parallel of see and its language specific function as a verbal complement.

The corpus I used for the study is the Lancaster Corpus of Mandarin Chinese (LCMC). Concordance lines of each verb were obtained from the LCMC Web Concordancer. The three verbs KAN, TING and JIAN have 1,478 tokens, 607 tokens and 1,469 tokens respectively. All the concordance lines were imported into Excel and assigned a random number between 0 and 1. The random numbers were sorted ascendingly. By doing this, all the concordance lines were in a randomized order. The LCMC corpus was marked with Part of Speech (POS) tag, however, some POS were miscoded by the LCMC tagging algorithm. Since this study focused on verbs, the usage of KAN, TING, JIAN as POS other than verbs was excluded. The POS was manually checked from the beginning of each randomized sorted data set and 200 qualified concordance lines were sampled for each verb.

To investigate the interaction of which CONCEPTUALIZER are carrying out the action and what the PERCEPTS are, KAN and TING were also coded for SUBJECT and OBJECT, both of which were coded in detail for ENTITY, ANIMATENESS and ABSTRACTNESS. Related to subject and object, TRANSITIVITY was also coded. Note that in Chinese, especially in the informal register (in this case in informal writing and speech or conversation in literature since LCMC does not include spoken data), the subject is often absent when the subject can be implied from the context. Sometimes a noun phrase occupying the position of subject is not actually the subject but rather the 'topic' of the sentence.(Li & Thompson 1981) In this study, only overt subjects found within a sentence were coded, omitted subjects or subjects implied by context were marked as 0. The objects, on the other hand, include any PERCEPTS found within the context following the verb. Otherwise, object will also be marked as 0.

The constructions in which the verbs exist and achieve the communicative purpose of speaker may include other functional elements. These elements sometimes provide information about how the verbs and construction behave within certain context and imply certain senses. Therefore these elements were also coded in the study, including AUXILIARY VERB, PARTICLE and ADVERB. Syntactic features of the sentences were also coded, including TENSE, ASPECT, VOICE, MOOD and POLARITY. Notably, the way of negation was coded in a separate column if the value of POLARITY is negative. Wherever an element is not applicable to a concordance line will be marked as 0. After finishing coding, the value of SUBJECT, OBJECT and syntactic elements and features will be examined with each domain.

The concordance lines of JIAN were firstly coded for VERB and VERBAL COMPLEMENT. Then I got two subsets of data: JIAN_VERB and JIAN_VERBAL COMPLEMENT. These two subsets will be coded and analyzed separately. JIAN_VERB will be mainly examined by DOMAIN and

SENSE. Coherent with the other two verbs, three categories will be coded under DOMAIN: PERCEPTION, COGNITION and OTHER. JIAN_VERBAL COMPLEMENT will be mainly examined by the verb preceding it, i.e., for what kind of verbs JIAN serves as the verbal complement.

4 Results

4.1 Visual perception verb KAN and auditory perception verb TING

4.1.1 KAN.

First, let's take a look at the distribution of senses and domains of KAN, as presented in Table 1.

Table 1 the domain and sense of KAN

domain	**sense**	**count**
perception	look at, see, watch	120
	read	12
	browse	2
	observe	2
	watch out	1
Perception total: 137		
cognition	consider, think, interpret, regard	35
	find out, know, realize, understand	4
	examine	3
	tolerate	2
	distinguish	1
	estimate	1
	expect	1
Cognition total: 47		
other	visit	10
	expect imminently	4
	try	2
Other total: 16		
Total: 200		

From Table 1, an overwhelming percentage of the usage of KAN still resides within its original domain of perception. Within the domain of perception, more than 97% of the tokens carry what are considered to be the literal meanings

appearing in the definition of most dictionaries: look at, see, watch and read. Interestingly, while the usage under the domain of cognition counts roughly for only 1/3 of the usage within the domain of perception, it enjoys more variety of senses. Still, more than half of the tokens carry a group of senses: consider, think, interpret, regard, the frequencies of other senses are much lower. Under the group of OTHER are a group of senses relatively random and unrelated. The most frequent sense is visit, which has the equivalent expression in English such as go to see somebody. However, the objects taken by KAN with the sense of visit can be variable, which shall be discussed later. When carrying the sense of try, KAN behaves more like a particle following another verb. The two tokens from the data set are:

(1) a. nǐ shuōshuō kàn
you say-say see
'*try to talk about it*'
b. wǒ xiǎng qǐng zhūwèi dada kàn
1SG want-to invite every-one answer-answe see
'*I would like to invite everyone to try to answer*'
wǒ chàngdǎo de jīngshén shì shénme
1SG advocate DE spirit is what
'*what is the spirit that I advocate?*'

With the sense of expect imminently, KAN is a morpheme in the word yǎnkàn 'soon; in a moment', which literally means eye-see, for example:

(2) a. yánkàn lí fēijī qǐfēi hái yǒu shíjǐ fēnzhōng
eye-see away airplane takeoff still exist more-than-ten minute
'*there are just more than ten minutes before the airplane takes off*'
b. péngdéhuái tóngzhì yǎnkàn dào le búhuòzhīnián
Pengdehuai colleague eye-see arrive PFV year-of-not-confused
'*Colleague Pengdehuai will turn 40 years old very soon.*'

4.1.2 TING.

The first step to look at is the sense and domain of TING as presented in Table 2. We can see from the table that senses under the domain of perception make up a larger proportion compared with KAN. However, the variety of senses narrows down to only two: hear and listen. Even the two senses are highly synonymic. Similar to KAN, a smaller proportion of usage under the domain of cognition has a bigger variety of senses. The most frequent senses obey, inquire and interpret counts 23 tokens out of 30 tokens of all 8 senses under the domain of cognition.

Table 2 Sense and Domain of the Auditory Perception Verb TING

domain	**sense**	**count**
perception	hear	100
	listen	67
Perception total: 167		
cognition	obey	9
	inquire	8
	interpret	6
	accept	2
	understand	2
	believe	1
	know from implication	1
	tolerate	1
Cognition total: 30		
other	attend	2
	appear as	1
Other total: 3		
Total: 200		

Among the 200 concordance lines of TING, overt subjects are marked in 143 sentences. Still, most of the subjects are human beings while the two exceptions are sound and thing. Below are the examples:

(3) a. tā de shēngyīn zài diànhuà lǐ tīng qǐlái hěn róuhé
3SG DE voice in phone inside hear up very soft
'*her voice sounds soft on the phone*'

b. hūnde sùde dōu yǒu, tīng qǐlái hěn fēngshèng
carnivore-food vegetarian-food all exist hear up very sumptuous
'*there are both meat and vegetables and it sounds very sumptuous.*'

c. chē zǎi duìjiǎngjī de gōngnéng kě chuáng shēng 15 gōnglǐ
car carry interphone DE function can conduct sound 15 km
'*car interphone can conduct the sound for 15 kilometers*'
què tīng bù chū fāngxiàng
but hear NEG out direction
'*but can not tell the direction*'

In (5a), the voice is the subject of 'hear' but it is actually the PERCEPTS. The verb TING describes the subjective feelings when someone hearing the voice. Similarly, in (5b), the verb TING indicates the prediction when someone hearing about a meal. In these two examples, TING still falls in the perception domain but has transformed into some senses other than its direct literal meaning. In (5c), the subject serves as a device to receive information in the form of sound. It can 'hear' by itself just as human ears, the verb TING remains its most basic meaning.

4.2 JIAN

Among the 200 tokens of JIAN, after the first step of analysis we acquire two subsets of data: the JIAN_VERB COMPLEMENT consists 53 tokens which are used as verbal complement and the JIAN_VERB subset consists 10 tokens which are used as a morpheme of a compound word with another verb and 136 tokens which are used as independent verb. We will look at the two subsets respectively.

Table 3 represents the main verbs for which JIAN serves as the verbal complement, usually the resultative complements.

Table 3 Counts of Main Verbs
When JIAN is Used as a Verbal Complement

kàn	*look*	32
tīng	*listen*	10
mèng	*dream*	5
qiáo	*glance*	3
piē	*glimpse*	1
wàng	*look over*	1
yù	*run into*	1
Total		53

Among the seven main verbs observed, four are visual perception verbs: KAN, QIAO, PIE, WANG. The others are auditory perception verb TING, unconscious mental activity verb MENG and physical activity verb YU. The total count for the four visual perception verbs consists roughly 70% of all the main verbs.

In the JIAN_VERB subset, 9 of the tokens of JIAN are used as a morpheme of a compound word together with another verb. We can see from the Table 8 that all the compound words observed in the data set have the meaning of

'meeting in some way', in other words, when JIAN is used as a morpheme in a compound word, it carries the meaning of 'meet' in the physical action domain.

Table 4 Meaning and Counts of the Compound Words in which JIAN is a Morpheme

compound word	meaning	counts
yuējiàn	*'make an appointment and meet'*	3
huìjiàn	*'formal meeting'*	2
jiējiàn	*'receive'*	4
yèjiàn	*'the younger visit the older'*	1
total		10

Finally, when JIAN is used as an independent verb, its senses and domains are in Table 5.

Table 5 Senses and Domains of JIAN as Independent Action

domain	**sense**	**counts**
perception	see	79
	refer to	14
Perception total: 93		
cognition	conclude	10
	expect	5
	consider	2
	interpret	2
Cognition total: 19		
other	meet	18
	experience	5
	exist	1
	expect imminently	1
Other total:25		
Total: 137		

Similar to KAN and TING, the senses under the domain of perception is the largest part among all senses. Particularly, all of the tokens of JIAN with the meaning of 'refer to' appear in academic literature, as in (4):

(4) a. gōngzuò guòchéng xiáng jiàn dì zhāng
work process detail see Chapter 3
'*for the detailed operation process, refer to Chapter 3*'
b. xiàn jiāng 2 suì xiǎoér de shēncháng gàosù jiāzhǎngmen
now JIANG 2-year-old toddler DE body-length tell parents
'*now inform the parents about the body length of 2-year-old toddlers*'
c. jiàn biǎo 5
see figure 5
'*(refer to Figure 5)*'

The senses under the domain of cognition count for a much smaller proportion, with half of the tokens in the sense of 'conclude'. The category of OTHER consists of a group of senses which do not fall into perception or cognition. 72% of tokens under this category carry the sense of 'meet'. With the sense of 'exist', what is worth to mention is that JIAN can not used without any modification to mean 'exist', but in the negation form bújiàn, which means 'lost; not found; not exist'.

5 Discussion

Considering the all the tokens of KAN, TING and the tokens of JIAN which are used as independent verb, we can see that the majority of the usage still resides in the domain of their literal meaning, as shown in Figure 1.

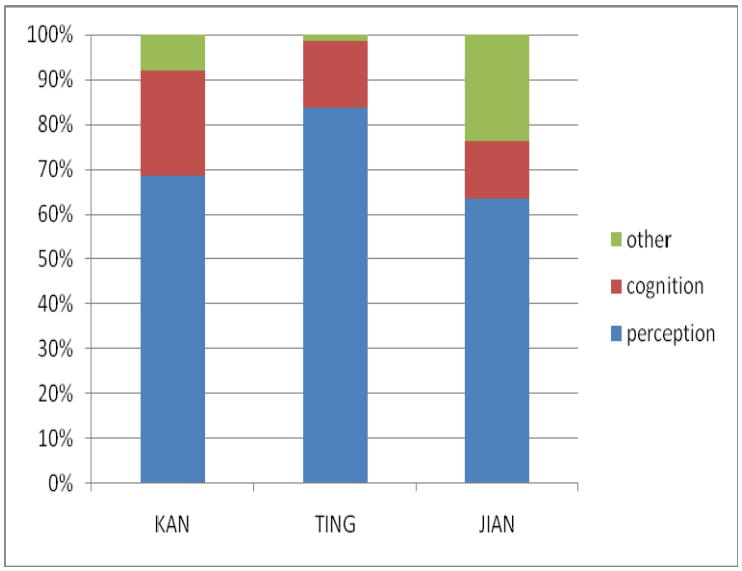

Figure 1 Distribution of KAN, TING and JIAN in each domain

Comparing the three perception verbs, the auditory verb TING has the highest percentage of usage that remains in the perception domain, while the visual verbs KAN and JIAN tend to have more tokens extending the senses into the cognition domain and other domain. JIAN appears to be the most versatile perception verb among the three. This finding suggests that the usage in perception domain is the prototype of the three verbs as it enjoys the highest frequency.

The tokens under the domain of perception take off the majority of all tokens, but with a smaller number of types of senses; on the other hand, the tokens under the domain of cognition consist a smaller proportion, but with a larger number of types of senses. The fixedness of usage is manifested by the ratio of type frequency to token frequency. (Bybee 2007) Therefore, usages under the domain of perception – the prototypes, are fixed while usages under the domain of cognition and other domains – the non-prototypes, are less fixed. From the data we can see that the prototype has a lower degree of productivity while less fixed usage enjoys a higher degree of productivity, i.e., when it comes to the usage of KAN and TING, compared to the domain of perception, the domain of cognition as well as other domains are more productive in the ways of having more types of meanings. This fact pertains to the common sense that when we use a word beyond its literal meaning and original domain, we tend to use more cognitive mechanisms to apply it with new meanings. We are more creative and have more freedom with less fixed rules.

If we combine the analysis results of the feature of SUBJECT and OBJECT, we can have the prototypical profiled frame of them:

Subject (person, animate, concrete) + VERB + Object (concrete)

The prototypical profiled frame is associated with prototypical meanings, i.e. the meanings within the domain of perception, while none prototypical profiled frame is usually associated with none prototypical meanings.

Text goes here. Text goes here. Text goes here. Text goes here.

6 Conclusion

In the study, the senses of KAN, TING and JIAN are investigated from a corpus-cased dataset. The results show that for all the tokens of KAN and TING as well as the tokens of JIAN that are used as independent verb, the senses within the domain of perception comprise the majority. Senses in other domain are more productive than the domain of perception. JIAN behaves not only as a verb but also verbal complement. As verbal complement it can follow a wide range a verbs. By examining the context of each verb, a pattern between the meaning and co-occurring elements was found, giving support to the theories that domain-general processes create new senses and uses in language.

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Syntactic and Pragmatic Properties of the Predicate '*kesi-*'[1]

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1 Issues

A cleft sentence is a general term applying to cases of a marked structure in which a focused constituent is extracted from its logical position. In other words, the cleft sentence, which is 'it-cleft' in English, is formed with the pattern 'It+be+XP$_i$+that…t$_i$….', functioning to bring about the focus that attracts the attention to the XP in the discourse. However, unlike 'it-cleft sentences' in English, Korean cleft sentences may have various patterns. According to Kim and Yang (2009), they can be classified into three types: Predicational, Identificational and Eventual as shown in (1-3).

(1) Predicational:
[[$_S$ _$_i$]-KES]-TOP XP$_i$-COP-DECL
[John-i _$_i$ ilk-un kes-un] [kacca]$_i$-i-ta
John-NOM read-MOD KES-TOP fake-COP-DECL
'*What John read is a fake.*'

(2) Identificational:
XP$_i$–TOP [$_S$ _$_i$]-KES-COP-DECL
[i chayk]$_i$-i palo [John-i _$_i$ ilk-un kes-i-ta]
this book-NOM very John-NOM read-MOD KES-COP-DECL
'*This book is what John read.*'

(3) Eventual:
[[adverbial], [$_S$ 'saturated clause']-KES]-COP-DECL
Kuttay [John-i cip-ey o-n] kes-i-ess-ta
the moment John-NOM home-LOC come-MOD KES-COP-PAST-DECL
'*It is at the very moment that John came home.*'

The three types of cleft sentences above consist of a cleft clause, an XP, and the copula verb. The predicational cleft in (1) consists of a cleft clause with a gap coindexed with *kacca* 'fake'; whereas the identicational cleft in (2) has the nominative phrase *i chayk* 'this book' as the XP coindexed with a gap in the following cleft clause. In case of the eventual cleft (3), there is no gap within the clause.

To analyze these three Korean cleft sentences above, Kim and Yang (2009) consider *kesita* as two independent elements, i.e. *kes* and *ita*. Besides, they posit three different patterns of Korean cleft sentences assuming that there are three different Korean copula verbs *ita* related to the constructions. In addition to these three different copula verbs, two different *kes*, i.e. bound noun and common noun, play an important role to explain the idiosyncratic behaviors of cleft sentences. These classifications seem to be neat, based on observing the structural patterns at issue.

However, it does not mean that this approach accounts for all the properties of Korean cleft sentences, though Kim and Yang (2009) have provided such classifications. Unlike Kim and Yang (2009), we claim here that there are two types of *kesita* constructions in Korean and each focus construction has a different internal structure of *kesita*. More specifically, besides a copula construction including *ita*, *kesita* as a morphological compound constitutes eventual focus constructions which involve no gap, while *kesita* as a syntactic compound licenses identificational focus constructions with a gap. We will review Kim and Yang's theory and provide our analysis in the following section.

2 Properties of *kesi-* Constructions

There have been two main approaches to Korean cleft sentences, which are transformational and non-transformational. However, not a single transformational approach was found that classifies Korean cleft sentences into concrete construction patterns.[2] On the other hand, under the non-transformational approach, Kim and Yang (2009) can be the only analysis that categorizes cleft sentences into concrete types. In this section, we closely examine the classifications of Korean cleft sentences proposed by them.

2.1 Predicational

Kim and Yang (2009) consider the pattern in (4) to be a predicational type. Korean clefts syntactically behave like relative clauses, differently from topic constructions which can be either gapped or gapless.

(4) [John-i $-_i$ ilk-un kes-un] kacca$_i$ [+PRD]-i-ta.
John-NOM read-MOD KES-TOP fake-COP-DECL
'*What John read is a fake*.'

But, within this analysis, the fact that this sentence can be ambiguous can't be explained. When there is a gap in the cleft sentence, the missing element can be construed to be *kacca* as they suggested. On the other hand, Kim and Yang (2009) seem to have overlooked the possibility that when the missing element is not a gap but *pro* in the sentence, the clause with *kes* should be understood as a saturated sentence, meaning the event itself to be *kacca*. In

this reading, the reason that *kacca* is focused is caused by the copula *ita.* Unlike Kim and Yang (2009), we regard this pattern as a subtype of copula constructions, which means that it has nothing to do with *kesita* constructions.

2.2 Identificational

The Identificational type in (5) requires the nominative phrase *i chayk* 'this book' as the pivot XP coindexed with the missing object in the following cleft clause. In other words, this type requires NP and S with a gap to be saturated.

(5) a. i chayk$_i$-i palo [John-i -$_i$ ilk-un kes-i-ta].
this book-NOM very John-NOM read-MOD KES-COP-DECL
'*This book is what John read.*'
b. *i chayk-i palo [John-i *sosel-ul* ilk-un kes-i-ta].
this book-NOM very John-NOM the novel-ACC read-MOD KES-COP-DECL
'** This book is what John read the novel.*'

In the above test to show that S with a gap is obligatory, we can observe that saturated sentences in the Identificational type are not possible.

As we can see the sentences in (6), *kes* can be replaced with the antecedent common noun, *chayk* in (6a) and *sakwa* in (6b).

(6) a. i chayk-i palo John-i ilk-un *chayk*-i-ta.
this book-NOM very John-NOM read-MOD a book-COP-DECL
'*This book is the thing which John read.*'
b. i sakwa-ka John-i mek-un *sakwa*-i-ta.
this apple-NOM John-NOM eat-MOD an apple-COP-DECL
'*This apple is the things which John ate.*'

On the basis of this observation, *kesita* in this construction can be analyzed as not a single verb, but a compound verb.[3]

2.3 Eventual

Unlike the Identificational type, Kim and Yang (2009) believe that the Eventual type requires an AdvP and a S with no gap to be grammatical. To us, the adverb phrase seems to be optional, depending on contextual information.

At the first glance, it seems that AdvP is obligatory as shown in (7).

(7) a. Kuttay [John-i cip-ey o-n kes-i-ess-ta].
the moment John-NOM home-LOC come-MOD KES-COP-PAST-DECL
'*It is at the very moment that John came home.*'
b. ?[John-i cip-ey o-n kes-i-ess-ta].
John-NOM home-LOC come-MOD KES-COP-PAST-DECL

'?*It is that John came home*.'

c. *John-i cip-ey o-n sikan-i-ta.
John-NOM home-LOC come-MOD time-COP-DECL
'*It is the time that John came home*.'

Unlike (7c), (7b) appears to be natural when appropriate contextual information is given. Specifically if a speaker or a hearer both already knew the circumstantial information at issue, (7b) sounds better. But (7c) still sounds odd though appropriate information is given. Further, ***sikanita***, replacing ***kesita*** in the Eventual type, is not allowed unlike the Identificational type.

2.4 *Kesi-* is a complex verb or a single verb

To test whether ***kesita*** is a single verb (a morphological compound) or a complex verb (a syntactic compound), we provide the following data:

(8) a. i sakwa-ka John-i mek-un kes-i-ta.
this apple-NOM John-NOM eat-MOD KES-COP-DECL
'*This apple is what John ate*.'

b. i sakwa-ka John-i mek-un kes-*tul*-i-ta.
this apple-NOM John-NOM eat-MOD KES-PLURAL-COP-DECL
'*This apple is the things which John ate*.'

In the Identificational type as in (8), a Korean plural suffix such as *tul* can be intervened between ***kes*** and *ita*, which means that ***kesita*** in this case is a complex verb, not a single verb. On the other hand, ***kesita*** in the Eventual type does not allow any suffix to intervene between ***kes*** and *ita* as shown in (9).

(9) a. Kuttay sako-ka nan kes-i-ta.
the moment an accident-NOM happen-MOD KES-COP-PAST-DECL
'*At the very moment, an accident happened*.'

b.*Kuttay sako-ka nan kes-*tul*-i-ta.
the moment an accident-NOM happen-MOD KES-PLURAL-COP-PAST-DECL
'*At the very moment, it is the facts that an accident happened*.'

c.*Kuttay sako-ka nan kes-*man*-i-ta.
the moment an accident-NOM happen-MOD KES-only-COP-PAST-DECL
'*At the very moment, only an accident happened*.'

It is a property of a single verb that a predicate cannot be split by any element as in (9).

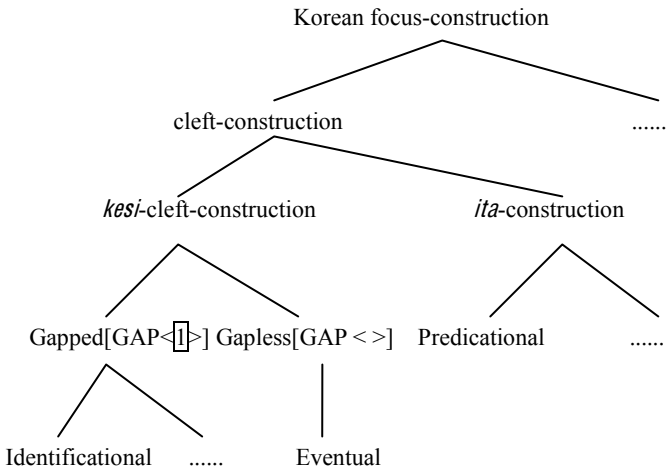
Hence, ***kesita*** in the Identificational pattern is a compound verb while that in the Eventual pattern is a single verb.

3 Our proposal: A Constrain- and Construction-based Analysis

3.1 Focus-constructions hierarchy type

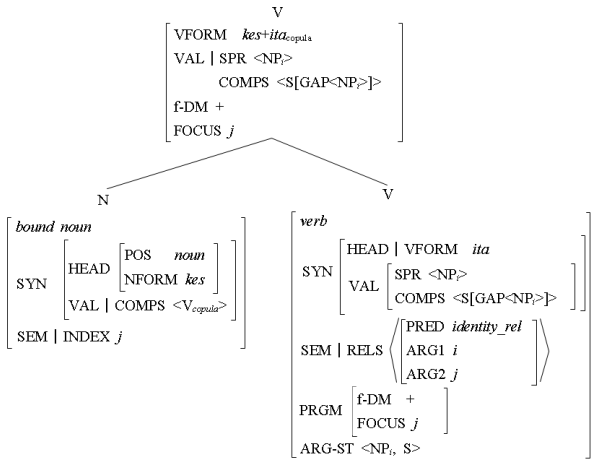
Kim and Yang (2009) suggest three different cleft types and lexical entries for *ita* to account for idiosyncratic properties of *kesita* constructions. On the other hand, we have claimed that *kesita* focus constructions should be two types, assuming the two different lexical entries for *kes.* To implement our claim into the current HPSG, we suggest a new Korean focus-construction hierarchy as follows:

(10) Korean focus-construction hierarchy [4]

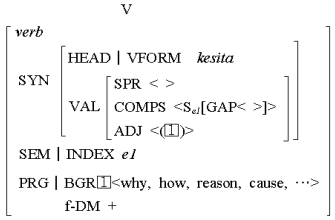


As shown above, Korean focus construction has two subtypes: one is *kesi*-cleft-construction and the other is *ita*-construction. Again, *kesi*-construction has two types: Gapped, i.e. Identificational type, and Gapless, i.e. Eventual type. In addition, the Predicational type belongs to a subtype of *ita*-focus construction. Further, the differences between Identificational and Eventual can be accounted for by setting up the two verb types as follows:

(11) a. Syntactic Compound Verb (Identificational)



b. Morphological Compound Verb (Eventual)



Given these tools, we can provide a constraint-based analysis for the *kesita* patterns mentioned above.

3.2 Our Analysis

3.2.1 Predicational

Sentence (1) can be ambiguously construed as in either (12) or (13). Specifically, '*ita*' may subcategorize for < S[GAP<NP$_i$>], NP$_i$[+PRD] > or < S[GAP< >], NP[+PRD] >. Under Kim and Yang (2009), (13) cannot be accounted for, simply because they overlooked the interpretation.

(12) John-i t_i ilk-un kes-un kacca$_i$ -i-ta.
John-NOM read-MOD KES-TOP fake-COP-DECL
'*What John read is a fake*.'

(13) [John-i *pro* ilk-un kes-un] kacca-i-ta.
John-NOM read-MOD KES-TOP fake-COP-DECL
'*The fact that John read something is fake*.'

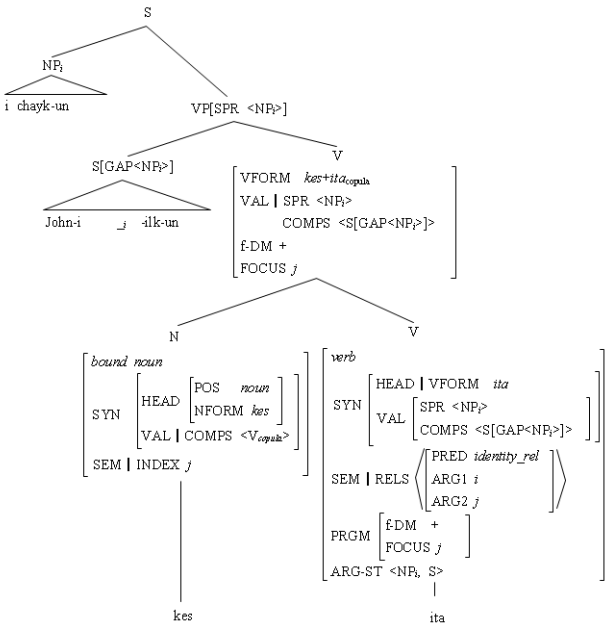
Assuming that this type is a subtype of *ita* construction, we can easily account for that the sentence in (12) means that something that John read is a fake. In this case, something refers to a missing element t_i. The sentence in (13) means that the fact that John read something (*pro*) is fake. In this case,

kacca is focused by not ***kes***, but a copula *ita*. So we can account for these meanings by including these patterns as *ita*-focus-constructions.

3.2.2 Identificational

Under our analysis, the Identificational focus constructions like (2) can be represented as follows:

(14)

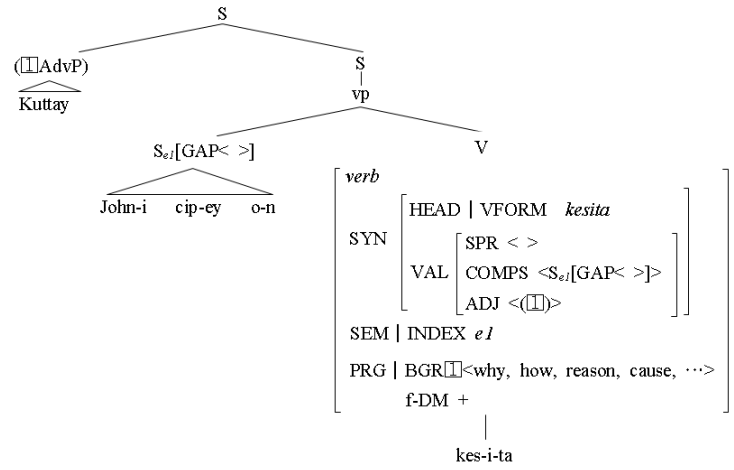


The noun ***kes*** combines with the copula *ita* on the bottom. Here the copula has a GAP feature which is inherited from the mother node V. The NP *i-chayk* functions as a filler of the GAP feature by coindexing with it. Thus, we can predict the Identificational type sentence to be well-formed as above.

3.2.3 Eventual

At last, the Eventual type (3) can be represented under our analysis as follows:

(15)



By the definition of the lexical entry in (11b), *kesita* as a single verb requires an S as a complement and an optional element AdvP. Thus, we can predict that the sentence (15) to be grammatical as shown above. In this analysis, it is important to note that the index *e1* gives us the background (circumstantial) information about the event.

4 Concluding remarks

There has been a variety of attempts to analyze Korean cleft constructions. One of them is Kim & Yang (2009) in which *kesita*-constructions can be divided into three types. Though their classification is interesting, this analysis leaves unsolved problems such as the ambiguity in the Predicational type and the necessity of AdvP in the Eventual type. Moreover, their analysis seems to be complex in that they assume three cleft-types and three lexical entries for *ita*.

To solve the problems that the previous analyses face, we have claimed that the Predicational type should be simply a subtype of *ita*-focus construction, and *kesita* can be regarded as either a morphological compounding verb or a syntactic compounding verb. In short, our analysis is more preferable than the previous analyses in that it enables us to give a simpler explanation for the structure of Korean cleft sentences and various linguistic properties related to focus constructions.

Notes

[1] This paper was presented at the 2011 WECOL at Simon Fraser University. We thank for questions and comments provided by the attendants in the conference.
[2] See Yoon (2005).
[3] Refer to Peter Sells (1994)
[4] Refer to Sag et al (2003) and Kim and Sells (2008).

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Features, Heads, and Argument Structure in Nominalizations

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1 Introduction

The paper investigates two types of nominalizations in the South Caucasian languages Georgian and Mengrelian in which mixed verbal and nominal categories may show a substantial overlap in terms of event-related functional projections such as AspectP, VoiceP/vP, CauseP, and Tense. The study focuses on the nominal structures referred to as event/process nouns in the literature (Grimshaw 1990, Alexiadou 2001, 2007 among others), and contrasts them with the result and derived nouns, which in these languages display quite a few verbal properties by being able to include Asp, CAUSE, Tense, and other verbal functional heads in their derivations. The main questions of research are: 1) which verbal functional heads occur in event as opposed to derived nouns; 2) why derived nouns with their elaborate verbal functional layer behave like simple underived nouns in lacking the ability to project argument structure. The paper arrives at the conclusion that it is primarily the morpho-syntactic features on the functional heads related to eventive interpretations of nominals that define whether the derived nouns can project argument structure or not.

The paper provides converging evidence for licensing the common patterns of temporal, aspectual, and manner adverbials in both event and derived nominalizations, which goes against the mainstream theory (Grimshaw 1990 and Alexiadou 2001) in allowing these modifiers in the environment of derived nouns. Moreover, the adverbials like *in an hour* and *for six weeks*, which do not typically occur with result or simple event nouns, may also occur with derived nouns in these languages. Following other accounts, the paper proposes that the potential to project event structure is present in event nominal, but the ability to license temporal, aspectual and manner adverbials is attributed to the functional layer and specifically, to the features on the event-related functional heads such as vP, AspP and Tense. The same conclusion has been reached about the

argument structure in these nominals, which contains both thematic and non-thematic arguments in event nominal, while derived nominals project only non-thematic referential argument called R like result nouns (Di Sciullo & Williams 1987, Higginbotham 1985, Grimshaw 1990). The study concludes that theta-assigning properties of event nominals are present in these languages, but derived nominals lack them due to the absence of event structure.

1.1 Three types of nominalizations and derived nouns

According to Grimshaw (1990), there are three main classes of nominalizations: Class I represents *complex event nominals*, Class II *result* nominals, and Class III, which is very similar to Class II, includes *simple event nouns* such as *race, trip*, etc. According to Grimshaw, only Class I nouns can license the argument structure since they include event subcomponents, which license the arguments in syntax[12]. Class II and III nouns are similar to each other in that they are interpreted as a result or a simple event and unable to support the argument structure. Grimshaw illustrates that morphologically in English the three classes may be ambiguous between event and result interpretations. For example, affixes like *-ation* and *-ment* in English are associated with both event and result readings, while the affix like *–ing* with just eventive reading. Therefore, *The examination of the students* may be interpreted as event or result nominal. It may also be argued that *–er* is only associated with result readings, the notion that will be of importance below for the analysis of derived nouns. Grimshaw's account attributes the verbal properties of event nominals to lexical properties of the nominals (stem-affix combinations).

According to Grimshaw, argument structure is the property linked to both verbs and event nouns. She argues that the presence of the internal argument *students* is mandatory for event interpretation of this nominal in *The examination of students*. In its result interpretation, this type of nominal cannot be broken up into aspectual subparts because of the lack of the non-thematic Ev argument and associated reading (Higginbotham 1985 and Grimshaw 1990). Note also that the nominal *exam* derived from the same root as *examination* cannot express event semantics and that it does not function as a theta-assigner like the *examination* in its eventful reading. *The exam* does not require an internal argument for its result reading:

(1)a. The examination of the papers	process
b.*The exam of papers	result

I expect that this type of difference is universal and in fact, Georgian shows the same with respect to event and result nouns derived from the same root:

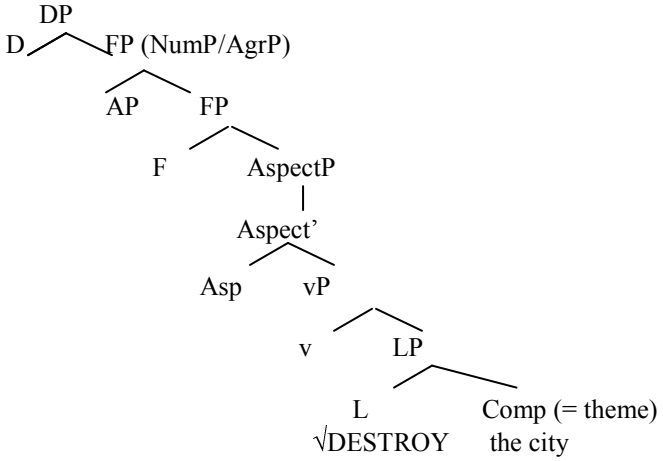
(2) Georgian

a. sabuteb-is gasinjva process
documents-gen examination
'The examination of the documents'

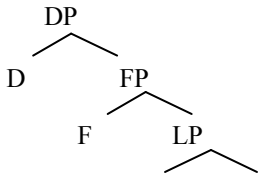
b.*sabuteb-is gasinjva result
documents-gen examination
'The examination of the documents'

Alexiadou argues that the lack of the genitive internal argument in result nominalizations correlates with the absence of the aspectual layer in the DP projection of the nominal. For example, when the root √destroy combines with the aspectual layer and D in derivation, it is spelled out as an event noun *destroying* or *destruction,* while when it combines with FP, this allows the result nominal to be spelled out as *destruction* (4) and have a result meaning:

(3) Process/event nominals



(4) result nominal



(Adapted from Alexiadou 2001)

The common building blocks in these projections are the lexical element root and two functional layers designated with FP (NumP/AgrP) and DP as defining the categorical status of nouns. [3] Result nouns cannot have eventive

interpretation due to the lack of the verbal functional layer that includes AspP or TP. In other words, the interpretive and syntactic differences between these classes of nominalizations are ascribed to the functional layer projected above the roots.

As it is shown in Section 1.2, derived nominals in Georgian and Mengrelian have very similar functional layer to that of event nouns but their theta-assigning properties differ from event nouns and verbs, and they do not project argument structure. Here it should be noted that most of derived nouns have the interpretation of *–er* nouns of English but they may have not only active agentive interpretations, but passive ones as well. The following section presents the empirical data of these nouns in the named languages and then their syntactic and morphological analyses are presented.

1.2 Common morpho-syntactic properties of event and derived nominals

Here are some common morpho-syntactic properties of event nominals and derived nouns:

(1) Both event/process and derived nominals include preverbal morphemes marking viewpoint aspect and contrast with respect to completeness of an event expressed by the root:

(5) Aspectual markers in process/event nominals

a. c'eril-is c'era zogjer did dros moitxovs.
Letter-gen writing sometimes a lot time requires
'letter-writing sometimes requires a lot of time.'

b. c'eril-is da-c'era zogjer did dros moitxovs.
Letter-gen prev-writing sometimes a lot time requires
'letter-writing sometimes requires a lot of time.'

In (5a), *'c'era' 'writing'* does not express a completive product of an activity denoted by the bound root *'c'er' 'write'* while in (5b), *da-cer-a 'wrote'* has this interpretation due to the preverbal aspectual marker *da-*. Derived nominals can also be marked for aspect:

(6) Aspectual markers in derived nominals in Georgian

a. m-ket-eb-el-i[4]
Nom-do-TH-Nom-nom
'one who is doing V'

b. ga-m-ket-eb-el-i
prev-Nom-do-TH-Nom-nom
'one who did V.'

(7) Aspectual markers in Mengrelian

mo-ɣoreb-ul-i
prev-cheat-Nom-nom

‘Deceived person’

(2) Another common morpheme in event/process and derived nominals are the nominalizer affixes, which are realized with different phonological exponents in these classes of nouns:

(8) Nominalizer affixes in event/process nouns

a. –n
txov-n-a
request-Nom-stem
‘request’

b. –ol
c’-ol-a
lie-Nom-Nom
‘lying’

c. –om
dg-om-a
stand-Nom-stem
‘standing’

d. -v
kitx-v-a
read-Nom-stem
‘reading’

e. -∅
ga-puch’-eb[5]-a
prev-spoil-TH-stem
‘spoiling’

The five affixes (*-n, -om, -ol, –v and -∅*) are the VIs inserted into the nominalizer functional head and as the result of derivation, they occupy the post-base slot in the nominal template. Note also that *–ol* and *–om* show up in intransitive environments only with the roots that can be projected as intransitive verbs. All other markers show up both in transitive and intransitive environments.

Note that nominalizer morphemes add agentive meaning to derived nouns denoting the argument is active volitional or passive non-volitional:

(9) Active volitional subjects (*m-av, m-ar/al, m(a)- el*) in Georgian:

a. da-m-xat-av-i
prev-voice-paint-voice-nom
‘one who paints’/painter

b. m-c’er-al-i
voice-write-voice-nom
‘writer’

(10) The volitional subject in Mengrelian:

ma-njɣv-er-i
voice-lead-voice-Nom
‘leading person /leader’

(11) Non-volitional passive argument (*-il/-ul*) in Georgian (a) and Mengrelian (b):

a. da-xat-ul-i	b. o-šum-al-i
prev-paint-voice-nom	voice-drink-voice-nom
'painted'	'drink' (noun)

(12) Volitional arguments derived from intransitive roots (*m-av, m-an,* etc.) in Georgian (a) and Mengrelian (b):

a. m-brun-av-i	b. ma-ngar-al-i
voice-rotate-voice-nom	voice-cry-voice-nom
'rotating (thing)'	'crying person.'

The nominalizer morphemes glossed here as 'Voice' in (9)-(12) indicate the agentive/non-agentive contrast in these nouns. There is no evidence that these affixes are sensitive to the transitivity property of the roots as shown in event nominals above. They are inserted for the realization of other morpho-syntactic features whose content and value are clarified in Section 4.

(3) Both event and derived nouns may include the affixes associated with the formation of the periphrastic causatives of *X makes Y do V* type, and expand the argument structure by the mandatory causer and the causee arguments merged as PP complements in these nominals:

(13) Event nominals including CAUSE:

a. da-c'er-a	b. da-c'er-in-eb-a
prev-write-stem	prev-write-CAUSE-TH-stem
'writing'	'making X write something'
c. da-uto-eb-a	d. da-uto-eb-in-eb-a
prev-iron-TH-stem	prev-iron-TH-CAUS-TH-stem
'ironing'	'making X iron something'
e. c'a-kitx-v-a	f. c'a-kitx-v-in-eb-a
prev-read-Nom-stem	prev-read-Nom-CAUS-TH-stem
'reading something'	'making X read something'

In (13a-c-e), the event/process nominals without CAUSE naturally have complex event structure and they require the mandatory internal argument such as *documents* in the *destruction of documents*. Nominals in (13b-d-f), besides the genitive internal argument theta-marked with the postposition corresponding to *of* in English additionally require another argument also marked with the postposition under the maximal nominal projections.

(4) Another common property of process/event and derived nominals is that they can occur with manner, temporal, and aspectual adverbials, which is a bit surprising of derived nominals as they are not interpreted as eventive:

(14) Process nominal with the manner adverbial in Georgian
dokumenteb-is *mtlianad/ saidumlod* ganadgureba
documents-gen completely/secretly destruction
'complete destruction of documents'

(15) Derived nominals with the manner adverbials:
mtlianad/saidumlod ganadgurebulma veɣar ixeira.
completely/secretly destroyed could not live.well
'completely/secretly destroyed could not live well.'

As seen above, these derived nominals can license manner adverbials. The following examples illustrate temporal and aspectual adverbials with both event/process and derived nouns:

(16) Temporal adverbials with event/process nouns
prezedentis mier sabutebis *sharshan c'in* ganadgureba
president-gen by documents last year before destruction
'the president's destruction of documents two years ago'

(17) Temporal adverbials with derived nouns

gasul c'els damarcxebul-ma archevnebshi xelmeored monac'ileoba
last year defeated-erg elections.in once again participating
veɣar gabeda.
could.not dare
'defeated the last year could not resolve to participate in elections again.'

These data show somewhat unexpected properties of derived nominals licensing aspectual adverbials much like event/process nominals:

(18) Aspectual adverbials with event/process nouns

kirurgis mier operaciis normebis *xshirad* darɣveva
surgeon by operation-gen norms often violation
'the surgeon's frequent violations of the operation procedures'

(19) Aspectual adverbials with derived nouns
ɣamistevit shatilshi c'asuleb-ma k'argi dro gaatares.
night.awaken-instr. Shatili-in gone-erg good time spent
'Gone to Shatili awaken for the whole night, they had a good time there.'

The adverbial in (19), *ɣamistevit* , whose literal meaning is '*awaken throughout whole night*', represents a compound taking on the aspectual meaning due to its underlying durative component '*throughout*' and it can attach to the locative 'Shatilshi' '*in Shatili'*.

It is also notable that event nouns can occur with the adverbials clearly modifying events such as *in an hour* and *for a week* and it is also possible for derived nominal to occur with such modifiers:

(20) Event and derived nouns with the adverbial *in an hour*:
a. ert saatshi sabutebis gasinjvam uproblemod chaiara.
one hour-in documents examination without.ptoblem accomplished.
Lit: 'in an hour examination of documents went without problems.'

b. ert saatshi chamosulma q'velaperi sc'rapad daamtavra.
one hour-in arrived everything quickly finished.
'arrived in an hour finished everything quickly.'

c. naxevar saatshi ɣoris gamt'q'avebeli sxva cxovelebs miubrunda.
Half hour-in pig skin.remover other animals turned-to.
'the pig-skin-remover in half an hour turned to other animals'.

This test indicated a somewhat puzzling property of derived nouns. Both active and passive derived nouns license adverbial adjuncts of the type *in an hour*. The basic difference is that event nominals are the only group of such expressions capable of projecting argument structure while derived and result nouns are unable to do so. This difference is shown in the following examples in which event nominals license argument structure with the thematic arguments projected as *of* and *by* phrases like in the following English sentence adapted from Grimshaw (1990):

(21) The defeat of the liberals by Reagan (Grimshaw 1990:87)

The eventive nouns can license both arguments:

(22) sakartvelos damarcxeba turketis mier
Georgia-gen defeat Turkey by
'the defeat of Georgia by Turkey'.

The same configuration is not possible with the derived nominals, which cannot license *by* phrase, although the genitive argument is still possible with the derived noun:

(23)a. *sakarvelos dammarcxebeli turketis mier
Georgia-gen defeater Turkey-gen by
Lit: 'The conqueror of Georgia by Turkey'.

b. sakartvelos dammarcxebeli
Georgia-gen defeater
'the conqueror of Georgia'

As seen from (21)-(23), event nouns can license the argument structure while derived nouns cannot, especially the arguments occurring with *by* as in English structure in (22). It is evident that *–er* nominals cannot theta-mark the nouns occurring in the *by* phase. Consequently, the *by* phrase is not licensed and derived nouns cannot be interpreted as event nominals. As mentioned above, derived nominals still can occur with adverbials related to their temporal and aspectual interpretations. Why this happens will be explained in Section 2.2.

2 Analysis of the morphosyntax in event and derived nominals

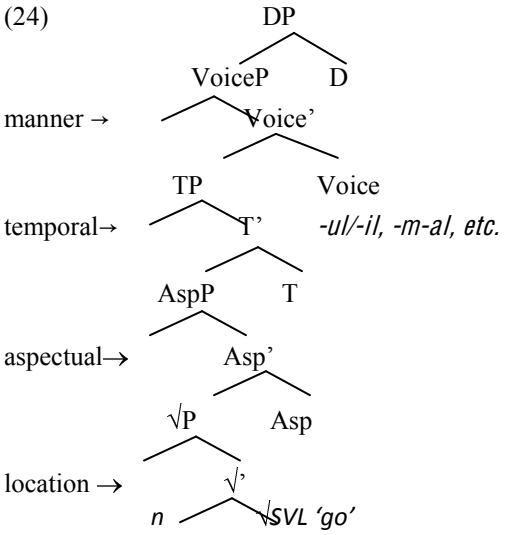
2.1 Aspectual properties of event and derived nouns

As shown in (5)-(6), a set of preverbal morphemes mark perfectivity in eventive and derived complex nominals. We argue that they express the viewpoint aspect, i.e. the perfective-imperfective distinction (Smith 1991 and that these markers alone cannot determine whether the argument structure can be projected or not because eventive nouns in (5) marked with the same preverbal marker as derived ones in (6) require the genitive internal argument DP, while the derived nominals in (6) may or may not. This is expected of the viewpoint aspect since many have illustrated in the literature (Smith 1991, Tenny 1994, Verkyul (1993), Travis 2000, Pustejovsky (1991) among others) that it is concerned with the endpoint of an event without explicating the role of the sentential elements like internal arguments in generating the accomplishment reading. This function to generate accomplishment reading is taken up by the situation aspect, which, according to Travis (2000) and others, is more basic type of aspectual dimension marking the distinction between *accomplishments* and *activities* as two main event types. Given this theoretical background it can be argued that derived nouns cannot have eventive interpretation just because of the morphological marker of the viewpoint aspect showing up in these nominals.

2.2 Analysis of adverbials with derived nouns

As shown in (13)-(17), temporal, manner, and aspectual adverbials are licensed by event and derived nominals in Georgian and Mengrelian. We assume that these adverbials attach to the verbal functional projections present in these nouns. It can be argued that in derived nouns, the aspectual adverbial can attach to the AspP. Similarly, the temporal adverbial in (24) can attach to TP, since in a limited sense this head is present in derived nominals. Finally, manner adverbials can attach to Voice as in event nominals. These attachment sites are illustrated in the following tree:

(24)



These attachment sites for adjoining adverbs to the verbal functional projections in nominals do not incur any consequences for the verbal properties in derived nouns, which in spite of verbal functional layer are unable to support argument structure. The next section clarifies why these nouns do not have a focal property of verbs and event nouns, which is a mandatory internal argument, nor the ability to generate argument structure.

2.3 Analysis of eventive structure in event and derived nominals

In the literature, eventive properties of nominals and verbs are often associated with the little v head in the maximal projections of these categories. I argue that there are two sources of variation of the head v in event and derived nominals shown in (11)-(13). Eventive nouns are sensitive to the transitivity property of the v and this can be due to the feature [± transitive] on this head. Consequently,

the v head in event nouns realized with the nominalizer markers *–n, -v*, and *–∅* is specified for [±transitive] while the same head in event nominals marked with *–ol/-om* is specified for [-transitive]:

(25) The insertion rules for VIs:
-n/-v ↔ *n* /[± transitive]
-ol/-om ↔ *n*/ [-transitive]
∅ ↔ *n*/ elsewhere

In both environments, the genitive internal argument is mandatory for these nominals, which is required by the eventive properties of these structures. The natural question is whether these features have any bearing on the ability of these nouns to project argument structure. The hypothesis regarding this is that morpho-syntactic features like [± transitive] may not have any direct effect on argument structure-projecting properties since they do not relate to event interpretation such as features related to tense, aspect, and mood properties, or evidentiality. Therefore, we argue that these features although important for distinguishing derived nouns from event ones, do not generally play any role in projecting argument structure.

Derived nouns are sensitive to the agentivity of the v head, not crucially to transitivity like event nouns. With the agentive v active nominals marked with *ma-al, ma-av*, etc. in (9) can be derived like gerunds and *–er* nominals of English. Furthermore, with the non-agentive v head realized with the exponents *–il/-ul* passive and the *destruction*-type nominalizations can be derived in Georgian. I argue that agentivity associated with the v head has nothing to do with the ability to project argument structure, and that the genitive argument present in event nominals is not required in derived nominals in these languages.

4 Conclusions

This paper has shown that event and derived nominals in Georgian show a certain amount of overlap in functional structure projected above roots and morphology realizing the verbal functional heads. As a result of these shared properties, they have common syntactic properties such as both event and derived nominals license temporal, manner, and aspectual adverbials. Derived nouns, therefore, differ from result nouns in that they can license various types of adverbial adjuncts typically associated with event nominals. The paper has argued that the presence of adverbial modifiers with derived nouns does not yet mean that these structures can project argument structure. In other words, the derived nominals do not have an event structure that can incur the projection of argument structure. Thus, in morphologically richer languages like Georgian and Mengrelian, nominalizations present an interesting data point with respect to

argument structure projecting properties of nominals and it deserves more detailed study given the empirical data in this paper.

Notes

[1]The difference between *event* and *process* nouns themselves is of no concern here as these classes differentially express aspectual properties within class I nouns such as *duration* of an event versus *accomplishment*

[2] The relevant question is what brings about the result interpretation in (2). Alexiadou argues that the presence of an additional functional category such as AspP is not necessary since a result can be derived from an aspectual head specified [RESULT] which dominates the root, as has been argued to be a case for stative participles by Embick (2000). Thus, the result meaning is derived through a combination of Aspect and the root. Roots in this account are taken to be primitives in the spirit of Doughty (1979) and Alexiadou takes roots to bear the semantics of the resultant state.

[3] Note that the glosses in these nouns indicate the following morphological items: Nom stands for Nominalizer affix, TH for a thematic affix, nom- for a nominative case marker. Also notice that the nominalizer affixes are often circumfixes that go on both sides of roots; voice stands for voice morphology, such as active, passive or median; prev- for the aspectual-directionality marker, CAUS- for the periphrastic causative affix, and -stem for a stem suffix.

[4] Note that –eb is a thematic marker typically showing up in certain series of verbs and we do not analyze it as a nominalizer morpheme. None of these nominalizer affixes show up in verbs except –v in very rare instances and this is why we analyze them as nominalizing morphemes.

[5] Note also that the derivation of these nouns are morphologically different from simple result nouns derived from the same roots such as 'painting' '*na-xat-i'* and 'letter' '*c'er-il-i'* , which do not occur with preverbal aspectual markers but still have the derivational morphology associated with referential reading like *na-* and *–il*. We do not analyze such result nouns in this paper as said at the outset.

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The Preservation of Tones in Syllable Contraction of Taiwan Mandarin: an OT Analysis

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1 Introduction

This paper employs a constraint-based model of Optimality Theory (OT) (Prince and Smolensky 1993) to account for the preservation of the tone in syllable contraction of Mandarin, which is spoken by Taiwan residents. In recent years, Taiwan Mandarin speakers have reduced the pronunciation of expressions when having a conversation. For instance, speakers often reduce [tʂɤ51 jɑŋ51] as [tɕjɑŋ51] 'like this', involving the contraction of two successive syllables. The length of the contracted syllable may equal or be longer than that of monosyllable, but smaller than that of disyllables (Chung 2002). This phonological operation also takes place diachronically to function as a means of word formation (Tseng 2005). Some forms historically become new lexical items of a given language after they get contracted, such as [ɹwo51] from [ɹu35 kwo21] 'if'. Moreover, it is generally hard to find the contracted form's sources synchronically. In order to avoid the principle of contraction being changed over time, this present study is a synchronic analysis of syllable contraction of Taiwan Mandarin.

As for syllable contraction, much previous work concentrates on its segmental preservation, like Cheng (1985), who has suggested 'syllable contraction is a phenomenon where reduced forms are combined with each other after losing their segment.' Chung (2002) adopts Edge-In(EI) association (Yip 1988) to retain the segment of the sources. Hsu (2003) points out in addition to EI association, the sonority of the segment should be taken into consideration in the segmental preservation, namely, to preserve more sonorous units. With regard to the contraction of the tone, Hsiao (1999) shows how tones are retained in syllable contraction of Southern Min by EI association. Following Hsiao and Chung, however, we discover that edge-in model wrongly predicts the preservation of tones in syllable contraction of Taiwan Mandarin. . Thus, on the basis of my previous proposal (Lin 2011), this paper reveals that Optimality-Theoretic approach is able to avoid the problems of the edge-in model. It will demonstrate how the relation between tonal preservation and segmental preservation in syllable contraction of Taiwan Mandarin is captured

by means of output-to-output correspondence and constraint rankings under OT framework.

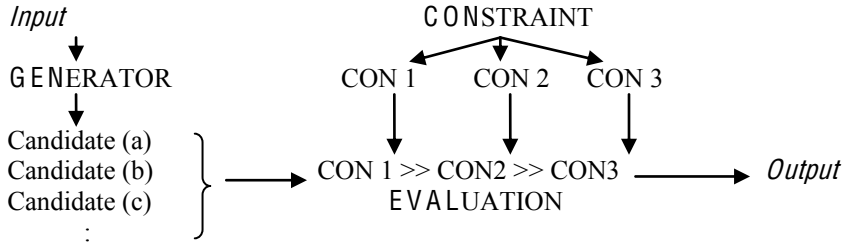
In this research all segments are transcribed in terms of International Phonetic Alphabet (IPA), and tones are transcribed by digital five-point scale (Chao 1930). There are four tones in Taiwan Mandarin, which are represented by 55, 35, 21, and 51, respectively. We organize this paper into the following sections. First, section 2 reviews theoretical backgrounds, including Optimality Theory, Correspondence Theory, and previous research essential to our discussion. Next, before applying OT approach, section 3 presents the patterns of tone preservation and generalizations in syllable contraction of Taiwan Mandarin proposed by my former study. Then, section 4 offers an OT analysis for the question of why and how the tone of the sources are preserved, and finally section 5 is a conclusion.

2 Backgrounds

2.1 Optimality theory

Prince and Smolensky (1993) proposes Optimality Theory, which is a constraint-based framework different from the traditional model of The Sound Pattern of English (Chomsky and Halle 1968). OT framework does not develop on the basis of ordered rules, rather, it proposes that the grammar of language can be driven by a universal set of constraints. Different languages are captured by different rankings of the constraints. Under the model of OT, the surface output is the best one among the competitions of the possible candidates. The competition is fulfilled by means of GENERATOR and EVALUATION, as in (1).

(1) OT schema



Given an input in the OT schema (1), component GEN associates it with possible representations. These representations are referred to as *candidates*. CON contains a set of ranked constraints. The ranking is used to evaluate the possible candidates. There is no intermediate stage for evaluation within the model. Candidates go through a parallel evaluation of the ranking of the

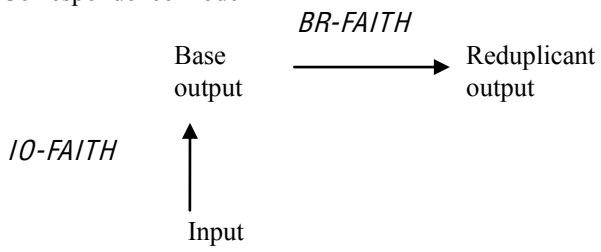
constraints and the constraint ranking selects the most harmonic one as the optimal output.

In OT, constraints are universal, violable, and ranked language-particularly. Specifically, the universality of the constraints means that the same set of constraints is used to construct grammar in all languages. These constraints are ranked in different ways, depending on the nature of a given language. In addition, these constraints can be violated. The violation of a lower-ranking constraint can be allowed in order to fulfill the requirement of a higher-ranking constraint. The optimal output is selected if there is no violation or only the minimal violations of the constraints or by the satisfaction of a higher-ranking constraint.

2.2 Correspondence theory

Constraints in OT are divided into faithfulness constraints and Markedness constraints. Faithfulness constraints, which regulate the consistency between two strings, are used to examine the relation between a given input and its surface output. McCarthy and Prince (1995, 1999) present a correspondence model that uses faithfulness constraints to account for the relation between the reduplicant and its base. Benua (1995) refers to the relation between two outputs as Output-to-Output correspondence. The main idea of Correspondence Theory is that correspondent elements, including input-to-output (IO) relation and base-to-reduplicant (BR) relation, should be governed by faithfulness constraints. Thus, the family of faithfulness constraints, including MAX, DEP, IDENT, LINEARITY, and CONTIGUITY, has to be more specific to account for IO faith and BR faith, as (2) shows.

(2) Correspondence model



2.3 Hsiao (1999)

Hsiao (1999) points out there are five types of tone contraction in Southern Min, as (3) presents. The first type preserves the first tone of the first source and the second tone of the second, as in (3a). The second type has the same way of

preserving tones as that of the first type but raises the pitch value of the first tone, as in (3b). The third type of tone contraction is also identical to that of the first type but raises the pitch value of the second tone, as in (3c). The fourth type preserves the tones of the first source, as in (3d). The fifth type preserves the tones of the second tone, as in (3e). (The preserving tone of the source is underlined.)

(3) The preservation of tones in Southern Min contraction

Contractum		Example	Translation
(a)	T1T4	tsa3̲3 hŋ5̲5̲ → tsaŋ35	'yesterday'
(b)	↑T1T4	ka1̲1 guan5̲5̲ kɔŋ53 → kan35 kɔŋ53	'tell me'
(c)	T1↑T4	pʰaʔ5̲ m1̲1 kī11 → pʰaŋ53 kī11	'loss'
(d)	T1T2	tsit5̲ e13 → tse55	'this'
(e)	T3T4	ka11 i3̲3̲ kɔŋ53 → ka33 kɔŋ53	'tell him'

According to Hsiao's analysis, all patterns in (3) can be explained by Yip's EI association, which is formulated in (4).

(4) Edge-in (EI) association (Yip 1988)
Associate the outermost unassociated melodic elements with the outermost unassociated skeletal slots one-to-one, until either all melodic elements or all skeletal slots are associated.

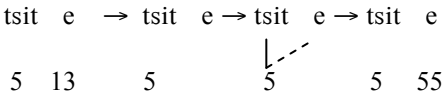
Thus, in the case of (3), all types preserve the initial tone of the first source and the final tone of the second source. The difference is that some types undergo tonal change, as (3b), (3c), and (3e) show. Hsiao proposes that the change of the tone occurs in order to assimilate to the neighboring high tone in register level, as formulated in (5).

(5) High register harmony (R: Register)

$$R \rightarrow [+high] \,/ \begin{bmatrix} [+high]\ \_\_ \\ \_\_\ [+high] \end{bmatrix}$$

Rule (5) predicts that if there is a high contracted tone after tone contraction, adjacent tones in the contractum also agrees on [+high] feature of H tone for a register assimilation, like (3b) and (3c). As for (3d), the second source undergoes a tone spreading before operating EI association, as processes (6) and (7) illustrate.

(6) Tone spreading



(7) EI association
tsit5 e55 → tse55

In brief, Hsiao (1999) suggests there are three rules for tone contraction in Southern Min. First, the second source loses its tone if it is a neutral tone, and gets the tone from the first source. Second, the initial tone of the first source and the final tone of the second source are preserved in tone contraction (EI association). Finally, for an assimilation in register level, contracted tones may change the tone to stay in high register.

3 Tone Preservation of in Taiwan Mandarin Contraction

3.1 The failure of edge-in preservation

The section illustrates how edge-in association fails to account for the preservation of tones in syllable contraction of Taiwan Mandarin. The contracted data are gathered from Chung (2006), as presented in (8).

(8) The preservation of tones in Taiwan Mandarin contraction

	Source 1	Source 2		Contractum	Translation
a.	tɕyɛ35	pu51	→	tɕyɛb35	'do you think so ?'
b.	tʂɹ55	pu51	→	tʂɹb55	'do you know?'
c.	tʂɤ51	jaŋ51	→	tɕjaŋ51	'like this'
d.	pu35	jau51	→	pjau51	'no'
e.	tʂɹ21	jau51	→	tɕjau51	'only'
f.	$p^hiŋ35$	$tʂ^haŋ35$	→	$p^hi\_aŋ435$	'usually'

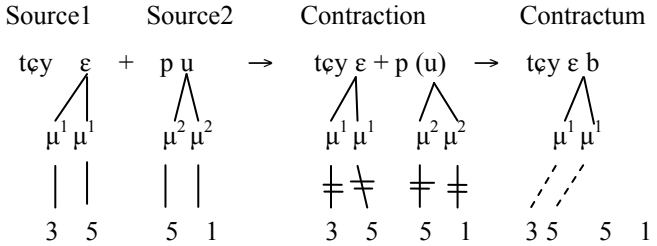
Each source word has two tones. When syllable contraction takes place, some tones are truncated but some tones are preserved. As a consequence, the number of tones of the contractum is less than the total tones of sources.

According to edge-in association, the tones at the leftmost of the first source and rightmost of the second source are preserved to form the contractum. However, in the case of (8), the edge-in model wrongly predicts 31 for (a), 51 for (b), 31 for (d), 21 for (e) and 35 for (f), which are ruled out.

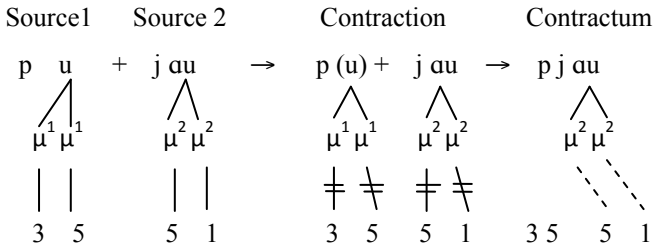
3.2 The account of autosegmental preservation

From an autosegmental perspective, I discover there are at least three strategies on preserving the tone of the sources in (8). The first strategy preserves the tones of the first source, as in (8a) and (8b). The second strategy preserves the tones of the second source, as in (8c-e). The third strategy preserves the high tone of the first source and the tones of the second source, as in (8f). On the basis of my former study, I propose that these strategies are governed by the preservation of segments' moras of the source. Specifically, when the mora of the source is preserved, its bearing tone is also retained in the contractum, as (9)-(11) formulate. (σ: syllable, O: Onset, R: Rime, μ: Mora, T: Tone, 1: the first source, 2: the second source)

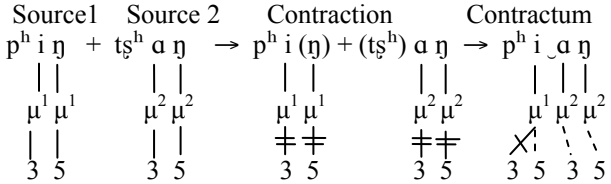
(9) The total preservation of tones of the first source



(10) The total preservation of tones of the second source



(11) The partial preservation of tones of both sources



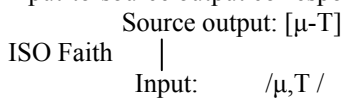
As (9)-(11) shows, the preservation of moras of sources accounts for the preservation of tones of source in a systematic way. When contraction occurs, the mora delinks its tone, some moras are lost, and the remaining moras look for their tones to associate. The mapping between mora and tone mostly remains faithful after contraction, except for (11) where a re-association occurs.

4 An OT analysis

In section 3 we claim that the contracted tone results from the preservation of tones of sources. That is, if the source's mora is not truncated, and then its bearing tone is also preserved in the contractum. This paper further accounts for the faithful relation between the preservation of the mora and the preservation of tone under an OT model, showing it is because of the interaction between faithfulness constraints and markedness constraints.

Now, let's look at how OT deals with the kind of faithful preservation. First of all, as for the source, we assume that each tone is realized only if it gets associated with a mora. In view of OT, this one-to-one mapping is captured by the requirement of constraints. We show an input-to-source output correspondence model (12), which presents how each tone correspond to its mora. There is no linking between mora and tone at the level of input. Through the evaluation of relevant constraints, only one-to-one correspondence is the best at the level of base output.

(12) Input-to-source output correspondence model



There are four relevant constraints related to the correspondence between the input and source output (ISO Faith), as given in (13)-(16).

(13) MAX-T-ISO
Assign one violation mark for every tone of the input that is not in the source output.

(14) $\sigma_{\mu\mu}$
Assign one violation mark for every source output with more or less than two moras.

(15) *Toneless(μ)
Assign one violation mark for every mora that does not bear tone.

(16) *Structure(T)
Assign one violation mark for every source output with tone.

MAX-T-ISO constraint prohibits tone deletion, $\sigma_{\mu\mu}$ constraint requires the source is bimoraic, *Toneless(μ) constraint requires every mora takes a tone, and *Structure(T) constraint disagrees any toned structure in terms of universal grammar. At the requirement of the four constraints, tableau (17) shows how the optimal mapping between mora and tone is selected. (The tone surrounded by the square means that it does not surface.)

(17)

/μ, T/	$\sigma_{\mu\mu}$	*Structure (T)	*Toneless (μ)	MAX-T-ISO
→ (a) μ μ | | T T		*		
(b) μ μ \ / T [T]		*		*!
(c) μ μ ∧ T T		*	*	
(d) μ μ [T] [T]			**	**!
(e) μ μ | T [T]		*	*	*!

As (17) shows, candidate (a) is the best output because it only violates *Structure (T). Other association types like (b), (c), (d) and (e) are harmonically bounded, causing more violations than (a).

Until now, we account for every mora of each base associated with every tone by one-to-one. As mentioned above, when contraction occurs, the number of moras is reduced as two or three. The further question is how four source tones compete with one another to associate with the remaining moras of the contracted form. To account for this, I propose an output-to-output correspondence model (18).

(18) Source output-to-contractum correspondence model

[μ-T] SOC Faith [μ-T]
Source output ——————— Contractum

Model (18) shows the faithfulness of mora-to-tone association that is captured by OT constraints, as in (19)-(21)

(19) MAX-Association-SOC (abbreviated as MAX-ASSOC)
Assign one violation mark for every mora-tone de-association in the contractum.

(20) MAX-μ-SOC
Assign one violation mark for every mora of the source that is not in the contractum.

(21) IDENT-Association-SOC (abbreviated as IDENT-ASSOC)
Assign one violation mark for each mora-tone association of the source changing in the contractum.

MAX-Association constraint requires that mora-to-tone association of the source cannot disappear. Thus, if there is a de-association, it will cause a violation of MAX-Association. MAX-μ-SOC constraint does not allow mora deletion. Therefore, if there is a reduction of mora, it will cause a violation of MAX-μ-SOC. IDENT-Association constraint prohibits the change of mora-tone association from base output to contractum. If there is a re-association, it will cause a violation of IDENT-Association.

There is a ranking between $\sigma_{\mu\mu}$ and MAX-μ-SOC, which guarantees the occurrence of contraction of the tone, as shown in tableau (22).

(22) $\sigma_{\mu\mu}$ >> MAX-μ-SOC

μμ+μμ		$\sigma_{\mu\mu}$	MAX-μ-SOC
→	a. μμ		**
	b. μμμ	*!	*
	c. μμμμ	**!	

In (22), $\sigma_{\mu\mu}$ favors candidate (a) over (b) and (c), since only (a) is a bimoraic structure. However, (a) causes more violations of MAX-μ than (b) and (c). For (a) being selected as the best output, $\sigma_{\mu\mu}$ must rank higher than MAX-μ.

Now let's use OT tableau to account for the first strategy that preserves the first source's tones, as in (23).

(23) The total preservation of tones of the first source

$\mu^1\mu^2$+ $\mu^3\mu^4$ 3 5 5 1	$\sigma_{\mu\mu}$	MAX-μ	IDENT-ASSOC	MAX-ASSOC
→ (a) $\mu^1\mu^2$ 3 5 [5][1]		**		**
(b) $\mu^1\mu^2$ [3][5] 5 1		**	**!	**
(c) μ^1 μ^2 3[5] 5[1]		**	*!	**
(d) μ^1 μ^2 3[5] [5]1		**	*!	**

As (23) presents, if the moras of the first base are only retained, it must violate MAX-μ and MAX-ASSOC. The reason for why candidate (b) is ruled out is that it causes more violations of IDENT-ASSOC because of the change of the association where moras are linked to the second base's tones. Also, (c) is ruled out by IDENT-ASSOC. The edge-in preservation, like (d), loses its effect because of the violation of IDENT-ASSOC.

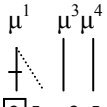
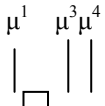
Again, IDENT-Association constraint plays a role in predicting the association of the remaining moras with tones. Since the moras of the second source are preserved alone, its tones are retained for satisfying the requirement of IDENT-Association, as (24) shows.

(24) The total preservation of tones of the second source

$\mu^1\mu^2$+ $\mu^3\mu^4$ 3 5 5 1	$\sigma_{\mu\mu}$	MAX-μ	IDENT-ASSOC	MAX-ASSOC
a. $\mu^3\mu^4$ 3 5 [5][1]		**	**!	**
→ b. $\mu^3\mu^4$ [3][5] 5 1		**		**

For addressing the third preservation strategy, a new constraint MAX-H-SOC, which assigns one violation mark for every H tone of the source that is not in the contractum, gets involved. Tableau (25) accounts for how the third strategy is manipulated.

(25) The partial preservation of tones of both sources

$\mu^1\mu^2$+ $\mu^3\mu^4$ 3 5 35	MAX-H-SOC	IDENT-ASSOC
→ a. 		*
b. 	*!	

The above tableau shows the ranking between MAX-H and IDENT-Association. Compared with (b) we expected, candidate (a) with re-associtaion is more favored by MAX-H but is less favored by IDENT- Association. Since (a) is the optimal output, MAX-H must ranks over IDENT- Association.

5 Conclusion

This study examines the tonal preservation in syllable contraction of Taiwan Mandarin, and addresses difficult cases that edge-in model encounters from the perspective of Optimality Theory. Key points include: (a) The preservation of tones of problematic cases are still systematic. (b) the preservation of segments can uncover the preservation of tones. (c) The mora-tone association tends to be retained from sources to the contractum. (d) H tone of the source has priority to be preserved.

However, maybe several issues should be further discussed. First, even though this study proposes that it is segment that uncovers the preservation of tones, so far we cannot predict which source get its tones preserved before discussing how segments of sources are preserved. Second, here we don't claim that the edge-in approach must be disregarded until we verify a large number of data. Third, it is better to discuss the priority of H tone preservation cross-linguistically to look for a universal account.

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Why Thompson River Salish Speakers Do Not Mark Focus Within Discourse Turns

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1 Introduction

Focus is often taken to be inherently presuppositional, yet Salish languages have been claimed to lack pragmatic presuppositions in the sense of Stalnaker (1974) (Matthewson 2006). What would a focus marking system look like in a language that lacks pragmatic presuppositions? This paper attempts to provde a preliminary answer to this question by investigating new fieldwork data from Nłeʔkepmxcin (Thompson River Salish),[1] a critically endangered Interior Salish language spoken in southwestern British Columbia. I show that, while speakers mark focus across discourse turns (such as question-answer sequences), they typically do not mark expected cases of narrow focus within their own discourse turn (unlike English *BILL$_{FOCUS}$ is sleeping, and SAM$_{FOCUS}$ is sleeping,* for example). I suggest that this is because speakers avoid introducing presuppositions triggered by focus marking unless they already have overt evidence from the addressee that the addressee believes that presupposition.

In section 2, I give some background on pragmatic presuppositions. I show that lexical presupposition triggers do not place constraints on Nłeʔkepmxcin Salish addressees, replicating the findings of Matthewson (2006) for St'át'imcets Salish. Section 3 shows that Nłeʔkepmxcin speakers mark narrow focus across discourse turns, but when a narrow focus is expected to be triggered within their own discourse turn, it is typically left unmarked. Section 4 accounts for this finding by appealing to cross-linguistic variation in pragmatics: while the speaker's own utterance counts for focus/presupposition marking in English, it does not necessarily count in Salish.

2 Background: Pragmatic Presuppositions

2.1 Previous work in English and St'át'imcets Salish

Recent work on St'át'imcets Salish (Matthewson 2006, 2008, von Fintel and Matthewson 2008) has argued for cross-linguistic variation in pragmatics in terms of how presuppositions are treated. Matthewson argues (following Gauker's 1998 model) that St'át'imcets Salish lacks pragmatic presuppositions in the sense of Stalnaker (1974). Pragmatic presuppositions are those for which

the speaker assumes that a presupposition P is in the common ground, such that P is held by both speaker and addressee.

In English, following Stalnaker (1974), felicitous use of a presupposition P requires that the speaker "assumes or believes that [the] addressee assumes or believes P" (Stalnaker 1974: 573). That is, P is part of the common ground for both speaker and addressee (Matthewson 2006: 2). Addressees that do not share the speaker's presupposition can challenge this. The challenge has been called the "Hey, wait a minute" test by von Fintel (2004, attributed to Shanon 1976). In (1), speaker B challenges A because B does not share the presupposition of *again*, namely that Henry has won the lottery before at some time in the past.

(1) A: Henry won the lottery again.
B: Hey, wait a minute! He's won the lottery before? I didn't know that!

On the other hand, in Salish, the addressee "may fail to assume a presupposition in context" (Matthewson 2006: 10). In other words, unlike English, there is no requirement that the speaker's presupposition P is part of the common ground for speaker and addressee. This means that addressees do not challenge presuppositions that they do not share. For example, speaker A's use of *muta7* 'again' in (2) does not result in a "Hey, wait a minute" response. As a result, St'á'timcets speakers are free to use presuppositions not shared by addressees. This results in licit overmarking of presuppositions; in English, overmarking of presuppositions is not felicitous and elicits a challenge (1).

(2) Context: As far as B knows, Henry is not a millionaire.[2]

A:	t'cum	**múta7**	k	Henry	l-ta	lottery-ha
	win.INTR	**again**	DET	Henry	in-DET	lottery-DET
	"Henry won the lottery again."					
B:	o,	áma.				
	oh,	good.				
	"Oh, good."			(Matthewson 2006: ex. (9))		

2.2 Replicating and extending the findings for Thompson Salish

Nɬeʔkepmxcin shows similar properties. Discourse-initial use of *ʔeɬƛuʔ* 'also' in (3) does not elicit a challenge, even though addressee B has no knowledge of anyone else having gotten hurt. Tellingly, B questions the truth-conditional content of A's claim, but not the presupposition that someone else got hurt.

(3) Context: Discourse-initial

A:	xa̓n'i=ʔeɬƛuʔ=xeʔ	e=Pátrick.[3]
	hurt=also=DEM	DET=Patrick[4]
	"Patrick got hurt too."	

B: ó, xə́n'i=n'.
oh, hurt=Q
"Oh, did he get hurt?"

As a new observation, I note that speakers typically avoid using utterances like (3A), that introduce presuppositions not shared by their discourse partner. When asked about conditions of use of utterances like (3A), consultants will comment on the presuppositional content of lexical presupposition triggers like *ʔeɬƛ̓uʔ*:

(4) Consultant 1 comment on (3A):
"If you're talking about somebody else getting hurt, you could say *xə́n'i ʔeɬƛ̓uʔ*. That means Patrick got hurt too. If somebody else got hurt."
Consultant 2 comment on (3A):
"Sounds like there's more than one person [that got hurt]."

2.3 The lack of presupposition challenges is not cultural

As Matthewson (2006) points out for St'át'imcets, the lack of challenges to "failed" presuppositions is not cultural. Nɬeʔkepmxcin speakers will challenge other inappropriate utterances. In (5), B challenges word choice ('lift' versus 'carry'), and in (6), B challenges pronunciation of the verb root 'met'.

(5) A: ʔe s-síx̣-n-x^{w} ƛəm'.
and NOM-lift-DRV-3O.2SGTS PERF
"And then you lifted it."
B: q^{w}ə́ɬ-n-x^{w}.
carry-DRV-3O.2SGTS
*"You **carried** it."*

(6) A: … [ptæn-ʃ].
… meet-TR.3O.3TS
"... she met her."
B: [ptɛn-ʃ]. [laughs]
meet-TR.3O.3TS
"Met."

One possibility is that speakers only challenge material that they know about: B knows about word choice in (5), and knows about pronunciation in (6), but does not know about the presupposed information in (3) (thanks to the audience at WECOL for this suggestion). However, this does not appear to be right: speakers will also challenge material that they don't know about, like the failed pronoun reference in (7) (thanks to Ileana Paul for pointing this out).

(7) Context: talking about Patricia's Uncle Simon
A: x^{w}úy'=xeʔ=nés mil't-m-s ɬ=kz'é-s ...
FUT=DEM=go visit-REL-TR.3O.3TS DET=grandmother-3POSS ...
u=ciʔ u=ɬ=pst-éwt.
to=there to=DET=across.water-isolate
"He was going to go visit x's grandmother ... across the river there."
B: *Like, whose* kz'é?
A: e=Patrícia e=k'zé-s.
DET=Patricia DET=grandmother-3POSS
"Patricia's grandmother."

2.4 Summary

So far, we have seen that in discourse in two Salish languages, speakers are free to introduce presuppositions not shared by the addressee, unlike in English where this results in a "Hey, wait a minute!" challenge. On the other hand, I have added the new observation that Thompson Salish speakers avoid introducing presuppositions not shared by their discourse partner.

3 Presupposition and Focus Marking

3.1 Focus as inherently presuppositional

Focus marking is often taken to be another type of presupposition trigger (Aloni et al. 1999, Aloni and van Rooy 2002, Geurts and van der Sandt 1999, 2004, Beaver and Clark 2008, Beaver and Geurts 2011; see also Sauerland 2005 on Givenness (Schwarzschild 1999) rather than Focus as the source of presupposition). For concreteness, I will follow Aloni et al. (1999: 58), who assume that the "first role of the Focus feature F is to trigger the presupposition that the background is among the topics under discussion."

In English, focus is grammatically marked via prosodic prominence. A common diagnostic for focus is the answer to a wh-question (e.g. Halliday 1967, Jackendoff 1972, Büring 2006), and wh-words are taken to be inherently focused themselves. In (8), focus marking on *Frank* triggers the presupposition that the background, here *x ate a cookie*, is among the topics under discussion.

(8) A: [Who]$_{\text{FOCUS}}$ [ate a cookie]$_{\text{BACKGROUND}}$?
B: [FRANK]$_{\text{FOCUS}}$ [ate a cookie]$_{\text{BACKGROUND}}$.
Presupposition: someone's eating of a cookie is under discussion

In (8), the presupposition triggered by the focus marking in B's answer matches that of the question. Thus, (8) is a felicitous discourse. When the focus marking does not match the question of discussion (9), this can trigger a "Hey, wait a minute" response, just like for lexical presupposition triggers.

(9) A: [Who]$_{FOCUS}$ [ate a cookie]$_{BACKGROUND}$?
B: #[Frank ate]$_{BACKGROUND}$ [a COOKie]$_{FOCUS}$.
Presupposition: Frank's eating of something is under discussion
A: Hey, I didn't ask you what Frank ate, I asked you who ate a cookie!

Focus marking is also triggered by contrast with a declarative utterance (10), and by contrastive contexts within the speaker's own discourse turn (e.g. *Bill* versus *Sam* in 11) (e.g. Rochemont 1986, Rooth 1992, Féry and Samek-Lodovici 2006, and many others).

(10) A: Tracy ate a cookie.
B: No, [FRANK]$_{FOCUS}$ [ate a cookie]$_{BACKGROUND}$.
Presupposition: someone's eating of a cookie is under discussion

(11) A: [BILL]$_{FOCUS}$ [is still sleeping]$_{BACKGROUND}$, and
[SAM]$_{FOCUS}$ [is still sleeping]$_{BACKGROUND}$.
Presupposition: someone's still being asleep is under discussion

3.2 Focus marking across discourse turns in Thompson River Salish

Across discourse turns, Salish speakers mark focus much like in English, except that focus is marked via a syntactic (clefting) strategy, rather than a prosodic marking (Kroeber 1997, Koch 2008, Koch and Zimmermann 2010, Koch 2011 on Nɬeʔkepmxcin; Davis 2007 for St'át'imcets; Benner 2006 for Sencóthen; Gerdts 1988 on Halkomelem pseudoclefts; Davis and Saunders 1978 on Nuxalk (Bella Coola); Kroeber 1999 for overview). In the subject focus case in (12), the presupposition of (12B) matches the question in (12A).

(12) A: swét=neʔ k=ex=ʕʷóy't.
who=there COMP=IMPF=sleep
"Who is sleeping there?"
B: c'é=xeʔ [e=sqaqx̣aʔ-íyxs]$_{FOCUS}$ [neʔ e=ʔéx ʕʷóy't]$_{BG}$.
CLEFT=DEM DET=dog-3PL.POSS there COMP=IMPF sleep
"It's [their DOG]$_{FOCUS}$ [there that is sleeping]$_{BACKGROUND}$."
Presupposition: someone's sleeping there is under discussion

3.3 Presuppositions via focus = presuppositions via lexical triggers

In section 2, we saw two behaviours in Salish for presuppositions triggered by lexical items like *also* and *again*. First, addressees did not challenge presuppositions that they did not share, meaning that speakers were free to introduce unshared presuppositions into the discourse. Secondly, speakers typically avoided introducing unshared presuppositions into discourse.

Presuppositions triggered by focus show the same two properties. First, as shown by Matthewson (2006), addressees do not challenge discourse-initial use of clefts. While Matthewson was interested in possible uniqueness or existential presuppositions found in English (and many other) cleft structures (Percus 1997, Hedberg 2000), I here point out that the presupposition generated by the focus marking in the cleft in (13A) also goes unchallenged. Speakers B and C have no knowledge of the presupposition generated by A's utterance, but do not produce a "Hey, wait a minute!" response, strikingly unlike in English.

(13) Context: Discourse-initial

A: c'é=ek^{w}u=xeʔ [e=Pátrick]$_{FOCUS}$
CLEFT=EVID=DEM DET=Patrick
[e=x^{w}úy' ç̣ən-xí-t-s piʔx̣áwt]$_{BG}$.
COMP=FUT ring-APPL-TR-2SG.OBJ.3TS day
"It's [Patrick]$_{FOCUS}$ [that will call you tomorrow]$_{BACKGROUND}$."
Presupposition: someone's calling you tomorrow is under discussion

B: Mm-hm.

C: ç̣ən-xí-t-i-s=xeʔ nwén' e=Pátrick ɬ=s-piʔx̣áwt.
ring-APPL-TRANS-1PL.O-3TS=DEM already DET=Patrick D=NOM-day
"Patrick already called us yesterday."

If speaker focus/presupposition marking is not binding on the addressee, then speakers should also be free to answer questions using a focus/background structure that does not match the preceding question. This prediction is borne out: in a judgement task using constructed discourses in which questions and answers were either matched or mismatched, listeners judged the discourse in (14) as felicitous, even though the presupposition generated by A and B do not match. In English, such discourses are infelicitous (c.f. 9) and elicit challenges.

(14) Context: Discourse-initial

A: sté?=xeʔ x^{w}úy' k=s=cúw=s e=Patrícia e=musésq't=us.
what=DEM FUT C=NOM=do=3POSS D=Patricia D=Thursday=3CONJ
"What is Patricia going to do on Thursday?"
Presupposition: Patricia's doing something on Thursday is under discussion

B: c'é=xeʔ [e=Patrícia]$_{FOC}$ [x^{w}úy' nés x^{w}es-x^{w}esít]$_{BG}$.
CLEFT=DEM DET=Patricia COMP.FUT go AUG-travel
"It's [Patricia]$_{FOCUS}$ [that is going to go travelling]$_{BACKGROUND}$."
Presupposition: someone's going travelling is under discussion
[offered and judged felicitous as possible answer to A]

To test the second prediction, namely that speakers do not typically use focus structures that introduce presuppositions not shared by their addressee, we can

turn to the findings of Koch (2008). In a corpus study of focus marking in discourse, Koch found that speakers typically do not use mismatched question and answer pairs. For example, subject focus questions are answered with subject focus clefts 92.9% of the time.

Thus, Thompson Salish speakers treat presuppositions triggered by focus marking just like presuppositions triggered by lexical items: they can introduce presuppositions not shared by the addressee, but typically avoid doing so.

3.4 Focus marking within discourse turns in Thompson River Salish

In English, we have seen that speakers can and must mark focus triggered by contrastive configurations within their own discourse turn (11, repeated as 15). (15) shows that in English, the speaker's own utterance of *Bill is still sleeping* is enough to count towards focus marking where "Someone's still sleeping" is presupposed as a question under discussion. This is done without any input from the addressee: as long as the addressee listens, the utterance *Bill is still sleeping* can enter the common ground for the purposes of focus/presupposition marking.

(15) A: [BILL]$_{\text{FOCUS}}$ [is still sleeping]$_{\text{BACKGROUND}}$, and
[SAM]$_{\text{FOCUS}}$ [is still sleeping]$_{\text{BACKGROUND}}$.
Presupposition: someone's still being asleep is under discussion

In Nłeʔkepmxcin, contrastive focus configurations that arise within the speaker's discourse turn are typically not marked. This is strikingly different from English, and also strikingly different from focus marking across discourse turns in Nłeʔkepmxcin, as we have just seen. Recall that focus is marked via clefting; in a case like (15), with subject focus, we would expect subject clefts to be used to mark focus on *Sam*, and possibly also *Bill*. (16) shows that this is not the case: two auxiliary/verb-initial clauses are used instead (aux/verb-initial clauses are used to mark focus on the verb or its extended projection – see Koch 2008, 2011, Koch and Zimmermann 2011). The literal translation of (16) is very unnatural in English. Because of the wide focus marking,[5] there is no presupposition generated at all (there is no information marked as background). This results in a radical undermarking of presuppositions within discourse turns.

(16) A: [ʔéx=iʔƛuʔ=xeʔ ʕʷóy't e=Bíll]$_{\text{FOCUS}}$,
IMPF=still=DEM sleep DET=Bill,
ʔeɬ [wʔéx=iʔƛuʔ ʕʷóy't e=Sám]$_{\text{FOCUS}}$.
and IMPF=still sleep DET=Sam
literally: *"[Bill is still SLEEPing]$_{FOCUS}$, and [Sam is still SLEEPing]$_{FOCUS}$."*

4 Account

How do we account for the cross-linguistic difference observed in (15) versus (16)? I will appeal to variation in pragmatic principles between English and Salish, following both Matthewson (2006), plus the new observation made in this paper that Salish speakers avoid introducing presuppositions into discourse when they lack overt evidence that the addressee shares these presuppositions.

In English, the addressee having listened to the speaker is enough to allow the speaker to mark presuppositions based on the speaker's own utterance. The speaker of (15) may reason as follows:

> I'll say *Bill is still sleeping*, and I will assume that the addressee has listened. Therefore, that utterance now counts as part of the common ground. Since *Bill is still sleeping* entails *someone is still sleeping,* I can focus *Bill* and *Sam*, thereby introducing the shared presupposition that someone's still being asleep is under discussion.

In contrast, for Salish speakers, we saw that speakers avoid introducing presuppositions into discourse if they have no overt evidence that the addressee shares this presupposition. Thus, the speaker of (16) may reason as follows:

> I've said *Bill is sleeping*, but I'm not going to assume that this utterance is accepted into the common ground without overt evidence from my addressee (e.g. an overt declarative or wh-question). Therefore I won't assume that *someone is still sleeping* is in the common ground as a question under discussion, so I won't mark *Bill* and *Sam* as focused because this would trigger precisely that unshared presupposition.

Recall that Matthewson (2006) found that presuppositions introduced by the speaker are not binding on the addressee. In those terms, if a presupposition introduced by narrow focus marking is not binding on the addressee, then the speaker may as well avoid using narrow focus marking in (16).

To formalize the pragmatic differences between the two languages, Matthewson proposed that the conditions on pragmatic presuppositions differ; as discussed in section 2, English has pragmatic presuppositions, Salish does not (17). I've added the new observation that speakers avoid introducing presuppositions based on their own utterances, without overt evidence that the addressee share these presuppositions (18); an initial attempt to formalize a new constraint to reflect these facts is shown in (19):

(17) Felicitous use of presuppositions in two languages
(based on Stalnaker 1974: 573, Matthewson 2006):
(i) English Pragmatic Presupposition Principle: The speaker assumes or believes that the addressee assumes or believes P.
(ii) Salish Pragmatic Presupposition Principle: The speaker does not need to assume or believe that the addressee assumes or believes P.

(18) Acceptance of propositions into the common ground in two languages (for purposes of focus/presupposition marking):
   (i) English common ground: The speaker assumes that an utterance heard by the addressee is in the common ground.
   (ii) Salish common ground: The speaker does not assume that an utterance heard by the addressee is in the common ground. The speaker relies on overt evidence for the addressee's take on the common ground.

(19) COOPERATIVE PRESUPPOSITION CONSTRAINT
Do not introduce a presupposition P not in the common ground, where
   (i) for English, the speaker's own utterance enters the common ground and counts as background when marking a new narrow focus and the resulting presupposition.
   (ii) for Salish, the speaker's own utterance should not count as background when marking a new narrow focus and the resulting presupposition.

Finally, the pragmatic principle in (19ii) is expected to be overruled when focus marking has truth conditional consequences. This is precisely what happens when speakers use the exclusive particle *ƛ̓u?* 'only' within their discourse turn. *ƛ̓u?* 'only' operates truth-conditionally on the focus marking of an utterance (Rooth 1996; Koch and Zimmermann 2011 on Nɬeʔkepmxcin). The prediction is therefore that use of *ƛ̓u?* 'only' will obligatorily trigger narrow focus marking *even within a speaker's discourse turn*. In the second line of (20), the speaker uses an object focus 'only'-cleft, focusing the DP *nce?* 'me,' even though there is no input from the addressee indicating that the addressee believes that 'who I cook for is under discussion.' This violates the pragmatic principle in (19ii). However, if the speaker didn't use a cleft (instead producing 21), they would be conveying an untrue proposition, namely that the only thing they do is cook for themselves. Truth conditions override pragmatic principles.

(20) téʔ=ƛ̓uʔ=teʔ k=s=k^{w}úk^{w}-x-ne téʔ k=swét.
NEG=only=NEG COMP=NOM=cook-APPL.TRANS-3O.1SG.TS NEG IRL=who
"[I never cook for anyone]$_{FOCUS}$."
cúk^{w}=ƛ̓uʔ ncéʔ e=ʔéx k^{w}uk^{w}-xi-t-sút.
CLEFT=only 1SG.EMPH COMP=IMPF cook-APPL-TRANS-REFL
"[I cook for]$_{BACKGROUND}$ only$_{1}$ [myself]$_{FOCUS,1}$."
Presupposition: Who I cook for is under discussion

(21) ʔéx=kn=ƛ̓uʔ k^{w}uk^{w}-xi-t-sút.
IMPF=1SG=only cook-APPL-TRANS-REFL
"I$_{BACKGROUND}$ only$_{1}$ [cook for myself]$_{FOCUS,1}$."

5 Conclusion

We are now in a position to provide an initial answer to the research question: what would the focus marking system in a language lacking pragmatic presuppositions look like? A closer look at focus and presupposition marking in Thompson River Salish has shown that, although speakers are free to introduce presuppositions not shared by the addressee (replicating Matthewson 2006 on St'át'imcets Salish), they typically avoid doing so. This is because speakers prefer not to mark presuppositions without overt evidence (in the form of a question or statement) that the addressee shares their presupposition.

The result for the focus marking system is that narrow focus is grammatically marked across discourse turns, when speakers respond to an overt wh-question or utterance by their discourse partner. Within their own discourse turn, however, speakers typically avoid marking narrow contrastive focus, unlike in English. This is because they lack overt evidence that the addressee shares the presupposition introduced by focus marking; and, if presuppositions are not binding on the addressee anyway (Matthewson 2006), then the speaker may as well simply not use narrow focus marking to trigger presuppositions. I have appealed to cross-linguistic variation in pragmatics to account for these differences between English and Salish. The fact that the pragmatic principle can be overridden when focus marking has truth conditional effects suggests that a pragmatic account is on the right track.

Notes

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[2] See Matthewson (2006) for a key to the St'át'imcets orthography.

[3] Nłeʔkepmxcin data are presented in the orthography developed in Thompson and Thompson (1992, 1996), and Kroeber (1997). I use acute accent ´ on vowels to indicate word-level stress. The phonemic key to the *orthography* is as follows (symbols not listed have the standard IPA interpretation): *c* = [ʧ], *ç* = [ts], *c'* = [ts'], *e* = [e, æ, a, ə, ɛ], *ə̓* = [ʌ], *i* = [i, ei, ai], *o* = [o, ɔ], *s* = [ʃ], *ṣ* = [s], *u* = [u, o, ɔ], *x̣* = [χ], *y* = [j, i]. See Thompson and Thompson (1992) in particular for the phonetic realizations of phonemic vowels across contexts.

[4] Symbols and abbreviations used in the Nłeʔkepmxcin glosses are as follows: '-' = affix, '=' = clitic, acute stress ´ = word-level stress, 1,2,3 = 1st, 2nd, 3rd person, APPL = applicative, AUG = augmentative reduplicant, BG = background, CLEFT = cleft predicate, CNSQ = consequential, CONJ = conjunctive (i.e. subjunctive), C(OMP) = complementizer, DEM = demonstrative, D(ET) = determiner, DP = determiner phrase, EMPH = emphatic, FOC = focus, FUT = future, IMPF = imperfective, INTR(ANS) = intransitive, IRL = irrealis, NEG = negation, NOM = nominalizer, NP = noun phrase, O(BJ) = object, OBL = oblique, PL = plural, POSS = possessive, Q = yes/no question, REL = relational (transitive), REFL = reflexive, SG = singular, S(UBJ) = subject, TR(ANS) = transitive, TS = transitive

subject suffix, VP = verb phrase. See Thompson and Thompson (1992, 1996), Kroeber (1997), and Koch (2008), for further details on glossed morphemes.

[5] An alternative is that aux/verb initial forms don't have any FOCUS marking at all – that is, they are unmarked for focus (e.g. Selkirk 2008, Rochemont 2011).

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Capturing the Non-optionality of Participial Codas in *There*-BE-Existentials*

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1 Introduction

English *there*-BE-existential sentences (*there*-BE-ESs) consist of *there*, *be* (BE), and a pivot, but they may also contain a present or a past participle (p) coda, in addition to/in lieu of a PP or an adjective phrase (AP) coda, as shown in (1-3). This paper looks at *there*-BE-ESs, with a view to illuminating the syntax and the semantics of p-codas.

(1) Bare-*there*-BE-ES:
There is [a rabbit]$_{\text{pivot}}$.

(2) *There*-BE-ESs with PP or AP codas:
a. There was [a live pig]$_{\text{pivot}}$ [at the picnic]$_{\text{PP coda}}$.
b. There was [no one]$_{\text{pivot}}$ [available]$_{\text{AP coda}}$.

(3) *There*-BE-ESs with p-codas:
a. There were [some men]$_{\text{pivot}}$ [shouting]$_{\text{present p-coda}}$ ([on the street]$_{\text{PP coda}}$).
b. There was [a live pig]$_{\text{pivot}}$ [roasted]$_{\text{past p-coda}}$ ([at the picnic]$_{\text{PP coda}}$).

In the literature, there has been a lack of consensus on the status of p-codas: some authors view them as predicates of small clauses, some as depictive verbal adjuncts, and still others treat them as arguments of existential BE (more on this later).[1]

In this paper, I offer a way to resolve some of the tension between the existing analyses. Two central claims will be that (i) p-codas have received conflicting analyses because they are syntactically complements but semantically modifiers and (ii) their hybrid status is due to the argument structure of existential BE.

Some of the key assumptions to be taken from the literature are that (i) *there*-BE-ESs are descriptions of some implicit/abstract spatio-temporal location (e.g., Milsark 1974, Sasse 1987, Blutner 1993, Erteschik-Shir 1997, Borschev & Partee 2001, Felser & Rupp 2001, Basilico 2003, Hazout 2004); (ii) *there* is the syntactic subject and the rest of the ES serves as its syntactic predicate (e.g., Jenkins 1975, Williams 1994, Zamparelli 2000, Hazout 2004, Hartmann 2008; cf. Moro 1997); (iii) existential BE is thematic (e.g., Milsark 1974, Keenan 1987,

Comorovski 1995, Borschev & Partee 2001); and (iv) a pivot denotes a generalized quantifier whose denotation contains an implicit predicate argument (Francez 2007).

This paper is organized as follows: section 2 briefly reviews two most popular analyses of p-codas, namely, the small clause analysis and the depictive verbal adjunct analysis. Section 3 presents a new analysis of *there*-BE-ESs with p-codas. Section 4 shows how the proposed analysis captures various properties of the construction. Finally, section 5 summarizes and concludes the paper.

2 Two most popular analyses of p-codas

2.1 The small clause analysis

What I call the small clause (SC) analysis posits that p-codas such as those in (3) stand in a direct predication relation with the pivot, forming a SC with it, as schematized in (4) (e.g., Stowell 1978, Safir 1982, Lasnik 1995, Chomsky 1995, Felser & Rupp 2001, Kallulli 2008, Deal 2009).

(4) $[_{VP}$ BE $[_{SC}$ $[_{NP}$ some men] $[_{XP}$ shouting]]]

As supporting evidence, some proponents of the SC analysis point out that even though p-codas are not required by syntax, they are not truly optional in a semantic sense. By way of illustration, compare the sentences in (5). While (5a) will be true if some book exists at some discourse-salient/implicit location, (5b) will be true if some book does not exist there (Chomsky 1995: 272).

(5) a. There is a book.
b. There is a book $[\text{missing}]_{\text{present p-coda}}$.

Notably, past p-codas exhibit a similar behavior to present p-codas. To illustrate, (6a) asserts the existence of some books at some location but (6b) asserts about their non-existence. Furthermore, whereas (6a) describes a static state, (6b) describes a dynamic event, i.e., an event of some books getting burnt to ashes at some spatio-temporal location (Milsark 1974, McNally 1997).

(6) a. There were books.
b. There were books $[\text{burnt to ashes}]_{\text{past p-coda}}$.

2.2 The depictive verbal adjunct analysis

Arguing against the SC analysis, several authors have claimed that p-codas are best analyzed as depictive verbal adjuncts (DVAs) which are adjoined to the main predicate's projection, as schematized in (7) (e.g., McNally 1997, Hazout 2004, Francez 2007, Hartmann 2008). Under the DVA analysis, p-codas are

treated on a par with secondary predicates and thus they are assumed to bear an indirect predicative relation to the pivot.

(7) $[_{VP}\ [_{V'}\ [_{V}$ BE $[_{NP}$ some men]] … $[_{XP}$ shouting]]

As far as I know, the most compelling argument for the DVA analysis has been that p-codas behave like untensed verbal adjuncts reported in Cinque 1990 in that while arguments (ARs) may extract from p-codas, adjuncts (ADs) may not, as shown in (8) (see McNally 1997, Hartmann 2008).

(8) a. To whom has there just been a celebrity introduced? (AR extraction)
b. ?How many cookies have there been children baking? (AR extraction)
c. *How many miles a day are there people running? (AD extraction)
d. *How badly has there been a man shot? (AD extraction)
(taken from McNally (1997:68))

2.3 Weighing the two analyses against each other

While the SC analysis gives us a way to capture the semantic contribution of (some) p-codas such as those in (5-6), it has difficulty accounting for the AR/AD asymmetry exemplified in (8); if p-codas were predicates of SCs, they should readily permit AD extraction.

The DAV analysis, on the other hand, lets us capture the AR/AD asymmetry but it cannot explain why there is a non-trivial semantic difference between bare *there*-BE-ESs and *there*-BE-ESs with p-codas; that is, why some p-codas do not seem entirely optional, as illustrated in (5-6).

A closer look at the extraction facts also casts some doubt on the DVA analysis. According to the pilot study I conducted with 42 native speakers of English via a written questionnaire method, AD extraction is sometimes possible. For example, all my subjects found the following sentences grammatical, even though they involve AD extraction from a p-coda.

(9) A: In what part of the body were there people [injured __]?
B: In the eye.

(10) A: ?How seriously were there people [injured __ in the recent explosion]?
B: Extremely seriously.

Also notable is the fact that my subjects were not always permissive with AR extraction from a p-coda, as their grammaticality judgments on the following data suggest:

(11) A: *Which cookies will there be children from John's church [baking __]?

B: Chocolate chip cookies.

(12) A: *Who was there some boy [chasing __] at the park?
B: Some girl wearing a blue hat.

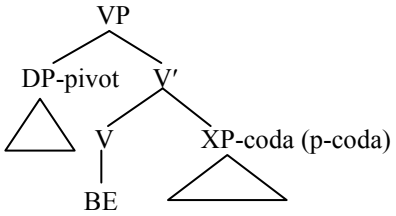
If the grammaticality judgments reported here are truly valid, we can conclude that extraction from p-codas does not exhibit as sharp an AR/AD asymmetry as has been claimed by some advocates of the DVA analysis (e.g., McNally 1997, Hartmann 2008).

3 A New Analysis

3.1 The syntax of *there*-BE-ESs with p-codas

In order to improve on the existing analyses while incorporating their core insights, I propose that *there*-BE-ESs with p-codas have a Larsonian (1988) VP-shell structure in which both the pivot and a p-coda occur as the complements of BE, but the coda occurs as the inner argument, forming an underlying constituent with the existential verb, as depicted in (13).

(13) Proposal on the VP structure of a *there*-BE-ES with a p-coda:



This idea draws on the view shared by some formal semanticists that when a *there*-BE-ES contains a coda, the coda and the pivot occur as co-arguments of BE, and the BE-pivot-coda string has the ternary branching structure sketched in (14) (e.g., Milsark 1974, Keenan 1987, Comorovski 1995, Borschev & Partee 2001).

(14) $[_{S}$ [there] $[_{VP}$ $[_{V}$ BE $[_{DP\text{-}pivot}$ some men] $[_{XP\text{-}coda}$ shouting]]]

I argue for a slightly more hierarchical structure here, however, because pivots can bind reciprocals or bound variables inside p-codas, as shown in (15), and given Principle A of Binding Theory, in order for such binding relations to hold, p-codas have to be lower than pivots in the syntactic structure, rather than at the same level.

(15) a. There were [some boys and girls]$_{i}$ [kissing <u>each other</u> $_{i/*j}$].

b. There were [several students]$_i$ [wanting to meet <u>their</u> $_{i/*j}$ professors].

3.2 The full-blown structure of *there*-BE-ESs with p-codas

To articulate the full-blown structure of *there*-BE-ESs with p-codas, I make the following assumptions.

Firstly, I assume that existential BE is the main sentential predicate and thus it occurs heading a Predicate Phrase (PrP) in the sense of Bowers (1993), though it originates from a lower V position as shown in (13) (compare Hazout 2004, Hartmann 2008).

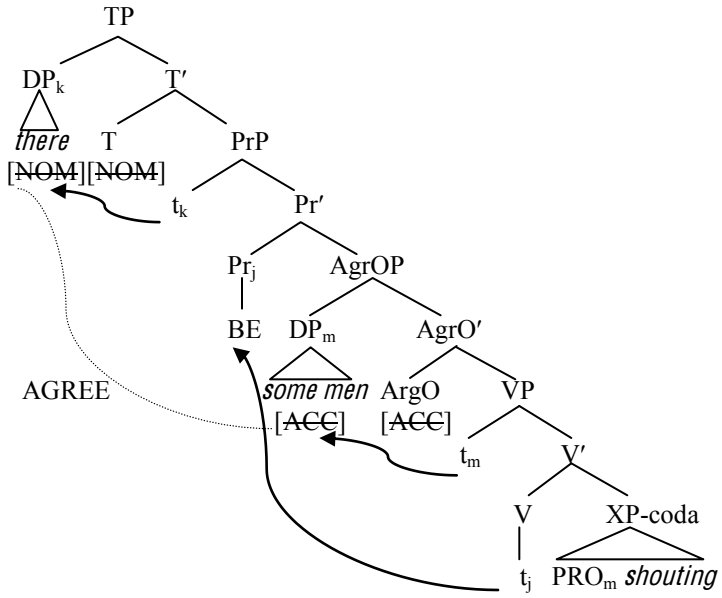
Second, *there* is the syntactic subject of an ES and as such, it is inserted at [Spec, PrP] but it later moves to [Spec, TP] and in so doing, it not only fulfills EPP but also receives Nominative Case (NOM) (Hartmann 2008).

Third, the pivot originates at [Spec, VP] but for case reasons, it moves to [Spec, AgrOP] (see Caponigro & Schütze 2003 for arguments for this movement). By moving to this higher position, the pivot also enters into an AGREE relation with *there*, a requirement a *there*-BE-ES has to meet, according to Deal 2009.

Lastly, a p-coda contains a PRO which is obligatorily controlled by the pivot. A PRO is posited here to satisfy the Theta Criterion.

Taken together, this set of assumptions yields (16) as the structure for (3a) (for simplicity, I ignore the optional PP-coda *on the street* here).

(16)



3.3 The semantics of *there*-BE-ESs with p-codas

In capturing the semantics of *there*-BE-ESs with p-codas, I build on Francez' (2007) formal analysis of the construction.

3.3.1 Francez' (2007) analysis of there*-BE-ESs with codas*

Francez (2007) claims that p-codas are contextual modifiers, by which he means that they contribute a subset of the topic time within which the ES's predicative meaning holds (this idea draws on McNally 1997). To formally implement this idea, Francez makes the following claims on each component of the *there*-BE-ES construction.

First, *there* and BE are both semantically vacuous, and the pivot functions as the main semantic predicate of a *there*-BE-ES.

Second, a pivot DP denotes a generalized quantifier (GQ) whose denotation contains an implicit predicate argument (compare, a.o., Barwise & Cooper 1981, Keenan 1987). To illustrate, the pivot of (3a) has the following lexical entry:

(17) $[[\textit{some men}]]_{\text{pivot}} = \lambda P_{<et>}[\text{some}(\lambda z[\text{men}(z)], P)]$

Third, codas denote sets of GQs and they further provide the value for the implicit predicate argument inside the pivot's denotation, as suggested by the following lexical entry for the p-coda *shouting* in (3a).

(18) $[[\textit{shouting}]]_{\text{p-coda}} = \lambda P_{<<et>t>}[\text{a}(\lambda i[i \subseteq l_t], \lambda j[P(\lambda x[\text{shouting}(x)(j)])])]$
(Here, l_t stands for the topic time; j is the hold time of shouting relative to individual x.)

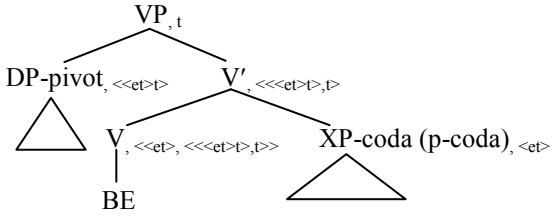
3.3.2 Marrying the syntax and the semantics of there*-BE-ESs with p-codas*

When we try to marry Francez' (2007) semantic analysis and the proposed syntactic analysis of *there*-BE-ESs, we run into some difficulty because while we analyze p-codas as inner complements of BE, Francez analyzes them as DVAs, which are located higher than both the pivot and BE, as depicted in (7). But we can make his semantics compatible with our syntax if we slightly revise our view on existential BE: while Francez assumes it to be semantically vacuous, we may entertain the possibility that it has some semantic import. More specifically, what I have in mind is that the existential verb contributes the existential quantifier and the topic time inside the coda's denotation given in (18), and it is also responsible for a pivot's denotation such as (17) to contain an implicit predicate argument.

Under this revised view, then, a *there*-BE-ES with a p-coda will have the composition scheme given in (19). This composition scheme is meant to show that pivots and p-codas end up having the semantics they do under Francez's (2007) analysis, precisely because they are semantic arguments of BE. That is,

what is responsible for their rather 'unusual' semantics is the syntactic predicate's argument structure.

(19) Composition scheme of a *there*-BE-ES with a p-coda:



According to the above composition scheme and other syntactic/semantic assumptions made thus far, then, the semantics of sentence (3a) is derived in the following manner (again ignoring the optional PP-coda):

(20)a. [[*some men*]] = $\lambda Q_{<et>}$[some(λy[men(y)], Q)]
b. [[*BE shouting*]] = $\lambda P_{<<et>t>}$[a(λI[$i \subseteq I_t$], λj[P(λx[shouting(x)(j)])])]
c. [[*there were some men shouting*]] = ignoring Tense & *there*
= [[BE *shouting*]]([[*some men*]]) = via Functional Application (FA)
= a(λI[$i \subseteq I_t$], λj[some(λy[men(y)], λx[shouting(x)(j)])])
(Here, I_t stands for the topic time; j is the hold time of shouting relative to individual x.)

3.4 Summary

The new analysis posits that existential BE selects for a p-coda as its inner complement and the pivot as its next complement, and because of the argument structure of BE, the pivot ends up denoting a GQ whose denotation contains an implicit predicate argument and the p-coda ends up denoting a set of GQs which restricts the pivot's denotation. In the next section, we assess merits of this analysis, in comparison with the existing analysis.

4 Assessing the proposed analysis

4.1 Comparing with the DVA and the SC analyses

The proposed analysis improves on both the DVA and the SC analyses of *there*-BE-ESs and in so doing helps resolve the tension between them, albeit indirectly.

First, treating p-codas as syntactic complements of a lexical verb, namely, existential BE, correctly predicts that AD extraction from p-codas will be possible, in contrast to the DVA analysis, assuming that AD extractions from p-codas are (potentially) well-formed as suggested above. (I abstract away from when they may not be allowed here.)

Second, unlike the SC analysis, the present analysis does not assume that a p-coda (or any coda) is the main predicate of a *there*-BE-ES and hence does not incorrectly predict that every *there*-BE-ES will have a copular sentence counterpart (or vice versa), contrary to fact, as illustrated below (see, a.o., Jenkins 1975, Williams 1984).

(21) a. There is a solution to this problem. (*there*-BE-ES)
b. A solution is to this problem. (copular sentence)
(adapted from Jenkins 1975)

Our analysis still establishes some type of subject-predicate relation between a pivot and a p-coda, however, since it posits that one denotes a GQ and the other ends up denoting a suitable functor for it, that is, a set of GQs.

Third, the present analysis provides a way to explain why some p-codas are not entirely optional, as exemplified in (5-6). Simply put, their non-optionality stems from their complement status. Why is it that some *there*-BE-ESs may be bare, then, as illustrated in (1)? In answer to this question, I submit that p-codas may sometimes be omitted (or not spelled out) because the information they convey is not crucial to the discourse at hand. Their partial optionality should not surprise us too much, though, since even objects of transitive verbs can be omitted sometimes, as illustrated in (22).

(22) A: Would you like something to eat?
B: I just ate __.

The ability to explain the (non)-optionality of p-codas is clearly an improvement on both the DVA and the SC analyses, since such analyses would incorrectly predict p-codas to be either invariably optional or invariably obligatory.

4.2 Capturing other recalcitrant properties of *there*-BE-ESs

The proposed analysis accounts for several other recalcitrant properties of *there*-BE-ESs with p-codas. In the interest of space, I discuss three such cases here.

4.2.1 Non-omissibility of existential BE

One of the characteristic properties of *there*-BE-ESs is that unlike copular BE, existential BE cannot be omitted in certain subject-to-object raising contexts, i.e., when a *there*-BE-ES occurs embedded under *consider*/*believe*, as exemplified in (23) (see, a.o., Moro 1997, Hartmann 2008).

(23) a. I consider there *(to be) dinosaurs. (*there*-BE-ES)
b. I consider John (to be) a fool. (copular construction)

In the literature, this property has been ascribed to the thematic property of existential BE (e.g., Hartmann 2008) or to the hypothesis that *there*-BE-ESs instantiate a predicate raising construction in which the underlying predicate of a sentence, i.e., *there*, surfaces as the syntactic subject (Moro 1997).

Under the present analysis, the non-omissibility of existential BE follows from its semantic import as well as its thematic nature (compare Hartmann 2008): unlike its copular counterpart, existential BE is not semantically vacuous and thus is required to be present in the sentence.

4.2.2 Semantic differences between ESs with present vs. past p-codas

Authors like Milsark (1974) and McNally (1997) have made an interesting observation that while *there*-BE-ESs with present p-codas have a stative semantics, those with past p-codas have a more eventive semantics. To exemplify, whereas sentence (24a) describes a homogeneous event, (24b) describes an event that involves a change of state.

(24) a. There was a pig running around.
b. There was a live pig roasted (at the picnic).
(adapted from McNally 1997: ex. (314))

To my knowledge, McNally 1997 is the only attempt that has been made to account for such semantic differences. Under her analysis, however, the semantics of *there*-BE-ESs is captured at the expense of assuming somewhat different syntax for the two types of p-codas. In a nutshell, she posits that while present p-codas invariably occur as what we call DVAs here, past p-codas occur as reduced relative clauses (RC) which are located inside the pivot's nominal projection, as schematically represented in (25) and (26), respectively. She further assumes that present p-codas and past ones have somewhat different semantics (see her work for details).

(25) Partial structure for a *there*-BE-ES with a present p-coda:
$[_{VP}\ [_{V'}\ [_{V}$ BE $[_{NP}$ a pig]] … $[_{XP}$ running around]]

(26) Partial structure for a *there*-BE-ES with a past p-coda:
$[_{NP}$ a [live pig] $[_{RC}$ roasted]]

Under the present analysis, a more uniform analysis is possible for present and past p-codas. To illustrate, (27), which contains a past p-coda, can be assigned an identical syntactic structure to (3a); that is, its full-blown structure will look like (16) except that *injured* occurs in lieu of *shouting* and *several* occurs instead of *some*.

(27) There were [several men]$_{\text{DP-pivot}}$ [injured]$_{\text{XP-coda}}$.

Under this analysis, we can nonetheless capture the more "eventive" semantics of (27) in comparison to (3a), if we assume that the lexical entries of past p-codas have passive as well as change of state meaning built into them. That is, p-codas carry semantics of *get*-passive, as exemplified in (28) and (29).

(28) $[[BE\ injured]] = \lambda P_{<<et>t>}[\mathrm{a}(\lambda I[i \subseteq I_t], \lambda j[P(\lambda x[\mathrm{get.injured}(x)(j)])])]$

(29) a. $[[several\ men]] = \lambda Q_{<et>}[\mathrm{several}(\lambda y[\mathrm{men}(y)], Q)]$
b. $[[BE\ injured]] = \lambda P_{<<et>t>}[\mathrm{a}(\lambda I[i \subseteq I_t], \lambda j[P(\lambda x[\mathrm{get.injured}(x)(j)])])]$
c. $[[there\ were\ several\ men\ injured]]$ = ignoring Tense & *there*
$= [[\mathrm{BE}\ injured]]([[several\ men]])$ = via FA
$= \mathrm{a}(\lambda I[i \subseteq I_t], \lambda j[\mathrm{several}(\lambda y[\mathrm{men}(y)], \lambda x[\mathrm{get.injured}(x)(j)])])$
(Here, I_t stands for the topic time; j is the hold time of shouting relative to individual x.)

4.2.3 Predicate restriction on (adjectival) codas

Another well-known property of *there*-BE-ESs (which is due to Milsark 1977) is that only stage-level predicates may occur in coda position, as shown below.

(30) a. There are firemen available. (stage-level)
b.*There are firemen intelligent. (individual-level)

In the literature, this restriction has been attributed to three different factors: (i) the semantics of the pivot, more specifically, the requirement that it has to be a weak Quantifier Phrase (e.g., Milsark 1977, Ladusaw 1994); (ii) the presence of the Kratzerian event argument in the structure signaled by *there* (e.g., Felser & Rupp 2001, Basilico 2003, Kallulli 2008); and (iii) the secondary predicate status of codas (e.g., McNally 1997, Hartmann 2008).

Under the present analysis, the predicate restriction stems from the compositional scheme of *there*-BE-ESs: by combining with BE, codas end up serving as contextual modifiers in the sense of Francez (2007). Hence, only those that can contribute a property which holds during some subset of the topic time can occur in coda position. That is, codas have to be what we call S-level predicates.

Notably, this line of account is not incompatible with the existing analyses in that it speaks to the peculiarity of the pivot's semantics and the argument structure of the main sentential predicate.

5 Conclusion

This paper has investigated the syntax and the semantics of p-codas of *there*-BE-ESs. I have claimed that (i) p-codas exhibit seemingly conflicting behavior

because they are syntactically complements but semantically modifiers and (ii) their hybrid status is due to the argument structure of existential BE. It has also been suggested that due to BE's argument structure and the syntactic configuration resulting from it, a *there*-BE-ES ends up denoting a higher-order predicate whose meaning holds true of some implicit/abstract spatio-temporal location. If proven valid, the claims made here implicate that everything in *there*-BE-ESs (including *there*, BE, and any type of coda) may be there for a reason; they may not be semantically vacuous or merely syntactic adjuncts.

Notes

* I wish to thank the audience at WECOL 2011 at Simon Fraser University, in particular Hotze Rullmann, Dennis Ryan Storoshenko, and Gregory Ward, for their helpful comments, although for space reasons, I could not incorporate all of them here. Needless to say, all remaining errors are my own responsibility.

[1] It should be noted that some p-codas may be construed as attributive noun modifiers, as illustrated by the following sentence.

(i) At Jill's party, there were people studying Gothic at MIT.

(adapted from Milsark 1974: 184)

Although such cases are robust, we will not be concerned with them here because there is little controversy over their syntax. More concretely, it is widely held that they are reduced relative clauses located inside the pivot nominal's maximal projection, as schematized in (ii) (see, e.g., Milsark 1974, Hartmann 2008).

(ii) At Jill's party, there were [$_{NP}$ [people] [$_{XP}$ studying Gothic at MIT]].

In comparison, when a p-coda contributes to describing the situation of some spatio-temporal location, as is the case in (3), it is far less clear where exactly they might/should be located, because there are several syntactic possibilities for them, as shown in subsequent sections.

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Structural Complexity and Sentence Processing – Evidence from Korean[1]

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1 The Little *v* Hypothesis and Korean Psych Verbs

In formal syntax, the term little *v* originates from the hypothesis that VPs are split into two distinct projections – an outer vP headed by the little *v* and an inner VP core headed by a lexical verb (Larson 1988; Hale & Keyser 1993; Chomsky 1995). It is a widely adopted assumption within the contemporary generative framework that the affixal causative morphemes in a variety of languages are overt realizations of little *v* (Travis 1994, Harley 1995, Kural 1996, Megerdoomian 2002, Pylkkänen 2002 among others.). Some researchers have further suggested that the little *v* comes in different flavors (Harley 1995, 2002; Folli & Harley 2005, 2007).

The purpose of this study is to examine whether different types of *v*'s impose different processing difficulty. Specifically, when a lexical verb can appear with verbal suffixes that correspond to different *v*'s, will the structure that is analyzed to be more complicated require longer processing time than the less complicated structures?[2] In this study, a self-paced reading experiment is conducted using Korean psych verbs, whose results reveal that the structurally more complex v_{CAUSE} morpheme incur longer reading time than the less complex v_{DO} and v_{BE} morphemes. The findings of this study show that with a correct measure of syntactic complexity, the link between the theory of grammar and processing can be maintained. Drawing on the results of the behavioral studies on English psych verbs, I propose that the cross-linguistic difficulty with processing Object Experiencer (ObjExp) verbs can in fact be explained on the same grounds.

This paper is structured as following: The remainder of this section discusses the properties of the three classes of Korean psych verbs and demonstrates that the verbal suffixes that they appear with are associated with v_{DO}, v_{BE}, and v_{CAUSE}, respectively. Section 2 presents a self-paced reading experiment. Some implications about the findings from the present experiment are discussed in section 3, followed by a brief conclusion in section 4.

1.1 Korean psych verbs

Korean psych verbs are good candidates to test the question about the processing load induced by different little *v*'s because they appear with three kinds –

namely, v_{DO}, v_{BE}, and v_{CAUSE}. These three types of Korean psych verbs in (1) fall under the cross-linguistic classification of psych verbs of Belletti & Rizzi (1988).

(1) Subject Experiencer Type #1

modeyl-i	sacinsatul-ul	musew-eha-ess-ta
model-NOM	photographers-ACC	be.fearful-do-Past-Decl

"*The model feared photographers*."

(2) Subject Experiencer Type #2

modeyl-eykey	sacinsatul-i	musew-ess-ta
model-DAT	photographers-NOM	be.fearful-Past-Decl

"*The model was fearful of photographers.*"

(3) Object Experiencer

sacinsatul-i	modeyl-ul	musep-keyha-ess-ta
photographers- NOM	model-ACC	be.fearful-cause-Past-Decl

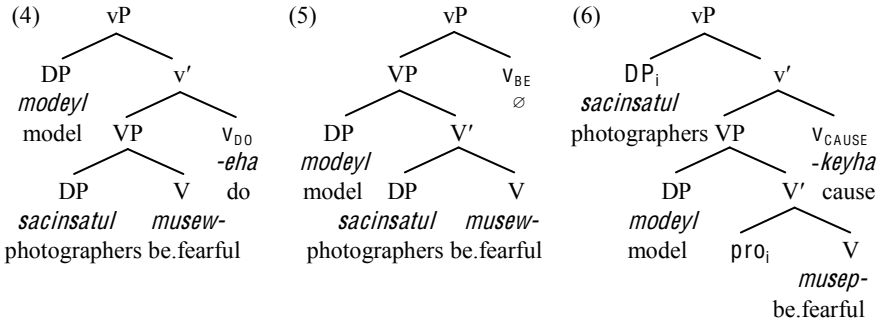
"*Photographers scared the model*."
(Lit. "*Photographers caused the model to be fearful.*")

There are three notable differences among (1)-(3). First, the three classes differ in the verbal suffixes – *-eha* 'do' (1), none (2), and *-keyha* 'cause' (3) – attached to the same lexical verb.[3] Second, each class has its own associated case frame indicated by the different case markers on the arguments. Finally, they denote different meanings.

In subsection 1.2, it will be shown that the verbal suffixes in (1)-(3) correspond to different little *v*'s, and that the above three differences can be explained together based on which little *v* the argument DPs occur with.

1.2 Different verb classes, different little *v*'s

In this subsection, I argue that *-eha* 'do' in (1) and *-keyha* 'cause' in (3) are overt realizations of v_{DO} and v_{CAUSE} respectively, while (2) is associated with a phonologically null little v_{BE}. Both *-eha* and *-keyha* require an immediately preceding lexical verb and carry minimal lexico-semantic information, including their theta-roles – which are typical properties of little *v*. Therefore, it would be valid to consider that both *-eha* and *-keyha* belong to little *v* – specifically, v_{DO} and v_{CAUSE}.[4] In addition, I will assume that the verb in (2) occurs with a null state-denoting v_{BE} (Harley 1995, 2002; Jung 2011) given that all VPs contain an outer *v*P shell. The case marking on the arguments in (2) shows that the null *v* indeed exhibits the property of v_{BE} that it does not take an external argument, therefore cannot license accusative Case. The syntactic structures of (1)-(3) can be diagramed as (4)-(6).



Comparing the amount of the structures in (4)-(6), one can see that the v_{CAUSE} construction in (6) is more complicated than (4) and (5) due to the theta-role requirements of v_{CAUSE} and the lexical verb. Specifically, (6) involves more theta-roles because v_{CAUSE} requires a Causer while the lexical verb requires an Experiencer and a complement Theme. Additionally, two relationships are represented in the structure in (6) – the relationship between the Causer and the caused event as well as the Experiencer's emotional state about the Theme – whereas only the latter is expressed in (4) and (5).

Note in (6) that the Causer *sacinsatul* 'photographers' in Spec-vP and the null Theme *pro* are co-indexed. The existence of the lower Theme *pro* is necessary in (6) because of the well known cross-linguistic peculiarity exhibited by ObjExp psych verbs – namely, the backward binding. Backward binding, as is illustrated in (7)-(9), is a phenomenon where the anaphor inside the subject is bound by the following object, which otherwise is a violation of Principle A.

(7) [casin]$_i$-uy sacintul-i [modeyl]$_i$-ul musep-keyha-ess-ta.
self-GEN pictures-NOM model-ACC be fearful-v_{CAUSE}-Pst-Decl
'Pictures of herself$_i$ scared the model$_i$'

(8) Each other$_i$'s supporters worried [Freud and Jung]$_i$.

(9) *Each other$_i$'s stupid friends eventually killed [John and Mary]$_i$.

On the other hand, comparison of (4) and (5) does not seem to suggest that one is more complicated than the other. (4) and (5) differ in the structural position of the Subject Experiencer (SubjExp). In (4) with the v_{DO}, *modeyl* 'model' appears in the Spec-vP position whereas in (5) the inherently dative marked counterpart originates in Spec-VP. Thus, it seems that the v_{DO} and the v_{BE} require the same amount of structure since the different position of the SubjExp does not affect the overall complexity.[5]

To summarize, if the processing of Korean psych verb constructions is influenced by how complex the structure is, it is predicted that the v_{CAUSE}

structure in (6) will impose more processing load than the other two structures. That is, one will read the sentence in (3) more slowly than the less complicated (1)-(2). On the other hand, since comparing (4)-(5) in terms of the amount of structure does not predict advantage for one over the other, no significant difference is expected between the two SubjExp constructions. These predictions are tested in the comprehension task in section 2.

2 Experiment: Self-paced Reading Task

A self-paced reading experiment was conducted to test the structural complexity hypothesis: Does encountering Korean psych verbs with the v_{CAUSE} suffix result in longer reading times than those appearing with the v_{DO} or v_{BE} suffixes? The experiment also tested whether there is a processing difference between the v_{DO} and v_{BE} structures, if any.

2.1 Methods

2.1.1 Participants

24 Korean native speakers with normal or corrected-to normal vision and without a history of brain injury (self-report) participated in the study. Participants were undergraduate and graduate students enrolled at the University of Arizona.

2.1.2 Materials

36 triplets of psych verbs like (10)-(11) were used for the experiment.

	Region 1	*Region 2*	*Region 3*
(10)	SubjExp + v_{DO}		
	modeyl-un	sacinsatul-ul	musew-eha-ess-ta
	model-TOP	photographers-ACC	be.fearful-v_{DO}-Past-Decl
	'The model feared photographers.'		
(11)	SubjExp + v_{BE}		
	modeyl-un	sacinsatul-i	musew-∅-ess-ta
	model-TOP	photographers-NOM	be.fearful-v_{BE}-Past-Decl
	'The model was fearful of photographers.'		
(12)	ObjExp + v_{CAUSE}		
	modeyl-un	sacinsatul-ul	musep-keyha-ess-ta
	model-TOP	photographers-ACC	be.fearful-v_{CAUSE}-Past-Decl
	'The model scared photographers.'		

The triplet was composed of the variants of the three structures in (4)-(6). The sentences in (10)-(12) were repeated from (1)-(3) with some modification. The initial DPs in Region 1 were manipulated so that they are identical in all three conditions by being accompanied by the topic marker *-(n)un* instead of the case

markers. The adjustment was made because the variable of interest was the verb type – more specifically, which little *v* the verb is associated with, not the role of case markers. Note that the theta-roles borne by the two DPs are reversed in (12) from that of the original example in (3) by this manipulation.

It can also be observed that the DPs in Region 2 are followed by two different case markers. Though not the main point of interest, it would be interesting to compare the processing of canonical objects (i.e. accusative-marked DPs) and non-canonical objects (i.e. nominative-marked DPs), both following the initial topic-marked DP.

The DPs in both Regions 1 and 2 were animate in every condition. The purpose of this unification was to avoid the animacy bias, which is the tendency that subjects find sentences with an animate subject easier to respond to than ones with an inanimate subject (Gennnari & MacDonald 2009). (10)-(12) would have sounded more natural with a likely Causer/Theme argument such as *paym* 'snake'. In this study, however, semantically neutral DPs are used in both Regions 1 and 2 to avoid an interpretive bias of preverbal arguments and to introduce the same DPs in the same region across the three conditions.

The design of the experiment was 3(list) × 3(class) factorial. The presentation of stimuli was controlled so that no subject was exposed to more than one class of the same lexical verb, resulting in the use of three lists. 18 filler items were used containing transitive sentences with an accusative object and intransitive sentences with a nominative object. The three lists were counterbalanced for order of presentation.

An acceptability ratings questionnaire was conducted independently by a different set of 5 native Korean subjects. The participants were asked to rate the naturalness of the target sentences on the scale of 1 ("Not natural at all") to 5 ("Completely natural"). The purpose of this questionnaire was to rule out the stimuli that are considered worse than natural (below the average point of 3) from statistical considerations.

2.1.3 Procedure

The subjects sat in front of a 14-inch laptop. The sentences were presented in a self-paced reading task using the DMDX software (Forster & Forster 2003). Before the sentence appeared on the screen, three discontinuous underlines indicating the number of phrases showed up on the screen. Each individual phrase appeared one by one replacing each underline. The participants were asked to read the sentences at a natural pace and press the right shift key once reading the relevant phrase and to proceed to the next item. The reading times for three individual regions were measured. 6 practice sentences preceded the test items. After each sentence, a comprehension question asking about the information contained in Region 1 or 2 followed. This ensured that the subjects attended to the stimuli, interpreting each sentence cumulatively instead of starting to build an interpretation after the whole sentence.

2.1.4 Data processing and statistical analysis

6 triplets that invovled items which scored lower than 3 out of 5 points in the acceptability ratings questionnaire were discarded. After removing the 6 triplets, the average naturalness of the three classes was v_{DO} M = 4.4, v_{BE} M = 4.0, v_{CAUSE} M = 4.5, respectively.

Additionally, the results of one subject were removed due to interruption during the experiment. One further subject, whose average reading time was 2 standard deviations above the group mean was removed, leaving 76.4% of the data for analysis.

A mixed-design ANOVA was carried out using General Linear Model in SPSS with repeated measures on the verb class (i.e. the type of little *v*) for Region 3 and Region 2. The class of psych verbs was the within-subjects factor and the list was the between-subjects factor.

2.2 Results

Average reading times for each region containing one phrase are shown in Table 1, followed by Figure 1. The critical region was Region 3.

Table 1 Mean reading times (ms) for each region, * indicates significance

	Region 1	*Region 2*	*Region 3*
	DP1	DP2	VP
v_{DO}	532	658	677
v_{BE}	531	678	642
v_{CAUSE}	519	650	734*

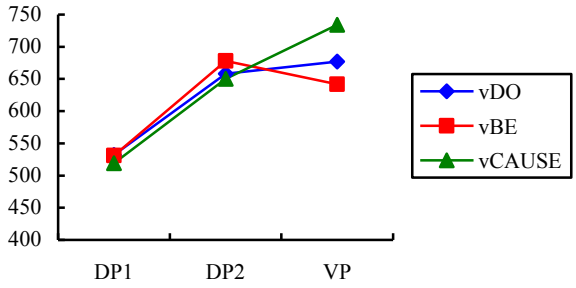


Figure 1 Mean reading times (ms) for each region

As was predicted, the results of Region 3 show that reading times for verbs occurring with the v_{CAUSE} suffix were longer than those with v_{DO} or with v_{BE} in both by-subjects and by-items analyses (F_1 (2, 38) = 5.59, p <.008, F_2 (2, 58) =

3.4, p <.04). No interaction between the type of little v and the list was found (F_1 (4, 38) = 0.96, p >.4). Pair-wise comparisons showed no systematic reading time difference between verbs with v_{DO} (4) and those with v_{BE} (5) (F_1 (1, 19) = 0.54, p>.4, F_2 (1, 29) = 0.87, p >.3).

Recall from the triplet in (10)-(12) that in Region 2, the v_{DO} and v_{CAUSE} conditions contained the DP2 followed by the accusative case marker *-ul* while in the v_{BE} condition the DP2 was followed by the nominative case marker *-i*. No significant difference among the three verb classes was found in this region (F_1 (2, 38) = 0.18, p >.8, F_2 (2, 58) = 0.19, p >.8.).

2.3 Discussion

The reading time data confirm the prediction made by the structural complexity hypothesis that the more complicated structure – the v_{CAUSE} condition – requires a behavioral cost compared to less complex structures – the v_{DO} and v_{BE} conditions. The fact that there was no interaction between the type of little v and the list in the by-subjects analysis shows that the lists played no role in processing the sentences, further supporting the view that longer reading times for the v_{CAUSE} condition were indeed due to the structural differences among the three verb classes.

Meanwhile, no effects were found on the reading time of the v_{DO} (4) and v_{BE} (5) conditions in Region 3. This result explains why it was impossible to make a firm prediction as to which, between the v_{DO} and v_{BE} structures, will be read faster based on the syntactic complexity. In addition, the finding that subjects exhibited no difference in processing Region 2 between the v_{DO}/v_{CAUSE} verbs and the v_{BE} verbs – where the distinction was the accusative and nominative objects – shows that the non-canonical nominative case marking on the object does not incur a processing cost.

3 General Discussion

3.1 Effects of structural complexity on sentence processing

The findings from the comprehension study of Korean psych verbs provide support for the hypothesis that syntactically complicated structures incur processing difficulty. The structural complexity effects found in this study are interesting because on the surface strings, the v_{DO}, v_{BE}, and v_{CAUSE} structures in (10)-(12) look close to identical except for which verbal suffix immediately follows the lexical verb.[6] Thus, the difference in syntactic complexity is not apparent. Rather, it is independently verified by a formal analysis of the structures. One can see from this that independent evidence converges to support the proposed grammar and the processing behavior it predicts.

Importantly, the consistency between the formal analysis provided in subsection 1.2 and the subjects' linguistic behavior indicates that a correct

measure of syntactic complexity is the amount of the structure – specifically, the theta-role requirements of the associated *v* and the lexical verb as well as the relationships captured by the argument structure. This diverges from the attempt to directly associate processing with the number of transformations (i.e. movements), which was put forth in the Derivational Theory of Complexity (Chomsky & Miller 1963).

3.2 Alternative interpretations

One might wonder about alternative interpretations of the present results. For example, because three Korean psych verb classes are distinguished by suffixation of different little *v*'s to the lexical root, a difference in the word length is inevitable. The average syllable number of the target items used in this experiment is as following: v_{DO} = 5.2, v_{BE} = 4.4, and v_{CAUSE} = 5.8. Then one might question if the v_{CAUSE} verbs resulted in longer reading times because they involve more syllables than v_{DO} and v_{BE} verbs.

Another potential confound is frequency (Mitchell et al. 1995). Again, the property of Korean psych verbs which form three distinct classes via suffixation leads to different average frequencies for the three verb classes. The corpora indeed reveal that the psych roots followed by the *-keyha* suffix (i.e. v_{CAUSE}) are less frequent than those appearing with the *-eha* suffix (i.e. v_{DO}) or those with no derivational suffix (i.e. v_{BE}).[7] The average frequency information (i.e. google hits) of the three verb classes is as following: v_{DO} =310, v_{BE} = 470, and v_{CAUSE} = 209.

However, although the alternative accounts such as word length and frequency effects point to the effects of v_{CAUSE} observed in the current study, they make wrong predictions. They incorrectly predict a meaningful difference in processing v_{DO} and v_{BE} conditions in Region 3 (frequency; $F(1, 29) = 33.69$, $p < .001$, word length; $F(1, 29) = 33.14$, $p < .001$), which was not present in the results reported in section 2. Specifically, according to the word length and frequency information, the difference between v_{DO} and v_{BE} is greater than that between v_{DO} and v_{CAUSE}. Thus, those accounts predict that if a significant behavioral difference is found between v_{DO} and v_{CAUSE}, there must be a difference between v_{DO} and v_{BE} as well, contrary to the fact. Then, only the structural complexity hypothesis is compatible with both the slowdown by v_{CAUSE} and the lack of difference in the reading times between v_{DO} and v_{BE}.

3.3 Processing ObjExp verbs

Interestingly, the results of this paper are in accordance with those of the studies on English psych verbs where SubjExp verbs have a processing advantage over ObjExp verbs (Cupples 2002; Ferreira 1994; Gennari & MacDonald 2009; Thompson & Lee 2009; Brennan & Pylkkänen 2010). While the English

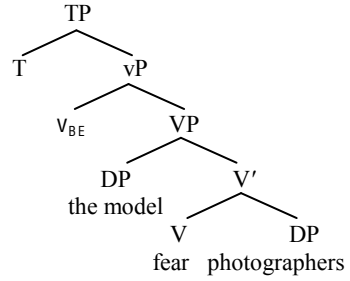
SubjExp construction in (13) corresponds to the Korean v_{DO}/v_{BE} structures, the ObjExp construction in (14) is related to the v_{CAUSE} structure.[8]

(13) SubjExp
The model *feared* photographers.

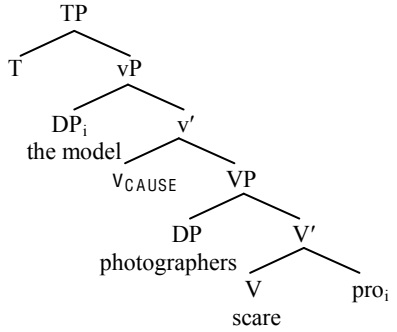
(14) ObjExp
The model *scared* photographers.

It has been argued in formal analyses of psych predicates that ObjExp verbs like (14) are more complex than SubjExp verbs in (13) structurally (Belletti & Rizzi 1988, Pesetsky 1995, Pylkkänen 2000). The structures of (13)-(14) can be diagramed as in (15)-(16).[9]

(15)



(16)



Comparing between (4)-(6) and (15)-(16), one can see that both in English and Korean, the ObjExp verbs have underlyingly more complicated structure and meaning than the SubjExp verbs. Note that in both experimental studies on English and the present study on Korean, the effects were observed in the region where the interpretation about the argument structure of the verb is completed – in the ObjExp region in English (i.e. *photographers* in (14)) and in the verb region in Korean (i.e. *musep-keyha* 'be.fearful-cause'). This points to a possibility that the sources of complexity of ObjExp verbs in English and Korean are in fact not distinct although how this complexity is manifested in the two languages differ. In other words, in Korean the lexical V and v_{CAUSE} morphemes are realized as they are – *musep-keyha* 'be.fearful-cause' – whereas in English, it is manifested in the form of the lexical complexity of *scare*.

4 Conclusion

This study was set out by asking whether the three classes of Korean psych verbs, distinguished by the different types of little *v*, trigger processing differences. The results of the experiment conform to the predictions made by

the structural complexity hypothesis. The syntactically more complex structures incur processing difficulty. Alternative interpretations about the results of the experiment were also considered and refuted. Finally, some implications of this study were discussed such as convergence of linguistic theory and performance and consistent behavioral cost imposed by ObjExp verbs in Korean and English.

Notes

[1] Special thanks to committee members Heidi Harley, Janet Nicol and Andrew Carnie for their invaluable comments and insights. I would also like to thank Sandiway Fong, Massimo Piattelli-Palmarini, Norbert Hornstein, Ken Forster and SynSalon audiences at the University of Arizona as well as WECOL reviewers and audiences for helpful comments. All errors are my own.

[2] Notice that an important assumption of this study is that speakers' linguistic representation guides the use of language, as advocated in Berwick & Weinberg (1983), and Marantz (2005) among others.

[3] The final consonant of the verbal root *musep-* 'be.fearful' alternates between *w* and *p* depending on whether it is followed by a vowel or consonant.

[4] The status of -(*e*)*ha* 'do' as a little *v* in Korean has been previously argued by Lim (1997) and D-K Jung (2002). The suffix -*keyha* 'cause' in (3) is known as a syntactic causativizer (Choi 1993, Lee 1996).

[5] If one adopts Miyagawa (2010), who argues that the nominative Theme overtly moves to Spec-FocusP in narrow syntax, (5) can be considered more complicated than (4). On the other hand, depending on overt theory of Case assignment, (4) has more uninterpretable features to be checked than (5), giving rise to more movements. However, note that the measure of complexity used in this study is the amount of the structure rather than the number of movements. Therefore, the contradictory predictions made by the theory of movement can be set aside.

[6] Although the case marking on the DPs in Region 2 differs between the v_{DO}/v_{CAUSE} condition (i.e. accusative) and the v_{BE} condition (i.e. nominative), recall that no difference in reading time of Region 2 was observed, as discussed in section 2. Therefore, one can conclude that the effects derive from the difference in the last VP region, which is the different type of little *v* morpheme. Interestingly, the very fact that the case marking differs in Region 2 combined with the independently attested processing mechanism that the parser uses the information coming from each region to build the mental structure incrementally (Kamide & Mitch 1999, Kamide et al. 2003, Aoshima et al. 2009) evidences that the effects must involve a syntactic component. That is, it cannot be due to purely semantic reasons.

[7] A search engine was used as a corpus tool instead of traditional corpora, inspired by Keller & Lapata (2003), who have demonstrated a strong correlation between the web search results and the traditional corpora/native judgment.

[8] It is interesting to note that the English SubjExp construction exhibits combinatory properties of the v_{DO} and v_{BE} structures in Korean. English SubjExp verbs license accusative Case like v_{DO} in (1)/(4) while denoting a stative reading like v_{BE} in (2)/(5).

[9] The structures in (15)-(16) are based on the structures (80) in Harley (2002: 55) and (530) in Pesetsky (1995: 209) respectively, with some modifications for reasons of simplicity. In the original structures in Harley (2002) and Pesetsky (1995), a PP is used instead of the VP in (15)-(16).

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On the *That*-Trace Effect by Japanese ESL Learners: A VAS Based Analysis*

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1 Introduction

Some syntactic researchers have focused on a subject/non-subject asymmetry in wh-movement since 1970's. Perlmutter (1971) found a subject/object asymmetry with respect to the long distance wh-movement, which is called the *that*-trace effect. Many researchers (Lasnik and Saito 1984, 1992; Rizzi 1990, among others) have attempted to explain it in terms of the Empty Category Principle (ECP) proposed by Chomsky (1981), which is considered to constitute part of the principles of universal grammar. In the field of second language acquisition, some researchers propose that the ECP functions in the early interlanguage grammar (White 1988; Kanno 1996, and among others).

The goal of this research is to investigate whether Japanese ESL learners exhibit the *that*-trace effect with respect to the wh-interrogative construction, as native speakers of English do. If the Japanese ESL learners show this effect, the ECP should be in operation in their acquisition of English. However, if they do not, it will raise the question as to why the ECP is masked. To address this issue, we conducted a judgment task with respect to the wh-interrogative construction using the Visual Analogue Scaling (VAS) evaluation method. The collected data were classified into three ESL level groups based on the scores on an English proficiency test, and the data was analyzed by a repeated measure of ANOVA and a multiple comparison (Bonferroni). Through the analyses, we found that for the advanced level ESL learners, the ECP tends to be in operation, while it does not for the beginner and the intermediate level ESL learners with respect to the wh-interrogative construction with long distance wh-movement.

The organization of this paper is as follows. Sections 2 and 3 provide the background and preliminary study, respectively. Section 4 presents the materials used in this study. Section 5 reports the results of the analysis. Section 6 discusses what the findings seem to suggest. Finally, Section 7 concludes this paper.

2 Background

2.1 The *That*-Trace Effect

Perlmutter (1971) reports a subject/object asymmetry in the wh-interrogative construction with long distance wh-movement, as shown in (1).

(1) a. who do you think that John saw [*t*]?
b. who do you think John saw [*t*]?
c. *who do you think that [*t*] saw Bill?
d. who do you think [*t*] saw Bill?

(1c) is clearly ungrammatical, which involves subject extraction from the embedded clause with the complementizer *that*. Under the definition of proper government proposed in Lasnik and Saito (1984), a trace is properly governed if and only if the trace is lexically governed or antecedent governed. However, the trace in (1c) is not lexically or antecedent governed. Therefore, (1c) is ruled ungrammatical as an ECP violation[1].

In this paper, we will assume the above account based on the ECP, although it cannot be maintained in the light of Chomsky's (1995) Minimalist Program, which only assumes minimality conditions. This is because no principled account has been proposed for the *that*-trace phenomenon in terms of minimality conditions alone. However, assuming the ECP-based account will not affect the main argument of this paper.

Sobin (1987) conducted a judgment task on the *that*-trace phenomenon based on the questionnaire he made, and reported that native speakers of English in the midwest show variable acceptance to the COMP-trace phenomena, suggesting that the *that*-subject trace is permitted by some informants, but not by many other informants.

2.2 SLA Research

White (1988) and Kanno (1996), among others, investigated the relationship between universal grammar and second language acquisition, examining whether the ECP would function in the early interlanguage grammar. White (1988) administered the grammaticality judgment task with respect to long distance wh-movement to French ESL learners. Kanno (1996) conducted the grammaticality judgment task with respect to the Japanese case-particle drop phenomenon to native speakers of English who are learning Japanese as a second language. Both researchers reported that the ECP functions in the early interlanguage grammar.

3 Preliminary Study

Hasebe, Maki and Niinuma (2011) conducted a grammaticality judgment task on the *that*-trace effect to 39 native speakers of English using the questionnaire-based survey to be used as a control for the present

experiment. The details of the materials will be shown in Section 4. Table 1 shows the result of Hasebe et al.'s (2011).

Table 1 Result of Hasebe et al.'s (2011)

	Rate of Correctness	Standard Deviation
Type (1a)	71.94	22.06
Type (1b)	96.66	6.56
Type (1c)	44.90	27.76
Type (1d)	96.40	8.53

The data was analyzed by a repeated measure of 1x4 ANOVA and a multiple comparison (Bonferroni), and the significant level was $p<.05$. They found a statistically significant difference between the scores on type (1c) on one hand, and the scores on types (1a, 1b, and 1d) on the other ($p<.01$).

4 Materials

4.1 The Grammaticality Judgment Task

We conducted the grammaticality judgment task with respect to the wh-interrogative construction with long distance wh-movement, using the Visual Analogue Scaling (VAS) evaluation method proposed by Gould et al. (2001). This is because the subjects' grammaticality judgment would not take discrete jumps. We used the 100mm line scale shown in (2) after showing one example of a totally unnatural sentence and another example of a completely natural sentence, and conducted the grammaticality judgment task to the participants.

(2) VAS Evaluation Method of this Research

How would you judge the naturalness of the sentence as English? Place a vertical mark [|] on the line below to indicate how natural you feel the sentence is.

Totally unnatural 0 ——————————— 100 Completely natural

The questionnaire of this research consists of two types for the counterbalanced design. The target sentences have four types shown in (3), which consist of minimal pairs to each other. Each type of sentence has eight examples. We used the verbs which take a human subject and a human object, in order to have complete minimal pairs for subject and object extraction.

(3) Examples of Target Sentences
   a. Who do you think that Ron found [*t*]?
   b. Who do you think Ron found [*t*]?
   c. Who do you think that [*t*] found Pam?
   d. Who do you think [*t*] found Pam?

4.2 The Minimal English Test

The Minimal English Test (MET) was developed by Maki, Wasada, and Hashimoto (2003) to measure one's ESL proficiency[2]. The MET is a five-minute test which requires the test taker to fill a correct English word into each blank space of the given sentences written on one piece of A4 paper, while listening to the CD which produces the sentences. Part of the MET is shown in (4).

(4) Part of the Minimal English Test (MET)

Please fill an English word into each blank spot, while listening to the CD.

1. The majority of people have at least one pet at ( ) time in their ( ).
2. Sometimes the relationship between a pet ( ) or cat and its owner is ( ) close
3. that ( ) begin to resemble ( ) other in their appearance and behavior.

…

35. As for the ( ) young aspirants who do ( ) succeed,
36. one wonders if they ( ) regret having ( ) their childhood.

4.3 Subjects' Background

In this research, 168 Japanese ESL learners participated in the grammaticality judgment task and the MET. The participants were college and university students in Japan who were learning English as a Second Language. They were classified into three level ESL groups (beginner, intermediate, and advanced) based on the deviation value of the scores on the MET.

Table 2 Participants of this Research

	Beginner	Intermediate	Advanced
Deviation Value (DV)	DV<45	45≤DV<55	55≤DV
Observations	50	60	58

As a control group of this research, we used 39 native speakers of English shown in Section 3. They were university students in the United States of America.

5 Result

This section presents the results of the analyses of the grammaticality judgment task. First, we show the standard analysis of the data in Table 3.

Table 3 Standard Analysis

	(A)	(B)	(C)	(D)	(E)
Type (3a)	71.94 (22.06)	75.78 (25.75)	78.15 (23.56)	80.78 (23.33)	68.56 (28.58)
Type (3b)	96.66 (6.56)	76.93 (27.34)	78.25 (27.85)	79.54 (25.54)	73.10 (28.95)
Type (3c)	44.90 (27.76)	66.37 (29.19)	61.63 (31.20)	72.74 (26.45)	63.87 (29.43)
Type (3d)	96.40 (8.53)	70.17 (29.63)	66.48 (33.24)	71.18 (29.00)	72.31 (27.10)

Average Scores in Millimeters (Standard Deviation)
A: native speakers of English, B: All the participants of Japanese ESL learners, C: beginner level ESL learners, D: intermediate level ESL learners, E: advanced level ESL learners

We analyzed the data by a repeated measure of ANOVA and Bonferroni. First, in order to investigate the difference between the native speakers of English and the Japanese ESL learners, we conducted a repeated measure of 2x4 (2 types of subjects' groups and 4 types of sentences) ANOVA, and found that while the native speakers of English showed a statistically significant difference between (3c) and (3d) (the *that*-trace effect) (p<.01), the Japanese ESL learners did not (p<.41).

Second, in order to investigate whether there would be a difference among the three ESL proficiency level groups, we conducted a repeated measure of 3x4 (3 types of ESL level groups and 4 types of sentences) ANOVA, and found the results shown in (5).

(5) a. There was no statistically significant difference between (3c) and (3d) for the beginner and intermediate level groups (p<1.00).
b. There was a marginally statistically significant difference between (3c) and (3d) for the advanced level group (p<.09).

Furthermore, independent analyses using a repeated measure of 1x4 ANOVA and Bonferroni show that while the beginner and the intermediate ESL level students showed no statistically significant difference between (3c) and (3d) (p<1.00), the advanced ELS level students showed a marginally statistically significant difference between (3c) and (3d) (p<.08).

These results indicate that the advanced level Japanese ESL learners tend to show the *that*-trace effect. Therefore, for the advanced level learners, the ECP seems to be in operation, while it does not for the beginner and the intermediate level learners.

6 Discussion

In this section, we will consider whether the Japanese ESL learners had genuinely acquired long distance overt wh-movement of subject by comparing the VAS scores on the three types of sentences in (6). Type (6c) is the mistake which Japanese ESL learners frequently make, which shows

that long distance overt wh-movement has not been acquired.

(6) Three Types of Sentences with Subject Extraction
   a. Who do you think that [*t*] found Pam?
   b. Who do you think [*t*] found Pam?
   c. Do you think who [*t*] found Pam?

We conducted a repeated measure of 3x3 (3 types of ESL level groups and 3 types of sentences) ANOVA. Table 4 shows the standard analysis of the grammaticality judgment task in (6).

Table 4 Standard Analysis

	(A)	(B)	(C)	(D)
Type (6a)	44.90 (27.76)	61.63 (31.20)	72.74 (26.45)	63.87 (29.43)
Type (6b)	96.40 (8.53)	66.48 (33.24)	71.18 (29.00)	72.31 (27.10)
Type (6c)	17.72 (20.28)	59.61 (36.83)	54.30 (36.32)	45.12 (36.92)

Average Scores in Millimeters (Standard Deviation)
A: native speakers of English, B: beginner level ESL learners, C: intermediate level ESL learners, D: advanced level ESL learners

Through the analysis, we found the following. First, the beginner level learners showed no statistically significant difference between (6a) and (6b) (p<.58), or between (6b) and (6c) (p<.96), which indicates that they have not genuinely acquired long distance wh-movement. Second, the intermediate level learners showed a statistically significant difference between (6b) and (6c) (p<.03), but no statistically significant difference between (6a) and (6b) (p<1.00). This indicates that they seem to have acquired long distance wh-movement, but the ECP is being masked. Third and finally, the advanced learners showed a statistically significant difference between (6b) and (6c) (p<.01), and between (6a) and (6b) (p<.05). This indicates that they have acquired long distance wh-movement, and at the same time, the ECP tends to be in operation[3]. Based on the results obtained from the series of experiments, it seems that Japanese ESL learners seem to experience two steps before being able to properly judge the *that*-trace effect.

7 Conclusion

In this research, we found that for the advanced level ESL learners, the ECP tends to be in operation, while it does not for the beginner and the intermediate level ESL learners with respect to the wh-interrogative construction with long distance wh-movement. Furthermore, as for the acquisition of the wh-interrogative construction with long distance wh-movement, the Japanese ESL learners seem to experience two steps: (i) acquisition of overt long distance wh-movement, and (ii) getting rid of the masking effect for the function of the ECP.

Notes

* An earlier version of this paper was presented at the Western Conference on Linguistics (WECOL) 2011 held at Simon Fraser University on October 14. We would like to thank the audience at the meeting, as well as Jessica Dunton and Roger Martin for their valuable comments.

[1] Lasnik and Saito (1992) elaborate the account of the *that*-trace phenomenon in the following fashion. They propose (i) and (ii), and explain the contrast between (1c) and (1d).

(i) Only X^0categories can be proper governors.

(ii) a. A [+wh] COMP has a [+wh] feature.
b. *That* in a [-wh] COMP has a [-wh] feature.
c. A null head in a [-wh] COMP does not have either a [+wh] feature or a [-wh] feature.
d. A trace does not have either a [+wh] feature or a [-wh] feature.

The more precise structures of (1c-d) are shown in (iii).

(iii) a. who$_1$ do you think [$_{CP}$ t_1' [$_{C'}$ that [$_{IP}$ t_1 saw Bill]]].
b. who$_1$ do you think [$_{CP}$ t_1' [$_{C'}$ Ø [$_{IP}$ t_1 saw Bill]]].

In (iii-a), *that* in COMP has a [-wh] feature, and the intermediate trace t_1' in CP SPEC does not have either a [+wh] feature or a [-wh] feature. Therefore, these two are not in SPEC-head agreement, so that the COMP cannot have the same index as the subject trace. Thus, the COMP cannot function as a proper governor for it, and (iii-a) is ruled out as an ECP violation. On the other hand, in (iii-b), the null head in COMP and the intermediate trace t_1' in CP SPEC have neither a [+wh] feature nor a [-wh] feature. Therefore, they are in SPEC-head agreement, so that the COMP can have the same index as the subject trace. Thus, the former, being an X^0 category, can function as a proper governor for it, so that (iii-b) is not ruled out by the ECP, and is correctly predicted to be grammatical.

[2] The MET contains 36 lines, each of which has two blank spaces. Therefore, there are 72 blank spaces on the MET, and the full score is 72 points. The MET is based on Lessons 1 and 2 of the textbook for college freshmen by Kawana and Walker (2002) and the CD that accompanies it. Lessons 1 and 2 contain 18 lines each, and between Line 18 (the last line of Lesson 1) and Line 19 (the first line of Lesson 2), there is a three-second interval in the CD. The CD reads out the sentences at a speed of 125 words per minute. The reliability and the validity of the MET have been investigated, and the MET has been shown to be a reliable ESL test (Goto, Maki and Kasai 2010; Maki et al. 2004-2010).

[3] One might argue that the relative acceptance of (6c) by some subjects is not due to the failure to acquire long distance wh-movement, but originates from misunderstanding the embedded COMP as [+WH] rather than [-WH]. To see if this is the case, we administered the Japanese-English Translation Test (JETT) to the same subjects (168 Japanese participants), using the same sentences used for the VAS-based task, including examples such as (iv), in which the embedded COMP is unambiguously [-WH], indicated by *to* 'that,' not *ka* 'Q.' The results of the JETT are shown in Table 6.

(iv) Anata-wa dare-ga Pam-o mituke-ta to omoi-masu ka?
you-TOP who-NOM Pam-ACC find-past that think-polite Q
'Who do you think found Pam?'

Table 5 The Rate of the Sentence Patterns Produced (%)

	Type (6b)	Type (6c)	P-value
Beginner	10.29	24.51	p<.02
Intermediate	20.39	19.41	p<.44
Advanced	26.56	14.45	p<.04

Table 5 shows that the ratio of producing sentence pattern (6c) is significantly higher than that of producing sentence pattern (6b) for the beginners (p<.02). This indicates that the failure for the beginners to conduct long distance wh-movement does not originate from misanalyzing the embedded COMP as [+WH] rather than [-WH].

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Gradable Predicates and the Distribution of Approximators

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The goal of this paper is to identify and explain the asymmetries in the distribution of *approximately* and *about* exhibited in (3) and (4). The analysis provided finds the distribution of *approximately* to be a direct result of composition and argument types, and the narrower distribution of *about* is a result of its inability to coerce scalar readings.

1 Introduction

The approximators *approximately* and *about* can appear in constructions like (1) and (2), where they modify the number phrase *50 sandwiches*.

(1) a. John served approximately 50 sandwiches.
b. John served about 50 sandwiches.

(2) a. What John served was approximately 50 sandwiches.
b. What John served was about 50 sandwiches.

Approximators can also modify a noun if it is coerced into a scalar reading, as *beef stroganoff* is in the examples below. In this context, however, approximators are more restricted in their distribution. Additionally, the ostensible synonyms *approximately* and *about* pattern differently with coerced scalars.

(3) a. ??John served approximately beef stroganoff.
b. ??John served about beef stroganoff.

(4) a. What John served was approximately beef stroganoff.
b. ??What John served was about beef stroganoff.

Below we investigate these asymmetries. Specifically, we will address why coerced-scalar nouns pattern differently from numerals ((3),(4) v. (1),(2)) and why *approximately* and *about* pattern differently with coerced-scalar nouns but not with numerals ((3) v. (4)). For the former asymmetry, I will show that by following Hackl (2000), an approximator in combination with a scalar (e.g. *ap-*

proximately beef stroganoff) requires more arguments than are supplied in (3). For the latter, I will suggest that *approximately* and *about* have differing abilities to coerce scalars.

2 *Approximately*

2.1 Hackl on modified numerals

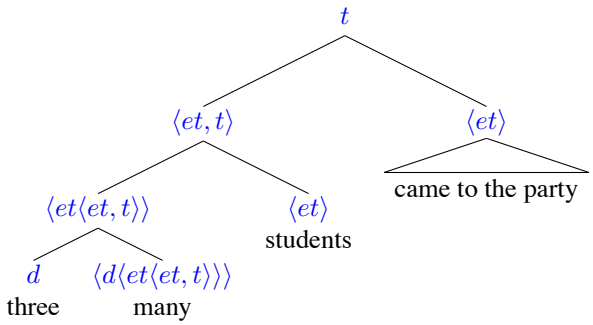
Hackl (2000) proposes that bare numerals combine with a phonologically-null 'degree function' *many*.

(5) $[\![\textbf{many}]\!] = \lambda d \in D_{Card}.\lambda\, {}^*f \in D_{\langle et\rangle}.\lambda\, {}^*g \in D_{\langle et\rangle}.\exists x\, {}^*f(x) = {}^*g(x) =$
1 & x has d-many atomic parts in f (Hackl, 2000, p. 213)

In the example in (6), *many* combines with the numeral *three* (which for simplicity I will treat as type d(egree)) and two predicates ranging over pluralities (*students* and *came to the party*) and asserts that there is some x that is true of both predicates which has three atomic student parts.

(6) a. Three students came to the party.

b.

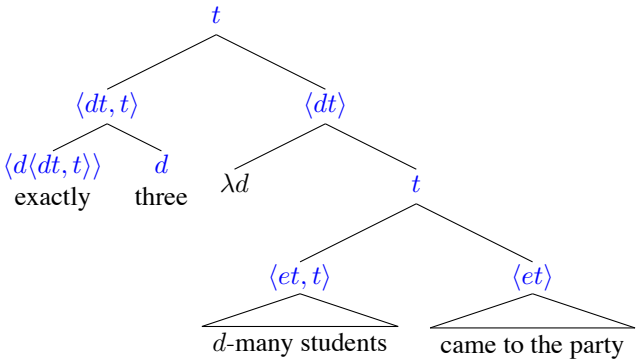


Numeral expressions can also involve 'degree quantifiers' like *at most* and *exactly*, which compose as in (8).

(7) $[\![\textbf{exactly n}]\!] = \lambda D_{\langle dt\rangle}.D(n) = 1$ & $\neg\exists d[d > n$ & $D(d) = 1]$

(8) a. Exactly three students came to the party.

b.



Here, *exactly* functions to assert that the number of students who came to the party is three and no more than three.

Hackl notes a restriction on *many*: unlike other degree functions like *tall*, *many* can only be used attributively. This is apparent in the complement of *look* and *consider*, which require predicative $\langle et\rangle$ arguments (Partee, 2008).

(9) a. John looks tall. (Hackl, 2000, p. 97)
b. *The guests look many.

(10) a. Mary considers John tall. (Hackl, 2000, p. 98)
b. *Mary considers the guests many.

The difference, Hackl proposes, is that *many* cannot be type-shifted to behave predicatively, whereas *tall* can.

A possible objection to this can be seen in (11), where *many* occurs in what may appear to be a predicative post-copular position. Hackl, however, claims copular constructions do not provide reliable tests for predicate status.

(11) The guests were many women. (Hackl, 2000, p. 97)

2.2 Extension to *approximately*

I treat *approximately* as a degree quantifier (cf. *exactly*, (7)) which feeds *many* a degree that falls within some contextually-determined distance σ of n. This composes just as *exactly* does in (8).

(12) $[\![\textbf{approximately n}]\!] = \lambda D_{\langle dt\rangle}.\exists x_d \in \{y | n + \sigma \geq y \geq n - \sigma\} : D(x)$

I treat coerced scalars as degrees such that the coerced scalar *beef stroganoff* denotes a degree on some scale or set of scales representing beef stroganoff.

Note that we cannot use *many* with these constructions, since it requires plural predicates and involves counting over atomic parts. Instead I assume what here is called *much*, which references scales, not cardinalities.

(13) $[\![\textbf{much}]\!] = \lambda d \in D_d.\lambda f \in D_{\langle et\rangle}.\lambda g \in D_{\langle et\rangle}.\exists x : f(x) = g(x) = 1$ & x falls at d on the relevant scale in f

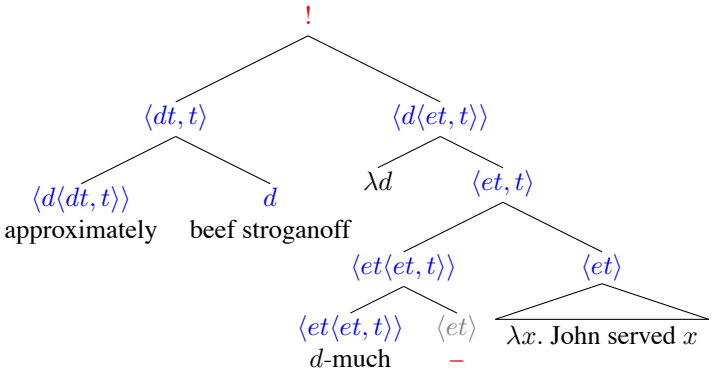
In (3), *much* can take *beef stroganoff* (type d) and [λx. John served x] (type $\langle et\rangle$) as arguments, but it is still missing an argument of type $\langle et\rangle$ and is therefore unacceptable.[1] This is illustrated below, where *much*'s (missing) $\langle et\rangle$ arguments are underlined.

(3) ??<u>John served</u> approximately beef stroganoff *much* _____.

The failed composition is shown in (14), with – in place of the missing argument.

(14) a. ??John served approximately beef stroganoff.

b.



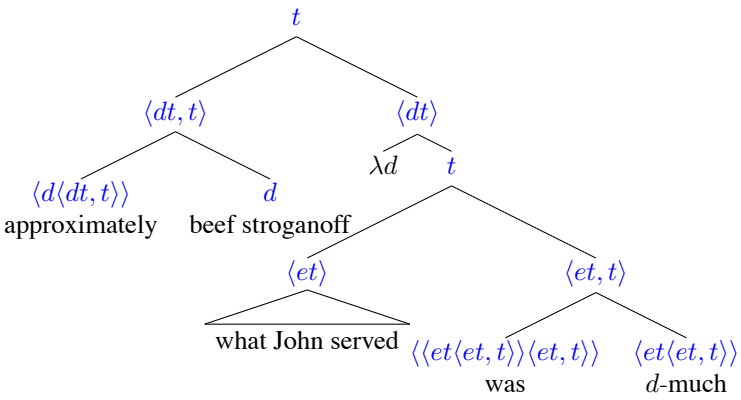
Given this explanation for the unacceptability of (3), the acceptability of (4) becomes mysterious, since it too seems to be missing an argument of type $\langle et\rangle$.

(4) <u>What John served</u> was approximately beef stroganoff *much* _____.

Recall, however, that Hackl does not consider post-copula positions to be strictly $\langle et\rangle$. A possible explanation for why these forms are permitted in copular constructions is to propose a copula-specific type shift, somewhat similar to Partee (2008).[2]

(15) a. What John served was approximately beef stroganoff.

b.



Note that coerced scalars are acceptable in other approximated copular expressions, not just pseudoclefts.

(16) This is approximately beef stroganoff.

Furthermore, *approximately* with a coerced scalar is unacceptable as the complement of *look* and *consider*, mirroring the behavior of *many* in (9) and (10). This supports the idea that this type-shift is tied to the copula such that *many* cannot behave predicatively without a copula.

(17) *That dish looks approximately beef stroganoff.

(18) *I consider that dish approximately beef stroganoff.

In sum, I assume that *approximately* is a Hackl-style degree quantifier which combines with *much* and requires two arguments of type $\langle et\rangle$. The unacceptability of (3) is due to a missing argument of *much*. The the acceptability of (4) is due to a copula-specific type-shift such that *much* is no longer missing an argument.

2.3 A note on adverbs

There is, however, a potential alternative to this Hackl-style analysis.[3] Consider (19) and (20), where the comparison with *frequently* highlights the adverbial status of *approximately* in the sentences we have been considering.

(19) What John served was frequently/approximately beef stroganoff.

(20) a. John served ??frequently/??approximately beef stroganoff.
b. John frequently/approximately served beef stroganoff.

Adverbs typically follow a light verb, as *frequently*/*approximately* do in (19), and they typically precede a lexical verb, as they do in (20b). *Approximately*'s acceptability in (19) (=(4a)) and unacceptablilty in (20a) (=(3a)) now appear to fall out

from the general structural position of adverbs.

Concerning interpretation, the approximative reading of *beef stroganoff* can result indirectly from modification of the copula (cf. *What John served approximately equaled beef stroganoff*). In (20a), the only acceptable reading of *approximately* is one in which it modifies *served*, not the noun *beef stroganoff*, which is what we expect from an adverb. Note that *approximately* sounds even better with an inherently scalar lexical verb, like *doubled*.

(21) a. John frequently/approximately doubled his income.
b. This frequently/approximately {corresponds to/matches} that.
c. This is frequently/approximately the same as that.

These examples, however, highlight a contrast in prosody between *approximately* and other adverbs. Some speakers prefer *doubled* to be prosodically prominent when modified by *approximately*, but not by *frequently*. This might suggest scope differences as in (22).

(22) a. John [frequently [doubled his income]]
b. John [approximately [**doubled**]] his income

Similarly, note the differences in the potential paraphrases in (23). While (23a) is a reasonable paraphrase of the *frequently* version of (21a), (23b) is not such a close paraphrase of the *approximately* version of (21a). Instead, (23c) is a much closer match.

(23) a. What John frequently did was double his income.
b. What John approximately did was double his income.
c. What John did was approximately double his income.

It seems then that while adverbs like *frequently* quantify over events, adverbs like *approximately* are instead more direct scalar modifiers, as they are under a Hackl-style analysis.[4]

3 *About*

We now have an explanation for why *approximately* is acceptable in (4) but not (3). Next we address why *about* is not acceptable in either of these examples.

3.1 Coercion

The difference between *approximately* and *about*, I propose, is that unlike *approximately*, *about* does not coerce scalar readings. *About*, therefore, cannot combine with non-inherently-scalar terms like *beef stroganoff* (see also prepositions *around* and *near*). Why this is the case is not immediately clear but may be related to the availability of non-scalar forms of *about*[5]:

(24) a. It's about to rain.
b. It's about time.
c. Tom moved about the room.
d. John talked about Mary.

An asymmetry in the distribution of *approximately* and *about* has been noted before. For example, Sauerland and Stateva (2007) claim that *approximately* freely combines with non-endpoint scalars, while *about* can only combine with non-endpoint scalars in the form of numerals and temporal expressions, as shown in (25) and (26) below.

(25) a. #approximately dry/pure/white
b. approximately three/north/the same
c. #approximately beef stroganoff/a heap of wood

(26) a. about three, at about noon, at about midnight, at about the same time
b. #about clean/open/north

Note that Sauerland and Stateva intentionally avoid coerced scalar readings, so for their purposes *approximately beef stroganoff* is infelicitous. If we assume that *beef stroganoff* in (3) and (4) is coerced into a non-endpoint scalar reading, this distinction would account for the asymmetries in question: *beef stroganoff* as a non-endpoint scalar should be felicitous with *approximately*, but it is neither a numeral nor a temporal expression and therefore should be infelicitous with *about*, as is indeed the case.

3.2 Additional restrictions

Sauerland and Stateva's characterization of *about*, however, is both too inclusive and too restrictive. There are many temporal expressions that *about* cannot modify.[6]

(27) a. ??He'll arrive on about Tuesday.
b. ?It's about Thanksgiving.

Additionally, there are non-numeral non-temporal expressions that *about* can occur with, particularly certain gradable adjectives.

(28) a. about full/empty/straight/?dry/?certain/?closed/#invisible/#pure
b. about #wet/#visible

Maximum-standard adjectives (Kennedy and McNally, 2005; Kennedy, 2007), shown in (28a), seem more felicitous than minimum-standard adjectives, shown in (28b). This may be because approximating a minimum-standard adjective results in something relatively trivial. That is, if any non-zero amount of water will cause something to be 'wet', the laxer *about wet* could be true of everything; a similar

pattern holds for *approximately* and *exactly*.[7]

Still, not all maximum-standard adjectives are acceptable with *about* (e.g. *pure*). The explanation I pursue here involves comparison with similar *just about* forms. Note that with the addition of *just*, *about* has a wider distribution.

(29) a. just about full/empty/straight/dry/certain/closed/?invisible/pure
b. just about ?wet/?visible

Below I will refer to those maximum-standard adjectives acceptable with bare *about* as AFMs (*about*-felicitous maximum-standard adjectives, e.g. *full*), and I will refer to those maximum-standard adjectives not acceptable with bare *about* as AIMs (*about-in*felicitous maximum-standard adjectives, e.g. *pure*).

Given the wider distribution of *just about* compared with bare *about*, I pursue the idea that when bare *about* appears with an AFM, it is a conventionalized abbreviation of *just about*. If *about* appears with an AIM, no such conventionalized form is available. I argue for this in two ways below. First, I show that the interpretation of *about* with AFMs mirrors that of *just about* and not that of numeral-/temporal-expression-modifying *about*. Second, I bring in corpus data to suggest that *just about* occurs more often with AFMs than with AIMs, and I argue that such use is consistent with the conventionalization of a *just*-less form of *just about* for AFMs but not for AIMs.

3.2.1 Conventionalization and the interpretation of about

Just about is, as described by Morzycki (2001), an '*almost* modifier', a class that includes terms such as *almost*, *virtually*, *nearly*, *damn near*, *pretty much*, *not quite*, and *just about*. *Almost*, as described by Nouwen (2006), has both a proximal and a polar component, which can be seen in the sentence in (30). This sentence expresses that Travis came close to dying (proximal), but that he did not die (polar).

(30) Travis almost died.
a. Travis came close to dying (proximal)
b. Travis did not die (polar)

This polar component, while present, is not prominent, as can be seen in the infelicity of (31) (cf. *Fortunately, Travis did not die*).

(31) #Fortunately, Travis almost died.

Returning to AFMs, we see that bare *about* patterns with *almost* modifiers in expressing proximity. This is unsurprising, since that *about* expresses proximity when combining with numerals and temporal expressions as well.

(32) a. almost full
b. just about full

c. about full
d. (about ten)

More interestingly, these uses of *about* continue to pattern with *almost* modifiers with respect to polarity: *about full* seems to express *not full*. Note that this polarity is not expressed with numerals/temporals.

(33) a. almost full → not full
b. just about full → not full
c. about full → not full
d. (about ten ↛ not ten)

Additionally, this polar component is not prominent with this use of *about*.

(34) a. #Fortunately, the glass was almost full when it fell.
b. #Fortunately, the glass was just about full when it fell.
c. #Fortunately, the glass was about full when it fell.

Overall, this use of *about* patterns with *almost* modifiers instead of with numeral/temporal *about*. This supports the idea that this use of *about* is an *almost* modifier with a phonologically null *just*.

3.2.2 Conventionalization and the frequency of just about

Another way to address whether the use of *about* in (28) is a conventionalized form of *just about* is to examine its attested use with different gradable predicates.[8] In particular, we might predict the following: AFMs (e.g. *full*) may occur more frequently with *just about* than AIMs (e.g. *pure*), and this higher frequency with *just about* may then lead to the abbreviated null-*just* form. Below we examine whether AFMs do in fact occur more frequently with *just about* than AIMs do.

For maximum standard adjectives in the relevant proximal uses, we find the following counts from the Corpus of Contemporary American English (Davies, 2008):

(35)

adjective	bare *about*	*just about*	all *about*	rating in (28)
full	2	2	34	
empty	0	2	13	
straight	0	1	12	
dry	2	3	15	?
certain	0	1	319	?
closed	0	0	5	?
invisible	0	1	13	#
pure	0	0	22	#

These numbers are quite low overall, but they may be trending in the right direc-

tion. Specifically, AFMs (notably *full*, ?*dry*) tend to occur more often with *just about* than AIMs do. A next step may be to collect more detailed acceptability ratings for a greater number of adjectives. The adjectives can then be accurately binned according to their level of *about*-felicity, allowing for higher/more reliable counts per bin.

To sum up, the analysis provided here is that *about* is unacceptable in (3) and (4) because it cannot coerce scalars. Instances where *about* appears to coerce scalar readings involve a null *just* and are *almost* modifiers.

4 Conclusion

In order to explain the difference of behavior of *approximately* in (1) and (2) v. (3) and (4), I have provided a Hackl-style analysis of *approximately* such that, in the absence of a copula, it can only act attributively.

(1) a. John served approximately 50 sandwiches.
b. John served about 50 sandwiches.

(2) a. What John served was approximately 50 sandwiches.
b. What John served was about 50 sandwiches.

(3) a. ??John served approximately beef stroganoff.
b. ??John served about beef stroganoff.

(4) a. What John served was approximately beef stroganoff.
b. ??What John served was about beef stroganoff.

The sentence in (3a) is unacceptable because *much* remains unsaturated, while the sentence in (4a) is felicitous due to a copula-specific type shift that obviates this 'missing' argument. *Approximately* and *about* pattern differently with coerced-scalar nouns but not with numerals because *approximately* can coerce scalar readings out of non scalars, but *about* cannot.

This analysis provides new support for a Hackl-style approach to quantification, as these contrasts would not be expected under a standard generalized quantifier theory. It also extends Hackl's approach to numerals, which (among other things) treats them as degrees modified by a possibly-null degree function, by extending it to coerced scalars like *beef stroganoff*. This analysis, however, raises a number of questions.

For instance, one might wonder whether separate *many*/*much* operators necessary. On some level, they both relate degrees (of cardinality, beef-stroganoff-ness, etc.), so perhaps one unifying operator could be posited. Note, however, that *many* is restricted to pluralities and atomic counts of items, not degrees (e.g. sandwiches, not cardinalities), while *much* is restricted to degrees (e.g. of beef-stroganoff-ness), not items (e.g. things John served).

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Notes

[1] Additional support for this can be found with coerced scalar adjectives. In (36), the sentence is acceptable when an additional NP argument ($\langle et \rangle$, e.g. *answer*) is present.

(36) John gave an approximately-correct answer.

[2]Partee's shift concerns moving between generalized quantifiers and predicates, not parameterized determiners and generalized quantifiers, which is what we need here.

[3]Thanks to Ed Cormany for reminding me of this option.

[4]Note that I have not shown how exactly a Hackl-style analysis could account for verb modification.

[5]To be clear, I do not assume that all uses of *about* involve the same lexical item. Instead, I suggest that the presence of non-scalar lexical entries with the same phonological form as scalar *about* causes us to resist forcing a scalar reading out of a non-scalar modified by *about*.

[6]Thanks to Gregory Ward for bringing these to my attention, as well as fact that scale matters for felicity (cf. *I'm about* {*at the boarder/# in New York*}).

[7]Note also that maximum-standard adjectives are more punctuated, like numerals and (acceptable, see previous footnote) temporal expressions.

[8]Thanks to Adele Goldberg for prompting me to take this step.

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Evaluating Singular Indefinites

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1 Introduction

There is a sharp contrast between the interpretation of bare plurals (e.g. *cookies*) and singular indefinites (e.g. *a cookie*) when they occur as object of an evaluative verb such as *like*, as demonstrated in (1).

(1) a. John likes cookies. (kind reading)
b. #John likes a cookie. (specific reading)

The sentence in (1a) with a bare plural indicates that John is favorably disposed toward cookies in general. The singular indefinite in (1b), however, only allows a (typically infelicitous) reading where John is favorably disposed toward one specific cookie. A similar pattern can be found with habituals, as shown in (2).

(2) a. John eats cookies.
b. #John eats a cookie.

There are, however, a number of constructions which use an evaluative verb and a singular indefinite object which do *not* lead to a specific reading of the object, shown in (3).[1]

(3) a. John likes a cookie after dinner.
b. ?John likes to have a cookie.
c. John likes a good cookie.
d. John likes a cookie as much as the next person.

With the exception of temporal modification as in (3a), these constructions do not have the same ameliorating effect on habituals, as shown in (4).

(4) a. John eats a cookie after dinner.
b. * John eats to have a cookie.
c. # John eats a good cookie.
d. # John eats a cookie as much as the next person.

This paper investigates why evaluative verbs and the modifications in (3) present this specificity contrast. Drawing on the analysis of habituals in Rimell (2004), we provide an analysis where the structures in (3) provide a restriction on situations. This restriction gives rise to a tripartite structure, and this tripartite structure allows the singular indefinite to avoid a wide-scope specific reading.

2 Specificity and domain restriction

2.1 Habituals (Rimell, 2004)

Rimell (2004) discusses habitual sentences like (5), which contain an episodic verb (e.g *drink*) and quantify over multiple episodes (e.g. of Mary drinking beer).

(5) Mary drinks beer.

She argues that simple habitual sentences like (6a) need to be distinguished from habituals with overt quantificational elements like (6b), due their contrast in felicity.

(6) a. #Mary drinks a beer.
b. Mary usually drinks a beer when she's at Dempsey's Pub.

On Rimell's analysis, overtly quantified habituals have a tripartite logical form like that in (7) (Rimell, 2004, p. 665).

(7)

USUALLY$_s$	[M at DP in s]	$\exists x$[beer(x) & M drinks x in s]
Q	*restrictor*	*nuclear scope*

When a quantifier has no restrictor overtly specified, as in (8a), one can be supplied contextually. Similarly, the presence of a restrictor, as in (8b), licenses a covert quantifier. GEN_s.

(8) a. Mary often eats roast beef sandwiches.
b. Mary eats green beans when she's hungry.

Speakers can infer either a covert restrictor or a covert quantifier, but they (typically) cannot infer both if they are given only a nuclear scope. Rimell argues that simple habituals (i.e. those with neither restrictor nor quantifier overtly supplied) do not, therefore, have a tripartite structure. Instead, generalization in simple habituals is due to a scopally inert affix of the matrix verb and a generalization operator ($\exists_{\text{sufficient}}$) over stages of individuals, shown in (9) (Rimell, 2004, p. 674).

(9) Mary drinks beer. (habitual)
$\exists_{\text{sufficient}} y^s.R(y^s, m) \wedge \exists z^s.R(z^s, b) \wedge drink'(z^s, y^s)$
'There are sufficient Mary-stages that drink beer-stages for us to generalize to Mary herself.'

Obligatory quantifier-raising of the singular indefinite object gives it widest scope, shown in (10), which results in a specific reading.

(10) #Mary drinks a beer.
$\exists x^o[beer'(x^o) \wedge \exists_{\text{sufficient}} y^s.R(y^s, m) \wedge \exists z^s.R(z^s, x^o) \wedge drink'(z^s, y^s)]$
'There is a beer such that there are sufficient Mary-stages that drink stages of that beer for us to generalize to Mary herself.'

This reading is infelicitous, since a single beer cannot typically be drunk on multiple occasions. This contrasts with the overtly-quantified habitual in (6b), where the quantifier *usually* takes scope over the indefinite, resulting in an interpretation where a different beer is drunk on each occasion.

2.2 Extension to evaluatives

The evaluative predicates we are concerned with (e.g. *like*) are stative, not episodic, but a similar generalization takes place. The statives generalize over situations[2] in which the judge experiences the object of evaluation positively, and just as with habituals, the quantification has less than universal force (i.e. $\exists_{\text{sufficient}}$, not $\forall$). In other words, it can be true that John likes cookies even if he is not positively disposed toward them in every situation. But there must be some sufficient number of situations in which he *is* so disposed.

If evaluative statives pattern with habituals generally, then we should see the same licensing of indefinites when there is an overt quantifier or restrictor (cf. (6b)). This is exactly what we find with temporal modification in sentences like (4a) and (3a), repeated below.

(4a) John eats a cookie after dinner.

(3a) John likes a cookie after dinner.

Their tripartite structures should be as in (12) and (11) respectively.

(11) GENs [after-dinner(s)] $\exists x$[cookie(x) and J likes x in s]

(12) GENs [after-dinner(s)] $\exists x$[cookie(x) and J eats x in s]

But while (12) is a good representation of (4a), (11) does not represent the most natural interpretation of (3a). The adverbial in (3a) cannot easily be applied to 'liking', as this results in what we term a 'fickle' reading: Restricting situations in which a person is positively disposed toward some

object makes that person appear fickle in their preferences, since a person's likes should stay relatively constant (or have a good reason for changing), cf. (13).

(13) # I like the president when it's raining.

The most natural interpretation of (3a) is one where John does not simply feel positively about a cookie, but rather where he feels positively about *having* a cookie. The availability of this *have*-reading appears to be tied to a certain class of verbs, to which we now turn.

3 Complement structure

3.1 Intensional Transitive Verbs

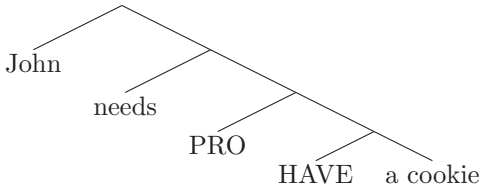
Schwarz (2008) argues for two distinct classes of intentional transitive verbs (ITVs), the *look-for*-class and the *need*-class, based on the presence or absence of certain interpretational ambiguities. On his analysis, the complements of ITVs in the *look-for*-class denote properties (cf. Zimmermann, 1993). In contrast, the complements of ITVs in the *need*-class denote propositions. We can see the relevant ambiguities in a sentence like (14), which is ambiguous between the readings in (14a) and (14b).[3]

(14) John needed a cookie after dinner.

a. There was a time after dinner at which John needed a cookie
b. John's need is to have a cookie after dinner

The explanation for this ambiguity Schwarz offers is that *need*-type ITVs can take a covert *HAVE*-clause complement, as sketched in (15).

(15) John needs a cookie.



Adverbials modifying *need*-type ITVs can then attach high (to *need*) or low (to *HAVE*), resulting in the ambiguities in (14).[4]

(14a) John [needed [PRO HAVE a cookie] after dinner] (high)

(14b) John needed [[PRO HAVE a cookie] after dinner] (low)

3.2 Extension to evaluatives

Evaluative *like* is ambiguous in the same way *need*-ITVs are, as shown in (16).[5,6]

(16) John liked a cookie after dinner.
  a. There was a time after dinner at which John liked (to have) a cookie (high)
  b. What John liked was having a cookie after dinner (low)

This shows us that *like* can (optionally) take a *HAVE*-clause argument. In fact, temporal adverbials like *after dinner* are typically only felicitous with *like* when modifying a *HAVE*-clause, since directly modifying *like* or similar statives results in the previously mentioned 'fickle' readings, cf. (13).[7]

We can identify two distinguishing characteristics of the constructions in (3): I) they allow a non-specific reading of the singular indefinite object and, as will be shown in greater detail in the next section, II) They allow a *HAVE*-clause reading.[8]

So why is (1b) not allowed a non-specific/*HAVE*-clause interpretation?

(1) a. John likes cookies.
  b. #John likes a cookie.

First we note that some singular-indefinite objects *are* allowed a non-specific reading in this context, as *a challenge* is in (17).

(17) Amy: Sorry to stick you with so much work.
  Ben: That's okay. I like a challenge.

We believe the important difference between the singular indefinites in (1) and (17) is that the evocativeness of *challenge* easily lends itself to a *HAVE*-clause reading, one where the agent is the consumer of a challenge. This evocativeness also seems to lead to a non-specific reading. Note the ambiguity with adverbial attachment, shown in (18), indicating the presence of a *HAVE*-clause in this example.

(18) I like a challenge in the afternoon.
  a. There are times in the afternoon when I like a challenge
  b. What I like is to 'have' a challenge in the afternoon

Nouns that pattern this way are arguably event denoting and include *puzzle* and *mystery*, as well as *nap*, *massage*, and *spanking* (these last three courtesy of Gregory Ward, p.c.). In these cases as well, the non-specific reading and *HAVE*-clause-reading are tied together. In contrast, the most salient (specific) readings of (3b) and (13) lack a *HAVE*-clause. In the next

section we examine each example from (3) and show how the modification leads to both a *HAVE*-clause reading and a non-specific reading.

4 Solutions

Below we explore how these modifications lead to two characteristics in the sentences in (3): I) they allow a non-specific reading of the singular indefinite object and II) they allow a *HAVE*-clause reading.

4.1 (3a) John likes a cookie after dinner.

I. Modification induces *HAVE*-clause reading As discussed in Section 3.2, the adverbial must modify a *HAVE*-clause in order to avoid a 'fickle' reading. These 'fickle' readings are shown in (19), where the adverbial modifies the *like*-clause. The felicitous reading is shown in (20).

(19) a. John [likes [a cookie] after dinner] ('fickle')
b. John [likes [PRO HAVE a cookie] after dinner] (high, 'fickle')

(20) John likes [[PRO HAVE a cookie] after dinner] (low)

II. Modification allows non-specific reading In this case we can apply our extension of Rimell (2004) directly. The modifier supplies a restrictor and the restrictor licenses a covert adverbial quantifier over situations, GEN_s. GEN_s takes scope above the indefinite, which allows a non-specific reading, as shown in (21).

(21) GEN_s [J in s and s after dinner] $\exists x$[cookie(x) and J likes(have(x, J) in s)]

4.2 (3b) ?John likes to have a cookie.

I. Modification induces *HAVE*-clause reading Here the modification is the introduction of an overt infinitival *have*-clause. Unsurprisingly, this sentence shows the appropriate attachment ambiguities; there is an overt attachment site in an overt subordinate clause, whose predicate, *have*, shares the interpretation of our covert *HAVE*. Just as with the covert *HAVE*, adverbial modification of *have* is preferred to the 'fickle' modification of *like*.

(22) John [likes [to have a cookie] after dinner] (high, 'fickle')

(23) John likes [[to have a cookie] after dinner] (low)

II. Modification allows non-specific reading Intuitively, interpretation (3b) requires further implicit restriction (e.g. *John likes to have a cookie when he's hungry*), and the overt verb *have* provides a salient (non-'fickle') target for an adverbial. As Rimell shows, an adverbial licenses a tripartite structure and therefore a non-specific reading of a singular indefinite. We propose that the overt verb leads hearers to anticipate or create a restrictor, which in turn allows them to provide a quantifier. This gives rise to a tripartite structure and allows for a non-specific reading.

(24) GEN_s [J in s and ??? in s] $\exists x$[cookie(x) and J likes(have(x, J) in s)]

The difficulty of supplying both a covert restrictor and a covert quantifier is reflected in the marginality some people report for this sentence.[9]

4.3 (3c) John likes a good cookie.

I. Modification induces *HAVE*-clause reading The most salient reading of (3c) involves a special reading of *good*, which we will refer to as *good**. We propose that instead of modifying the nominal and asserting that the cookie in question is 'good', *good** restricts us to consider only cookie-*HAVING*-situations that meet some standard of 'good'-ness.

This use of *good* seems to be related to cases where *good* modifies quantities, as in (25).

(25) a. John read a good ten books.
b. John saw a good number of geese.

Here the claim is not that the *ten books* or the *number of geese* is 'good'. Rather, *good* indicates that the quantity in question meets some cardinality standard.

In support of our claim that *good** is not modifying the nominal, consider the interpretation of standard intersective adjectives like *white*. These can appear in the same construction but are felicitous only under an intersective reading with contrastive stress. Non-prominence for a contrastive intersective adjective results in infelicity, shown in (26b).

(26) a. I like white shirts. (intersective *white*)
b. #I like a white SHIRT. (*white**, unavailable)
c. I like a WHITE shirt. (intersective *white*)

*Good** patterns differently. It needs to be less prominent than the noun. Otherwise, an intersective reading results.

(27) a. I like good cookies. (intersective *good*)
b. I like a good COOKIE. (*good**)
c. I like a GOOD cookie. (intersective *good*)

The infelicity of (26b) and the felicity of (27b) follow from the analysis above of *good** and *white** as situation modifiers: situations can be evaluated against standards of acceptability or 'good'-ness, but situations cannot typically be evaluated against standards of pertaining to colors.

(26b) #I like a shirt-*HAVING* situation that is white. (*white**)

(27b) I like a cookie-*HAVING* situation that is good. (*good**)

The felicity of both (26c) and (27c) is expected under this analysis as well, since contrastive intersective adjectives modify the singular indefinite, not the situation, and a cookie can be good, just as a shirt can be white.

(26c) I like *HAVING* a white-shirt. (intersective *white*)

(27c) I like *HAVING* a good-cookie (intersective *good*)

II. Modification allows non-specific reading Ferreira (2005) proposes that the habitual operator is a covert definite determiner over pluralities of events. On this view, *good** can be understood as a modifier of pluralities of events in much the same way that the *good* of quantity in (25) modifies pluralities of objects.

In a system like Ferreira's, the adjective *good** would selectively modify only pluralities of events. In our current system that corresponds to licensing a covert quantifier by providing an overt restrictor. *Good**, then, is a situation restrictor and as such introduces a tripartite structure. As before this allows for a non-specific reading, shown in (28).

(28) GEN_s [J in s and s is a cookie-*HAVING* situation and s exceeds a threshold for goodness] [J likes s]

In this case the entire object is translated to the restrictor in the tripartite structure, providing an interesting parallel to the case of *I like a challenge* in (17), shown in (29).

(29) GEN_s [J in s and s is a challenge-*HAVING* situation] [J likes s]

Intersective adjectives like *white* also allow a non-specific reading when a *HAVE*-clause is present. The reason for this becomes more clear in the paraphrase in (30), where *white* acts as a restrictor. The tripartite structure is shown in (31).

(30) John likes a shirt if it is white.

(31) GEN_s [J in s & $\exists$ some shirt x in s and x is white] [J likes x in s]

4.4 (3d) John likes a cookie as much as the next person.

I. Modification induces *HAVE*-clause reading Similar to (3c), (3d) restricts us to cookie-*HAVING* situations that meet some standard of acceptability. Here, the standard appears to be somewhat lower than in that required in (3c) and is something like 'an average level of acceptability'. This is sketched in the paraphrase below.

(32) I like a cookie-*HAVING* situation that meets the average acceptability threshold of cookie-*HAVING*.

The presence of a *HAVE*-clause in the felicitous reading of (3d) is made apparent when it is contrasted to sentences like (33).

(33) ?I like a dictionary as much as the next person.

The noun in (33) requires considerable contextual support to be associated with a *HAVING* situation (e.g. *Don't get me wrong, I like a dictionary as much as the next person, but I don't think they make appropriate anniversary gifts*). Lacking that support in null contexts it contrasts in felicity with (3d).

II. Modification allows non-specific reading Here we have a tripartite structure much like that in (29), but with reference to a somewhat lower standard. As before, the tripartite structure licenses a non-specific reading of the indefinite.

(34) GEN_s [J in s and s is a cookie-*HAVING* situation and s meets a standard of acceptability] [J likes s]

We will not discuss how these tripartite structures arise compositionally. Reconciling the syntax of these evaluative constructions with something like Diesing's tree-splitting algorithm (Diesing, 1992) is not trivial and is beyond the scope of this work. The structure in (34) deserves some comment, as it is particularly suspect from a compositional perspective. Note, however, that (3d) is likely idiomatic. This is view is supported by the infelicity of paraphrases and similar expressions seen in (35).[10]

(35) a. # John likes a cookie the same amount as the next person.
b. # John likes a cookie more than the next person.

5 Conclusion

In this paper we investigated sentences with evaluative predicates, shown in (3), in which modification allows the singular indefinite object to avoid a specific reading. We proposed that evaluative sentences do not typically give rise to tripartite structures unless there is overt quantification or restriction, an extension of Rimell's analysis of habitual sentences. We further showed that *like* gives rise to the same kind of attachment ambiguities as those presented in Schwarz (2008) for *need*-type intensional transitive verbs, and we argued that *like* as well takes a covert *HAVE*-clause argument. Further, we showed a systematic connection between the availability of a *HAVE*-clause and the availability of a non-specific reading of the indefinite. In the process we argued for the presence of a non-intersective *good** which, along with the idiomatic modifier *as much as the next person*, directly modifies situations rather than individuals. Such situation modifiers directly map to the restrictor in our tripartite structures.

We noted certain parallels and asymmetries between evaluative and habitual sentences, shown in (3) and (4). Specifically, unmodified habituals and evaluatives both give rise to a specific reading of a singular indefinite object, as was shown in (1b) and (2b). Adverbial modification licenses a non-specific reading of the singular indefinite, as shown in (3a) and (4a), but the other forms of modification discussed here license a non-specific reading of the singular indefinite for evaluates only, not habituals, as shown in (3b)-(3d) and (4b)-(4d). This asymmetry follows from our analysis, which links the non-specific reading to the *HAVE* clause. Recall that habituals do not take infinitival or *HAVE*-clause complements, so where a *have*/*HAVE* clause is required as the target of modification, as is in (3b)-(3d), the parallel is not available with habituals, as demonstrated in (36).

(4) a. John eats a cookie after dinner.
b. *John eats to have a cookie.
c. #John eats a good cookie.
d. #John eats a cookie as much as the next person.

While we have presented an analysis to account for specificity contrasts in (1) and (3), there are a number of additional questions that arise. Though the data is somewhat different, this work is very much in the spirit of other work on licensing by modification (Dayal, 2004; Ferreira, 2005, a.o.). Whether the current analysis can be brought to bear on these other licensing phenomena is left for future work. There is also a question of what material constitutes a restrictor. In our analyses we mapped both adverbials (e.g. *after dinner*) and situation evaluators (e.g. *good*) to the restrictor. It is left to future work to explore whether this difference is meaningful and

whether there are formal properties of situation evaluators that preclude them from being analyzed as adverbials. Lastly, while we identified a systematic connection between non-specific indefinites and the presence of a *HAVE*-clause, under this analysis these are both more or less independent results of modification. We leave open the possibility that there may be a more direct connection between the two.

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Notes

[1]See Beller and Zaroukian (in press) for an analysis of evaluatives in the presence of subjunctive modals as in (36). In such contexts a singular indefinite also avoids a specific reading.

(36) John would like a cookie.

[2]Carlson's stages of individuals (Carlson, 1980) do the same work in Rimell's analysis.
[3]Other verbs, even *look-for*-type ITVs have only a single reading.

(37) John needed a cookie after dinner.
  a. only: There was a time after dinner at which John needed a cookie

(38) John looked for a cookie after dinner.
  a. only: There was a time after dinner at which John looked for a cookie

[4]Schwarz points out that ITVs do not always fill their propositional complement with a null *HAVE*, as highlighted in examples like (39).

(39) a. I need a shower. ($\neq$ have a shower) (Schwarz, 2008, pp. 271-2)
  b. John needs a marathon. (??have a marathon)

Instead he suggests that there is also a relational variable R that can be filled in by the context.

(40) a. I need [PRO R a shower].
  b. John needs [PRO R a marathon].

For simplicity, we abstract over these two options, calling them simply *HAVE*-clauses.
[5]Habituals like *eat* are not ambiguous.

(41) John ate a cookie after dinner.
  a. only: There was a time after dinner at which John ate a cookie

[6] *Like* is ambiguous in (at least) one more way: with high attachment of the modifier, the *HAVE*-clause may be absent (this is not a possibility for *need*-type ITVs). All attachment readings given below:

(42) John liked a cookie after dinner.

a. There was a time(s) after dinner at which John liked to have a cookie. (high, +*HAVE*, 'fickle')

b. There was a time(s) after dinner at which John liked a cookie. (-*HAVE*, 'fickle')

c. What John liked was having a cookie after dinner. (low, +*HAVE*)

The *like*-modifying/high-attaching 'fickle' reading is compatible with a continuation like *. . . though she may not have liked that cookie at other times.* The *HAVE*-modifying/low-attaching reading is compatible with a continuation like *. . . when she was in college.*

[7]Note that fickleness is not a problem for habituals like *eat*, since restricting eating in a sentence like (4a) is perfectly natural.

[8]Note that these are characteristic of *need*-type ITVs as well, cf. (14).

[9]There seems to be another available reading of (3b), which corresponds (29) and is similar to the analyses provided here for (3c) and (3d).

(43) GEN_s [J in s and s is a cookie-*HAVING* situation] [J likes s]

[10]The extent to which (35b) is felicitous it is interpreted as a witticism, (35a) is not at all felicitous.

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Brave New *Would*: Demonstrative Equatives and Information Structure*

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1 Introduction

In their analysis of the epistemic *would* equative construction, illustrated in (1), Birner, Kaplan, and Ward (2007), argue that copular sentences of the form *That would be XP* are equative clauses with a referential subject (Heycock & Kroch 1997) and a focus-functional modal operator (Rooth 1985, 1992; Beaver & Clark 2008):

(1) a. Anyone over 35 who'll be at the Jonas Brothers concert tomorrow night better bring ear plugs. *That would be me.* [Bay Area DJ]
b. Largest testicles of any species? *That would be the bush cricket.* [http://www.guardian.co.uk/science/2010/nov/10]
c. GW: Do I go out here [pointing] for Hastings Street?
Skytrain Agent: No. *That would be the other exit.*
[conversation, 11/17/11]

In this paper, I review the analysis of Birner, Kaplan, and Ward 2007 (henceforth BK&W), paying particular attention to the semantic-pragmatic status of the subject demonstrative pronoun (*that*), the epistemic modal *(would),* and the postverbal constituent. I then provide additional evidence in favor of the BK&W analysis by reporting on a series of empirical prosodic studies that were conducted in collaboration with Julia Hirschberg and colleagues at Columbia University (Benus *et al*. 2008).

2 Birner, Kaplan & Ward 2007

Drawing on a large corpus of naturally-occuring data, BK&W (2007) argue that epistemic-*would*-equatives such as those in (1) above form a natural class with two closely related equative constructions. The other two constructions are *that*-equatives and *that*-clefts, illustrated in (2) and (3), respectively:

(2) Server: Who ordered the corned beef?
Customer: *That's John; he'll be right back.*
[service encounter, 9/10/2008]

(3) RC: I remember reading somewhere months ago that "Juno" will do to teen pregnancy what "Pretty Woman" did to prostitution.
Piper: RC, *I think that was me who made the comparison.*
[http://www.strangeculturebloc.com/2007/12/juno-teen-pregnency.html]

In addition to the equative syntax and semantics, all three constructions consist of a demonstrative subject and an open proposition (OP) that is contextually salient (i.e., evoked or inferable) at the time of utterance (Prince 1986). The demonstrative subject pronoun of the equative may be used to refer deictically to the instantiation of the variable of the OP. This possibility – of the instantiation of the variable being the referent of the demonstrative – accounts for a set of otherwise mysterious properties associated with this construction. Moreover, BK&W argue that each of the three constructions is functionally complex in that the discourse-functional properties associated with each construction's use can be derived from the properties of its elements.

First, consider the example of epistemic-*would*-equatives in (1b), repeated below in (4) for convenience:[1]

(4) Largest testicles of any species? *That would be the bush cricket.*

Crucial to the analysis of the construction is the presence of the epistemic modal *would*. Following Palmer (1990), Nuyts (2001), von Fintel & Gillies (2007), *inter alia*, I'm taking expressions of epistemic modality to mark the speaker's assessment of the necessity or possibility of a proposition relative to some body of evidence or knowledge. Thus, in (4), the speaker's use of *would* is epistemic in that it conveys his or her assessment of the truth of the proposition being expressed. More specifically, the use of *would* in these examples conveys the speaker's high level of confidence in the truth of the proposition; i.e., the speaker is making a commitment to the truth of the proposition expressed.

As for the other modals, they may be similarly used to convey an assessment of the truth of the associated proposition, but the speaker's degree of commitment to the truth of that proposition will of course vary depending on the modal used. Compare the use of *would* in, e.g., (4) with two other epistemic modals, as in (5):

(5) a. That must be the bush cricket.
b. That should be the bush cricket.

As BK&W note, use of either of the epistemic modals in (5) conveys a lesser degree of speaker commitment to the truth of the proposition 'That's the bush cricket' than the use of *would* does in (4). For example, the use of *must* in (5a) indicates that the proposition being expressed represents the result of some kind

of calculation or logical deduction (Stone 1994); thus, the speaker's confidence in the truth of the proposition is only as strong as the evidence available to support that proposition. If the species with the largest testicles turns out to be one other than the bush cricket, the speaker's use of *would* would indicate a commitment to a false proposition, whereas the use of *must* in (5a) would indicate only an error in the speaker's reasoning process.

Moreover, the felicitous use of an epistemic *would* equative requires that an open proposition (OP) be contextually salient (i.e., evoked or inferrable) at the time of utterance.[2] Corresponding to the utterance in (4), for example, is the OP informally sketched in (6):

(6) THE SPECIES WITH THE LARGEST TESTICLES IS X.

This OPs is required to be contextually salient for the felicity of the use of the corresponding epistemic *would* utterance in (4). Thus, for example, the question in (4) gives rise to the issue of the species with the largest testicles (i.e., the OP in (6)), which in turn licenses the utterance in (4). In this way, the epistemic *would* construction provides the instantiation of the variable in the OP, and this instantiation constitutes the focus of the utterance and consequently receives nuclear stress.

An examination of the other epistemic modals reveals that *would* is unique in requiring a contextually salient OP for felicity. Consider a context in which B is reading the newspaper in the living room when A enters holding an envelope, and interrupts B's reading by uttering (7):

(7) a. #This would be my new VISA card. [=BK&W 2007, ex. (7a)]
b. This must/should be my new VISA card. [=BK&W 2007, ex. (7f,d)]
c. This might/could be my new VISA card. [=BK&W 2007, ex. (7d,e)]

Here, the OP 'THIS (ENVELOPE) IS X' is not salient in the context, given that B cannot be expected to be attending to the envelope. In such a context, the use of epistemic *would* is infelicitous, while the use of the other epistemic modals is felicitous and may serve to direct B's attention to the envelope in question. Notice, however, that in a context in which B has first asked *What's that envelope you're holding?*, the OP in question becomes salient and (7a) accordingly becomes fully felicitous. Thus, epistemic *would*, unlike the other epistemic modals, requires an appropriate salient OP for felicity.

BK&W observe that the combination of a contextually salient OP and the syntax of the equative construction allows for the instantiation of the variable of the OP to serve as the referent for the demonstrative subject, and for that subject to be equated, via the copula, with the post-copular focus. Consider the examples in (8):

(8) a. A (holding cup): Whose is this?
B: *That would be my son.* My youngest son, to be exact.
[=BK&W 2007, ex. (18a)]
OP: THIS CUP BELONGS TO X.

b. GW: What is the per minute charge to Italy?
Operator: Do you have the one-rate plan?
GW: I'm not sure – can I find out through you?
Operator: No, *that would be… 1-800-466-3728.*
[=BK&W 2007, ex. (18b)]
OP: YOU CAN FIND OUT THROUGH X.

c. A: The pot's light
B: *That would be me.* [tosses in a chip]
[=BK&W 2007, ex. (18d)]
OP: THE PERSON WHO FAILED TO ANTE IS X.

In each of these examples, the most plausible referent for the demonstrative is the instantiation of the variable in the OP. In (8a), for example, the prior discourse provides no antecedent for the demonstrative; its referent, we argue, is the OP instantiation – i.e., the person to whom the cup belongs. Similarly, in (8b), *that* is not being used to refer to any particular individual or entity that has been explicitly evoked, but rather to the as-yet-unspecified means for obtaining the desired information. Finally, in (8c), the utterance *The pot's light* indicates that there are fewer antes in the pot than there are players in the game; hence one may infer that some player has failed to ante. This gives rise to the OP 'THE PERSON WHO FAILED TO ANTE IS X', and the demonstrative in *That would be me* is being used to refer to the instantiation of this variable; the speaker here, in effect acknowledges the salience of this OP by making the equative assertion 'X is me.'

The salient OP introduces a new entity into the developing discourse model – the instantiation of the variable of the OP – that corresponds to the unknown entity that will satisfy the description provided in that OP. In (8a), it is the person to whom the cup belongs; in (8b), it is the entity through which callers can find out whether they have the "one-rate" plan; and in (8c), it is the person who failed to ante.

Given the presence of this entity in the discourse model, BK&W suggest that the demonstrative *that* can be used to deictically refer to it, as a type of discourse deixis. It is well known that discourse deixis can involve reference to linguistic expressions in a discourse (Lyons 1977, Levinson 1983, Webber 1988); consider (9):

(9) I bet you haven't heard *this story*. [=BK&W 2007, ex. (19a)]

Speakers can also refer to abstract entities in a discourse model, including elements of the discourse, such as propositions and speech acts, as in (10):

(10) A: I've never seen him.
B: *That*'s a lie. [=BK&W 2007; ex. (20)]

The 'impure textual deixis' (Lyons 1977:670) of Speaker B's demonstrative in (10) is a reference to the speech act performed by Speaker A, which itself is an entity in the discourse model. Open propositions are also abstract entities in a discourse model, and they themselves introduce entities – in this case elements of information structure – into the discourse model which can subsequently be referred to deictically.[3]

In this way, under our account, the referent of the demonstrative in these examples is not an entity or individual, but rather the instantiation of the variable of the OP. What this means is that, in the case of, say, (8a), the interpretation of the epistemic-*would*-equative *That would be my son* is, in effect, "The instantiation of the OP variable corresponds to my son".[4]

3 The demonstrative as variable-denoting

As BK&W (2007) note, the possibility of using a demonstrative subject to refer to the instantiation of the OP variable gives rise to three predictions, which I will discuss in turn. First, this account predicts that utterances such as those in (8) will be systematically ambiguous between the reading on which the referent of the demonstrative is the instantiation of the variable of the OP and a reading on which its referent is an evoked discourse entity. As usual, context will generally disambiguate. Thus, in addition to being anaphoric to an OP variable, the demonstrative pronoun in (8a) could, in a context in which the son in question has just entered the room, be used to refer directly to the son. Not all contexts, however, disambiguate; in a context that provides a plausible discourse referent, for example, the demonstrative may remain ambiguous, as in (11):

(11) [King dips his finger in a bowl held by a servant and then licks the food off his finger and proclaims it delicious.]
King: What do you call this dish?
Servant: *That would be the dog's breakfast.* [=BK&W 2007, ex. (21a)]
OP: YOU CALL THIS DISH X.

Here, the demonstrative *that* in the italicized clause is referentially ambiguous: It can be used to refer to the instantiation of the variable in the salient OP 'YOU CALL THIS DISH X' or it can be used to refer to the dish in question. In the first case, the demonstrative corresponds to the name of the dish (and thus may be paraphrased as *We call this dish the dog's breakfast*), whereas in the second it

provides the identity of the discourse entity evoked by the NP *this dish* (and thus is paraphraseable as *That dish is the dog's breakfast*).

The second property that arises from the possibility of demonstrative reference to the OP variable is an apparent number disagreement. Consider (12):

(12) One of the best mulches is composted leaves, so good for the garden, the flowerbed, and a wonderful amendment to the soil. Also, here's hoping you won't burn your leaves, wasting them, despite the fact that burning them is illegal in most Illinois counties – *that would be the populated ones, like Cook, DuPage, Lake, e.g.* [=BK&W 2007, ex. (22a)]

OP: THE ILLINOIS COUNTIES IN WHICH BURNING LEAVES IS ILLEGAL ARE X.

Here, the demonstrative's only plausible antecedent in the prior discourse is plural – *most Illinois counties* – and as would be expected, the postcopular NP in each case is also plural. However, instead of the plural distal demonstrative *those*, the demonstrative appears in the singular. The reason the example is acceptable is that the referent of the demonstrative is not, in fact, the plural entity evoked in the prior discourse, but rather the (singular) instantiation in the OP. That is, associated with the epistemic-*would*-equative in (12) is the OP 'THE ILLINOIS COUNTIES IN WHICH BURNING LEAVES IS ILLEGAL ARE X', where X represents some set of Illinois counties. The utterance with epistemic *would*, then, instantiates the variable, equating X with the set of populated counties. Since it is a single, hence numerically singular, variable that is being instantiated (regardless of the cardinality of its instantiation), the demonstrative appears in the singular. Notice also that selection of a singular or plural demonstrative will disambiguate what might otherwise have been a referential ambiguity of the sort described above. Consider (13):

(13) The show started on ABC as Two Guys, A Girl And A Pizza Place. The show centered on three young characters just starting out in life - *that would be the two guys and a girl.* [=BK&W 2007, ex. (23)]]

OP: THE THREE YOUNG CHARACTERS JUST STARTING OUT IN LIFE ARE X.

Here, the selection of the demonstrative *that* forces a reading on which the demonstrative is used to refer to the instantiation of the variable of the OP. However, if *that* is replaced with *those*, the resulting utterance – *those would be the two guys and a girl* – forces a reading on which the demonstrative is being used to refer to (the referent of the NP) *three young characters just starting out in life.* Thus, an otherwise puzzling number disagreement falls out naturally from BK&W's account, which acknowledges the possibility of the

demonstrative being used to refer to the instantiation of the variable of the relevant OP.

The third otherwise puzzling property that can be explained in terms of reference to the variable of the OP is the possibility of an apparent disagreement in tense. Notice that when epistemic *would* is used in reference to an event in the past, this past time reference may or may not be reflected in the predicate:

(14) Sabrina: Do you remember a rainy afternoon we spent together? My father had driven your mother and David into town for a music lesson.
Linus: How old was he?
Sabrina: I don't know... Fourteen, fifteen.
Linus: *That would be the oboe.* [=BK&W 2007, ex. (24b)]
OP: DAVID WAS TAKING LESSONS IN X AT THAT TIME.

In (14), despite the fact that the speakers are discussing a past-time event, the final clause contains *be* rather than *have been.* The explanation mirrors the explanation provided earlier for the apparent number mismatch. Because the demonstrative can be used to refer to either a previously evoked constituent or the instantiation of the OP variable, the clause as a whole can be taken to be making an assertion either about the past event or about the present instantiation of the variable. That is to say, in (14), the use of simple present-tense *be* indicates that the clause is describing a present-tense occurrence, specifically the instantiation of the variable. Thus, the demonstrative here refers to the instantiation of the variable contained in the salient OP 'DAVID WAS TAKING LESSONS IN X AT THAT TIME', and the entire clause may be interpreted as 'X is the oboe'.

So far, I have reviewed BK&W's analysis of equative sentences in which epistemic-*would*-equatives are presuppositional in requiring the presence of a salient OP for felicity. Moreover, the possibility of deictic reference to the instantiation of the variable of that OP accounts for a number of otherwise mysterious properties associated with this construction: systematic referential ambiguity, apparent number mismatch, and apparent tense mismatch.

In the next section, we will see that this analysis of the epistemic-*would* construction can be straightforwardly extended to the modal-less *that*-equative construction.

4 *That*-equatives

As noted in BK&W 2007, the crucial (and obvious) difference between epistemic-*would*-equatives and *that*-equatives is the presence of the focus-functional modal operator *would*. As argued above, the occurrence of the modal

operator requires a contextually salient OP for the construction to be felicitous. Correspondingly, the *that*-equative construction, with no focus-functional operator present, does not require a contextually salient OP; however, that is not to say that such OPs are not frequently associated with this constructions. On the contrary, *that*-equatives are typically used in response to identity questions, as illustrated in (15):

(15) a. Server: Who ordered the corned beef?
Customer: *That's John; he'll be right back.* [= ex. (2)]
b. "There's four people who can help control people on the field. *That's the two coaches and the two refs on the field*."
[USA Today, 10/19/06]

Such questions clearly have a salient OP associated with them; consider the OPs in (16a-b) that correspond to the examples in (15a-b), respectively:

(16) a. OP = THE PERSON WHO ORDERED THE CORNED BEEF IS X
b. OP = THE FOUR PEOPLE WHO CAN HELP CONTROL PEOPLE ON THE FIELD ARE X

The equative construction serves to equate the instantiation of the variable with the variable itself; in (16b), for example, the variable is being equated to the two coaches and the two refs who can help control people on the field. And, as was shown to be the case with epistemic-*would*-equatives, the demonstrative of a *that*-equative can be used to refer to the variable of an OP.[5]

However, unlike epistemic-*would*-equatives, *that*-equatives do not REQUIRE a salient OP. Consider, for example, (17) uttered out of the blue by one of a pair of companions walking in downtown Chicago:

(17) Oh, look – *that's where Oprah Winfrey lives!*

This utterance has a demonstrative subject and an equative, but lacks a salient OP. The speaker may use the *that*-equative in (17) to direct his hearer's attention to the residence in question, whereas in the case of an epistemic-*would*-equative the hearer's attention must already be focussed on the identity of the referent of the postverbal NP. Thus, as predicted, in the absence of a salient OP, the demonstrative in (17) cannot be used to refer to the instantiation of the OP variable; rather, the only interpretation available for the demonstrative here involves spatial deixis, with reference to an entity in the extra-linguistic context.

Another important difference between the two constructions is their respective background presuppositions. Consider (18):

(18) A: Where is John vacationing?
B1: ? *That's Japan.*
B2: *That would be Japan.*

Compare the infelicity of B1's *that*-equative in (18) with the felicity of the construction in a slightly different context:

(19) A: I forget. Where is it that John's vacationing this week?
B1: *That's Japan.*
B2: *That would be Japan.*

While acknowledging that the judgments here are subtle, I would like to suggest that the two questions differ with respect to their background presuppositions. A's question in (19) – *Where is John vacationing?* – presupposes simply that John is vacationing somewhere, while A's question in (19) – *Where is it that John's vacationing?* – presupposes that it's [somewhere]$_{\mathbf{F}}$ that John is vacationing. And it is the latter (F-containing) presupposition to which *that*-equatives are sensitive. That is, the cleft version presupposes that there is a focussed instantiation of the variable of the OP. And it is this presupposition that renders the OP variable sufficiently salient for subsequent reference with a *that*-equative.

As a further illustration of the difference between the two constructions, consider the examples in (20):

(20) a. [context: Speaker enters room full of unknown schoolchildren]
A: Who wants candy?
B1: # *That's me!* [vs. Me! or I do!]
B2: *That would be me.*
b. A: # Who is it that wants candy?

One can generally presuppose that children want candy (as in 20a), but one can't in this context presuppose that it is someone-F who wants candy (as in 20b). Given that the cleft question in (20b) is infelicitous, so is the corresponding *that*-equative in (20a).

However, when the context is such that there is a salient correspondence between (sets of) entities, a *that*-equative may be licensed:

(21) a. A: I know everybody's going somewhere this weekend. John is going to New York, and Mary is going to Miami. Now what about Diane – where is *she* going? (I.e., Where is it that she's going?)
B: *That's Japan.*
b. Server: Who (is it that) ordered the corned beef?
[Alternatively: Which of you was it that ordered the corned beef?]
Customer: *That's John.* [= ex. (2)]

For the demonstrative to be interpreted as referencing an OP variable, the context must override the unmarked entity-denoting interpretation of the demonstrative and support the variable-denoting interpretation. The unmarked

interpretation of *That's X* is an identificational one – with the demonstrative denoting an entity. One way to support the variable interpretation is through a salient correspondence relationship. In contrast, epistemic-*would*-equatives – with a built-in focus-functional modal operator – the variable interpretation of the demonstrative as an OP variable is readily available as part of the conventional meaning of the construction.

5 Meaning and use of epistemic-*would*-equatives

As further evidence in support of the BK&W analysis of epistemic-*would*-equatives, I present in this section the results of a series of psycholinguistic studies recently conducted at Columbia University by Julia Hirschberg and collaborators. Participants were asked to assess the meaning of epistemic *would* using a certainty assessment paradigm (Benus *et al.* 2008).

Previous work on modality *per se* has failed to provide an adequate account of the contribution that epistemic *would* makes to utterance interpretation. Palmer (1990) and Perkins (1983) both characterize this use of the modal as 'tentative', while Coates (1983) on the other hand claims that it expresses 'predictability'. Sweetser (1982) analyzes it as an implicit conditional with a suppressed antecedent, in a valiant attempt to unify epistemic *would* with irrealis or conditional *would*.[7] However, there seems to be nothing tentative, conditional, or predictable about many of the naturally-occuring example discussed in the previous sections. In a different vein, Ward *et al.* (2003) have argued that, as a focus-functional operator, the modal of epistemic-*would*-equatives conveys a high level of speaker commitment to the truth of the conveyed proposition.

To assess these various (and contradictory) claims regarding the contribution of the modal to utterance interpretation, Benus *et al.* (2008) conducted a series of experiments designed to assess how speakers interpret the modal in a controlled laboratory setting. The first experiment was a written perception task and the second was an oral perception task, using aural stimuli produced with one of three intonational contours.

5.1 Written perception task

Our initial goal was to assess the effect of epistemic modality alone on the degree of perceived certainty. To accomplish this, we conducted a perception experiment in which participants read short conversations and rated the certainty of target sentences with or without epistemic *would* (i.e. epistemic-*would*-equatives and *that*-equatives, respectively). This textual condition allowed us to study the effect of modality on the assessment of speaker certainty, in isolation from the effect of intonation.

5.1.1 Materials and method

The materials for this study were based on 20 short dialogues containing an epistemic-*would*-equative. In order to render the materials as naturalistic as possible, stimulus items were based on the BK&W 2007 corpus of naturally-occuring tokens of the epistemic-*would*-equative construction. An example dialogue is provided in (22), with the target sentence underlined:

(22) Jennie: What a great party!
David: Yeah, but we're stuck cleaning up all the crap.
Jennie: Hey, somebody left their iPod out on the floor.
David: <u>That would be my roommate</u>.

We paired each original epistemic-*would*-equative with the corresponding *that*-equative (i.e. the same sentence without the modal). Thus, the matching target sentence for (22) would be *That's my roommate.* Additionally, we selected 40 separate short dialogues as fillers, in which the target sentences (all copulars) did not include either of the target constructions, as illustrated in (23):

(23) David: Have they posted the results of the swim meet yet.
Ronnie: Some of them. You already know who won the 100m butterfly.
David: The<u> winner of that event was Chris Jesperson</u>.

In the first perception study, participants were shown transcripts of the 20 original dialogues, each with either an epistemic-*would*-equative or a *that*-equative, along with the 40 fillers. These 60 dialogues were presented in a different random order to each participant; the construction type was also chosen at random. Participants were asked to rate the perceived certainty for each token's target sentence, using a Likert scale with five degrees: very uncertain, somewhat uncertain, neither certain nor uncertain, somewhat certain, and very certain.

Twelve undergraduate students (8 female, 4 male; mean age: 20.3) from Northwestern University participated in this study. All were native speakers of American English and reported no hearing problems. They completed the study in a quiet lab, indicating their Likert-scale ratings using a computer interface on a lab workstation.

5.1.2 Results and discussion

The only independent variable in the statistical analysis of our first perception study was *Construction*, with two values: epistemic-*would*-equatives and *that*-equatives. To compute the dependent variable, *Certainty*, we first assigned a numeric value to each degree in the Likert scale (Very uncertain = –2, Somewhat uncertain = –1, Neither = 0, Somewhat certain = 1, Very certain = 2). We next normalized each rating by participant, using z-scores, to account for participant variation in use of the scale.[7] The mean *Certainty* for epistemic-*would*-equatives was –0.13 (st.dev. = 1.11), and for *that*-equatives it was –0.03

(st.dev. = 1.04). There were 120 data points in each group. A one-way ANOVA reported no significant difference between the two means ($F(1, 238) = 0.58$, $p = 0.45$). After doubling the data to simulate a larger sample, the *p*-value was still non-significant at 0.28, suggesting that increasing the sample size would probably not lead to finding a significant difference. So, contra Palmer (1990) and Perkins (1983), it appears that the epistemic-*would*-equative construction (with epistemic *would*) is judged to be no more uncertain than the corresponding *that*-equative construction without the modal.

5.2 Oral perception task

Participants were then asked to perform a certainty assessment task in which they were presented with spoken productions of epistemic-*would*-equatives and *that*-equatives and asked to assess the speaker's certainty of each utterance. As with the written perception study, all stimulus items consisted of dialogues based on the BK&W 2007 corpus of naturally-occuring tokens of epistemic-*would*-equatives. All utterances were recorded by one of the male research collaborators, a native speaker of Standard American English, in a sound-proof booth in the Speech Lab at Columbia University.

Each stimulus item was produced with one of three distinct intonational contours: declarative, *yes-no* question, and downstep. The standard declarative contour, represented as H* L- in the ToBI system of intonational transcription (Beckman *et al.* 2004), is illustrated in the pitch track provided in Figure 1.

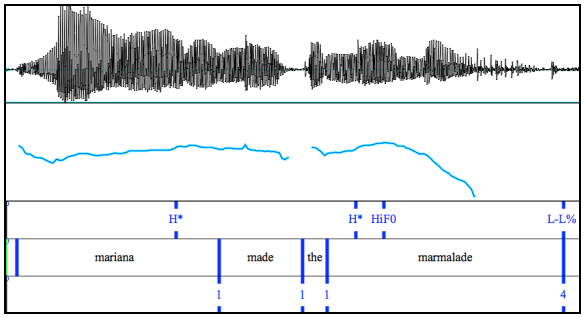

Figure 1. **Pitch track showing a declarative contour.**

This contour is arguably the most neutral in English and is used to accompany assertions that may or may not constitute shared information with the speaker's interlocuter(s). The *yes-no* question contour, illustrated in Figure 2, is transcribed as (L*) L* H- H% in the ToBI system.

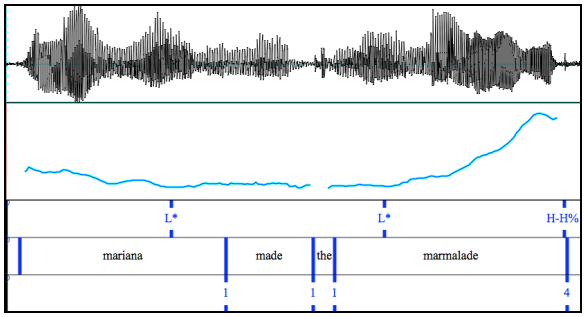

Figure 2. **Pitch track showing a *yes-no*-question contour.**

As its name suggests, this contour is typically used with questions, i.e. when a speaker is trying to elicit information from an interlocuter.

Finally, the so-called downstep contour is characterized by a series of pitch accents uttered in an increasingly compressed pitch range, producing the impression of a flight of stairs in the F0 contour. In the ToBI system, the most common version of this contour is represented as H* !H* (!H*) L- L%; it is illustrated in the pitch track found in Figure 3, where each subsequent high tone (H*) is measurably lower than the preceding one.

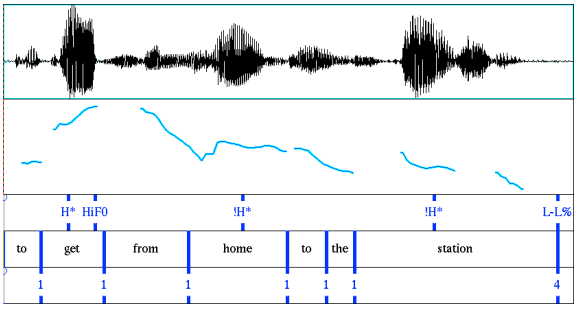

Figure 3. **Pitch track showing a downstep contour.**

The downstep contour (as described in Pierrehumbert & Hirschberg 1990) has been shown to be quite common in Standard American English (Benus *et al.* 2008). Yet, despite its relative frequency in naturally-occuring speech, very little empirical work has been done on the meaning of the contour. In their

pioneering survey of the meaning of various intonational contours, Pierrehumbert & Hirschberg (1990) suggested that downstep contours mark discourse topic structure, occurring frequently in phrases which signal topic beginnings and endings. Moreover, they claimed that the interpretation of sequences of downstep pitch accents might be characterized as conveying that the hearer should be able to infer, from the shared beliefs of both hearer and speaker, the existence of discourse entities realized with such accents. A possibly related observation is that downstep serves as an alternative to deaccenting, when information being expressed represents given information in the discourse. Thus, to the extent that given information represents information about which the speaker is certain, we can hypothesize that the speaker's use of downstep will convey an epistemic disposition of certainty.

We found that the presence of both the downstep contour and the epistemic-*would*-equative construction made a significant and independent contribution to the assessment of speaker certainty. That is, participants rated utterances with the downstep contour as the most certain ones, followed by those with the declarative contour, while the *yes-no*-question contour was perceived as highly uncertain. Similarly, participants rated speakers' responses using an epistemic-*would* equative as significantliy more certain than those using a *that*-equative (without epistemic *would*).

5.3 Written perception task: spoken condition

We performed a second perception experiment, where participants now listened to the same target sentences, produced with the three different intonational contours used in the oral perception task, and rated perceived certainty. This spoken condition allowed us to study the effect of both construction type and intonational contour, combined or in isolation, on the assessment of speaker certainty.

5.3.1 Materials and method

Each of the 40 stimuli used in the first perception study was recorded using three different intonational contours: declarative, downstep, and *yes-no*-question. Thus, for each of the 20 original dialogues there were six recorded stimuli (2 constructions × 3 intonational contours), for a total of 120 recorded stimuli. Additionally, we divided the 40 fillers into three groups at random, and recorded 13 of them with a declarative contour, 13 with a downstep contour, and 14 with a *yes-no*-question contour. The 120 stimulus sentences and the 40 filler sentences were recorded by a male native speaker of Standard American English in a sound-proof booth using a close-talking head-mounted microphone.

The Praat software (Boersma & Weenink 2001) was used for capturing, digitizing, and analyzing the sentences. We verified the intonational contour,

and checked the average amplitude and pitch range of each sentence; the sentences with incorrect intonation or outlier values for pitch range and amplitude were re-recorded.

In this second perception study, a different group of participants were presented with 60 tokens: the 20 original dialogues, in which the target sentence was produced with one of the three intonational contours and was either an epistemic-*would*-equative (containing the modal *would)* or a *that*-equative (with no modal), and the 40 fillers. These 60 tokens were presented in a different random order to each participant, and construction and contour were also chosen at random for each stimulus. Participants were shown a transcript of each target utterance's corresponding dialogue context (although they did NOT see the target sentence itself), as illustrated in (24):

(24) Jennie: What a great party!
David: Yeah, but we're stuck cleaning up all the crap.
Jennie: Hey, somebody left their iPod out on the floor.
David:

Participants were then asked to rate the perceived certainty of the target sentence, using the same 5-degree Likert scale described above. Participants could listen to the target sentence as many times as they wished, by clicking a button in the interface.

A different pool of 30 undergraduate students (24 female, 6 male; mean age: 21.2) from Northwestern University participated in this study, all native speakers of American English with no hearing problems. They completed the study in a quiet lab using headphones to listen to the tokens, indicating their classification decisions in a computer interface on a lab workstation.

5.3.2 Results and discussion

In the analysis of our second perception study, we wanted to test the hypothesis that both contour and construction influenced participant perceptions of certainty. Our independent variables were *Construction* (with two levels: epistemic-*would*-equatives, *that*-equatives) and *Contour* (with three levels: declarative, downstep, *yes-no*-question). For the dependent variable, *Certainty*, we used the same conversion and the same participant normalization described above.

Table 1. **Certainty mean ± standard deviation for each of the six stimulus types.**

	declarative	downstep	yn-question	·
epistemic-*would* equative	**0.57** ±.50	**0.73** ±.43	**–0.84** ±.72	**0.15** ±.90
that-equative	**0.39** ±.62	**0.67** ±.54	**–1.02** ±.66	**0.01** ±.96
	0.48 ±.57	**0.70** ±.49	**–0.93** ±.70	**0.08** ±.93

Table 1 shows the mean and standard deviation of *Certainty* judgments for each of the six types of stimulus (there were 100 data points in each cell). An initial two-way ANOVA assuming the full model (*Certainty* = *Construction* + *Contour* + *Construction* * *Contour*) revealed no significant interaction between the *Construction* and *Contour* factors ($F(2, 594) = 0.698$, $p = 0.498$). The almost parallel lines of Figure 4 illustrate this lack of interaction.

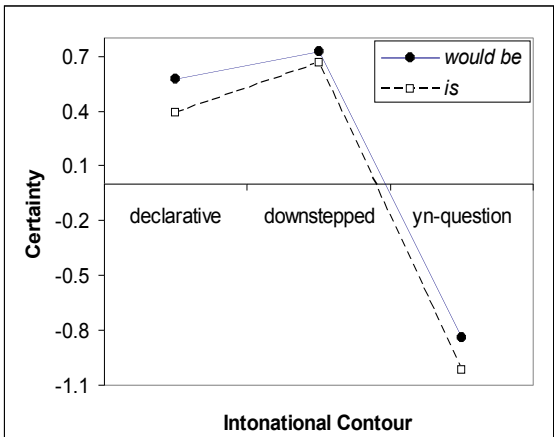

Figure 4. **Interaction plot for *Construction* and *Contour*.**

We then ran a two-way ANOVA test assuming the additive model (*Certainty* = *Construction* + *Contour*), and found both factors to have a significant effect on *Certainty* (*Construction*: $F(1, 596) = 8.8$, $p = 0.003$; *Contour*: $F(2, 596) = 456.32$, $p \approx 0$). For *Construction*, this indicates that the epistemic-*would*-equative construction (observed mean = 0.15, see Table 1) tended to be perceived as significantly more certain than the *that*-equative construction (mean = 0.01). For *Contour*, downstep utterances were perceived as most certain (mean = 0.7), followed by declarative utterances (mean = 0.48); the *yes-no*-question contour was perceived as strongly uncertain (mean = –0.93). A Tukey test revealed that the differences in means between all three contours were significant at the 95% level. It is also worth noting that the standard

deviations in the textual condition were much higher than in the spoken condition; which presumably shows the important disambiguating role of intonation in the assessment of speaker certainty.

Next, we studied the effect of *Construction* separately for each intonational contour. For stimuli uttered with a declarative contour, the perceived certainty of sentences with epistemic *would* was significantly higher than that of sentences without it (ANOVA, $F(1, 198) = 5.29$, $p = 0.02$). For the other two contours, despite the fact that epistemic-*would*-equatives had a higher *Certainty* mean than *that*-equatives, such differences were not statistically significant, although they approached significance for the *yes-no*-question contour (downstep contour: ANOVA, $F(1, 198) = 0.81$, $p = 0.37$; *yes-no*-question contour: ANOVA, $F(1,198) = 3.42$, $p = 0.066$).

We also studied the effect of *Contour* separately for each construction type. For stimuli containing a *that*-equative, ANOVA ($F(2, 297) = 222.51$, $p \approx 0$) and Tukey tests (at the 95% level) revealed, again, that downstep productions were perceived as significantly more certain than declarative ones, and declarative productions, in turn, as more certain than *yes-no*-question ones. Finally, for epistemic-*would*-equative stimuli, ANOVA ($F(2, 297) = 234.96$, $p \approx 0$) and Tukey tests (95%) showed both downstep and declarative productions as significantly more certain than *yes-no*-question ones, although no significant difference was found between these two. Table 2 summarizes these findings.

Table 2. **Summary of findings of Perception Study II[8]**

General results in the spoken condition

epistemic-*would*-equatives > *that*-equatives
downstepped > declarative > yn-question

Given a particular intonational contour

declarative: epistemic-*would*-equatives > *that*-equatives
downstepped: ---
yn-question: epistemic-*would*-equatives > *that*-equatives (approaching significance)

Given a particular construction

epistemic-*would*-equatives:

downstepped declarative	>	Yn-question

that-equatives:

downstepped > declarative > yn-question

Our initial hypothesis that epistemic modality influences hearers' perceptions of certainty was borne out by this perception study. The epistemic-*would*-equative construction does indeed convey more certainty than the corresponding *that*-equative construction without the modal. In addition, downstep contours do indeed convey more certainty than either declarative or *yes-no*-question contours. Note however that, when we examine the effect of *Construction* on contour interpretation, we find a significant effect only for declarative contours, although we approach significance for *yes-no*-question contours. That is, the perceived certainty associated with epistemic-*would*-equatives is clearer in declarative and *yes-no*-question contours than in the downstep contours. Also, for either construction, *yes-no*-question contours are interpreted as the most uncertain ones, and for *that*-equatives (without epistemic *would)*, the downstep contour is perceived as the most certain of all contours.

6 Conclusion

In this paper, I reviewed Birner, Kaplan, and Ward's (2007) analysis of epistemic-*would*-equatives in which the construction is argued to be

presuppositional in requiring the presence of a salient OPEN PROPOSITION for felicity. The demonstrative of the construction can be used to refer to the instantiation of the variable of that OP. A comparison was then made between epistemic-*would*-equatives and simple *that*-equatives (*That's John*), with the latter shown to be sensitive to slightly different presuppositions than the former. I then provided additional evidence in favor of the BK&W analysis by reporting on a series of psycholinguistic experiments that were conducted in collaboration with Julia Hirschberg and colleagues at Columbia University (Benus *et al*. 2008).

The results of our empirical studies found that participants rated speakers' responses with epistemic *would* as significantly more certain than those without it. Participants were asked to rate the perceived degree of certainty of epistemic-*would*-equatives and *that*-equatives (e.g., *That would be me* vs. *That's me*), which were also variously produced with one of three intonational contours (downstep, declarative, and *yes-no*-question). We found that both the downstep contour and the presence of epistemic *would* made a significant and independent contribution to the assessment of speaker certainty. That is, participants rated utterances with the downstep contour as most certain, followed by those with the declarative contour, while the *yes-no*-question contour was perceived as highly uncertain. Similarly, participants rated speakers' responses with epistemic *would* as significantly more certain than those without it. These findings support our initial hypotheses that both the epistemic-*would*-equative construction and the downstep intonational contour can be employed to convey speaker certainty.

7 Notes

[*] This work reported on in this paper has been thoroughly collaborative. My collaborators, without whom this work would not have been possible, include (in alphabetical order): Stefan Benus (Univerzity Konštantína Filozofa), Betty Birner (Northern Illinois University), Agustín Gravano (Universidad de Buenos Aires), Julia Hirschberg (Columbia University), Jeff Kaplan (San Diego State University), and Elisa Sneed German (Nanyang Technological University). Different subsets of them have collaborated on different parts of the project; they may very well not all agree with everything that appears here. An earlier version of this paper was presented at CLS 44.

[1] Many of the examples discussed in this section are drawn from Birner, Kaplan, and Ward's corpus of 1000+ tokens of naturally-occuring tokens of the construction.

[2] OPs correspond to the notion of the 'Question under Discussion' (QUD), as described by Roberts (1996), *inter alia.*

[3] As further evidence, note the adjacency of the epistemic-*would*-equative in each case to the sentence that expresses the proposition that renders salient the OP, which is exactly what we would expect under a deictic-based analysis.

[4] As will become clear, under the BK&W account the demonstrative is actually ambiguous; it can be used to refer either to an individual or to the instantiation of the variable of the open proposition.

[5] The apparent number 'mismatch' between the singular demonstrative (*this*) and the plural subject (*the two coaches and the two refs on the field*) in (15b) is significant; as argued above (see §3), a singular demonstrative pronoun (regardless of the number of the postverbal constituent) is exactly

what one would predict under an analysis in which the demonstrative is used to refer to the instantiation of an OP variable.

[6] In fact, the most plausible candidate antecedent for a conditional analysis of (1) might be some kind of epistemic hedge, along the lines of *if I'm not mistaken*, as in (i):

(i) If I'm not mistaken, *that would be Jeffrey*, my not-so-secret admirer.

The problem with an implicit antecedent along these lines is that the same antecedent could be posited for virtually any assertion, reducing it to near vacuity.

[7] $z = (X - mean) / st.dev$, where X is a rating by subject S, and *mean* and *st.dev* correspond to all ratings by S.

[8] ' >' means '*perceived as significantly more certain than*'.

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A Minimalist Theory of the Pseudopassive

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1 Introduction

This paper investigates the extent to which the pseudopassive construction in English can be correctly analyzed without reference to any enforced selectional relationship between passive morphology and failure of a preposition to assign Case. I consider a very general and restrictive version of Minimalist syntax, where selectional relations can only be enforced in two ways: by c-selection or by an Agree relation, which are the preconditions on external merge and internal merge respectively. The options available in this type of theory are assumed to be representative of the predictive power of most of the more particular analyses of the construction.

The fact of the matter is that we do not observe any instances which are otherwise like pseudopassive but where there is no passive morphology on the verb. That is, we do not find instances where a DP merged as the argument of a preposition undergoes movement to subject position, in the absence of passive morphology on the verb. The project here is to explain this fact without enforcing it, to allow, in principle, passive morphology of a verb to be independent of the Case properties of a preposition. This idea was suggested by Abels (2003); I aim to explore its consequences more fully here.

The results of the project are mixed. I show that in the basic cases, the cooccurrence requirement does indeed follow from independent properties of the verbs, prepositions, and arguments involved, without the cooccurrence requirement being stipulated. Other cases are shown to be derivable, but only with some further stipulations whose plausibility is questionable. Finally, some further examples are shown to be problematic for the idea.

I will not address here the semantic restrictions on pseudopassive, as discussed by Couper-Kuhlen (1979), Ramchand and Svenonius (2004), and others, except as these map onto the high/low adjunct distinction. This pattern inform the correct syntactic analysis of the phenomenon, but I concentrate here the implications of more purely formal apsects of the structure.

The paper is organized as follows. Section 2 lays out the basic clausal architecture, and general space of analyses of passive and prepositions that I assume. Section 3 investigates the consequences of assuming that there is no enforce-

ment of the absence of non-Case checking prepositions with active verbs, namely the extent that this might overgenerate. Section 4 turns to a slightly different issue: the role of this idea in issues of adjacency between the verb and the preposition in pseudopassives. Section 6 gives a conclusion.

2 Basics of Case assignment, passive and pseudopassive

2.1 Case assignment and passive

I assume here a fairly standard, though simplified[1], analysis of the passive/active alternation in English. The two constructions are distinguished by the flavor of functional v head which is merged in the structure; V, the lexical verbal head, is the same in the two structures. Active v, which is silent in English checks the Case features of the complement of V via the mechanism of Agree[2], and also introduces an external argument; passive v, spelled out as passive morphology, fails to do either. The absence of the other two logical possibilities of v-types is a consequence of Burzio's Generalization, which can be expressed (but not explained) as (1).

(1) Minimalist Burzio's Generalization: A v which checks Case features must introduce an external argument. (Chomsky 2000, 2001)

Note that the converse of (1) is not assumed; we will see later that a v *can* introduce an external argument without checking Case. This is a simplified way to analyze unergative verbs; it will be crucial to the analysis of verbs with prepositional complements.

Thus, in (2), the Case features of the DP are checked by v, whereas in (5) they cannot be checked by v, resulting in the movement of the DP to spec-TP, where the Case features are checked by T. As a convention, a double-headed arrow indicates a relation of Agree, while a single-headed arrow indicates movement. In (4) and (6) I show head-raising of V to v; we will see evidence in section 4.2 that in the case of passive v, we may have head-lowering instead.

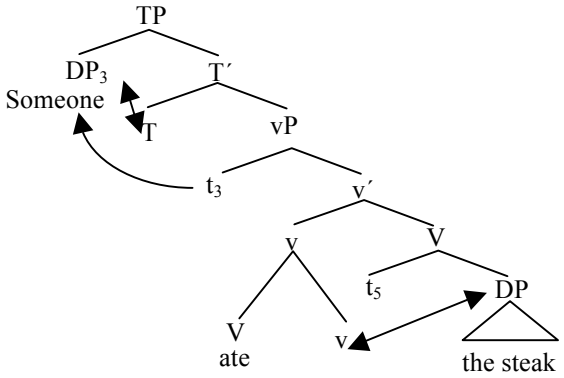
2.2 Prepositions and pseudopassive

Prepositions, I assume, also check the Case features of DP in sentences like (2). Notice that this is a case of a v which introduces an external argument, but which does not check Case.

(2) Someone talked to John.

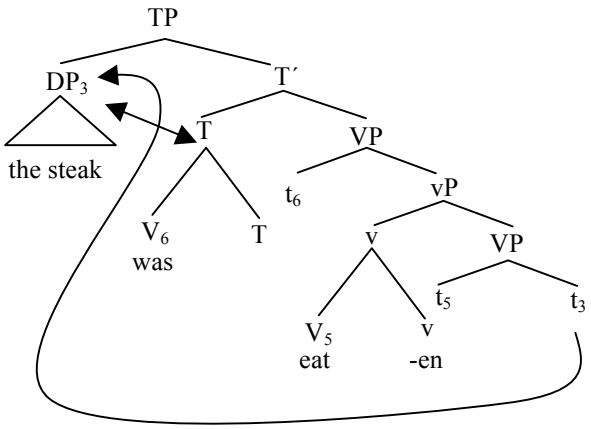
(3) Someone ate the steak.

(4)



(5) The steak was eaten.

(6)

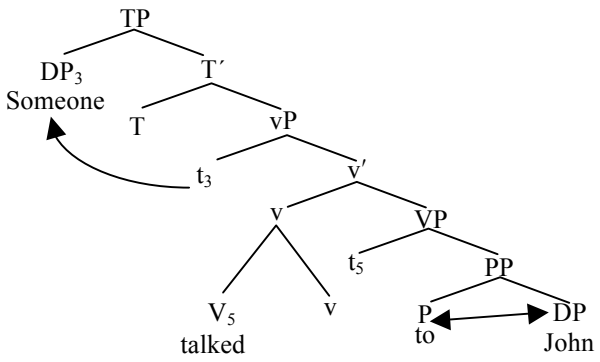


The central question of this paper, then, is how (8), the pseudopassive, fits into the system. It seems uncontroversial that there is movement somewhat as in (9), which is the simplest imaginable structure given the assumptions laid out above.

What is controversial is the status of the preposition and the verb. Traditional reanalysis accounts (Chomsky 1981 and others) propose that the P and V play the role of a single complex verb. The Case-checking properties of the P are likewise incorporated into this complex, and hence the passivization takes away this Case-checking possibility, thus the need for movement.

Reanalysis hypotheses of this sort have been argued against extensively, notably by Baltin and Postal 1996. However, it is only one of a family of analyses that share a crucial trait: the idea that the passive morphology on the verb is directly responsible for the inability of the preposition to check Case.

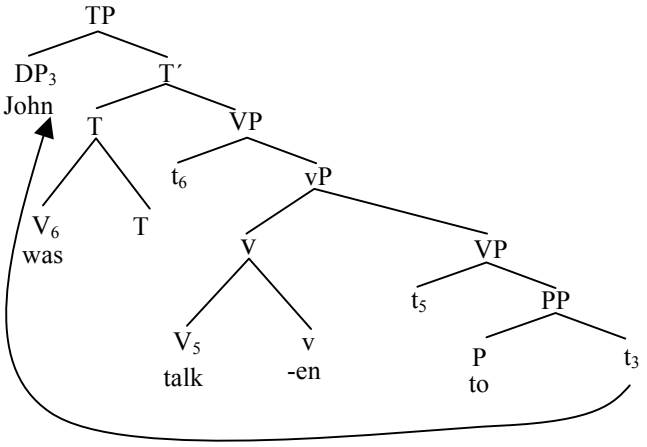
(7)



The preposition is, for some reason, unable to check the Case features of the DP, which must therefore move to spec-TP as in the passive (6).

(8) John was talked to.

(9)



This feature is shared by most recent analyses of the pseudopassive, such as that of Drummond and Kush 2011 and Ramchand and Svenonius 2004. It is the question of the necessity of this feature which I question in this paper.

Drummond and Kush, for example, propose to capture the insights of the reanalysis hypothesis using standard mechanisms of work in the Minimalist Program. The trait of this analysis which superficially reminds one most of true reanalysis is their proposal that the preposition raises via head-movement to the verb. However, in my view, the real action is that they propose that this process only occurs when P cannot itself check Case, modeled in their analysis by the absence of an Agr head.

2.3 Passive v, Passive P

In the interest of simplicity, I give this family of analyses one representative, and contrast it with a minimally distinct alternative which denies the direct role of passive morphology in pseudopassives. I refer to the former as "cooccurrence restrictive" analysis, and to the latter as "non-cooccurrence restrictive analyses. I assume the clausal architecture in the structures above, including T, v, V, and P, but abstracting away from the possibility of Agr heads as well as the revisions to basic clause structure of the type found in Collins 2005 or that in Bowers 2010. (I also take a simplified view of the role of the verb *be* in passives, assuming it does not itself drive any movement or agreement.)

I assume that it is T which checks Case with subjects, v which checks Case with direct objects, and P which checks Case with objects of P. It is a common trait of Minimalist analysis that T and v have "defective" variants, which among other properties cannot check Case. The defective T in English is *to*; the defective v is passive morphology (and possibly also for unaccusative verbs; see note 3.) Somewhat controversially, I assume here that there is a defective P, too, which selects a DP complement but cannot check its Case features. Unlike with T or v, defective P can be instantiated by various lexical prepositions, namely all of those that allow pseudopassive. (This is a simplifying assumption; the more correct characterization may be that there is a nonlexical head associated with Case in prepositions, such as an Agr or "little-p" head, and it is this head's defectiveness, or perhaps absence, that causes pseudopassivization. I abstract away from these details here.)

With these assumptions place, the way I model standard analyses of pseudopassive is simply that defective P cannot occur in the absence of defective v. For example, in (9), the P seen is defective, so on the standard analysis, an Agree relation which occurs between v and P in (9).

The alternative, then, is that there is no such Agree relation; defective P is in principle independent of defective v. This is a Minimalist endeavor; it is part of a general methodology, noted for example by Hornstein (1999, 2001), that seeks to derive observed syntactic patterns from as few stipulations as possible. The standard clausal architecture, that C selects T which selects v which selects V which (sometimes) selects P, is already a stipulation. Restricting certain instances of v to only occur with certain instances of P counts as yet another stipulation. It is a slightly more egregious one, because it acts at a distance; V selects P, and v selects V, but v must act at a distance (as through Agree) to impose a restriction on P. Of course, such long-distance relationships have been observed and well argued for in human language, but the fewer we propose to account for the same data, the better.

Hereafter I refer to defective v and P as "passive," and non-defective v and P as "active." So the alternative is that in principle, any combination of ac-

tive/passive v/P can be merged. The remainder of this paper investigates to what extent this latter idea can derive the correct facts about pseudopassive.

3 No active v with passive P

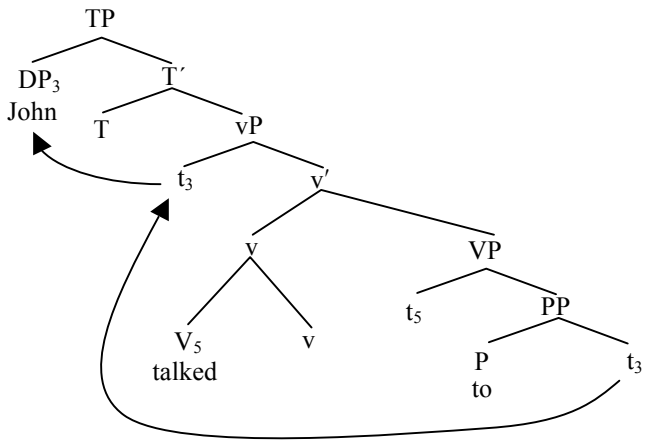
3.1 No pseudopassive with active unergatives

One of the most basic facts that cooccurrence restrictive analyses attempt to explain is that (again in our terms) passive P does not cooccur with an active verb. We don't find sentences like (10), with an active verb but with an argument moving from the argument position of a preposition.

(10) *John talked to.

However, (10) can be ruled out with no reference to a cooccurrence restriction between passive morphology and passive P. We simply rely on the standard claims that a) the preposition *to* must introduce an argument (whether active or passive, b) the v associated with *talk* must introduce an argument if it is active[3], and c) A DP cannot occupy more than one argument in a derivation, contra Hornstein 1999 and subsequent work. Relaxing c) would allow a derivation like (11), where *John* moves from the argument position of passive P, to the argument position of *talk*, to subject, with a predicted meaning like 'John talked to himself.' It may be possible to reconcile movement through argument positions with the idea here, possibly incorporating ideas from Hornstein 2001, but I leave this to future work.

(11)



3.2 No pseudopassive unaccusatives

Drummond and Kush claim that the idea that "languages with pseudopassives have P heads which assign Case only optionally," suggested by Abels (2003), incorrectly predicts the existence of DP raising from the complement of P in unaccusative or middle constructions. I show here that the worry is unfounded for unaccusatives; I investigate the matter with middles in section 3.3 and show that the matter is more serious there, though perhaps not insurmountable.

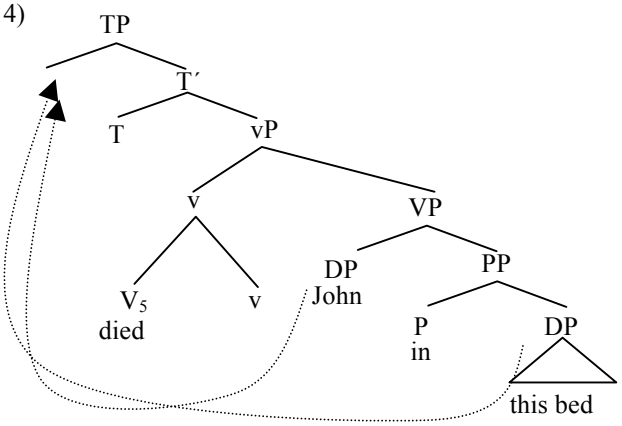
Drummond and Kush consider two versions of what a pseudopassive unaccusative would look like: one with passive (12a) and one with active (12b) morphology on the verb. The passive variant will be considered below, but for now, we may note that it may be a special case of a more general cooccurrence restriction against passive morphology on unaccusative verbs (13)[4]. It is also noteworthy that some speakers seem to find a contrast between (12a) and (12b), the latter sounding worse; we will see even better examples below.

(12) a. *This bed was died in.
b. *This bed died in.

(13) *John was died.

As for (12b), it is implied by Drummond and Kush that cooccurrence restriction preventing active v with passive P is required to rule it out. But this is not the case. Passive *in* and active *die* both introduce their own arguments. So the problem with (12b) is that *die* has failed to merge an argument; the θ-criterion is not fulfilled. Moreover, it can't possibly be, because if both arguments are introduced, they will be competing for the one Case position in the structure (14).

(14)



Perhaps a different form of the objection is: Why is there no *die′* just like *die* but introducing no argument of its own in VP, and hence, because of the probing re-

quirements of T, only usable when another Caseless DP is introduced, i.e. only in pseudopassive. This question dissolves into the related question: why are there no zero-argument verbs in the first place, if weather-*it* is not indeed a true expletive (Chomsky 1981 a.o.).

Actually, one might think that there would be more support for the cooccurrence restriction if, contra the discussion above, sometimes unaccusatives *could* be passivized, and in those situations, pseudopassive *was* possible. There seems to be some evidence that this is true, though the examples are marginal.

(15) a. ??This conclusion was arrived at by 5.
b. ??This park has been gone to many times.

To the extent that (15) is good, my theory can explain it too, by claiming that unaccusatives can be passivized as long as their one argument can be suppressed. This can only happen if there is a DP complement of a passive P, since otherwise there would be nothing for T to agree with (*there* is defective, and needs a DP-associate, while *it* must have a CP associate, cf. Landau 2006).

3.3 No pseudopassive middles

Drummond and Kush also mention the impossibility of prepositional passives in middles (16).

(16) *Paper cuts through easily.

Whether this is a problem for an analysis with no cooccurrence restriction depends on the proper analysis of middles. If they work mostly like passives, by suppressing the Case-checking and argument-introducing properties of the verb by merging the unaccusative-type v in the structure, then (16) is unexplained unless we stipulate that this v cannot cooccur with a passive P.

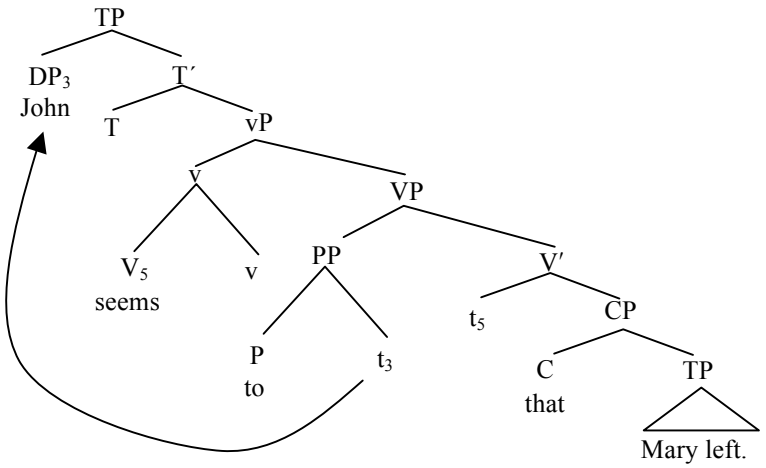
On the other hand, there are possible analyses of middles which would make (16) unsurprising without such a restriction. For example, perhaps middles are derived lexically, by altering the thematic grid of a verb to one which selects only one argument, turning it essentially into an unaccusative. In that case, (16) would be ruled out by the same factors that rule out (12b) as discussed above.

3.4 No pseudopassive with raising verbs

A potentially more serious problem for the idea here is that we don't find passive-type movement from a PP associated with a raising verb as in (17), which without a cooccurrence restriction might be derivable as in (18).

(17) *John seems to that Mary left.

(18)



It may be, however, that movement from a PP in this particular position is independently ruled out, independent of passivization, since wh-movement from it seems bad as well.

(19) *Who does it seem to that Mary left?

However, if we instead place the PP *after* the clause, there seems to be a contrast between wh-movement and passive-type movement, though both are marginal.

(20) a. ??Who does it seem that Mary left to?
b. *John seems that Mary left to.

To the extent that (20) is good, it shows that movement is theoretically possible from a PP experiencer of a raising verb. If so, then perhaps a cooccurrence restriction between active v and passive P is required after all.

4 Locality issues

The previous section discussed issues with ruling out mismatches between active v and passive P, in a theory where such a mismatch is not explicitly banned. This section investigates a different type of consequence of the idea, which is that if there is no enforced relationship between the verb and the preposition, whether reanalysis, agreement, or head movement, then there should be no enforced locality between the verb and the preposition in pseudopassives either.

4.1 Intervention by DP

Pseudopassivization cannot occur around an object DP (21). This has the consequence that pseudopassivization is generally impossible from a transitive (usage of a) verb.

(21) *John was spoken French to.

This example might seem to be a minimality violation, but the explanation is simpler than that: *French* does not have its Case features checked in this position, because the verb is passive.

4.2 Adjuncts and adjacency

4.2.1 Adjacency with PP complements

One advantage often claimed for reanalysis approaches to the pseudopassive is that they predict that pseudopassive is only possible when the verb and the preposition are directly adjacent. Judgments differ though; I find (22) to be, at least, considerably better than (21).

(22) %John was spoken frequently to.

However, for those people who find (21) ungrammatical, the explanation by Drummond and Kush extends to my analysis: for those speakers, V does not move up to passive v; instead, v lowers to V. (This claim was originally due to Caponigro and Schütze 2003.) Assuming that the PP in this case is a complement of V, there is then no way for the adverb to be in the relevant position.

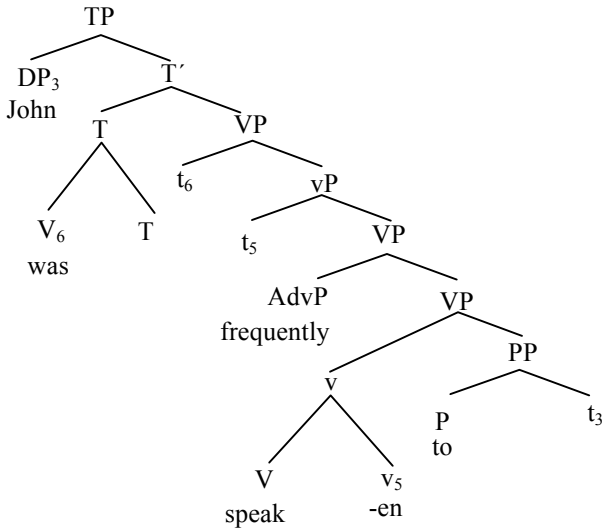
4.2.2 Pseudopassive from an adjunct

Reanalysis and head movement analyses predict, at least under normal assumptions, that pseudopassive should be impossible out of adjunct PP. The data are mixed. Lower adjuncts allow it (23a) while higher adjuncts to not (23b) (Couper-Kuhlen 1979).

(23) a. The park was played in.
b. *Ten minutes were slept for.

The analysis here predicts no restrictions on the position of the PP in a pseudopassive except that it must not be higher than the position to which the DP must move. Thus, perhaps the PP in (23b), and the class of PPs which cannot undergo pseudopassivization in general, is adjoined to the TP itself. However, I must leave the test of this hypothesis to future work. (The analysis of Ramchand and Svenonius 2004 predicts that it is possible from PP adjuncts to VP, but not adjuncts to VP; this might be a better way divide things correctly.)

(24)



4.2.3 Adjacency with Movement from Adjuncts

Combining the previous two sections, we might ask what happens when we try to have an adverb intervene when pseudopassivization is from a (low) adjunct. The result has the same judgment as non-adjacency with complements.

(25) %The park was played frequently in.

Even with v-lowering to V, the analysis here predicts that (25) should be good, unless *frequently*, and in the relevant dialects all adverbs, cannot adjoin to VP but must adjoin to vP, which seems doubtful.

4.3 Intervention by PPs

Pseudopassivization cannot take place from a PP which is separated from its verb by another PP (26), whether the PP is an adjunct (26a) or a complement (26b). The violation here is much worse than intervention by an adverb (22), and has more the status of intervention by DP (21). This distinction is also noted by Drummond and Kush.

(26) a. *John was spoken to Mary about.
b. *The park was spoken to Mary in.

Unfortunately, the Case-based explanation of (21) does not automatically extend to (26), since *Mary* is assigned Case in situ. Drummond and Kush suggest that it is "plausibly ruled out as a violation of Minimality or some similar condition on movement." It is not immediately apparent how this could be, especially in the case where the second PP is an adjunct, since in the latter case the PP moved from may actually be higher than the linearly intervening PP; this problem is not unique to the non-cooccurrence restriction analysis. Moreover, even in the double-complement case, *Mary* does not c-command the moving DP, so there seems to be no intervention.

Of course, DPs are independently observed to sometimes behave as if they c-command out of their PPs, such as the experiencer of a raising verb (Chomsky 1986) (27). Perhaps *Mary* c-commands the trace of the subject in (26) in the relevant way as well, thus violating minimality. (In the case of an adjunct PP, this would require a substantial reanalysis of the status of low adjuncts, perhaps denying that they are adjuncts at all.)

(27) *John seems to her_i t_{John} to like $Mary_i$.

However, in exactly this construction, the experiencer seems to *not* intervene for A-movement, as seen in the movement of *John* in (27).

This latter issue prompts Collins (2005) to propose that the movement in raising constructions where an experiencer is present is allowed because of smuggling, an operation which "gets around" minimality. In the case of (27), the movement proceeds in two steps: first, a larger constituent (which contains *John* is moved to cross *her*, and then *John* itself moves from this constituent to the subject position.

As a speculation towards a solution, then, perhaps the relevant constituent which smuggles *Mary* in is simply not available in (26). The relevant constitu-

ent in (27) is for Collins the VP headed by *seem*; perhaps only raising verbs can move in this way. But as with the possible solutions to many of the problems with the proposal here, I must leave pursuit of this possibility to further research.

5 Conclusion

On average, it seems that some cooccurrence restriction barring passive P with active v may be necessary after all, however it is to be modeled. It is nevertheless important to observe which types of facts such a restriction is strictly necessary in order to derive. This paper has, at the very least, shown that the principle does less work than has sometimes been thought, when one considers the roles independently played by argument selection and Case properties. It has also noted that some of the constraints on pseudopassive, such as certain adjacency phenomena, are in principle orthogonal to the issue of cooccurrence restrictions.

If the restriction should indeed turn out to be real, it is still a problem that it doesn't currently fit naturally into the rest of the assumptions common to analyses of passive and prepositions. Future research should search for models where the restriction fits naturally into this general spectrum of assumptions.

Notes

[1] In particular, I do not deal with the understood agent, remaining neutral on the question of the thematic properties of the passive morphology and the role of the *by*-phrase, where present (cf. Baker, Johnson, and Roberts 1989, Collins 2005, Bowers 2010).

[2] I will refer to this process as "checking, remaining neutral on the exact mechanism involved, which could be feature deletion (Chomsky 2000) or feature valuation (Chomsky 2006). The important point is simply that the two heads enter into a relationship which licenses the DP.

[3] In much work, such as Chomsky 2001, it is assumed that there is a v which neither introduces an argument nor checks Case, but does not bear passive morphology; this is the v associated with unaccusative and raising verbs. This v must be prevented, in any case, from being merged to a transitive or unergative verb. I assume here that this is a simple matter of selection. I discuss this matter further in section 3.2.

[4] This, of course, could follow from theories, such as Baker et al. 1989, where passive morphology must receive an external argument θ-role, since unaccusative verbs do not assign such θ-roles. As mentioned before, incorporating this idea would complicate the analysis of unergative verbs, the main licensors of pseudopassive in the first place, so I do not pursue that explanation here.

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Optionality in Presupposition Filtering with Attitude Reports

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1 Introduction

Presuppositions triggered in the scope of propositional attitude verbs like *believe* and *want* pose special problems for analyses of the projection problem for presupposition, the question of how the presuppositions of a complex sentence are compositionally derived from the presuppositions of its parts.[1] The problem can also be framed as determining the scope of a presupposition triggered in a subordinate environment. As Beaver and Geurts (2011) note:

> [G]iven that the theoretically most challenging mode of embedding is within the scope of an attitude verb, one might expect that the interaction between presuppositions and attitude verbs should have received a lot of attention.

Full-fledged accounts of this interaction, however, are few and far between. Heim (1992) and Geurts (1998) offer the only article-length treatments devoted entirely to these issues. Beaver and Geurts note that the relative dearth of literature addressing presuppositions in attitude contexts cannot be attributed to the fact that there are no theoretically interesting problems left to solve; there are.

The goals of the present paper are modest. First, we wish to highlight the special problems that presuppositions in attitude contexts pose for analyses of the projection problem. One of the relevant issues is the existence of multiple candidate presuppositions: sentences of the form *a believes that p{q}*, where *p{q}* indicates that *q* is a conventionally triggered presupposition of *p*, appear to presuppose both (i) *q* and (ii) *a believes that q*. A second issue is what we call "optionality": sentences of the form *a wants that p{q}* appear to sometimes presuppose *a believes that q* and at other times to presuppose *a wants that q*.

We then turn our sights on a recent re-conceptualization of Heim's (1983) influential analysis of the projection problem developed in Schlenker (2009) and expanded in Schlenker (2011). Schlenker (2009) attempts to capture the empirical predictions of Heim's account within a computational system that meets what has come to be known as the 'explanatory challenge':

(1) **Explanatory challenge** (Schlenker 2009; p. 8)
Find an algorithm that predicts how any operator transmits presuppositions once its syntax and its classical semantics have been specified.

The problem with the analysis in Heim (1983) is that it in essence stipulates the presupposition transmission properties of operators in their lexical entries. Schlenker's system has the same empirical coverage as Heim's by design, but has the theoretical advantage of meeting the explanatory challenge.

However, the account in Heim has been criticized on empirical grounds, as well, mostly importantly for our purposes in regards to issues relating to both multiple presuppositions and optionality. Schlenker (2011a) proposes a simple extension of his (2009) algorithm that attempts to meet this 'descriptive challenge': find an algorithm that makes empirically adequate predictions about the presuppositions of complex sentences. The main contribution of the present paper is to point out that while this extension meets the descriptive challenge as it relates to multiple presuppositions (aka, the 'proviso problem'), it fails with respect to optionality, and it is not clear to us, at present, how it can be extended in a principled way to meet this challenge.

2 Presuppositions in Attitude Reports

The current section introduces the evidence for multiple presuppositions and optionality. We restrict the discussion to a single presupposition trigger: the aspectual verb *stop*. However, what is said carries over to additional triggers. The presuppositions of (2a) can be established using the "family of sentences" tests, which we will exhibit via *perhaps* (2b).

(2) a. Mary will stop writing. **Presupposes**: Mary is currently writing.
b. Perhaps Mary is writing. **Presupposes**: Mary is currently writing.

Another test uses the filtering conditions (Karttunen 1973) of *and*, by which a sentence of the form *p and q{r}* presupposes *r* unless *p* entails *r*.

We now turn our attention to cases in which *stop* occurs in the complement clause of the propositional attitude verbs *believe* and *want*. We first establish that there are multiple candidate presuppositions associated with triggers occurring in attitude contexts. We then establish the puzzle we call "optionality".

2.1 Attitude contexts and multiple presuppositions

In out-of-the-blue contexts, both (3a) and (3b) presuppose that Mary is currently writing, as shown by (4a) and (4b) respectively.

(3) a. Claire believes that Mary will stop writing soon.
b. Claire wants Mary to stop writing soon.

(4) a. Perhaps Claire believes that Mary will stop writing soon.
b. Perhaps Claire wants Mary to stop writing soon.

The sentences in (3) also presuppose (5).

(5) Claire believes that Mary is currently writing.

Note that the variants of (3a) and (3b) in (4a) and (4b) continue to imply (5), in addition to the unembedded presupposition that Mary is currently writing.

Second, recall that a sentence of the form *p and q{r}* presupposes *r*, unless *p* entails *r*. That Claire believes that Mary is currently writing doesn't entail that Mary is currently writing, so if the second conjuncts of the sentences in (6) presuppose that Mary is currently writing, as established above, then the entire sentence should, in fact, presuppose that Mary is writing.

(6) a. Perhaps Claire believes that Mary is currently writing and she believes she will stop writing soon.
b. Perhaps Claire believes that Mary is currently writing and she wants her to stop writing soon.

However, the examples in (6) imply *neither* that Mary is writing nor that Claire believes that Mary is writing. So *Claire believes that Mary is currently writing* filters the implication by (3a) that (5). In short, (5) behaves like a presupposition with respect to our diagnostics. The same observations hold for desire reports.

We conclude that presupposition triggers in the complements of attitude verbs give rise to two implications that pass standard diagnostics for presupposition.

2.2 Optionality

Note that the embedded presupposition for desire reports is not that Claire *wants* Mary to be writing, but rather that Claire *believes* that she is. However, this presupposition can be filtered by a preceding desire report, as in (7).

(7) Perhaps Claire wants Mary to be writing and she wants Mary to stop writing soon.

(7) implies neither that Mary is writing nor that Claire believes that she is, which is unexpected given how filtering works: that Claire *wants* Mary to be writing does not entail (i) that Mary is writing or (ii) that Claire believes Mary is writing. We call this puzzle 'optionality' because the presuppositions of *a wants*

p{q} can be filtered by either of two independent, non-mutually entailing statements, *a believes q* and *a wants q*, with no requirement that the other be true.

This pattern is problematic for the satisfaction-based approaches to the projection problem introduced in the next section. Discourse representation theory (Geurts 1998), however, has an adequate analysis of optionality. We note this because the revised and extended satisfaction account in Schlenker (2011a) discussed in section 5 purports to capture some of the good aspects the DRT based approaches, but, as we argue, it does not extend to optionality.

3 Satisfaction Theories of Presupposition Projection

3.1 Introduction and basic cases

Two approaches to the projection problem stand above others: satisfaction accounts (Heim 1983, a.o.) and anaphoric accounts (van der Sandt 1992, Geurts 1999). We present the basics of satisfaction accounts here.

Satisfaction based accounts of presupposition are normally formulated within dynamic semantic frameworks. In dynamic semantics, the significance of a sentence lies in its potential to update a discourse context. Formally, discourse contexts are sets of possible worlds, representing the shared beliefs of discourse participants (Stalnaker 1978). As a discourse progresses, this background body of information grows incrementally. Clauses denote updates and presupposition triggers are modeled as partial functions: they place constraints on the information in input contexts. If the constraint is not satisfied, update is undefined.

To illustrate, let **p** stand for the semantic value of sentence *p*, viz. a proposition, and let $\mathbf{p}^w$ stand for the semantic value of *p* at world *w* (following Schlenker 2009). On the dynamic semantic approach the update associated with an atomic sentence *p* is simply the generalized conjunction of the input context *C* and **p** as shown in (8).

(8) $C[p] = C \cap \{w \in W \mid \mathbf{p}^w = 1\}$

The update in (8) simply adds **p** to the information already contained in the input context *C*, so any *w* in *C* such that which $\mathbf{p}^w = 0$ is excluded from the output.

The dynamic entry for *and* is a function from pairs of update functions, appropriately Curried, to update functions. The conjuncts of *p and q* are applied to the input context in a left-to-right order: *and* first applies *p* to the input *C* and then applies the result to *q*.

(9) $C[p \text{ and } q] = (C[p])[q]$

Note that *q* does not update *C* but rather *C*[*p*], the result of updating *C* with *p*. *C* in this example is the global context and *C*[*p*] a local context. Local contexts are intermediate steps in the computation of the output context.

Local contexts play an important role in dynamic semantic treatments of presupposition. A sentence p that presupposes q is a partial function, defined only for input contexts that satisfy the presupposition of p, i.e. that entail q.

(10) $C[p\{q\}]$ = undefined if $C[q] \neq C$
= $C[p]$ otherwise.

An complex sentence P presupposes q iff $C[P]$ is undefined unless C entails q. We can put these pieces together to illustrate the satisfaction account of the projection problem. Consider a conjunction where the second conjunct q presupposes r, as in (11).

(11) $C[p \textit{ and } q\{r\}] = (C[p])[q\{r\}]$

The local context of $[q\{r\}]$ is $C[p]$, which must entail r. If it doesn't, not only is the local update undefined, but the global update fails, too, for if any part of the computation is undefined, the global computation is undefined, also. If p entails r, then the presupposition of q is satisfied no matter what information is included in the initial context C. If p does not entail r, on the other hand, then C must entail the conditional $p \rightarrow r$. This follows from the assumption that $C[p]$ is the generalized conjunction of C and p and the equivalence between $(C \wedge p) \rightarrow r$ and $C \rightarrow (p \rightarrow r)$. Similar predictions follow for standard dynamic semantic lexical entries of the conditional operator (cf. Heim 1983) and for attitude reports (cf. Heim 1992): presuppositions need only be satisfied in local contexts. Thus satisfaction accounts make systematically weak predictions regarding the presuppositions of complex sentences.

3.2 Non-indexed local context in static semantics

Schlenker (2009) preserves the insights of the satisfaction approaches sketched above, viz. that presuppositions should be processed incrementally, but does so in a way that meets the explanatory challenge in (1. His system otherwise makes the same empirical predictions as Heim's 1983. The difference from earlier approaches relates to the underlying semantic theory and the algorithm for computing the value of local contexts. Schlenker meets the explanatory challenge simply by assuming a classical static semantics.

Local contexts on his account are not products of the interpretation procedure, but object language variables adorning all constituents of propositional and predicative type, i.e. expressions with types "ending in t". These variables are interpreted according to the rule in (12).

(12) The local context of an expression d of propositional or predicative type which occurs in a syntactic environment a_b in a context C is the strongest

proposition or property x which guarantees that for any expression *d′* of the same type as *d*, for all strings *b′* for which *a d′ b′* is a well-formed sentence,

$C \vDash^{c \to x} a\ (c' \text{ and } d')\ b' \leftrightarrow a\ d'\ b'$

The value of the local context attached to the matrix clause, for example, is identical to the value of the global context. As in the classical satisfaction approach, presuppositions are assessed relative to local contexts. However, they are not definedness conditions on update functions, but rather aspects of the meaning of an expression that are marked for pragmatic processing and which must be entailed by their local context at a 'post-semantic' stage of interpretation. A simplified formulation is given in Schlenker (2011a), his (41):

The definition in (12) ensures that the local context c′ of *d* is the strongest element x such that *d* can be interpreted conjoined with x, without affecting the truth conditions of the sentence no matter how it ends. The definition quantifies over well-formed completions of the sentence, thus what comes after *d* contributes to the value of the local context, but what comes after does not.

Schlenker (2009) proves that his system replicates Heim's (1983) predictions for sentential connectives and quantifiers. We provide an informal illustration for the case of *and*. In the notation of (13), an expression of the form ${}^{Cx}CP_x$ is interpreted as the conjunction of the interpretations of C_x and CP_x.

(13) ${}^{C0}[_{CP0}\,{}^{C1}CP_1 \text{ and } {}^{C2}CP_2]$

The values of C_0 and C_1 are identical to the value of the global context C for (13).[2] The value of C_2, however, is the strongest proposition p such that $[\![CP_1]\!] \wedge ([\![C_2]\!] \wedge [\![CP_2]\!]) = [\![CP_1]\!] \wedge [\![CP_2]\!]$ evaluated relative to the global context C. The requisite value for C_2 is $[\![CP_1]\!]$ conjoined with C; that is, the strongest refinement conjoins CP_2 with CP_1 before conjoining it with CP_1.

The presuppositions of CP_2 (which we indicate with $\pi(CP_2)$) are assessed at C_2. Assuming that CP_1 has no presuppositions, and given that the value of C_2 is the global context conjoined with the first conjunct, it must be the case that $C \wedge [\![CP_1]\!] \rightarrow \pi(CP_2)$, or equivalently, $C \rightarrow [[\![CP1]\!] \rightarrow \pi(CP_2)]$, which is the same prediction as in dynamic semantics.

3.3 Non-indexed local contexts and attitude reports

3.3.1 Belief reports

Schlenker shows that, with suitable assumptions about the semantics of propositional attitudes, his system makes the same predictions as Heim's (1992) dynamic semantic account of presupposition filtering in attitude reports. Unlike Heim, Schlenker does not consider desire reports, but we show in section 3.3.2 that his system mirrors the predictions of Heim in these cases too. We present a simpli-

fied and informal presentation here, moving to the full formal system when proving that it extends to desire reports.

(14) $^{C0}[_{CP0}$ Claire [believes $^{C1}[_{CP1}$ that Mary will stop writing]]]

The presupposition triggered by *stop* in the complement clause must be entailed by its local context C_1. The question is how the value of C_1 is calculated. Schlenker shows that, the value of C_1 is whatever C_0 entails about the content of Claire's beliefs. Thus in order to be felicitous, C_1 must entail that Mary is currently writing and C_0 must entail that Claire believes that Mary is currently writing, again matching the predictions of Heim's (1992) account.

3.3.2 Desire reports

Schlenker doesn't discuss desire reports, but the calculation of the local contexts for (15) proceed in a parallel way to that for the belief report in (14).

(15) $^{C0}[_{CP_0}$ John wants $^{C1}[_{CP_1}$ Mary to write.]]

Generally, it seems that the local context for the CP complement of an attitude verb depends on the domain of quantification of that attitude verb; modulo some technical modifications of the semantic type, the value of the local context is generally identical to this quantificational domain, just as the local context for the complement of *believe* is the doxastic set of the believer.

For desire reports, a choice needs to be made about the lexical semantics of *want*. Heim (1992) considers two alternatives, which differ in their domain of quantification. A Hintikka-style semantics quantifies over bouletic worlds, or the set of the desire-worlds of the attitude-holder.

(16) $[\![\text{want}]\!] = \lambda p \lambda x \lambda w_0.\ \forall w \in \text{Bul}_x(w_0).\ p(w)$

On the semantics in (16), the local context given by Schlenker's algorithm is just the bouletic set, and this would be the set of worlds relative to which the presuppositions of the complement are assessed. For (15), this means that C_1 corresponds to Claire's desire-worlds, which must then entail that Mary is currently writing. This means that (15) as a whole presupposes that Claire wants Mary to be writing, but not that Claire believes that Mary is writing, exactly as the dynamic version of the semantics in (16) predicts in Heim's (1992) system.

For independent reasons, Heim instead opts for a semantics of *want* that quantifies over the belief-set of the attitude holder. A rough classical version is given in (17), where $w_1 <_{x,w0} w_2$ means that according to x's preferences in w_0, w_1 is preferable to w_2; (17) means that if x wants p, then among the worlds x believes might be the actual one, x prefers p-worlds to non-p-worlds.

(17) $[\![\text{want}]\!] = \lambda p \lambda x \lambda w_0.\ \forall w_1, w_2 \in \text{Dox}_{w_0}(x).$ if $p(w_1) = 1 \wedge p(w_2) = 0$, then $w_1 <_{x,w0} w_2$

Heim showed that the dynamic version of this entry accounts for believe-want filtering, but it is unable to capture want-want filtering in a natural way, a fact we turn to in section 5.

In Schlenker's system, the semantics in (17) leads to a local context for the CP complement of *want* corresponding to the belief-set of the attitude-holder. We prove this below, adopting Schlenker's formal notation. In (18), $\underline{p}p'$ is interpreted as the conjunction of p conjoined with p' and the underlining indicates that p is presupposed.

(18) $want_J\ \underline{p}p'$

The semantics is modified so that clausal constituents are given an additional world argument, and attitude predicates like $want_J$ are typed up accordingly; this ensures that the world variable associated with the global context can play the appropriate role in determining the belief set. So formally:

(19) $want_J$ is of type <s, <s, <st, t>>> and F is of type <s, <s, t>>
$(\mathbf{want_J}\ F)^{w^*, w} = 1$ iff $\mathbf{want_J}^{w^*, w}(\lambda w'\ \mathbf{F}^{w^*, w'})$
iff for all worlds $w_1, w_2 \in \text{Dox}_J(w)$, $w_1 <_{J, F, w^*} w_2$

(20) a. $w_a <_{J, F, w^*} w_b$ iff if $\mathbf{F}^{w^*, w_1} = 1$ and $\mathbf{F}^{w^*, w_2} = 0$, then $w_1 <_{J,w^*} w_2$
b. $w_a <_{J,w^*} w_b$ iff J prefers w_a over w_b in w*

Adapting Schlenker's proof for *believe* for the current case, the local context of *F* is the strongest element x of type <s, <s, t>> such that:

(21) for every clause d′ of type <s, <s, t>>, for every w* in C,
$(\mathbf{want_J\ d'})^{w^*, w^*, c_{\_x}} = (\mathbf{want_J}\ ^c\mathbf{d'})^{w^*, w^*, c_{\_x}}$,
i.e. [for every $w_1 \in \text{Dox}_J(w) \wedge w_2 \in \text{Dox}_J(w)$, $w_1 <_{J, d', w^*} w_2$]
iff [for every $w_1 \in \text{Dox}_J(w) \wedge w_2 \in \text{Dox}_J(w)$, $w_1 <_{J, ^cd', w^*} w_2$]

As for $believe_J$, the desired value for x is:

(22) $x = \lambda w^* \lambda w(w^* \in C$ and $w \in \text{Dox}_J(w^*))$.

This restriction is innocuous since *want* like *believe* both quantify over worlds in $\text{Dox}_J(w^*)$. But we need to show that (22) is the *strongest* restriction possible, i.e. that excluding any additional worlds might affect truth conditions.

Suppose for some w* in C and some w in $Dox_J(w^*)$, $x(w^*)(w) = 0$. In other words, we exclude a world from our local context consistent with the subject's beliefs. Now, suppose the following: (a) for all w_1, w_2 in $Dox_J(w^*)$ such that $w_1 \neq w$ and $w_2 \neq w$, $w_1 <_{J, d', w^*} w_2$; (b) $d'^{w^*, w} = 1$; (c) for some w′ in $Dox_J(w^*)$, $d'^{w^*, w'} = 0$; (d) it is not the case that $w <_{J, w^*} w'$. It follows that $(\mathbf{want_J}\ \mathbf{d'}^{w^*,w^*,c\to x}) = 0$, since by (b) – (d), the pair <w, w′> falsifies it. However, $(\mathbf{want_J}\ ^{c}\mathbf{d'})^{w^*,w^*,c\to x} = 1$, since we excluded from the local context, and by (a), all other pairs satisfy the condition.

So a sentence of the form *want$_J$ pp′* presupposes that every world compatible with what J believes should entails p, as with belief. This follows inevitably from assuming (21) and the rule for calculating the values of local contexts; there is no flexibility in how we compute this value – it follows from the classical semantics and the algorithm in (12).

4 The Proviso Problem and Indexed Local Contexts

4.1 The proviso problem

First noted by Geurts (1996), the 'proviso problem' is an issue confronted by most satisfaction accounts of presupposition projection, including Heim (1983, 1992) and Schlenker (2009). These accounts fail to predict that the presuppositions of embedded clauses can themselves be requirements of the global context, and hence predict presuppositions that are too weak in many cases.

Discussions of the proviso problem generally focus on conditional sentences, but the problem arises for attitude reports, as well (cf. Schlenker 2011b e.g.). Recall that satisfaction accounts predict that sentences of the form *a believes q{r}* presupposes only that *a believes r*. However, in many contexts they also seem to presuppose *r* (as noted in section 2).

To account for these intuitions satisfaction accounts are forced to derive *r* from the compositionally derived presupposition that *a believes r*, perhaps via a pragmatic reasoning mechanism (cf. Beaver 2001). Perhaps listeners adopt a principle of 'charity': ceteris paribus, if *a* believes that *p*, then *p*. We refer to this derived proposition as a 'secondary presupposition'.

The problem is that this principle should then apply in any case where a sentence presupposes *a believes r*; such a sentence has available a secondary presupposition that *r*. In particular, a sentence like *John knows that a believes r*, which presupposes that *a believes r* due to the factive verb *know*, should have a secondary presupposition that *r*. But intuitively it does not (23).

(23) John knows that Claire believes that Mary will stop writing soon.

So even provided an appropriate pragmatic mechanism capable of deriving the necessary inference, satisfaction accounts systematically fail to predict the right presuppositions for the right sentences.

4.2 Indexed local contexts

Several attempts to solve the proviso problem within satisfaction approaches have surfaced in recent years (cf. Heim 2006, van Rooij 2007, Singh 2007, 2008, and Schlenker 2011a,b). We focus on Schlenker (2011a), which takes as its starting point the local context system of Schlenker (2009) and attempts to solve the proviso problem by incorporating insights from DRT while retaining the advantages of a satisfaction approach.

The main innovation is that a presupposition can be coindexed with a higher local context variable in addition to the one associated with the clause that contains it. This is made possible by the fact that these variables are part of the object language. The values of local contexts are calculated via (12), as before, but the indexing requires a presupposition to be entailed by *every* local context that the trigger is co-indexed with.

For (24), the presupposition trigger is indexed both with its own local context, C_1 and with that for the attitude report as a whole, here the global context C_0. This ensures that (24) presupposes both that Claire believes that Mary is currently writing, and that Claire is in fact currently writing.[3]

(24) $^{C0}[_{CP0}$ Claire [believes $^{C1}[_{CP1}$ that Mary will stop writing$]_{0,1}]]$

In this way multiple indexing accounts for the presence of multiple presuppositions noted in section 2.1.

5 Indexed Local Contexts and Desire Reports

The indexing system, while promising, fails to solve the optionality problem. This is significant because the indexed local context system aims to replicate many advantages of Geurts's (1999) DRT analysis. The latter analysis, however, has no trouble with optionality, as noted in section 2.2.

The indexing in (25) allows the presupposition triggered in CP_1 to be assessed relative to both C_0 and C_1. The C_0 indexing entails that the sentence should presuppose that Mary is currently writing, as desired. The result of indexing with C_1 depends on one's lexical semantics for *want*, as described in section 3.3.2; assuming the preferred semantics in (19), C_1 denotes Claire's belief set, and the sentence presupposes that Claire believes that Mary is currently writing.

(25) $^{C0}[_{CP0}$ Claire [wants $^{C1}[_{CP1}$ Mary to stop writing$]_{0,1}]]$

Indexing does not change the semantic value of C_1; indexing a presupposition trigger p{q} with a context variable C_x simply causes presupposition failure if C_x does not entail q; what C_x does in fact entail is determined, without regard to indexing, by (12) and the content of the global context.

In (25), C_1 will entail that Mary is currently writing if C_0 entails that Claire believes that she is. But whether or not C_0 entails that Claire *wants* Mary to be writing is irrelevant, and must be irrelevant. Optionality is thus underivable; it would only be derivable (while still deriving all the facts which motivated the belief-based semantics of *want*) if there were a way that C_1 could entail that Mary is currently writing just in the case where C_0 does not entail that Claire believes that Mary is currently writing, but does entail that Claire wants Mary to be, but in all other cases C_1 entails only what Claire believes, all while maintaining a constant semantics for *want*. This is not possible in the current system.

6 Conclusion

While Schlenker's (2009, 2011a) system meets the explanatory challenge, it fails on the descriptive challenge. Even with the extensions in the 2011a work, designed to incorporate descriptive advantages of DRT, it replicates some of the descriptive limitations of Heim 1992 which DRT has no problem with.

More generally, to our knowledge, there is no proposal which meets both challenges at the same time. We have pointed out here a system that begins the attempt to do so, but systematically fails for a certain class of facts. We leave to future research a full evaluation of which direction is the most promising.

Notes

[1] We are agnostic as to the nature of presuppositions. Beaver's (2001) characterization of them as "a proposition[s] taken to be accepted in advance" suffices for our purposes and we rely on the standard diagnostic tests to determine what, if anything, a sentence (or utterance or speaker) presupposes.

[2] This fact, too, can be calculated by way of (12); since nothing has been uttered yet, any refinement of the context might well change the truth value of the utterance.

[3] It doesn't actually seem necessary to index the presupposition trigger to its own local context. The presupposition of the trigger will be assessed at that local context anyway, assuming that aside from indexing, Schlenker's 2011a system inherits all of the properties of the 2009 system. However, multiple indexing may indeed be required for cases of multiple attitude embedding, as in (i), to get the presupposition to be assessed at all *three* local contexts.

(i) $^{C0}[_{CP0}$ Joe thinks $^{C1}[_{CP1}$ that Claire [believes $^{C2}[_{CP2}$ that Mary will stop writing$]_{0,1(,2)}]]$

(i) seems to presuppose at least the following three things: a) that Joe thinks that Claire believes that Mary is currently writing, b) that Joe thinks that Mary is currently writing, and c) that Mary is in fact currently writing. a) follows from assessing the presupposition at C_2, whether by indexing or by the normal mechanism of the system. c) follows from indexing C_0 with the presupposition trigger. To derive the b), we need to index CP_1 with the presupposition trigger.

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The Development of Children's Place Contrast Systems in L1 English

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1 Introduction

Children differ concerning their productions of back consonants (/K/). Some children likes /K/. They produce /K/ in place of either coronal /T/ or labial /P/ such as in consonant harmony (CH) (1a-b). These children include Amahl (Smith 1973), Daniel (Menn 1971), Trevor (Compton & Streeter 1977, Pater & Werle 2003), etc. Other children dislikes /K/. They produce either coronal /T/ or labial /P/ in place of /K/ such as in velar fronting (VF) (1c-d). These children include Virve (Vihman 1978), E (Inkelas & Rose 2007) and Julia[1] (this work).

(1) a. CH: duck [gʌk] (Amahl at 2;60 (year;day))
b. CH: milk [ŋiʌk] (Daniel at 25^{+}-25.5 months)
c. VF: kleiT (dress) [tɛt] (Virve at 1;4 (year;month))
d. VF: camel ['p^{h}amo^{w}] (Julia at 2;145 (year;day))

Previous research on L1 acquisition has not accounted for why /K/ is preferred by some children but disliked by others. I explore this question in this paper. I propose: /K/ is velar (placeless) for some children at certain stages in L1 development. Children's major place contrasts among consonants develop through time (cf. Fikkert & Levelt 2008). For children acquiring languages with a three-way place contrast with labial and dorsal being equally marked, there are three stages that children go through and two paths possible for Stage 2. The amount of structure reflects markedness: the simpler the structure is, the less marked the segment. Onsets of prosodic heads support more complex structures than onsets of prosodic dependents. Onsets of prosodic dependents cannot be more complex than onsets of prosodic heads. Onsets are specified for Place. It is the phonological licensing constraints, coupled with the amount of structure children permit at different developmental stages, that lead to many of the processes attested in children's grammars including CH and VF.

The paper is structured as follows. In section 2, I discuss the status of /K/ in child language. Drawing on analogy from adult languages, I argue that /K/ is velar (placeless) for some children at certain stages in development. In section 3, I propose possible paths circumscribed by Universal Grammar (UG) that children may take in acquiring the major place contrasts of their target language, especially for languages having a dorsal /K/. I provide evidence in section 4 for the hypothesis raised in section 3 by analyzing the processes of VF and different patterns of CH attested in two children's productions, namely, Julia and Trevor.

Finally, section 5 concludes the paper.

2 The Status of /K/

In this section, I first show that /K/ cannot be specified as dorsal for Julia. I then argue that /K/ is velar (placeless) in some adult languages, in contrast to the dorsal /K/ in other languages like English. In section 2.3, I propose that /K/ is velar for children like Julia at certain stages in development.

2.1 Julia's productions of /K/

Julia systematically avoids /K/ in prosodic head position, but favors it at prosodic dependent position when she is 2;28-2;145 (year;day). This asymmetrical distribution raises questions concerning the status of /K/. If /K/ is specified as dorsal, the most marked place of articulation, as has been commonly assumed in the child language literature, it would be mysterious that it can only occur in prosodic dependent position but cannot occur in prosodic head position.

Most of Julia's outputs (age: 2;28-2;145) are of the shape of C_1VC_2 and C_1VC_2V with stress falling on the initial syllable. Since English is trochaic, the word-initial consonant is foot-initial and is in prosodic head position. Julia systematically applies VF foot-initially (27/34 tokens), as shown in (2).[2]

(2) a. coat [dəth] (2;28) b. cookies [ˈdʌχis] (2;111 imitation) c. car [dʌχ] (2;60)

Following Goad (1996) and Goad & Brannen (2003), I regard word-final consonants as the onsets of empty-headed syllables (OEHS).[3] So word-medial and word-final onsets are foot-internal onsets and are in prosodic dependent position. Julia produces foot-internal /K/ with a target-like place of articulation, though it is sometimes realized as a fricative (3) (word-medially: 95% (19/20 tokens), word-finally: 90% (53/59 tokens)).

(3) a. monkey [ˊmʌxi] (2;88) b. bike [bʌx] (2;81)

Clearly, it is impossible that /K/ is specified as dorsal for Julia, as otherwise the opposite pattern should be observed. In the next section, I show that in some adult languages, /K/ is not dorsal, but velar; that is, it is less marked than labial and coronal. We will see, then, that if /K/ is velar for Julia during the age range we focus on here, the attested patterns follow straightforwardly.

2.2 /K/ in adult languages

Following Rice (1996a), I argue that adult languages are of two types with respect to the status of the back consonants /K/: dorsal languages and velar languages. In dorsal languages in which coronal is the least marked place of articulation, assimilation targets coronal or neutralization of place yields coronal. On the contrary, in velar languages in which velar is the least marked place of articulation, assimilation targets velar or neutralization yields velar. I regard markedness as correlating with complexity of structure: the more complex the structure is, the more marked the segment. I will not go into detail on the more familiar dorsal languages. Readers are referred to Avery & Rice

(1989) and Paradis & Prunet (1991) for discussion of the unmarkedness of coronals in such languages. I focus on one velar language below in which processes are observed showing that /K/ is the least marked place of articulation.

In Tlachichilco Tepehua (Watters 1988), stops neutralize to velar/uvular before a consonant other than an underlying glottal stop (4) (The apostrophe indicates either a glottal stop or glottalization of oral stops).

(4) a. /ʃap/		b. /q'ut/	
ʃa^{w}k-ɬi	"X panted"	ʔoq-ɬɪ	"X drank it"
ʃap-'a	"X pants"	ʔot-'a	"X drinks it"

As adult languages are of two types concerning the specification of place in /K/, and if children's grammars are possible (adult) grammars (Pinker 1984), it is expected that this difference will be reflected in children's languages as well. When viewed from this perspective, Julia's treatment of /K/ as velar is not surprising. I show below that Julia is not the only child who treats /K/ as velar.

2.3 /K/ in child languages

There are many children who behave like Julia in their productions of /K/, suggesting that /K/ must be velar for them. First, E (Inkelas & Rose 2007), Ruth (Hills 1914), and 67 normally developing English-learning children (Stoel-Gammon 1996) all behave like Julia in producing word-initial /K/ as /T/. Children learning languages other than English also use /T/ to replace /K/ in prosodic head position. Noortje (Fikkert & Levelt 2008) acquiring Dutch, Melanie (Berg 1992) acquiring German and Virve (Vihman 1978) acquiring Estonian are some of them. Second, Julia produces /K/ earlier than any other stops foot-internally (5), but later than any other stops foot-initially (6). Note also that /K/ is produced earlier in prosodic dependent position (1;198) than in head position (1;250), different from the pattern observed for /P/ and /T/.

(5) a. dog [dɑ:x] (1;198) b. that [da:t^{h}] (1;315) c. yup [jʌp] (2;97)
(6) a. key [giʃ] (1;250) b. dog [dɑ:x] (1;198) c. baby [bibi] (1;167)

Similar to Julia, Molly (Holmes 1927) produces final /K/ in 9/10 cases, but deletes /T/ in 5/9 cases and no word-final /P/ is ever attempted at 1;180. Wood (1995) reports that N uses /K/ and /ʔ/ interchangeably word-finally when both coronal and labial stops word-finally are subject to deletion.[4] Ruth (Hills 1914) is reported to have acquired /K/ word-finally by the age of 2;0 but still uses /T/ to replace /K/ word-initially (Ingram 1974:240).

There are children who apply other processes to avoid /K/ in prosodic head position, implying that /K/ is velar. Philip at 1;270 (Ingram 1974:236) applies metathesis to avoid word-initial /K/ (7) (Truncation also applies in (7a)). Notice that the consonants that alternate with /K/ can be either coronal or labial, implying that this process cannot be due to labials being favored at the left edge of words, but must be induced by velar being disfavored in head position.

(7) a. alligator [dæge] b. gumby [bæŋki] c. coffee [baki]

In sum, /K/ is preferred in prosodic dependent position but disfavored in prosodic head position for many children including children acquiring languages other than English. In short, /K/ cannot be dorsal. Rather, it must be velar. If /K/ is velar for some children at certain point of development, how do these children

acquire the target grammar in which /K/ is dorsal? In section 3, I take up this issue and propose a set of the possible routes circumscribed by UG that children might take in acquiring the place contrasts among consonants of their target language. I focus on supra-laryngeal contrasts only and also ignore children's acquisition of sub-coronal contrasts.

3 Elaboration of Segmental Structure

If children's grammars are possible (adult) grammars (Pinker 1984), it is expected that for all the stages that children go through in acquiring the place contrasts of their target language, the system of contrasts they have at each stage should match with the type of systems observed for adult languages. In this section, I show that this is true. I examine the place contrast systems of adult languages, and show that these reflect the possible routes circumscribed by UG for children to take in acquiring the place contrast of target English-type languages. It has been reported that there is no language that uses only one place of articulation for the series of stops (Maddieson 1984:31). Therefore, I propose that the initial stage of children's language acquisition, Stage 1, is characterized by a two-way place contrast. Following the hypotheses of minimality and monotonicity (Rice 1996b) (see below), I suggest that children only have minimal structures at Stage 1, and the process of establishing L1 place contrasts is through monotonic addition of structure. The result of this is that different possibilities exist for how to elaborate the two-way place contrast at Stage 1 into a three-way place contrast at Stage 2. I argue that only two of them are legitimately circumscribed by UG. At Stage 3, the two legitimate paths from Stage 2 converge into the same three-way place contrast in which labial and dorsal are equally marked. I discuss each of these three stages in detail below.

3.1 Stage 1: two-way contrast (labial vs. non-labial)

Concerning two-way place contrasts in adult language, Hawaiian stands out as having a contrast between labial and non-labial.[5] Its consonant inventory is /p, t ~ k, ʔ, h, m, n, w ~ v, l/ (Elbert & Pukui 2001).

The same contrast system should be attested in child language if children's grammars are possible (adult) grammars. And this is exactly what is reported in the early stages of children's development. For example, Daniel (Menn 1971:231) and Timmy (Vihman, Velleman & McCune 1994:22) are reported to have a two-way place contrast between labial and velar. Ingram (1976:18) reports that when children come to acquire about 50 words, the consonant inventory is characterized as having two sets of speech sounds: labial vs. coronal.[6] Wood (1995) also shows that N only has a contrast between labial and coronal word-initially before the age of two. Recall from the inventory above that in Hawaiian coronal and velar never contrast. Returning to Julia, she uses /T/ and /K/ interchangeably in her early outputs (8), implying that the contrast between /K/ and /T/ has not yet been established.

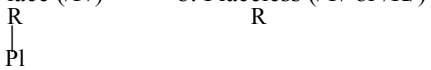
(8) a. truck [kax] (1;270) b. truck [tax] (1;270)

Following the minimality hypothesis proposed by Rice (1996b) in (9) below, I propose that the initial segmental structures that young children have are in (10)

(cf. Rice 1996b).[7,8] Following Rice and Avery (1995) in regarding children's early phonological representation (PR) as underspecified, I suggest that no specific place features are present in children's PR at this stage. (10a) is realized as labial by phonetic enhancement. I suggest that the early emergence of labial is due to factors other than language. See Qu (2011) for detailed discussion on this.

(9) Minimality: initially the child has minimal structure (Rice 1996b:12).

(10) Stage 1 (labial vs. non-labial): a. Place (/P/) b. Placeless (/T/ or /K/)



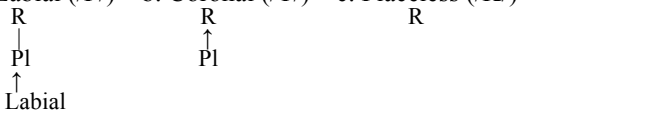
3.2 Stage 2: two learning paths

To elaborate the two-way contrast in (10) into a three-way contrast, three possibilities exist if we follow the monotonicity hypothesis (Rice 1996b) in (11):

(11) Monotonicity (Rice 1996b: 12)
Inventories are built up in a monotonic fashion as contrast is added.

Option 1 (Stage 2 Path 1) is: Place is added to the root node of (10b) resulting in a split into coronal and velar (12b-c). Then Labial is forced to be added as a dependent of Place of (10a) as in (12a) under the pressure of maintaining phonological contrast. The three-way contrast that results is among labial, coronal and Placeless with labial being the most marked place of articulation.

(12) a. Labial (/P/) b. Coronal (/T/) c. Placeless (/K/)

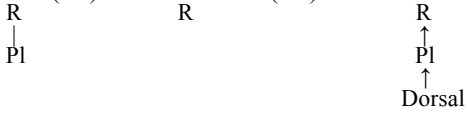


One adult language that shows a contrast like (12) is Chukchi (Bogoras 1922).[9] In Chukchi, both dental and labial do not assimilate to following velars (13a-b). This pattern is expected if velar has no place feature to share with a preceding coda. Velars assimilate to following labials, but not to following dentals (13c). Note that /k/ in coda can acquire features as it is Placeless. Even though /k/ has less structures than /t/, it fails to assimilate to the following /t/ because /t/ lacks a Place node dependent in contrast to the representation of /p/.

(13) a. ɣe-tku-lin → ɣetkulin "he consumed it"
b. ɣe-pkir-lin → gepkirin "he came"
c. mykpenwel → mywpenwel "many two-year-old reindeer-bucks"
uwiktimnen → uwiɣtimnen "she killed herself"

Option 2 (Stage 2 Path 2) is: Place is similarly added to the Root node of (10b) resulting in a split (14b-c). Dorsal is added as a dependent of this Place node (14c), leaving (10a) intact as (14a). The contrast that results is among dorsal, labial and Placeless with dorsal being the most marked place of articulation.

(14) a. Labial (/P/) b. Placeless (/T/) c. Dorsal (/K/)

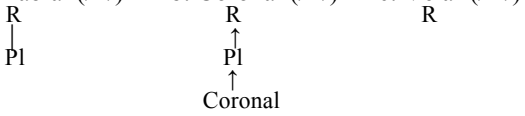


One adult language in which dorsal is more marked than the other two places of articulation is Korean (15) (Jun 1995:51-52). In Korean, coronals in consonant clusters assimilate to following dorsals and labials (15a); labials assimilate to following dorsals, but not to coronals (15b), and dorsals assimilate neither to labials nor to coronals (15c), suggesting that dorsal is the most marked and coronal the least marked place, as revealed in the structures in (14).

(15) a. /mit + ko/ → [mikko] "believe and"
/kot + palo/ → [koppalo] "straight"
b. /ip + ko/ → [ikko] "wear and"
/ip + ta/ → [ipta] "wear + SE"
c. /ʧak + pʰa/ → [ʧakpʰa] "destruction"
/ik + ta/ → [ikta] "ripe + SE"

The last option is that Place is added to the bare Root node of (10b). Coronal is then added as a dependent of this Place node (16b), leaving (10a) intact as (16a).

(16) * a. Labial (/P/) b. Coronal (/T/) c. Velar (/K/)

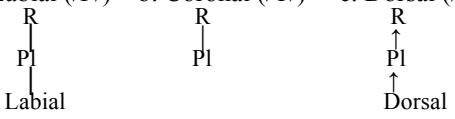


Note that coronal is the most marked place of articulation in this system. To my knowledge, there are no languages in which coronals are the most marked place of articulation for the stop series. In addition, it is commonly assumed that the feature coronal is not present in PR unless sub-coronal contrasts are present, and the latter is typically the case when both labial and dorsal features are present. Therefore, option 3, likely must be ruled out by UG.[10] This leaves options 1 and 2 as the possible learning paths for children acquiring the major place contrasts of their target language.

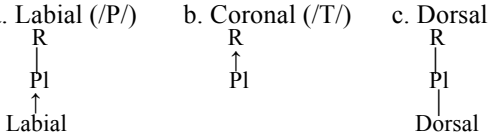
3.3 Stage 3: labial, coronal and dorsal

When the two paths at Stage 2 are further elaborated at Stage 3 following monotonicity in (11), they converge on the same three-way contrast among labial, coronal and dorsal, with labial and dorsal being equally marked (17-18).

(17) Stage 2 Path 1 → Stage 3: a. Labial (/P/) b. Coronal (/T/) c. Dorsal (/K/)



(18) Stage 2 Path 2 → Stage 3: a. Labial (/P/) b. Coronal (/T/) c. Dorsal (/K/)



Note that labial and dorsal are now equally marked compared to the unmarked coronal, just like the major place contrasts in English. (Notice that English coronal unmarkedness will only be observed with nasals in the adult grammar).

To briefly summarize, the hypothesis concerning children's development of major place contrasts is constrained by the principles of minimality and monotonicity, and the acquisition process is guided by UG. In section 4 below, I provide evidence for the hypothesized stages by analyzing some processes attested in children's early outputs, mainly the widely attested VF and CH.

4 Phonological Licensing and Processes in Child Languages

As almost all the CH processes attested in child language are assimilations involving major place features, it should not be surprising to find that different systems of place contrasts may have an effect on child CH. I argue that there is nothing particularly special about child CH when compared with other processes attested in children's productions, e.g. VF, metathesis, etc. In the spirit of Steriade (1995), Piggott (1997), Zoll (1998), Rose (2000) and Goad (2001) who regard harmony as a process triggered by phonological licensing (Harris 1994, 1997), I suggest that almost all substitution and assimilation processes attested in children's outputs are induced by phonological licensing coupled with the segmental structures that children build at different stages in development.

In section 4.1, I elaborate on the phonological licensing theory of Harris (1994, 1997). As my focus is on syllable onsets, I propose three particular prosodic licensing constraints for onsets. In section 4.2, I focus on Julia's VF. I propose that Julia takes Path 1 at Stage 2 when VF systematically applies in her outputs. In section 4.3, I examine Trevor's CH patterns, mainly regressive CH (Compton & Streeter 1977, Pater & Werle 2003). I show that the different patterns of CH attested at different ages in Trevor's dataset are due to Trevor going through different stages in acquiring the major place contrasts of English. In short, VF and different patterns of CH are all induced by phonological licensing coupled with the types of phonological representations that children build at different stages. I leave Stage 1 aside in this section as it typically reflects the point when children's vocabulary is less than 50 words, and most outputs at this stage are core syllables or reduplicated structures.

4.1 Phonological licensing

Phonological licensing is of two different types: prosodic licensing and autosegmental licensing. Under prosodic licensing, each unit in the prosodic hierarchy is required to belong to some higher-order structure. Under auto-segmental licensing, the attachment of melodic material to skeletal slots is regulated (Harris 1994:154-155). As the focus of this work is on syllable onsets, I focus on the autosegmental licensing relations of onset consonants. Harris (1994:160) proposes that an onset head position must be licensed by a following nucleus position by the principle of onset licensing. He suggests further (p. 208) that the distributional asymmetry between the nuclei contained in a foot is potentially mirrored in the onsets they license at the inter-constituent level (licensing inheritance principle). As the dominant nucleus within a prosodic head supports more complex structures than its dependent nucleus, as is stated in

the prosodic licensing principle in (19), the onsets of prosodic heads are expected to support more complex structures than those of prosodic dependents. Therefore, I propose the two licensing constraints for syllable onsets in (20a-b).

(19) Prosodic Licensing Principle
  a. Prosodic heads support more complex structures than non-heads. (Harris 1997)
  b. The dependent in any constituent cannot be more complex than its head. (Dresher & van der Hulst 1998)

Turning to place features of onset consonants, the focus of this study, in many languages, placeless segments can only occur post-vocalically. In Chamicuro (Peruvian) (Parker 2001), Tiriyo (Jones 1972) and Macushi (Hawkins 1950), placeless consonants (/ʔ/ or /h/) never occur in onsets. So I propose one more constraint for syllable onsets in (20c), that onsets must be specified for Place.

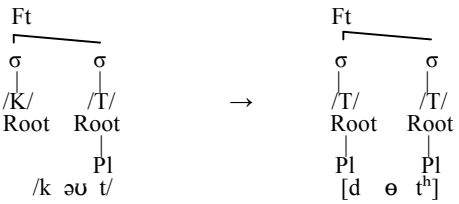
(20) Prosodic Licensing Constraint (Onsets)
  a. Onsets of prosodic heads support more complex structures than onsets of prosodic dependents.
  b. Onsets of prosodic dependents cannot be more complex than onsets of prosodic heads.
  c. Onsets are specified for Place.

In children's grammars, the combination of (20c) with (20a-b) means that onsets of prosodic heads will be specified for Place. That is, Placeless consonants are prohibited foot-initially. In what follows, I provide evidence for the hypothesized stages proposed in section 3 by focusing on Julia's VF and Trevor's CH. I show that both processes are induced by the constraints in (20), coupled with the specific PR children permit at different stages.

4.2 VF (Julia: Stage 2 Path 1)

Recall that VF systematically applies foot-initially when Julia is 2;28-2;145. Recall also that during this age range, Julia treats /K/ as velar, and a three-way place contrast has been established before the age of two (see (6) above). Therefore, I propose that Julia is taking Path 1 at Stage 2 when VF applies. Note in (2) above, VF is attested in Julia's /KVT(V)/, /KVK(V)/ and /KVV/ words. For Julia's /KVT(V)/ words, the onsets of the prosodic dependents are more complex than the onsets of the prosodic heads as the markedness hierarchy for children taking Path 1 at Stage 2 is Labial>Coronal>Placeless. As the constraints in (20a-b) are violated, VF applies to "repair" this ill-formed structure (21).[11]

(21)



If Julia's VF is indeed induced by the prosodic licensing constraints (onsets) in (20), we expect that Julia applies labial harmony (LH) in /KVP(V)/ and /TVP(V)/ words as these forms also violate the constraints in (20). And this is

exactly what is attested in Julia's outputs (22).[12]

(22) LH (Julia: Stage 2): camel ['pamo] (2;145 imitation)

As far as Julia's /KVK(V)/ and /KVV/ words are concerned, VF applies because Placeless /K/ occurs in the onsets of prosodic heads, violating the constraint in (20c). Therefore, it is phonological licensing combined with Julia's PR at Stage 2 that drives the application of VF attested in her dataset.

4.3 CH (Trevor: Stage 2 Path 2 + Stage 3)

Turning to CH patterns attested in the outputs of Trevor (Compton & Streeter 1977, Pater & Werle 2003), I argue that Trevor follows Path 2 at Stage 2 and then enters Stage 3, so different patterns of CH are attested at these two stages.

Recall that when a child leaves Stage 2 Path 2 and enters Stage 3, the segmental structure is elaborated in the manner shown in (18). As dorsal and labial are equally marked at Stage 3, dorsal harmony (DH) and labial harmony (LH) should only target coronal if both are attested. For children taking Path 2 at Stage 2, however, DH should target coronal as well as labial, as dorsal is more marked than both. That is to say, DH targeting labials ceases while DH targeting coronals still applies if children go through Path 2 of Stage 2 to enter Stage 3.

Trevor is reported to apply DH to word-initial coronals (93%, 41/44 tokens) at the age of 1;10,13-2;03 (year;month,day) (23). No other CH patterns are systematic during this period (DH targeting word-initial labials: 5%, 5/93 tokens) (Pater & Werle 2003: 394). This is Trevor's Stage 3 when only DH targeting coronals is attested.

(23) DH (Trevor: Stage 3): a. dog [gɔg] (1;11,12) b. duck [gʌk] (1;11,12)

At an earlier age (-1;9,2),[13] however, DH systematically targets both word-initial coronal and labial as shown in (24) (/PVK(V)/: 95%, 125/132 tokens; /TVK(V)/: 96%, 69/72 tokens). This is Trevor's Stage 2.

(24) DH (Trevor: Stage 2): a. dog [gɔg] (1;5,14) b. tickle [gɪ:gu:] (1;7,26)
c. bug [gʌg] (1;5,18) d. pickle [gɪgʊ] (1;9,2)

More evidence for this stage comes from Trevor's LH. When children take Path 2 at Stage 2, LH targeting word-initial coronal is predicted to apply as well. In Trevor's outputs, LH is attested before 1;6 (100%, 5/5 tokens) as in (25).[14]

(25) LH (Trevor: Stage 2): top [pap] (1;6,8)

Therefore, Trevor is at Stage 2 and takes Path 2 before 1;9,2. Note that DH targeting word-initial labials (in /PVK(V)/ words) ceases to apply at 1;10,13 when DH targeting word-initial coronal (in /TVK(V)/ words) still applies, conforming to the predictions made earlier in this section. Trevor's CH patterns attested at different ages lend further support to both the hypothesized stages that children go through and the phonological licensing account of child CH.

To summarize, both Julia's VF and Trevor's CH lend support to the hypothesized stages proposed in section 3 and the proposal that most assimilation and substitution processes attested in child language are triggered by phonological licensing coupled with the PR children build at certain stages.

5. Conclusion

This work has provided a unified account of VF and CH, both of which are widely attested in child language. Some previous accounts of CH (e.g. refs) have not provided a grammatical account of VF because these analyses are all based on the assumption that children share the same PR with adults and that coronal is the least marked place of articulation. By drawing parallels with adult languages, I have shown that /K/ is velar, less marked than coronal, for some children at certain stages in their language development. It follows then that children do not have adult-like phonological representations. In order to acquire adult-like phonological representations, they have to go through several stages. As the generative approach to phonological development is still a relatively young field, there are many more questions than answers. For example, why is CH across major place features limited to child grammar? Why does LH cease earlier than DH when both target word-initial coronals and both are predicted to apply at Stage 2? Why are so few tokens of LH attested targeting either word-initial velars (Julia) or word-initial coronals (Trevor)? It is unlikely to be due to the low frequency of these words in the target language. It is more likely instead because of some property of the child's grammar. Moreover, note that Julia does not have CH at Stage 3. Is this unique to Julia or common to all children who take Path 1 at Stage 2? Clearly, more data and more work are needed in order to answer these questions, and these are also the directions of my future research.

Endnotes

1. Julia is a monolingual English acquiring girl in Montreal, Quebec, Canada. Data were collected as part of an FCAR grant (Quebec government) awarded to Heather Goad.
2. For the rest of the foot-initial /K/s, five are replaced by /P/ and two are subject to deletion. Thus, none of the foot-initial /K/s are target-like when Julia is 2;28-2;145.
3. Julia treats word-final consonants the same as word-medial onsets, as can be seen in the following examples where *t* is aspirated in both: den̲tist [ˊdʌt̲ʰɪs] (2;60), boa̲t̲ [pʊt̲ʰ] (2;28).
4. Sometimes, N also produces word-final coronal and labial stops as either glottal or velar stops. The same process is attested in Julia's outputs.
5. Mohawk (Michelson 1988) and Wichita (Maddieson 1984) have also been reported as languages with a two-way place contrast, where the contrast is manifested as alveolar (/T/) vs. velar (/K/). However, I regard Mohawk as a language with a three-way place contrast in disguise (see Postal 1969 for /kʷ/ as /p/). As a series of labiovelar stops (/kʷ/) is also attested in Wichita, Wichita can likely be represented in the same manner as Mohawk.
6. Note that in the reported studies, researchers mainly focus on word-initial position. Thus, children's preference for labial vs. coronal over labial vs. velar is probably only apparent.
7. I follow the feature geometry proposed by Clements & Hume (1995). Irrelevant structures are omitted.
8. Although glottal stops are also considered to be placeless, I regard glottal stop as lacking an articulator in the oral cavity, and the difference between velar and laryngeals, I assume, lies in the dependents of the laryngeal node, following Halle (1989, 1992).
9. Bogoras (1922:652) indicates that the medial consonant cluster /pt/ is legal but no words containing this cluster are provided. In addition, he points out that /tp/ is an accidental gap. Concerning the nasal stops, the velar nasal is the least marked among the nasals at the three major places of articulation (see Rice 1996a for detailed discussion).
10. It seems that option 3 cannot be formally ruled out. We leave this problem to future research.
11. I regard this process as involving feature copying, following Goad (1997), to ensure that the medial vowel is skipped.
12. During the age range I focus on (1;167-2;145), no /TVP(V)/ targets are ever attempted by Julia and the target form in (22) is the only /KVP(V)/ word Julia tried to produce. I regard this as a case of selection and avoidance, which is due to prosodic licensing.

13. As I do not have access to Trevor's complete dataset, it is not possible to determine when Trevor's Stage 2 starts.
14. LH targeting word-initial coronals ceases to apply at 1;7. According to Pater & Werle (2003:394), between 1;7 and 1;9, no LH is attested in 16 tokens of /TVP(V)/ words. As there is no way of knowing what these tokens are, how many lexical types are involved or what they are, I have to leave the question open as to why LH ceases earlier than DH at Trevor's Stage 2. Note that the number of /TVP(V)/ targets (16) is very small compared to the number of /TVK(V)/ targets (52) and /PVK(V)/ targets (73) at 1;7-1;9.

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Prosodic Cues for Information Structure in a Tone Language*

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1 Introduction

Across languages, it is widely accepted that prosodic structure can convey discourse-level information (Gussenhoven 1983, Pierrehumbert & Hirschberg 1990, among others). Acoustically, there are three dimensions that are commonly regarded as providing cues about information structure, namely duration, intensity, and fundamental frequency (F0). In English, longer duration, greater intensity, and changes in F0 movement are usually considered to be associated with elements that are semantically or pragmatically prominent (e.g. Ladd 1996). Different types of prominence are distinguishable by prosody: Katz & Selkirk (2011) recently show that contrastive focus has stronger effects than new information focus on words' relative duration, relative intensity, and F0 movement.

While little disagreement exists over the role that duration and intensity play in signaling information structure, the relationship between F0 contours and different kinds of information is less well-understood. For instance, it has traditionally been argued that different types of focus occur with distinct pitch accents. Pierrehumbert & Hirschberg (1990) conclude that syllables in new-information focus receive an H* pitch accent, whereas syllables in contrastive focus receive an L+H* pitch accent. However, others have argued that the mapping between information types and pitch accents is not always a straightforward one-to-one relation. An eye-tracking study conducted by Watson, Tanenhaus, & Gunlogson (2008) reveals that when listeners hear an L+H* pitch accent, they look towards contrastive referents, whereas hearing an H* accent leads listeners to consider both new and contrastive referents.

The question of how prosodic cues map on to different information types becomes even more complex when we consider tone languages, where duration, intensity, and F0 also play a role in distinguishing lexical items. In Mandarin, for example, four pitch patterns that are referred as 'tones' work as phonemes: high (Tone 1), rising (Tone 2), low (Tone 3), and falling (Tone 4). They can alter lexical meaning, as shown in (1).

(1)

Tone 1	ma [High]	'mother'
Tone 2	ma [Rising]	'hemp'
Tone 3	ma [Low]	'horse'
Tone 4	ma [Falling]	'scold'

In addition to the four-way distinction based on F0 movement, lexical tones in Mandarin also differ in amplitude and length. As noted by Whalen & Xu (1992), Tone 2, Tone 3, and Tone 4 are perceptible solely on the basis of their amplitude contours, and Tone 3 is 1.5 times longer than the other tones when produced in isolation (Xu, 1997).

Prior work suggests that Mandarin resembles English in the way that it alters duration and intensity to emphasize information in an utterance, but differs from English in terms of F0 movement (e.g. Jin, 1996; Chen, Wang, & Xu, 2009). Below we briefly review some existing work on new-information focus and contrastive focus in Mandarin. In most of the studies mentioned in this paper, as well as the current study, the information in contrastive focus was provided to correct the listener's mistake. Being an alternative to replace wrong information in a previous utterance, corrective information is considered as a subtype of contrastive focus (Dik 1997). We will refer to such subtype of contrastive focus as 'corrective focus' henceforth.

In Mandarin, new-information focus has been reported to affect the duration, mean intensity and F0 ranges of the word that is being focused: Words have longer duration, greater mean intensity, and larger F0 ranges when they serve as the new information in a sentence (Jin 1996, Xu 1999, Chen et al. 2009). Corrective focus has also been found to result in lengthening and F0 range expansion in Mandarin (Chen 2006, Chen & Gussenhoven 2008), but there seems to be no study that investigated the intensity of correctively-focused words. Crucially, despite that discourse focus affects the F0 movement during a focused word, Chen & Gussenhoven (2008) show that the F0 patterns specified by different lexical tones are still distinctively distinguishable from one another within a focus type. Compared to English where there is no lexical tone, pitch accents such as H* and L+H* are imposed on words depending on information structure in discourse (Pierrehumbert & Hirschberg 1990, Watson et al. 2008), in Mandarin, rather than substantially changing the shapes of F0, words change the *ranges* of F0 to convey different information structures. This is presumably associated with the fact that the *shapes* of F0 are the major cue for lexical tones in Mandarin.

It remains unclear, however, to what extent prosodic cues can differentiate one type of focus from another in Mandarin. For example, do new-information focus and corrective focus differ from each other in terms of their prosodic realization in Mandarin? Are new and given information marked differently in prosody? Although these kinds of issues have been investigated in existing work, the results do not yield a very clear picture. Different studies define a focus type in

different ways, e.g. Chen & Gussenhoven (2008) and Grief (2010)[1], and also lead to divergent results, e.g. Jin (1996) and Chen et al. (2009) on mean intensity.

In this paper, we report a psycholinguistic production that aims to answer two questions: First, *how is information structure encoded prosodically in a tone language*, where all the three acoustic dimensions – duration, F0, and intensity – already serve lexical purposes? Prior studies are mostly devoted to duration and F0; those which have presented results on intensity only looked at mean intensity. Given that intensity contours, as well as F0 contours, are associated with lexical tones, we believe that intensity ranges could reflect discourse-level information just like F0 ranges do. Thus, we wanted to investigate how and whether all three dimensions encode information structure. Second, *are different kinds of information structure distinguished prosodically?* Existing work on Mandarin (Chen & Gussenhoven 2008, Grief 2010) concentrates mostly on subtypes of contrastive focus, but the two major types of information structure that have received the most attention in broader crosslinguistic work (e.g. Pierrehumbert & Hirschberg 1990, Watson et al. 2008, Katz & Selkirk 2011) – new information and contrastive focus – have not been carefully compared in Mandarin. In this paper, building on prior work, we examine the acoustic correlates of new information and corrective focus. Duration, F0 ranges, and intensity ranges were analyzed.

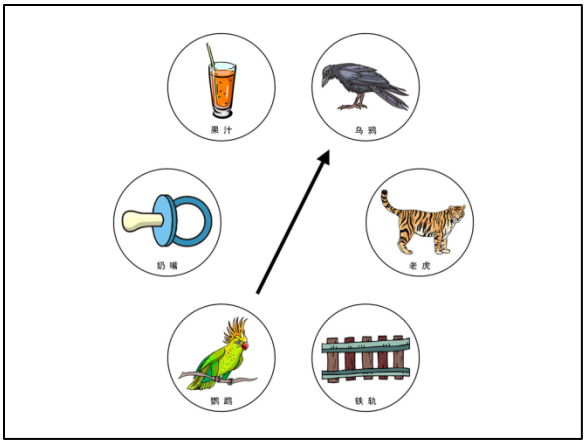
The rest of the paper is organized as following: Section 2 presents the details of the experiment that we conducted. In Section 3, we report the results, which are discussed in Section 4. Conclusions are in Section 5.

2 Production study: Method

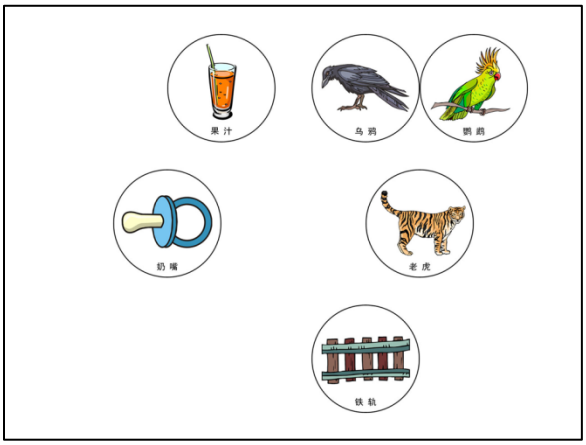
To investigate the prosodic representations of information structure, we conducted a production study. Participants produced utterances based on pictures and arrows on the computer screen. Using pictures allowed us to avoid presenting participants with written sentences which can result in unnatural 'reading' intonation. We first discuss the experimental design and the stimuli in Section 2.1, and then go over the procedure in Section 2.2.

2.1 Design and stimuli

Participants saw colored pictures on the computer screen. Objects were presented in circles, each with its name shown below. There were six pictures on each screen. Arrows were used to indicate the commands participants should produce. For example, in Figure 1a, the arrow points from the parrot to the crow, so participants should say: 'Move the parrot next to the crow.' After they produced the instruction, participants saw a moving event on the computer screen that correctly or wrongly responded to their instruction. For example, in Figure 1b, the parrot is moved next to the crow, which is a correct response.



(a)



(b)

Figure 1: A sample screen for stimuli

To investigate discourse-level intonation across lexical tones, we manipulated the information structure of a target word and controlled its tonal combination. Specifically, a repeated-measures design with two independent variables was used: (i) **correctiveness** (with two levels: presence or absence of correction) and (ii) **givenness** (with two levels: new or given information). Target words were bisyllabic, with one of the three tonal combinations: High-High (HH), High-Low (HL), or Low-High (LH). A third of the target words were HH, a third were HL and another third were LH. All sentences were produced in the frame illustrated in (2)[2]:

(2) ba OBJECT fang-dao/-zai LOCATION pangbian
PAT put-PREP side
'*Move the OBJECT next to the LOCATION*'

A target word always appeared in the OBJECT role in a sentence. Table 1 shows the summary of the four conditions. Target sentences were the last two sentences in a trial, *i.e.* the sentences in bold in Table 1. Next, let us consider the four conditions in more detail.

Table 1: Structure of target trials

Trial type	New information	Given information
1st Sentence	*(a) Move A next to B*	*(d) Move A next to TARGET*
1st Visual event	(Correct moving)	(Correct moving)
2nd Sentence	**[Non-Corrective New]** ***(b) Move TARGET next to C***	**[Non-Corrective Given]** ***(e) Move TARGET next to C***
2nd Visual event	(X is moved next to C)	(X is moved next to C)
3rd Sentence	**[Corrective New]** ***(c) Move TARGET next to C***	**[Corrective Given]** ***(f) Move TARGET next to C***
3rd Visual event	(Correct moving)	(Correct moving)

Broadly speaking, there were two types of target trials: New-information trials and Given-information trials. The New-information trials were composed of three spoken instructions (sentence (a), (b) and (c) in Table 1). First, a participant saw an image with an arrow and produced the corresponding sentence, *e.g. Move the parrot next to the crow* (sentence (a)). The object moved correctly in the display, and after that, another arrow appeared. To convey the information represented by the second arrow, the participant produced another sentence, *e.g. Move the juice next to the pacifier* (sentence (b)). After the second sentence was uttered, a wrong object moved to the location. For example, instead of the juice, the tiger moved next to the pacifier. To correct the moving event, the participant repeated the instruction, e.g. Move the JUICE next to the pacifier (sentence (c)). This time, the correct object moved on the screen. The correction sentence was the last sentence in the trial.

Note that on these New-information trials, the target word (*juice* in this case) had not been mentioned until sentence (b) was uttered for the first time, *i.e.* neither of the two objects mentioned in sentence (a) (e.g. parrot, crow) was the target word in sentence (b). Thus, 'juice' was new information when it was mentioned in sentence (b). We refer to this as the **Non-Corrective New information condition**. Then, the participant repeated the instruction in order to

correct the incorrect moving event, and produced sentence (c), which we refer to as the **Corrective New information condition**. This is because here, the target word (e.g. juice) was uttered in a corrective context. Note that the distinction between new and given in this study is defined from the *hearer's perspective*. From the perspective of the speaker, by the time they got to sentence (c), 'juice' was already given information because the speaker had already uttered it in sentence (b). However, from the perspective of the *hearer,* 'juice' was presumably still new information at the point where the third sentence was uttered, since the hearer apparently did not hear sentence (b) correctly and moved an incorrect object instead of the 'juice'. Thus, because we are using the terms 'given' and 'new' from the perspective of the hearer, sentence (c) is considered an example of corrective, new-information focus.

Having considered the New-information trials, let us now turn to the subtype of Given-information trials. The Given-information trials had the same structure as the New-information trials, except for the information-structural properties of the target words. Specifically, in the Given trials, the target word had already been mentioned in the LOCATION role of the first sentence (sentence (d) in Table 1). In other words, it had already been involved in an earlier moving event, as shown in Table 1. Thus, in the Given-information trials, the second spoken instruction (sentence (e) in Table 1) is in the **Non-Corrective Given information condition**, and the third sentence (sentence (f) in Table 1) is in the **Corrective Given information condition**.

Each condition contained 9 items, 3 for each tone combination. (See Appendix for the list of target words.) Thus, there were 27 target trials. The dependent variables that we measured were the duration, F0 range, and intensity range of the target word region in a target sentence. In target trials, either three or four of the objects were mentioned in a particular trial. The extra two to three pictures in a display were present to ensure that participants could not predict which picture was going to be involved in the next instruction. The experiment also included 45 filler trials, which differed from the targets along one or more of the following parameters: the number of sentences in a trial, whether and in which sentence a wrong moving event occurs, on which noun the correction is made in a corrective sentence, and the lexical tones of a noun.

Among all the trials, any two of the words co-occurred less than four times, and any three of the words co-occurred less than once in a trial. The tonal combinations used in target words (HH, HL, and LH) appeared for 56 times each, and the tonal combination which was only used in filler words (LL) appeared for 48 times. All the words had a frequency no higher than 15.23 counts per million words according to Cai & Brysbaert (2010). The positions and directions of arrows were counterbalanced.

2.2 Procedure and participants

Participants were told to give instructions to move objects based on the pictures and arrows on the computer screen, to check if their instructions were carried out correctly, and to provide a correction if their instructions were not followed. Participants were asked to only use the sentence frame in (2) during the entire experiment, and to speak as naturally as possible. Participants were told to imagine that they were speaking to a person in another room, in front of another computer connected to the participants' computer, and that the listener would move the objects according to the participants' instructions.

Eight adult native speakers of Mandarin, four women and four men, participated. All were either born in Beijing or had lived in Beijing since childhood. All of them were students or visiting scholars at University of Southern California who left Beijing no longer than two years before. The participants were paid $10 for their participation.

3 Results

Acoustic analyses were done using the Praat software with the ProsodyPro script (Xu 2005-2011). Length, maximum and minimum F0, and intensity were extracted by the script. Repeated measures ANOVAs and paired t-tests were conducted on the duration, F0 ranges (F0 maximum – F0 minimu), and intensity ranges (maximum intensity – minimum intensity) of target words.[3]

Overall, as can be seen in Figure 2, words in the non-corrective conditions (the two bars on the right) have smaller F0 ranges than words in the corrective conditions (the two tall bars on the left). Within the non-corrective conditions, New information has larger F0 ranges than given information, but this distinction between Given and New does not appear in the corrective conditions. These observations are confirmed by statistical analysis: ANOVAs show a main effect of correctiveness ($F(1,7)=20.512$, $p<.01$), with correction conditions showing significantly bigger F0 ranges than non-corrective conditions, and no main effect of givenness ($F(1,7)=4.192$, $p=.08$). There is a significant interaction between correction and givenness ($F(1,7)=10.695$, $p<.05$). More specifically, t-tests reveal that the correctiveness effect on F0 ranges occurs in both new information ($t(7)=4.081$, $p<.01$) and given information ($t(7)=4.781$, $p<.01$), while the givenness effect on F0 ranges emerges only when the words are non-corrective ($t(7)=2.919$, $p<.05$) but not when the words are corrective ($t(7)=.126$, $p=.903$). In other words, while non-corrective words show an effect of givenness, no effect of givenness is detected on corrective words.

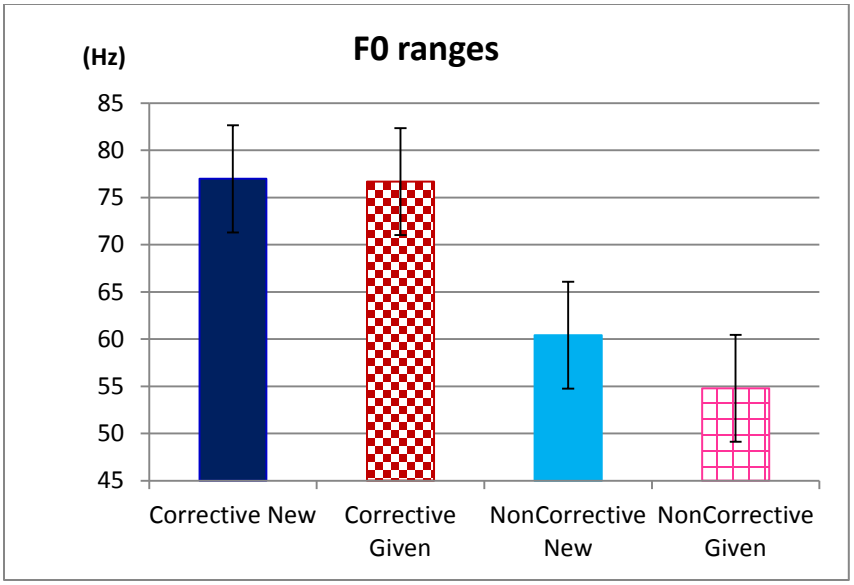


Figure 2: Average F0 ranges of the target word in each condition

Having considered the F0 ranges, let us now turn to the findings for duration. Overall, duration shows a similar pattern (no graph is included here for reasons of space). Mirroring the findings for F0 range, words in the non-corrective conditions are shorter than words in the corrective conditions. New information has longer duration than given information in the non-corrective conditions, but this distinction is not present in the corrective conditions. These observations are again confirmed statistically: ANOVAs show a main effect of correctiveness ($F(1,7)=21.297$, $p<.01$) but no main effect of givenness ($F(1,7)=2.159$, $p=.185$). There is a significant interaction between correctiveness and givenness ($F(1,7)=12.327$, $p<.05$). T-tests reveal that the correctiveness effect on duration occurs in both new information ($t(7)=4.246$, $p<.01$) and given information ($t(7)=4.956$, $p<.01$), while the givenness effect on duration emerges when the words are non-corrective ($t(7)=3.177$, $p<.05$) but not when the words are corrective ($t(7)=.138$, $p=.894$). Thus, these patterns closely parallel the observations for F0 range: while the durations of non-corrective words show an effect of givenness, no effect of givenness is detected on the duration of corrective words.

Finally, turning to the findings for our third parameter, intensity ranges, we find that the patterns for intensity ranges are in fact different from the patterns observed for F0 ranges and duration. On the one hand, the distinction between non-corrective and corrective conditions remains: words in the non-corrective conditions have smaller intensity ranges than words in corrective conditions.

However, new information is not distinguishable from given information by intensity ranges, in either the non-corrective or corrective conditions. ANOVAs show a main effect of correctiveness ($F(1,7)=14.927$, $p<.01$) but no main effect of givenness ($F(1,7)=.172$, $p=.690$). There is no interaction between correctiveness and givenness ($F(1,7)=.386$, $p=.554$). T-tests show that the correctiveness effect on intensity ranges appears in both new information ($t(7)=3.594$, $p<.01$) and given information ($t(7)=3.577$, $p<.01$), while no givenness effect is found in either non-corrective words ($t(7)=.806$, $p=.447$) or corrective words ($t(7)=-.085$, $p=.935$).

4 Discussion

The study presented in this paper investigated the prosodic cues for two types of information structure in Beijing Mandarin: corrective focus and new information. As we saw in the preceding section, corrective focus yields lengthening, F0 range expansion, and intensity range expansion, whereas new information focus only triggers lengthening and F0 range expansion, but does not affect intensity range. In this section, we consider the implications of our findings and how they relate to earlier work on Mandarin Chinese.

Broadly speaking, in tone languages, discourse-level intonation and lexical tones potentially occupy the same acoustic dimensions. Existing work has found that all the three prosodic dimensions – duration, F0, and intensity – provide cues for discourse-level information, and also make contrasts between word meanings in Mandarin (lexical tones). Consistent with prior studies, we found lengthening and F0 range expansion in corrective focus (e.g. Chen 2006, Chen & Gussenhoven 2008) and new information focus (e.g. Jin 1996, Xu 1999). Furthermore, our results show that intensity ranges may also be expanded to emphasize words in an utterance: Intensity excursions become larger when the speakers express a correction, or when new information is conveyed even though no correction is made. In other words, there is no evidence for specialized functions where some prosodic dimensions mark information structure and others mark lexical items, *e.g.*, it is *not* the case that duration is used to mark only lexical distinctions whereas F0 range is used to mark only information-structural cues. All three prosodic dimensions are multi-functional.

Nevertheless, if we take a closer look, we see that there is a difference in how prosodic cues encode information structure and how prosodic cues encode lexical meaning distinctions: one has to do with the *shapes* of F0 and intensity movement and the other with the *ranges* of F0 and intensity movement. Prior work has pointed out that, for different lexical tones, the shapes of F0 contours are clearly different for different tones, whereas with focus types what varies are the ranges of F0 contours vary with focus types (Xu 1997, Chen & Gussenhoven 2008). Whalen & Xu (1992) suggest that intensity and F0 are positively correlated in lexical tones, which enables Mandarin speakers to perceive tones

without the presence of contrastive F0 patterns. As our results show that intensity ranges are used to differentiate information types, there appear to be parallels between F0 and intensity in the specialization of parameters. Lexical information is encoded by the shapes of F0 contours and the shapes of intensity contours, whereas discourse information is marked by the ranges of F0 and, as indicated by our findings, the ranges of intensity. This highlights the fine-grained ability of the language production system to utilize different aspects of acoustic dimensions.

Given that prosodic cues are present for information structure in a tone language, are there different prosodic cues that distinguish one type of discourse information from another in Mandarin, like the correspondence between pitch accents and focus types in English? Our results suggest that corrective focus and new information focus do differ in their acoustic properties. Corrective focus impacts duration, F0 ranges and intensity ranges, while new information focus affects duration and F0 ranges, but not intensity ranges. However, the distinction between new and given information only emerges in non-corrective words. There are a few possible reasons for the absence of new information effect in corrective focus. Cognitively, correction might be far more salient than newness (Kaiser, in press), which blurs the distinction between new and given information when the words convey corrective messages. Physiologically, it might be difficult or inefficient to produce corrective words with different degrees of emphasis, since correction yields extremely strong prosodic cues even when the information is given. Another possible explanation is that speakers might define givenness from their own perspective (rather than from the hearer's perspective, see Section 2.1), which removes the distinction between new and given information in the corrective focus in our experiment. Target sentences in the corrective conditions had been uttered by a speaker, although the listener apparently did not hear them properly the first time. If speakers fail to keep a log of listeners' knowledge state, then the prosodic differences between new and given information in non-corrective conditions might actually reflect whether the words had been uttered more than once, rather than whether the listener had heard the words (Lam & Watson, 2010).[4] These are intriguing questions that deserve to be investigated further in future work.

5 Conclusions

On the basis of the production study reported in this paper, we can make two main conclusions. First, our findings provide further evidence for the multi-functionality of acoustic-prosodic dimensions. Even in a language with lexical tones, which differ in F0, intensity, and duration, all of these dimensions also encode information structure (e.g. Chen et al. 2009). Nevertheless, since the shapes of F0 and the shapes of intensity mark lexical items (Whalen & Xu 1992), these two acoustic dimensions are modulated in another way to mark discourse

importance. Parallel to what has been found in F0, of which the ranges provide cues for focus (e.g. Jin 1996), our results clearly show that the ranges of intensity encode discourse information as well. Second, not only can prosodic cues indicate discourse importance, they also distinguish different types of information structure in Mandarin. Lengthening and F0 range expansion occurs in both corrective focus and new information, whereas intensity range expansion only appears in correctively-focused words regardless of their givenness.

Notes

* We would like to thank the anonymous reviewers and the audience at WECOL (Western Conference on Linguistics) 2011 for their valuable comments and suggestions. Earlier version of this work were presented at AMLaP (Architectures and Mechanisms for Language Processing) 2011, ETAP (Experimental and Theoretical Advances in Prosody) 2, and LSA (Annual Meeting of the Linguistic Society of America) 2012, and we would also like to thank those audiences for their insightful comments. Thanks also go to the USC Language Processing Lab group for feedback during the development of this project.

[1] Due space limitations, we do not discuss the subtypes of corrective focus examined in Chen & Gussenhoven (2008) and Grief (2010) in detail in this paper. Please see their papers for the conditions in their experiments.

[2] For the verb 'put', the variant *fang* is also possible, in addition to *fang-dao* and *fang-zai*. These forms are interchangeable across speakers in this context. Participants were asked to use the one most natural to them; only one participant used the short form *fang*.

[3] Two sentences are missing from the recordings due to technical problems, which amount to less than 1% (0.69%) of the data.

[4] There is another possible explanation as to why the distinction between new and given information is not found in corrective focus. Terken and Hirschberg (1994) show that given information receives prosodic prominence when it appears in a different syntactic role. In our study, a target word in the Given conditions first occurs in the LOCATION role and then in the OBJECT role. Although we did find prosodic differences between given and new information when there is no correction, the degree of givenness might not be large enough for given information to be substantially de-accented in corrective focus. We thank Christine Gunlogson and Gregory Ward for bringing this issue to our attention.

Appendix: Target words

Tone	Word	
HH (high+high)	xiang.yan	'cigarette'
	wu.ya	'crow'
	qing.wa	'frog'
HL (high+low)	qiu.yin	'earthworm'
	ying.wu	'parrot'
	ban.na	'zebra'
LH (low+high)	gui.wu	'ghost house'
	yu.yi	'raincoat'
	hai.ou	'seagull'

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Representational Approach vs. Derivational Approach

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1 Introduction

It has been accepted since the late 1980s (see Saito 1989, 1992, Ueyama 1998 among others) that clause-internal scrambling in Japanese exhibits both *A*- and *A*'-properties. With regard to *B*ound *V*ariable *A*naphora (henceforth *BVA*) and scope dependency, we can state the accepted observations as in (1) and (2).

(1) Having *A-properties*:

a.	BVA:	A-ACC [... B ...]-NOM V	
		Binder Bindee	*possible*
b.	Scope:	A-ACC B-NOM V	
		Wide Narrow	*possible*

(2) Having *A*'*-properties* (i.e., exhibiting so-called *reconstruction effect*):

a.	BVA:	[... B ...]-ACC A-NOM V	
		Bindee Binder	*possible*
b.	Scope:	B-ACC A-NOM V	
		Narrow Wide	*possible*

There are two competing approaches in capturing the dual properties. One is *representational*, and the other is *derivational*. The aim of this paper is to argue for the *representational* approach on the basis of experimental results.

2 Summary of the Past Works

2.1 Representational approach vs. Derivational approach

Under a representational approach (e.g., Mahajan 1990, Miyagawa 1997, Ueyama 1998, 2003), BVA and scope dependency are licensed at one designated level of representation (though the choice of the 'designated level' varies depending on the researchers), and the position of the scrambled object at

this level determines whether the scrambled object has an A-property or an A'-property.

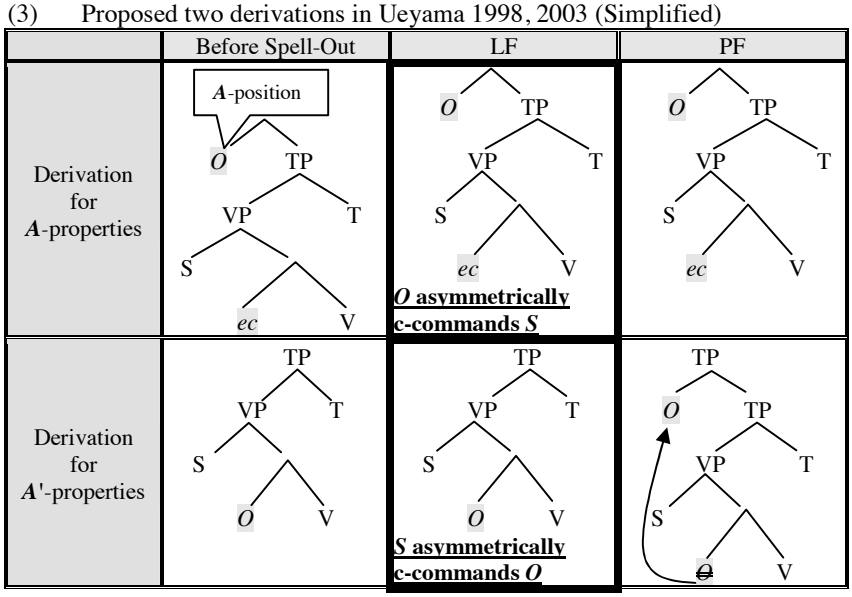
Under a derivational approach (e.g., Webelhuth 1989, Saito 2003), on the other hand, BVA and scope dependency can be licensed at more than one level, and the dual properties in question are due to the timing of the licensing in the course of derivation.

In the rest of this section, we see one of the crucial differences between the two approaches, focusing on Ueyama 1998/2003 and Saito 2003 as the representative of each approach.

2.1.1 Representational approach—Ueyama 1998, 2003

Ueyama maintains that BVA and scope dependency are possible only if *at LF*, the intended binder c-commands the intended bindee in the case of the former and the intended wide-scope taking element c-commands the intended narrow-scope taking element in the case of the latter. She further claims that the scrambling construction can correspond to two distinct types of LF representations (as a result of two distinct types of derivations) as in (3).

(3) Proposed two derivations in Ueyama 1998, 2003 (Simplified)



The scrambled object's A-property is due to the LF representation of the first derivation in (3), in which the scrambled object *O* c-commands the subject *S*.[1] Its A'-property, on the other hand, is due to the second derivation in (3), where *S* c-commands *O* at LF and yet *O* precedes *S* on the surface because of the

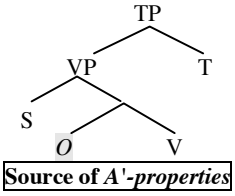
adjunction of *O* at PF. Due to the two types of LF representations, therefore, the observations in (1) and (2) are as expected under Ueyama's analysis.

2.1.2 Derivational approach—Saito 2003

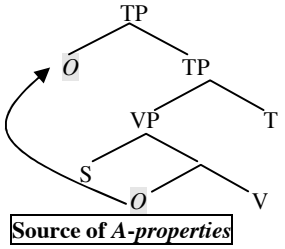
Saito (2003) maintains that a scrambling construction corresponds to a single derivation in (4).

(4) Proposed derivation in Saito 2003 (Simplified)

a. *Before* the movement of *O*bject (*O*)



b. *After* the movement of *O*



Under this analysis, the dual properties in question are due to the timing of the licensing. A'-properties are due to the c-command relation *before* the movement of the object *O* (see (4a)), while A-properties are due to the c-command relation *after* the movement of *O* (see (4b)).[2]

2.1.3 Crucial difference between the representational approach and the derivational approach

As pointed out in Hoji 2006, the difference between Ueyama's representational approach and Saito's derivational one is as follows: under Ueyama's, the 'scrambled' object *cannot* have A and A'-properties *simultaneously* because they are results of two distinct LF representations, while under Saito's, it *can* since one sentence corresponds to one derivation that can be the source of both A- and A'-properties at the same time.[3]

2.2 Experiment conducted and reported in Hoji 2006

Hoji (2006) argues that the difference just noted leads us to the different predictions on the scrambling *ditransitive* construction in (5).

(5) (Hoji 2006: (117) (slightly adapted))

[**o** … β …]$_1$-ACC [$_S$ … **γ** …]-NOM α-DAT ec_1 V-T

Intended readings:

(i) BVA between ***O*** (binder) and ***γ*** (bindee)

(ii) BVA between *α* (binder) and *β* (bindee)

Notice that the scrambled object *O* as a whole is the intended binder of the element γ inside the subject *S*, and at the same time, the scrambled object *O* contains the element β that is intended to be bound by the dative object α. In order for the intended reading in (i) to arise, *O* needs to have an A-property. In order for the one in (ii) to arise, on the other hand, *O* needs to have an A'-property.

Under Ueyama's (1998, 2003) representational approach, it is predicted to be impossible to have (i) and (ii) simultaneously. On the other hand, under Saito's (2003) approach, both are predicted to be possible.

(6) is one of the examples included in Hoji's (2006: section 5) experiment.

(6) (Hoji 2006: (120) (slightly adapted))

[$_O$ so-ko-o hihansita kaikeisi toka dareka toka]$_1$-o
[o that-place-ACC criticized accountant or somebody or]-ACC

[$_S$ so-itu-no koukou-no sensei]-ga
[S that-person-GEN high:school-GEN teacher-NOM

[$_\alpha$ 55% izyoo-no kaisha]-ni ec_1 suisensiteita (tositara...)
[α 55% or:more-GEN company]-DAT recommended (if:then...)

'If *that person's* high school teacher had recommended
[$_O$ some accountant or others who criticized that place]
to [$_\alpha$ (each of) 55 % or more companies], ...'
Intended readings:
(i) BVA between ***O*** (binder) and *so-itu* 'that person' (bindee)
(ii) BVA between *α* (binder) and *so-ko* 'that place' (bindee)

His experiment includes three such examples conforming to (5), and 16 informants participated in it. The average score on the three examples by the 16 informants was *2.25*, quite close to zero ('completely unacceptable', on the *0-100 scale*).[4] This result suggests that the two readings are not possible simultaneously, providing support for Ueyama's representational approach over Saito's derivational approach.[5]

3 New Experiment

3.1 Two distinct predictions

We have conducted another experiment along the lines of Hoji 2006, making recourse to the schema in (7). Notice that one of the readings at stake is scope dependency.

(7) [$_O$ ... β ...]$_1$-ACC ***S***-NOM α-DAT ec_1 V-T

Intended readings:
(i) ***O*** takes wide scope with respect to ***S***.
(ii) BVA between α (binder) and β (bindee)

In (7), the intended scope interaction in (i) is possible only if the 'scrambled' object *O* has an A-property, while the intended BVA in (ii) is possible only if *O* (i.e., the element that contains the intended bindee β) has an A'-property. While Ueyama's representational approach does not allow the two readings at the same time, Saito's derivational approach does. (8) is one instance of (7).

(8) An instance of (7):
[$_{O}$ So-ko-ni syuushoku sitagatteita san-nin-izyoo-no gakusei]$_1$-o
[$_{O}$ That-place-DAT get:a:job wanted:to three-CL-or:more-GEN student]-ACC

[$_{S}$ go-nin-no gizyutusya]-ga [$_{\alpha}$ sukunakutomo yot-tu-no kigyoo]-ni
[$_{S}$ five-CL-GEN technician]-NOM [$_{\alpha}$ at:least four-CL-GEN company]-DAT

ec_1 syookaisita.
introduced

(Lit.) '[$_{O}$ Three or more students who wanted to get a job at [that place]$_1$,
[$_{S}$ five technicians] introduced to [$_{\alpha}$ at least four companies] ec_1.'
Intended readings:
(i) ***O*** takes wide scope with respect to ***S***.
(ii) BVA between α (binder) and *so-ko* 'that place' (bindee)

Ueyama predicts that the intended readings are impossible, while Saito predicts they are possible.

If the scrambled object *O* need not to have A- and A'-properties simultaneously, the two analyses yield the same predictions. There are four such cases. Three of them are instances of the *Accusative Object-Subject-Dative Object-Verb* order, just like (7), but do not involve the two dependency readings at the same time (or none at all). The other case involves the two readings simultaneously, but does not involve a scrambled object.

The first three predictions are about (9), (10) and (11).

(9) [$_{O}$ ... β ...]$_1$-ACC S-NOM α-DAT ec_1 V-T
Intended reading: *Neither* BVA *nor* scope interaction is involved

(10) ***O***$_1$-ACC ***S*** -NOM α-DAT ec_1 V-T
Intended reading:
O takes wide scope with respect to ***S***

(11) $[_O$ ... $\boxed{\beta}$ ...$]_1$-ACC S-NOM $\boxed{\alpha}$-DAT ec_1 V-T
Intended reading:
BVA between $\boxed{\alpha}$ (binder) and $\boxed{\beta}$ (bindee)

Neither of the two readings is involved in (9), and only one of the two readings is asked in (10) and (11). In other words, *O* can either have an A or A'-property in (9), and it is only required to have an A-property in (10) or an A'-property in (11). As we have seen in sections 2.1.1 and 2.1.2, those are all possible under both analyses. We thus expect that the intended readings in (12), (13) and (14), for instance, are all acceptable to varying degrees; see Appendix.

(12) An instance of (9):
$[_O$ Toyota-ni syuushoku sitagatteita san-nin-izyoo-no gakusei$]_1$-o
$[_O$ Toyota-DAT get:a:job wanted:to three-CL-or:more-GEN student]-ACC

a-no gizyutusya-ga GM-ni ec_1 syookaisita.
that-GEN technician-NOM GM-DAT introduced

(Lit.) '$[_O$ Three or more students who wanted to get a job at Toyota$]_1$, that technician introduced to GM ec_1.'
Intended reading: *Neither* BVA nor scope interaction is involved

(13) An instance of (10):
$[_{\boldsymbol{O}}$ Toyota-ni syuushoku sitagatteita san-nin-izyoo-no gakusei$]_1$-o
$[_{\boldsymbol{O}}$ Toyota-DAT get:a:job wanted:to three-CL-or:more-GEN student]-ACC

$[_{\boldsymbol{S}}$ go-nin-no gizyutusya]-ga GM-ni ec_1 syookaisita.
$[_{\boldsymbol{S}}$ five-CL-GEN technician]-NOM GM-DAT introduced

(Lit.) '$[_{\boldsymbol{O}}$ Three or more students who wanted to get a job at Toyota$]_1$, $[_{\boldsymbol{S}}$ five technicians] introduced to GM ec_1.'
Intended reading:
O takes wide scope with respect to ***S***.

(14) An instance of (11):
$[_O$ **So-ko**-ni syuushoku sitagatteita gakusei$]_1$-o a-no gizyutusya-ga
$[_O$ That-place-DAT get:a:job wanted:to student]-ACC that-GEN technician-NOM

$[_{\alpha}$ sukunakutomo yot-tu-no kigyoo]-ni ec_1 syookaisita.
$[_{\alpha}$ at:least four-CL-GEN company]-DAT introduced

(Lit.) '$[_O$ (A/the) student(s) who wanted to get a job at that place], that technician introduced to $[_{\alpha}$ at least four companies] ec_1.'
Intended reading:
BVA between $\boxed{\alpha}$ (binder) and *so-ko* 'that place' (bindee)

The last one of the four predictions that the two analyses share is about (15). Notice that the word order in (15) is *Subject-Dative Object-Accusative Object-Verb* (*S-DO-AO-V*).

(15) *S*-NOM [$_{\alpha}$ ... β ...]-DAT ***O***-ACC V-T
Intended readings:
(i) α takes wide scope with respect to ***O***.
(ii) BVA between *S* (binder) and β (bindee)

There is no scrambled object to begin with, and thus no requirement of having an A-property and an A'-property simultaneously.[6] (16) is one example conforming to the schema in (15).

(16) An instance of (15):
[$_{S}$ Sukunakutomo yot-tu-no kigyoo]-ga
[$_{S}$ At:least four-CL-GEN company]-NOM

[$_{\alpha}$ **so-ko**-ni syuushoku sitagatteita san-nin-izyoo-no gakusei]-ni
[$_{\alpha}$ that-place-DAT get:a:job wanted:to three-CL-or:more-GEN student]-DAT

[$_{o}$ go-nin-no gizyutusya]-o syookaisita.
[$_{o}$ five-CL-GEN technician]-ACC introduced

(Lit.) '[$_{S}$ At least four companies] introduced to [$_{\alpha}$ three or more students who wanted to get a job at that place] [$_{o}$ Five technicians].'

Intended readings:
(i) α takes wide scope with respect to ***O***.
(ii) BVA between *S* (binder) and *so-ko* 'that place' (bindee)

The table in (17) summarizes the predictions.

(17) Summary of the predictions:

	(7)	(9)	(10)	(11)	(15)
Under Ueyama's Analysis	unacceptable	OK	OK	OK	OK
Under Saito's Analysis	OK	OK	OK	OK	OK

3.2 Design and results of the experiment

The experiment was conducted online. There were nine examples that conform to each of the five schemata given in (7), (9), (10), (11) and (15), and 14 informants participated in the experiment. The informants were asked to indicate how acceptable they found each example on a five-point scale by clicking one of the five radio buttons. Each reported judgment was later

converted to a numerical value from '0' ('completely unacceptable') to '100' ('fully acceptable'), and the average score on each schema (the nine examples) by the 14 informants was calculated.

The table in (11) shows the results of the experiment.

(18) Results of the experiment:

Schema	(7)	(9)	(10)	(11)	(15)
Average Score	**0.33**	**98.00**	**76.00**	**69.00**	**91.67**

(*Completely unacceptable: 0; fully acceptable: 100*)

4 Concluding Remarks

The results of the experiment dealing with BVA and scope dependency thus replicate those of Hoji's (2006) experiment (which dealt with two instances of BVA) and strongly favor Ueyama's representational approach over Saito's derivational approach.

The puzzle however remains if so-called a *floating numeral quantifier* (henceforth *FNQ*) is taken into account. An FNQ is the number-classifier sequence that appears without any case-marker or copula attached to it, and it can be separated from the noun phrase whose amount is 'counted' by FNQ (following the common practice in the field, I call such a noun phrase the *host NP* (of FNQ)). For instance, the bold-faced phrase **san-nin** 'three-CL' and the italicized phrase g*akusei* 'student' in (19) are an instance of FNQ and its host NP, respectively.

(19) *Gakusei-ga* (kinoo) **san-nin** kita (koto)
Student-NOM (yesterday) three-CL came (that)

'(that) three students came (yesterday)'

Hasegawa 1993 observes that in the construction where the 'scrambled' object is the host NP of FNQ, FNQ and its host NP, combined, do not exhibit A-properties with respect to scope dependency.[7]

(20) Hasegawa's (1993) observations in terms of scope dependency:

a. The host NP's *not* having *A-properties* (Cf. (1b).):

i. A_1-ACC **FNQ**$_1$ B-NOM V
Wide Narrow *impossible*

ii. A_1-ACC B-NOM **FNQ**$_1$ V
Wide Narrow *impossible*

b. The host NP's having *A'-properties* (Cf. (2b).):

i. $\boxed{B}_1$-ACC **FNQ**$_1$ $\boxed{A}$-NOM V
Narrow Wide *possible*

ii. $\boxed{B}_1$-ACC $\boxed{A}$-NOM **FNQ**$_1$ V
Narrow Wide *possible*

If this is a valid (i.e., repeatable) observation, it should mean that, in the cases where the 'scrambled' object is the intended host NP of FNQ, the scrambling construction necessarily corresponds to a derivation in which the 'scrambled' object has A'-properties under Ueyama's representational approach, and we should seek a principled account of it. A more careful (empirical as well as theoretical) investigation is needed and I plan to address relevant issues in a separate work.

Appendix: The Fundamental Asymmetry in Generative Grammar

The research presented in this paper is a part of the research that investigates the properties of the language faculty by the *hypothetico-deductive* method. Since the inception of generative grammar in the 1950's, it has been claimed that humans have a mental organ (the language faculty), and generative grammatical research has been concerned, ultimately, with a discovery of the properties of the Computational System, assumed to be at the center of the language faculty.[8] We have also adopted the view that informant judgments are a primary source of evidence for or against hypotheses concerning the Computational System. However, these basic assumptions have raised issues as to how hypotheses concerning the properties of the Computational System can be put to (rigorous) test. This testability problem stems from the indirect relationship between the object of inquiry (*competence* in the sense of Chomsky 1965) and what is observable (*performance* in Chomsky 1965—the informant judgment is an instance of that).

One of the key assumptions for solving the testability problem is as given in (21).

(21) The informant accepts a sentence under a specified interpretation *only if*;
he/she successfully comes up with a numeration that produces
(i) a PF representation that is non-distinct from the presented sentence, and
(ii) an LF representation that satisfies the necessary condition(s) for the specified interpretation.

That is to say, if it follows from one's theory that there is no numeration that could produce (i) a PF representation that is non-distinct from sentence α and (ii) an LF representation that satisfies the condition(s) for specified interpretation γ, we predict that α *cannot* be acceptable under γ.. Even if interpretation γ on sentence α is predicted to be *acceptable*, on the other hand, the reading γ on sentence α does not necessarily have to be actually acceptable, for there can be extra-grammatical factors that would prevent the informant from judging it acceptable. From (21) thus follows the fundamental asymmetry in (22).

(22) The Fundamental Asymmetry
   a. What is predicted to be *un*acceptable should be judged completely *un*acceptable.
   b. What is predicted to be acceptable should be judged acceptable to varying degrees.

Therefore, in our experiments, it is crucial that the average score on *what is predicted to be unacceptable* comes out as close to '0' ('completely unacceptable') as possible. If it does not, it means that the prediction is disconfirmed and something must be wrong with the experimental design and/or at least one of the hypotheses that are responsible for the prediction.

Now recall that Saito's analysis in the text discussion *does not* provide us any prediction that something is unacceptable, at least with regard to BVA or scope dependency in the 'short-distance' scrambling construction, while Ueyama's analysis *does*, as summarized in (17).[9] Therefore, even with the results of the experiments in (18), one could still argue that the computational system can produce a grammatical PF-LF pair that corresponds to the sentences of the form in (7), as Saito's theory predicts, but the informants do not accept those sentences for some extra grammatical reason.

As Hoji 2006 concludes, however, I maintain that to the extent that Ueyama's (1998, 2003) analysis gives us a prediction on *what is unacceptable* and that prediction is *not* disconfirmed, it is to be regarded as being superior to Saito 2003, in line with (22), which I take as a key to rigorous testability in language faculty science as an exact science.

Notes

* I would like to thank Hajime Hoji for his feedback and suggestions. I also wish to thank Kiyoko Kataoka, Ayumi Ueyama, and the audience of WECOL 2011 for their comments, and the 14 informants for their judgments. The regular disclaimers apply.

[1] In the first derivation in (3), the thematic object of the verb is not the 'scrambled' object but the *ec*; see Ueyama 1998: section 2.5.2 and 2003: section 5.4 for details.

[2] Assuming that noun phrases have several types of feature, Saito (2003) claims the timing of feature copying and feature deletion is responsible for A- and A'-properties. While the space limitation forces me to omit a detailed and more accurate summary of it, the omission does not affect the argument for the main point of the present paper.

[3] Other proponents of a representational approach may have a different view from Ueyama as they assume that the scrambled object can be either in an A-position or in an A'-position due to the ambiguous (A- and A'-) nature of the movement operation (e.g., Mahajan 1990). Such a difference is inconsequential to our current discussion to the extent that the scrambled object cannot have an A-property and an A'-property simultaneously in such an analysis either.

[4] I have converted Hoji's (2006) "-2-to-+2" scale to the 0-100 scale for the ease of comparison with the other experiment that will be introduced later.

[5] Hoji's experiment also contains instances of two more schemata where only one of the two readings is at stake. Those examples are predicted to be acceptable under both analyses. The average scores for them are *99.5* and *81.25* on the 0-100 scale, showing a sharp contrast with the score of *2.25* for the schema in (5).

[6] It is straightforward that the intended reading in (ii) in (15) is predicted to be possible under both analyses if we maintain the widely-adopted assumption in the field that the subject c-commands the object in the 'unmarked' (*Subject-Object-Verb*) order.

The reading in (i) involves scope interaction between the two objects. There has been a debate regarding the hierarchical relation between the dative object and the accusative object. One view is that the dative object asymmetrically c-commands the accusative object just as the subject asymmetrically c-commands the object in the *Subject-Object-Verb* order (Hoji 1985, Saito 1992, Fukui 1993, Takano 1998, Yatsushiro 2003 among many others). The other view is that there is no such asymmetrical relation between the two objects as there is no such relation between the object and the subject in the *Object-Subject-Verb* order (Miyagawa 1997, Matsuoka 2003, Miyagawa & Tsujioka 2004 among many others).

While the issue is beyond the scope of this paper, I should like to note that, regardless of which view is chosen, Ueyama's analysis and Saito's analysis yield the same prediction that the reading in (i) as well as (ii) is acceptable in (15). That is because in either of the two views, the required c-command relation for (i) must be established in one (of the possible) LF representation(s) under Ueyama's analysis, and likewise, the required relation in question must be licensed at some level of derivation under Saito's analysis.

[7] Though the indices are used to show which NP is the host NP of FNQ in (20), they are not meant to be part of the theoretical devices.

Instances of (20a) are given in (i).

(i) a. (Cf. (20a-i).)
Tihoozititai$_1$-o **yot-tu**$_1$ san-nin-no seizika-ga hihansita.
Local:govenment-ACC four-CL three-CL-NO politician-NOM criticized

(Functionally:) 'Four local governments$_i$, three politicians criticized *ec*$_i$ last year.'

b. (Cf. (20a-ii).)
Tihoozititai$_1$-o san-nin-no seizika-ga **yot-tu**$_1$ hihansita.
Local:govenment-ACC three-CL-NO politician-NOM four-CL criticized

[8] Hoji (2010: footnote 3) warns that a characterization of *generative grammar* in this way might be too narrow, citing works such as Culicover and Jackendoff 2005: chapter 1. I will not address this issue in this paper.

[9] With regard to the 'long-distance' scrambling construction, Saito's (2003) analysis as well as Ueyama's (1998/2003) analysis yield predictions that something is unacceptable. Hoji 2006 contains detailed discussion of how reliably the predictions can be tested.

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Ambiguity in Complex Segments: the Case of Nivacle *k͡l**

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1 Introduction

1.1 The problem

The goal of this paper is to contribute to the phonological understanding of the Nivacle complex segment phoneme that surfaces as [k͡l]. This lateral sound is interesting from both typological and theoretical perspectives in that:
i) To the best of my knowledge, it is neither attested in any of the genetically related languages nor in other indigenous languages of the area.
ii) It has been described as a non-homorganic affricate that involves the simultaneous articulation and release of a velar and a dento-alveolar lateral (Stell 1989:58).
iii) A sonorant lateral /l/ is absent from the Nivacle phonological inventory – the only other lateral in the language is the obstruent /ɬ/. According to the *World Atlas of Linguistic Structure Online* (Dryer and Haspelmath 2011) only 1.4 % of the 567 surveyed languages have no /l/, and have lateral obstruents instead. Nivacle shares this feature with genetically unrelated and areally remote languages like Athna (Athabascan), Kutenai (isolate), Nuu-chah-nulth (Wakashan), Tlingit (Na-Dene), Kiowa (Kiowa Tanoan), Chukchi (Chukotko-Kamchatkan), Kabardian (Northwest Caucasian), and Tigak (Austronesian).

Complex segments are ambiguous as to whether they involve a simultaneous articulation of two major occlusions or a sequence of two phases. In addition, complex segments consisting of two phases are ambiguously interpretable as to which phase determines their phonemic status (François 2010). The phase that is phonemically definitional is not necessarily the one that is phonetically prominent. For instance, *k͡l* can be phonetically described as the combination of a voiceless velar stop, sometimes realized as a uvular, with a voiced velarized alveolar lateral approximant. In this regard, *k͡l* could be interpreted as: (i) a prestopped lateral, (ii) a laterally released stop, or (iii) a (non-canonical) lateral affricate.

I propose that [k͡l] is a complex segment that may be the diachronic result of lateral hardening; [k͡l] was historically an underlying lateral approximant /l/ that

hardened in a prosodically strong position, specifically onset. Further, the fact that [k͡l] delateralizes to [k] in coda position, and not to [l], suggests that in the syncronic underlying representation the dorsal part is a major articulation/phase. It is a lateral stop, specified as [-cont, +lateral) (Clements 1999).

This paper is organized as follows. After presenting some background information on the Nivacle language, §2 draws on Nivacle syllable structure constraints in order to show the patterning of *k͡l* with complex segments, such as ejective stops. Its distribution argues against the hypothesis that *k͡l* is a consonant cluster. Based on the described syllabic and phonotactic patterning of *k͡l*, §3 presents and analyzes the acoustic correlates of this segment. In turn, §4 draws on comparative data from other Matacoan languages and explores the hypothesis of lateral hardening while discussing the articulatory and perceptual factors that might have influenced in the development of Proto-Matacoan **l* into Nivacle *k͡l*. Finally, §5 presents the main conclusions of this paper.

1.2 Background

Nivacle[1] is a Matacoan-Mataguayan language spoken in the Argentinean and Paraguayan Chaco. Very few linguistic works are available for this language. The Nivacle data discussed here come from my own fieldwork[2] with two native speakers and from Stell's (1989) thesis.

Tables 1 and 2 present the Nivacle phonemic inventory. Of special interest for this study are the series of glottalised stops and affricates, and the alternation between velar and uvular obstruents. The glide /w/ has both labial and velar properties and hence is listed under both place of articulation columns.

Table 1. Nivacle consonants

	lab.	dentoalv.	alveopal.	palatal	velar	uvular	laryng.
ejective stops and affricates	p'	t' t͡s'	t͡ʃ'		k' ~	[q']	
Pulmonic stops and affricates	p	t			k ~	[q]	ʔ
		t͡s	t͡ʃ		k͡l ~	[q͡l]	
fricatives medial	f	s ɬ	ʃ		x ~	[χ] ~	[h]
nasals	m	n					
approx.	w~[β]			j	w		

Table 2. Nivacle vowels

	front		central		back	
	plain	glottalised	plain	glottalised	plain	glottalised
close	i	i’			u	u’
close-mid	e	e’			o	o’
open					ɑ	ɑ’
			a	a’		

2 Nivacle Syllable Structure Constraints

Table 3 illustrates the attested syllable types. Briefly, *ONSET is inviolable; the glottal stop functions as the default onset. The maximal syllable in Nivacle is CCV. $_{\sigma}$[CC occurs only in stem-initial position, as in the form in Table 3c.

Table 3. Syllable structure

	Syllable types	Morphemic breakdown		Syllabification
a.	CV	ɬa-n-ku-ʔa 3S-DIR-like-3O	‘S/he likes(sby.)’	ɬan.ku.ʔa
		ʧ’aɬu	‘short’	ʧ’a.ɬu
b.	CVC	k’afok	‘raven’	k’a.fok
		watk͡la	‘property’	wat.k͡la
c.	CCV	ʃnawap	‘spring’	ʃna.wap

This stem-initial property persists under reduplication as seen in (1) and (2).

(1) txux-txux-ʔin
ROOT-RED-IMPFV
‘narrow.’

(2) tʃim-tʃim
‘very irregular road.’

Of particular importance, note that complexity never occurs in coda position. Simplex codas, but not complex codas are attested. A further constraint is that where there is a word-internal coda, the following onset is always of equal or greater sonority.

It has been observed that both PLACE and LARYNGEAL features are often restricted in coda position (Ito 1986, Ito and Mester 1994; Lombardi 1991, 1995). Deletion, neutralization, and simplification are common repair strategies to comply with such constraints. In this regard, whereas all Nivacle consonants may appear in singleton onset, the segments that may appear in coda positions are more restricted. For instance, following Lombardi's (1995) *laryngeal constraint*, in Nivacle a constricted glottis feature is only licensed in a consonant if it immediately precedes a [+voc] segment in the same syllable. The series of ejective obstruents /p' t' k' t͡s' t͡ʃ'/ can neither serve as word-internal nor word-final codas; they neutralize to the their plain counterparts in word-internal coda position. They are not attested word-finally. We can thus see a correspondence between a prosodic constraint and a morphological category constraint:

(3) a. Coda constraint *[c.g]]$_{\sigma}$
b. MSC *[c.g]]$_{MCat}$

Interestingly, *k͡l* can occur in MCat-final position, but not in coda position.

Nivacle affricates and laterals constitute a striking asymmetric patterning with regards to coda permissibility – summarized in Table 4. Whereas both the alveopalatal affricate [t͡ʃ] and the alveolar lateral fricative [ɬ] have freedom of distribution, the alveolar t͡s cannot occur in word-final position. This segment generally simplifies to a voiceless dental stop [t]. When it is preceded by a glottalised vowel, though, it simplifies to the alveolar fricative [s]. Nivacle *k͡l* can neither occur in word medial coda nor in word final coda. An underlying root having /k͡l / in the coda delateralizes to /k/.

Table 4. Affricates, lateral fricative ɬ, and k͡l

Segment	Onset	Word medial coda	Word final coda
t͡ʃ	✓	✓	✓
ɬ	✓	✓	✓
t͡s	✓	✓	**t͡s → s** k͡lɑ̱s *to clean* k͡lɑ̱ts-etʃ *cleanliness* **t͡s → t** snat *to make* snats-etʃ *creation*
k͡l	✓	**k͡l → k** (6-9)	k͡l → **k** (4-5)

(4) a. xa-pe**k͡ɬ**-eɬ
1SBJ-return-1PL
'We return.'

b. xa-pe**k**
1SBJ-return
'I return.'

(5) a. ɬaxpe**k͡ɬ**-is
shadow-PL
'shadows.'

b. ɬaxpe**k**
shadow
'shadow.'

(6) a. sɑkɑ**k͡ɬ**it 'soul'

b. sɑkɑ**k**.t-is 'souls'

(7) a. tu**k͡ɬ**-ijan 'to close'

b. tu**k**-ʃi 'closed'

(8) a. βa**k͡ɬ**etʃ 'to walk'

b. βa**k**tʃ-emat 'to limb'

(9) a. ta**k͡ɬ**ɑ̱k 'weed'

b. ta**k**xɑj 'weeds'

So far, we have observed that Nivacle laterals display an asymmetric pattern of distribution, yet they contrast in onset position, as the minimal pair in (10) shows.

(10) a. xa-**k͡ɬ**ɑn
1SBJ-kill
'I kill'

b. xa-**ɬ**ɑn
1SBJ-light.up
'I light up (a fire)

In addition, *k͡ɬ* contrasts with *k* in onset position:

(11) a. ∅-tkam**k͡ɬ**ɑj
'S/he makes (sby.) suffer.'

b. ∅-tkam**k**ɑj
'S/he makes flour.'

As a consequence, it cannot be advanced that *k͡ɬ* is in allophonic distribution with either /**ɬ**/ or /k/.

In turn, there are two arguments that run against the hypothesis that Nivacle *k͡ɬ* is a consonant cluster. The first type of argument comes from the phonotactics of Nivacle; at most two consonants can occur in onset position, as the allophonic alternation between /ɬ-/ and /ɬa-/ – '3POSS.SG' – show. Whereas /ɬ-/ occurs before vowel and singleton consonant-initial roots (12), /ɬa-/ is attached to roots starting with CC (13).

(12) a. ɬ-ɑxke
3POSS.SG-vase
'His/her vase.'

b. ɬ-k͡lĩʃ
3POSS.SG-language
'His/her language'

(13) ɬa-f.xux
3POSS.SG- toe
'His/her toe.'

If it were assumed that *k͡l* constitutes a consonant cluster then (14) and (15) would violate that constraint.

(14) ∅-tk͡laxaj
3SBJ-lean
'S/he leans.'

(15) sk͡lɑkxaj
'wildcat'

The second argument is native speakers' judgments. During fieldwork and workshops on the Nivacle language, my consultants indicated the importance of differentiating Nivacle *k͡l* from Spanish consonant clusters [kl] or [gl], which also occur in onset position. Invoking Clements' (1999) *inseparability* property of affricates, Nivacle native speakers also claimed that the two components could not be separated by any vowel.

To sum up, *k͡l* patterns with complex segments such as ejective stops in that they cannot occur in coda position. Similarly to the affricate *t͡s*, it simplifies in word final coda position, but it consistently simplifies to *k*. Lastly, it has been argued that *k͡l* is not a consonant cluster.

3 Acoustic properties

Acoustic analysis shows that *k͡l* consists of two clearly distinct phases. The consonant's onset phase corresponds to a voiceless stop, generally realized as velar [k] though variantly realized as uvular. This occlusive onset is released into an alveolar approximant. Importantly, the lateral release is voiced and it is not fricated. These characteristics are displayed in Figure 1.

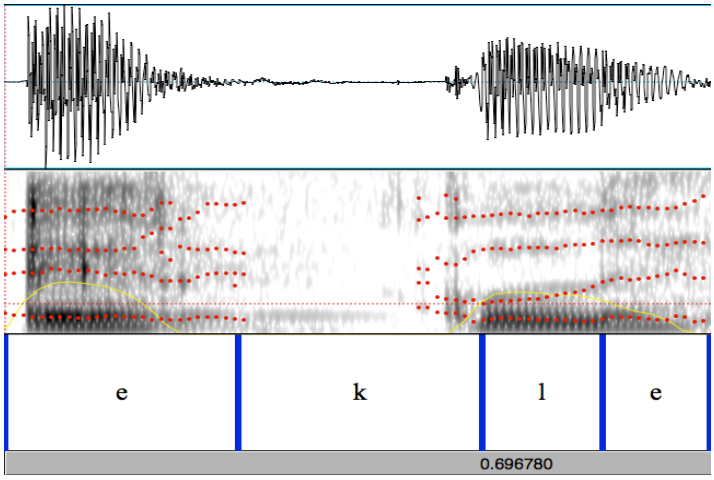

Figure 1. Spectrogram of [ek͡le]: ‘parrot’.

Even though a sonorant lateral /l/ is absent from the Nivacle phonological inventory, this sound can be found in two loanwords. One of the loanwords is [ele] ‘German Catholic missionary’, which comes from Maká, another Matacoan language. The spectrogram of this word is presented in Figure 2.

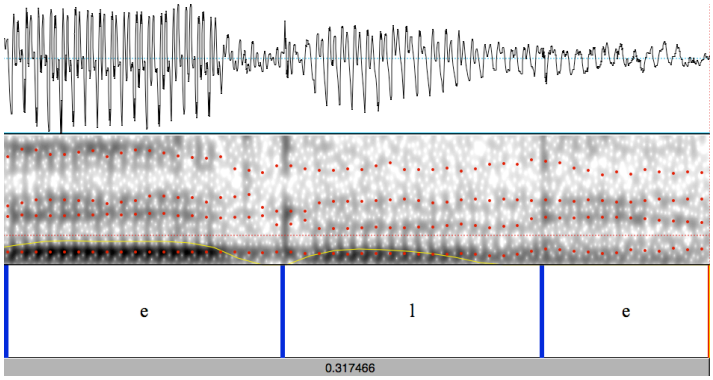

Figure 2. Spectrogram of [ele]: ‘German Catholic missionary’.

Both [ek͡le] and [ele] were recorded from the same female Nivacle consultant.

In order to compare the formant transitions of the lateral release of *k͡l* (in [ek͡le]) and the lateral approximant (in [ele]), the mean average of F1, F2, and F3 at 7 timepoints across five tokens was calculated using a Praat script. Figure 3 and 4 show the results.

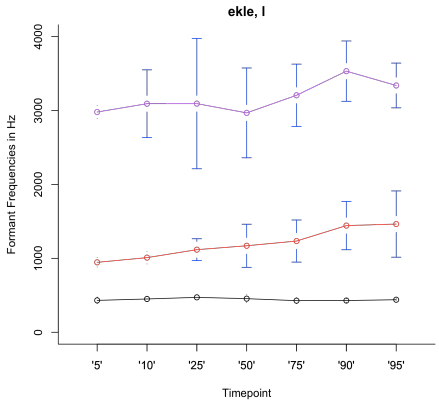

Figure 3. Mean average of F1, F2, and F3 at 7 timepoints of [l] in [ek͡le] across 5 tokens.

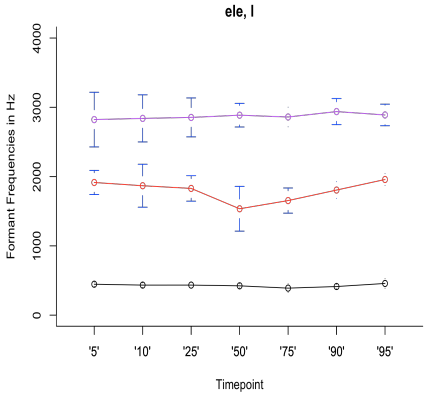

Figure 4. Mean average of F1, F2, and F3 at 7 timepoints of [l] in [ele] across 5 tokens.

The most striking difference between the two figures is that F2 is clearly lower in the lateral realization of *ekl͡e*, thus indicating a dorsal tongue gesture and a narrower constriction at the back.

As mentioned before, the lateral component is lost in coda position. Figures 5 and 6 show the alternation between *kl͡* and *k*, respectively. In figure 6, it can be seen that no trace of the lateral realization is present.

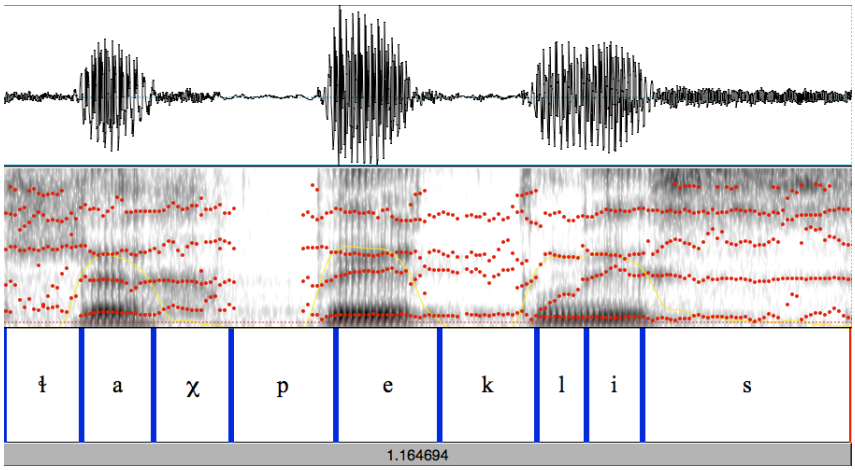

Figure 5. Spectrogram of [łaχpekl͡is] ‘shadows’.

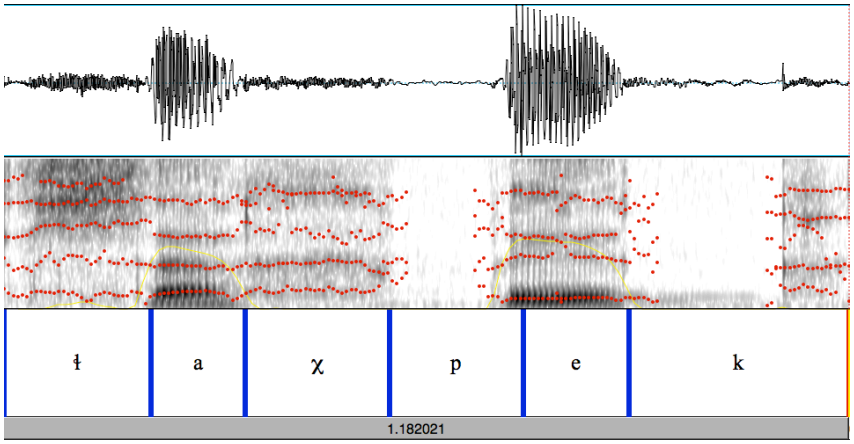

Figure 5. Spectrogram of [łaχpek] ‘shadow’.

4 Lateral hardening

The concept of strengthening/hardening has been object of extensive debate in the literature. Yet, it has been commonly assumed that certain types of segments are strong by their very own nature and/or that certain phonological environments are strong. The effect of position in the word was discussed by Escure (1977). She claims that there is a hierarchy of weak positions, from top (weakest) to bottom (strongest).

(16) V_C##
V_##
V_V
##_V

As pointed out by Lavoie (2001), Escure did not consider syllable structure or stress as conditioning factors. It is certainly the case that V_V́ is a stronger position for hardening than V́_V is.

In this paper, I adopt Keating's (2006) definition of hardening in terms of consonantal strength. Consonants which occur at the beginning of some prosodic domain (i.e. syllable, foot, word, intonational phrase.) are 'stronger' than consonants that occur finally in the same domain. 'Stronger' is defined by Keating in terms of amount of contact between active and passive articulators, and duration of the contact.

At this point, it is necessary to consider cross-linguistic comparison between Nivacle lateral [k͡l], and the correspondent segments within the Matacoan related languages (Chorote, Maká, Wichí).

Table 5. Comparative evidence: the Matacoan family

Proto-Matacoan	**Chorote**	**Maká**	**Wichí**	**Nivacle**	**Gloss**
*$_{\sigma}$[l	e**l**eʔ/ale	ehe**l**ʔ	e**l**eʔ	e**k͡l**e	*parrot*
			lup	**k͡l**ɒp	*winter*
	-**l**an	-**l**an	-**l**on	-**k͡l**ɑn	*to kill*
	we**l**a	xuwe**l**	iwe**l**a~ we**'l**a	xiβeʔ**k͡l**a	*moon*
	siwa**l**ak	siwa**l**aχ		siβɑ**k͡l**ɑk	*spider*
*l]$_{\sigma}$	saka**l**	sinqa**l**		sɑqɑ**k͡l**it	*soul*
		afti**l** afti**l**ets		afte**k** afte**k͡l**es	*orphan* *orphans*
	a-pi**l**met apilamet	het-pi**l**	tapiɬ	xat-pe**k** xat-pe**k͡l**eɬ	*I return* *We return*

The comparative data suggest that Nivacle [k͡l] corresponds to /l/ in other Matacoan languages. Table 5 shows the Proto-Matacoan lateral approximant in both onset and coda position. While the lateral approximant is maintained in Chorote, Maká, and Wichí onset and coda positions, it hardens to *k͡l* in Nivacle onset position and delateralizes to *k* in coda position. It is worth noting that *k͡l* occurs before both high and low vowels.

One of the possible perceptual explanations for the development of *k͡l* is the phenomenon of prestopping of laterals in Montana Salish (Flemming et al 2008) and Icelandic (Hansson 1996). Flemming, Ladefoged and Thomason (2008) observe that in most environments, the voiced and voiceless laterals are usually realized with a brief stop closure that produces a burst-like transient at the beginning of the lateral. These spectral transients at the onset of laterals can be misinterpreted as *real stop bursts.* One could posit, then, that k͡l developed from the reinterpretation of a prestopped lateral. However, a further question is: why did the Proto-Matacoan **l* developed into k͡l rather than t͡l?

It has been observed that formant transition cues are more limited before lateral [l], and stop place contrasts tend to be more limited in this context. For instance, many languages allow initial [pl, kl] / [bl, gl] clusters, but exclude [tl, dl] (Kawasaki 1982). Further, Flemming (2007) finds that the lateral release has a substantial effect on the acoustics of coronal stops, shifting them acoustically closer to velars. Consider, for instance, the case of English speakers pronouncing [klɪ] instead of [tlɪ]] for Tlingit.

5 Conclusions

In this paper, I argue for the analysis of Nivacle k͡l as a complex segment, that developed from Proto-Mataguayan *l. It is a non-canonical affricate in that the sequence of two phases agrees neither in place nor in sonority. Acoustic analysis shows that the occlusive dorsal onset is released into an alveolar approximant. Importantly, the lateral release is voiced and it is not fricated.

The development of k͡l can be rooted in both prosodic (strengthening in prominent positions; i.e onsets) and speech perception factors (the reinterpretation of stops bursts as emergent stops). As a consequence, the two Nivacle laterals [ɬ] and [k͡ɬ] maximize their perceptual saliency and distinction.

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[1] The estimated number of speakers is 12,200: 12,000 in Paraguay; 200 in Argentina, (Fabre 2005).

[2] Fieldwork was conducted in *Uje Lhavos*, Filadelfia (Paraguay), in July 2009, July-August 2010, and July 2011.

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Nominal Semantics and Number in Turkish

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1 Introduction

This paper is concerned with the semantics of root nouns, bare NPs and number marking in Turkish. The status of root nouns in terms of their inherent properties in the language is somewhat controversial. There are a number of analysis in which root nouns have been considered root nouns in Turkish to be *transnumeral* in the sense that they are semantically neither singular nor plural (cf. Lewis 1967, Wiese 1997 Schroeder 1999 and Corbett 2000). On the other hand, Rijkhoff (2002a) argues that nouns are *flexible* in that there is no clear lexical distinction between nouns and adjectives in the language. Others have used the terms such as *general number* (cf. Rullmann and You 2006) and *number-neutral* (cf. Wilhelm 2006, 2008; Görgülü 2010ab, 2011 and Bale et. al. 2011) in order to capture the fact that nouns are not specified for number in Turkish. However, none of these terms seem to actually account for the facts in the language, nor can they be used to make a clear distinction between nouns in Turkish and nouns that are often considered to be transnumeral in different languages. For instance, root nouns in both Turkish and Chinese are often classified as transnumeral even though there are significant differences between nouns in the two languages in terms of their morpho-syntactic and semantic properties. On the other hand, nouns with no number marking at all in languages like Dëne Sułiné are regarded as number-neutral but nouns do get some kind of number marking in Turkish. The question that arises at this point is whether it is possible to come up with a better classification of noun types in the language given that the term transnumerality and number-neutrality covers different types of nouns across languages. In this paper I argue that it is necessary to propose a new account in which the true nature of root nouns and bare NPs is investigated. This will shed light on how nouns in the language should be typologically re-classified. Based on existing and new data, I will propose a morpho-syntactically driven semantic account in line with Rijkhoff (2002ab) and argue that nouns in Turkish exhibit the properties of nouns which are generally referred to as *set nouns* in Rijkhoff's cross-linguistic typology of noun subcategories.[1]

The structure of this paper is as follows: in section 2 I discuss basic morpho-syntactic and denotational properties of root nouns and bare NPs in Turkish. Section 3 will introduce Rijkhoff's typological classification of nouns subcategories and provide the framework adopted in this paper. In section 4 I

will propose my new account and argue that the behavior of nouns in the language indicates that they should be classified as set nouns. In this section I will also discuss the specification of number in the language and show how it is different from number marking in languages like English and Chinese. Section 5 briefly concludes the paper.

2 The Morpho-syntax of Nouns

2.1 Root nouns, bare NPs and number-neutrality

In this section I will discuss the semantic and morpho-syntactic properties of nouns and bare NPs in the language. The behavior of nouns in Turkish significantly differs from their counterparts in languages like English and Dutch on the one hand, and Chinese and Thai on the other. More specifically, they are called number-neutral or transnumeral as they are not lexically specified for number (cf. Schroeder 1999, Corbett 2000, Rijkhoff 2002a and Acquaviva 2005). Consider the examples below.

(1) adam
man
"man/men"

(2) kitap
book
"book/books"

The nouns in (1) and (2) do not themselves establish any number and the specification of number is made by other means in the language. This property of nouns in Turkish significantly contrasts with English type nouns since root nouns in English are known as lexically specified for a number value, namely singular. Note also that this property of nouns differs from the behavior of nouns in Chinese as nouns are considered to denote concepts or kinds in Chinese.

Another distinctive property that nouns display in Turkish is that they are not marked with the plural marker when they are modified by numerals inside phrases. This is also considered to be evidence that nouns are number-neutral in the language. This is illustrated below.

(3) bir adam
one man
"one/a man"

(4) iki / beş / on adam
two/five/ten man
"two/five/ten men"

The noun *adam* 'man' in (4) does not take the plural marker when it co-occurs with a numeral greater than *one*. In fact, the presence of the plural marker in this structure would lead to ungrammaticality. This property of nouns is also different from the property of nouns in languages like English as the presence of the plural marker is obligatory when nouns are modified by numerals greater than *one*. Furthermore, nouns do not need to appear with so-called 'classifiers' in Turkish as opposed to nouns in languages like Chinese. Classifiers in Chinese type languages are obligatory in those cases in which nouns are modified any cardinal numeral.

When the behavior of bare NPs in some constructions is considered, it is also observed that they keep their number-neutral properties, as shown in (5) and (6).

(5) Aşağı-da adam var.
down-LOC man exist
"There is a man / are men downstairs."

(6) Sepet-te kedi var.
basket-LOC cat exist
"There is a cat / are cats in the basket"

As it is clear from the examples above, when bare NPs appear in existential structures they are not specified for number even though they are interpreted existentially. For instance, the sentence in (5) would be true in those cases in which there is only one man or more than one man. In these cases the context would help make it clear the number of entities being denoted (i.e. one or more than one). It should be noted at this point that the existence of bare NPs in (5) and (6) sharply contrasts with those cases where nouns such as *man* and *cat* that are generally referred to as singular count nouns do require the presence of the indefinite determiner in existential constructions in languages like English. The absence of the indefinite determiner would either lead to ungrammaticality or trigger a semantic shift from a count reading to a mass reading. Similarly, the interpretation of bare NPs in existential structures in Turkish is different from that of bare NPs in similar constructions Chinese since bare NPs refer to concepts or kinds in existential structures in Chinese, as noted by Huang (1987).[2]

Furthermore, bare NPs in Turkish may act as a predicate of plural NPs functioning as the subject of a sentence. This is also considered to be another piece of evidence indicating that bare NPs are indeterminate in terms of number in the language (cf. Kan 2010 and Bale et. al. in press). Consider (7) and (8) below.

(7) Aydın rehber.
Aydın guide
"Aydın is a guide."

(8) Hüseyin-le Aydın rehber / rehber-ler.
Hüseyin-COM Aydın guide / guide-PL
"Hüseyin and Aydın are guides."

The structure in (7) shows that it is possible for a bare NP to be a predicate of a singular subject NP. Interestingly, the same NP may also be a predicate for a plural subject NP, as illustrated by (8). The structure in (8) also indicates that when the subject NP is plural, then the predicative NP may be plural as well.

The data presented so far show that the morpho-syntactic and semantic properties of root nouns and bare NPs in Turkish. More specifically, root nouns and bare NPs in certain constructions:

(i). are unspecified/indeterminate with respect to number.
(ii). are not marked with the plural marker when they are modified by numerals.
(iii). do not require the presence of classifiers when they co-occur with numerals.

The properties outlined above show that with respect to their morpho-syntactic and semantic properties root nouns and bare NPs in Turkish are significantly different from their counterparts in languages such as English, Dutch on the one hand, and Chinese and Thai on the other. This is interesting because nouns in languages like Turkish and Chinese are usually classified as transnumeral or number-neutral even though there are significant distinctions between the two types of nouns, as shown above. This calls for a re-classification of the nouns in the two languages. On the other hand, it is also important to account for the distinctions between nouns in Turkish and English. To this end, I will introduce a classification of noun subcategories that was first suggested by Rijkhoff's (2002ab) and propose a new account that better explains the properties of nouns in the language, also providing a cross-linguistic characterization.

3 A Typology of Nominal Subtypes

In his seminal work, Rijkhoff (2002a) investigates more than fifty languages and offers a typology of six noun subcategories based on their morpho-syntactic characteristics. Rijkhoff notes that an in-depth analysis of nouns within and across languages indicates that first order nouns (i.e. nouns used for discrete objects in the real world) do not seem to all share the same semantic and morpho-syntactic properties which have to do with quantification. His point is that languages differ in terms of (i) whether or not first order nouns appear with

the plural marker when modified by a numeral (where n > 1), and (ii) if the first order nouns directly co-occur with a numeral or whether the numeral needs to appear with a classifier.[3] A cross-linguistic investigation with respect to these two properties leads to the classification of six nominal subtypes including (i) singular object nouns, (ii) set nouns, (iii) sort nouns, (iv) mass nouns, (v) collective nouns, and (vi) general nouns. In the next section I will introduce the first three of these noun subtypes which are most relevant to the discussion here, and elaborate on their morpho-syntactic and semantic characteristics. I will then address the question of whether nouns in Turkish fit into this typological classification.

3.1 Nominal subtypes

3.1.1 Singular object nouns

Singular object nouns appear to denote singular entities only. This type of nouns is obligatorily marked with the plural marker when they are modified by a numeral greater than *one*. Moreover, they do not need the presence of classifiers when modified by numerals. The most representative example of this type of nouns is one found in many languages including English, Dutch and West Greenlandic. The examples are taken from Rijkhoff (2002a:35-37).

(9) twee boek-en (Dutch)
two book-PL
"two books"

(10) puisi-t qulit (West Greenlandic)
seal-PL ten
"ten seals"

The examples in (9) and (10) clearly show that when a singular object noun is modified by a numeral the plural marker is obligatory. This is true for all singular object nouns whenever reference is made to more than one entity. Moreover when the NP denotes plural entities, the presence of the plural marker is also needed regardless of whether there is a numeral or not, as in *books* and *seals* in English. It should also be noted that this type of nouns always takes singular agreement when reference is made to singular entities, as in *"I read a book/*book"*.

Rijkhoff notes that the morpho-syntactic and semantic properties of singular object nouns suggest that they must be different from nouns in other languages at some level. He argues that the main distinction between different nouns appears to be semantic and proposes a lexical semantic account in order to explicate the properties of different types of nouns cross-linguistically. More specifically, nouns are specified for lexical features [±Shape, ±Homogeneity].

The different combinations of these features output different noun types. Rijkhoff argues that singular object nouns are lexically specified for the features [+Shape, -Homogeneity]. The feature [+Shape] indicates that the property denoted by the noun has a well-defined outline. Roughly, the feature [-Homogeneity] indicates that the property being denoted is strictly singular in number.

3.1.2 Set nouns

Set nouns are different from singular object nouns in that they are number-neutral. Set nouns may refer to one entity or more than one entity in question. When they are modified by a numeral they are not marked with the plural marker. However, just like singular object nouns, they do not need the presence of classifiers when they co-occur with numerals. Consider (11) and (12), taken from Rijkhoff (2002a:40-41).

(11) két lány (Hungarian)
two girl
"two girls"

(12) gala lamaani (Oromo)
camel two
"two camels"

The examples in (11) and (12) clearly show how set nouns look like when modified by numerals. However, these languages have a plural marker and its presence is obligatory when reference is strictly made to pluralities. For instance, while the reference of the noun *saree* 'dog/dogs' is number-neutral, the reference of the noun *sareellee* 'dogs' needs to be plural in Oromo. This type of nouns is referred to as set nouns as a set may contain any number of entities including one (i.e. a singleton set) or more than one (i.e. a collective set). The behavior of set nouns prompted Rijkhoff to argue that they are lexically specified for the features [+Shape, ±Homogeneity]. Again, the feature [+Shape] shows that the property denoted by the noun has a definite outline. On the other hand, the feature [±Homogeneity] indicates that the property denoted by the noun is not specified for number.

3.1.3 Sort nouns

Sort nouns are also known as transnumeral or number-neutral however, there are important differences between this type of nouns and nouns of other types that have often been considered to be quite similar in nature. First of all, they do not

directly combine with numerals. They need the presence of a specific class of words known as *classifiers*. This is illustrated below.

(13) pèt hâa tua (Thai)
duck five CLF:body
"five ducks"

(14) thian sìi lêm
candle two CLF:long, pointed object
"two candles"

As shown in (13) and (14), the numeral needs the presence of a classifier and the noun itself is not marked for number. The absence of classifiers in these cases would yield ungrammaticality. The reason why this is the case is that sort nouns are often considered to be denoting concepts or kinds. Therefore, they cannot be quantified directly. In other words, the lexical specification of this type of nouns is not set for the feature [Shape], and a classifier that provides the notion of individuation is necessary for quantification. That is why they are lexically specified for the features [-Shape, -Homogeneity] in Rijkhoff's classification of nominal subtypes.

Other types of nouns include collective nouns, mass nouns and general nouns. Collective nouns are those such as *family* and *bunch* in English where reference is made to pluralities excluding singularities. Some example of mass nouns would be *water* and *butter* in English. General nouns, on the other hand, are those that are neutral with respect to unit or shape, and therefore they do not distinguish between sortal classifiers that are used with nouns that would be regarded as singular object nouns in languages like English and mensural classifiers which are often used with mass nouns, indicating size, volume or weight.

It appears that the morpho-syntactic and semantic properties of nouns in Turkish are closely similar to nouns classified as set nouns. Basically, they combine with numerals without the presence of the plural marker and they do not need classifiers when modified by numerals. Moreover, they are semantically number-neutral. This kind of classification provides us with the explanatory power that would otherwise unavailable, since classifying nouns as transnumeral in Turkish does not seem to be unproblematic nor does it help capture the important differences between nouns that are generally considered to be transnumeral. However, it should be noted at this point that Rijkhoff (2002a:42-43) calls nouns in Turkishas 'flexible' as he maintains that there is not a clear lexical distinction between nouns and adjectives in the language. His arguments stem form the fact that nouns and adjectives can be used interchangeably. However, there are important differences between the two

lexical classes that need to be addressed here. In the next section, I will investigate this issue.

3.2 The noun/adjective distinction in Turkish

It is a well-known fact that adjectives may also function as nouns in Turkish. The fact that quite a number of adjectives can bear nominal inflectional morphology and many nouns can take comparative and superlative forms like adjectives have led to the conclusion that nouns and adjectives are indistinguishable in the language. (cf. Braun and Haig 2000). However, it is not always the case that nouns and adjectives are interchangeable as there are also significant distinctions that have been noted between them as lexical categories. For instance, Göksel and Haznedar (2007:12-13) and Uygun (2007) argue that there are certain operational means for unambiguously distinguishing nouns from adjectives in the language. The main differences between the two categories can be summarized as follows:

(i). Predicative adjectives and some complex adjectives do not denote entities.
(ii). Adjectives used as nouns are lexicalized in meaning. For instance, when an adjective like 'güzel' *beautiful* is used as a noun, it has a lexicalized and animate reference: 'beautiful woman or man', and not 'beautiful house or book'. Thus such terms cannot refer to just any object which has the property described by the adjective.
(iii). Even though adjectives carry nominal inflectional morphemes, they are not inflected with nominal inflection. As there is no overt pronominal form denoting nouns in Turkish (e.g. *one* in English) and as NPs can be headless, the inflectional markers appearing morphologically on a noun can appear on an adjective where there is no noun head in the construction. Thus adjectives appear to be inflected for number, person and case, making them look like nouns.
(iv). There are some suffixes which mark a word either as an adjective or a noun. This also allows one to categorize whether a particular constituent is a noun or an adjective.

The arguments above show that nouns and adjectives are not always indistinguishable and there is sufficient evidence that point out that they should be considered to be distinct lexical categories. In the next section I will investigate how nominal number marking is done in the language. This turns out to be significant given that nouns display distinctions from their counterparts in other languages.

4 Number Marking in Turkish

4.1 The specification of number

Since nouns are not specified for number in the language, the question that arises is how it is achieved. Basically, nouns strictly denote singular entities when they co-occur with the numeral 'bir' *one* which also functions as the indefinite determiner in the language. This is illustrated (15) and (16).

(15) bir adam
one man
"one/a man"

(16) bir kalem
one pencil
"one/a pencil"

The NPs ' bir adam' *a man* in (15) and 'bir kalem' *a pencil* in (16) are not interpreted as number-neutral in the sense that they are not indeterminate for number any longer. They specifically denote singular entities. Rijkhoff (2002ab) makes a distinction between *number marking* that applies to singular object nouns and collective nouns in languages, and *nominal aspect marking* that is associated with set nouns. The difference between the two types of marking is that while number marking involves a strict singular/plural distinction and plural marking is obligatory with number marking, nominal aspect markers behaves differently in that they in a sense restrict the reference to singulars (i.e. singleton set) and plurals (i.e. collective set). Therefore, the singularization process in (15) and (16) is in fact specifying that the noun designates a property of a singleton set and not strictly number marking.[5] This is basically the difference between nouns that are specified for the feature [-Homogeneity] and nouns that have the feature [±Homogeneity].

On the other hand, nouns denote plural entities when they are marked with the plural marker '-lAr'. This is shown below.

(17) adam-lar
man-PL
"men"

(18) kalem-ler
pencil-PL
"pencils"

The examples above show that plural marked nouns inside phrases denote sets with plural entities. In other words, the plural marker -lAr restricts the reference

to a collective set which contains pluralities only. In the next section I will discuss further evidence for the argument that nouns should be classified as set nouns in Turkish.

4.2 The number (dis)agreement in the verbal complex

Another piece of evidence indicating that nouns in Turkish are set nouns is due to a phenomenon that is often referred to as 'number discord'. Rijkhoff (2002ab) points out that another distinction between singular count nouns in languages like English and set nouns in languages like Oromo is that the systematic number discord between an NP and a verb is only observed with set nouns. The number discord can be accounted for if we assume that the verb may agree with the set in which case we have singular verb agreement or with the individuals in the set in which case we have plural verb agreement. For instance, with set nouns in Oromo, Georgian and Lango, verb agreement is always with the single set. Consider (19).

(19) gala lamaani sooloo d'ak'-e (Oromo)
camel two market go-3SG.MPAST
"Two camels went to the market"

In (19) the verb has the singular agreement marker agreeing with the set, hence singular verb agreement. In other words, the pronominal element in the verbal complex agrees with the set and not with individuals. A similar phenomenon is also observed in Turkish. A verb may have singular or plural agreement when the subject NP is plural and the referent is a human or humanized entity.[4] This is illustrated below.

(20) Üç adam bura-ya gel-di-ø.
three man here-DAT come-PAST
"Three men came here."

(21) Üç adam buraya gel-di-ler.
three man here-DAT come-PAST-PL
"Three men came here."

The only difference between the two structures above is the fact that whereas the verb in (20) lacks the plural agreement, the one in (21) is marked with the pronominal marker, agreeing with the plural subject NP. The consensus in the traditional analyses is that in those cases in which there is no plural agreement marker on the verb, the plural subject is interpreted as a *collective*. In contrast to that in those cases in which the verb carries the plural agreement marker, the quantity referred to by the plural subject should be interpreted as a group of

distinct human entities (cf. Dizdaroğlu 1976:68, Sezer 1978 and Gencan 1979:93f). This line of reasoning appears to be compatible with the account proposed here in that in the former there is no plural agreement marker on the verb even though reference is made to pluralities in the subject NP. If we argue that in those instances in which the verb agrees with the set and not with the individuals we can account for the *collective* reading that the subject NP is assigned. On the other hand, in the latter the plural agreement marker on the verb invokes a reading in which the reference is made to a *distinct* group of human entities. This in fact makes sense if we argue that the verb agrees with distinct individuals in the set. Therefore, the number (dis)agreement on the verb supports the argument that we are dealing with set nouns in Turkish.

5 Conclusion

In this paper I have made a three-way distinction between nouns in Turkish, English and Chinese based on their morpho-syntactic and semantic properties. I have argued that the denotational and grammatical properties of root nouns in Turkish indicate that they should be classified as set nouns and not as transnumeral, a term that seems to be used to categorize different types of nouns. The inherent nature of nouns also accounts for the optional plural agreement on the verb, which has consequences for the interpretation of subject NPs. For future work, it appears to be necessary to investigate the behavior of bare NPs in the object position inside verbal domains.

Notes

[1] Due to space reasons I will only investigate nouns that denote entities with a well-defined structure. Therefore, I will omit nouns that refer to substances and mass entities.
[2] In his work Huang discusses four different kinds of existential sentences. Here I consider *You*-sentences such as *You gui* 'There are ghosts (here)', as they are the closest counterparts to *there be*-sentences in English and *var* sentences in Turkish.
[3] See also Wiese (1997) and Acquaviva (2005) for a morpho-syntactically driven semantic analysis of nouns in various languages.
[4] There is a vast body of literature on the (non)-agreement of verb with its subject NP argument. See Schroeder (1999:115-129) and references therein.
[5] See Rijkhoff (2002a:319-321) who independently suggests that 'bir' *one* could be a singulative marker even though he maintains that nouns in Turkish are flexible and not set nouns.

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Personal Pronouns in Blackfoot and Plains Cree

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1. Introduction: the syntax of pronouns

As part of a comparative syntax project on Algonquian languages, we here present an analysis of independent pronouns (henceforth pronouns) in Blackfoot and Plains Cree. The two languages have nearly identical pronoun paradigms, but closer examination reveals differences in internal and external syntax. We analyze these differences using the syntactic analysis of pronouns of Déchaine & Wiltschko (2002a), who argue that pronouns have (at least) three syntactic layers, namely D, Phi and N, 0a. We argue that while Blackfoot pronouns are pro-PhiPs 0b, Plains Cree pronouns are pro-DPs 0c. After discussing Blackfoot pro-PhiPs (§2), we turn our attention to Plains Cree pro-DPs (§3), and then conclude (§4).

(1) a. $[\,[_{D}\ \ldots\,]\quad [_{PHI}\ \ldots\,]\quad [_{N}\ \ldots\,]\,]$

b. $[\,[_{D}\ \ldots\,]\quad [_{PHI}\ \textbf{PROFORM}\,]\quad [_{N}\ \ldots\,]\,]$ Blackfoot

c. $[\,[_{D}\ \textbf{PROFORM}\,]\quad [_{PHI}\ \ldots\,]\quad [_{N}\ \ldots\,]\,]$ Plains Cree

2. Blackfoot independent pronouns

Blackfoot (like Plains Cree) is a head-marking language: arguments are marked in the V-complex and full DP's are optional. There is nevertheless a series of independent, morphologically complex, pronouns whose category we argue to be PhiP. We discuss their internal syntax (§2.1), their A-binding and A'-binding properties (§§2.2-3), and their occurrence in predicative contexts (§2.4).

2.1 Internal syntax of Blackfoot pronouns

Blackfoot pronouns are built on the dedicated pronominal stem *-iistó* (Frantz & Russell 1995:22), cognate *-oistó-* 'body'. The latter occurs in *m-oistó-m* 'body' (Wiltschko et al. 2011). The pronoun stem appears with prefixal person marking (*n-* '1' ,*k-* '2'*, o-* '3') and, when applicable, suffixal number marking (*-nnaan* '1PL', *-nnoon* '21PL', *-waaw* 'PL'). In addition to these person/number contrasts (which are found in the pronominal system of all Algonquian languages), Blackfoot pronouns also inflect as proximate (*-wa)* or obviative (*-yi*); this seems to be specific to Blackfoot. We consider these affixes in turn: person prefixes, number suffixes, and proximate/obviative suffixes.

TABLE 1: THE INTERNAL COMPOSITION OF BLACKFOOT PRONOUNS

	PROXIMATE	OBVIATIVE
1	*n-**iistó**-wa*	*n-**iistó**-yi*
1PL	*n-**iistó**-nnaan-wa*	*n-**iistó**-nnaan-yi*
2	*k-**iistó**-wa*	*k-**iistó**-yi*
21PL	*k-**iistó**-nnoon-wa*	*k-**iistó**-nnoon-yi*
2PL	*k-**iistó**-waaw-wa*	*k-**iistó**-waaw-yi*
3	*o-**(ii)stó**-wa*	*o-**(ii)stóa**-yi*
3PL	*o-**(ii)stó**-waawa-wa*	*o-**(ii)stó**-waawa-yi*

Blackfoot person prefixes appear on V- and N-stems. As in other Algonquian languages, on V-stems they mark the argument of the verb that is highest on the person hierarchy, irrespective of its semantic or grammatical role, with the ranking being [2>1>3.PROX>3.OBV]. On N-stems, person prefixes mark possessors. In addition, Blackfoot person prefixes have a long form (*nit-, kit, ot*) and a short form (*n-, k-, o-*). In the N-domain, the short forms are used for inalienably possessed Ns (2)a, while the long forms are used for alienably possessed Ns (2)b. Observe that pronouns occur only with the short form of the person prefix, (3). In the V-domain, Blackfoot person prefixes occupy SpecIP (Ritter & Wiltschko 2009; Déchaine & Wiltschko 2010). Assuming a structural parallel between C-I-V and D-Phi-N, this leads us to expect that, in the N-domain, Blackfoot person prefixes occupy SpecPhiP, rather than SpecDP.

(2) a. *amo **n**o'tokáán*
amo n-o'tokaan
DEM 1-hair
'This is my (own) hair.'
(Bliss & Gruber 2011)

b. *amo **nit**o'tokáán*
amo nit-o'tokaan
DEM 1-hair
'This is my (clipping of his) hair.'

(3) a. ***n****istoowa*
n-iistó-wa
1-PRO-PROX.SG
'I, me'

b. ****nit****istoowa*
nit-iistó-wa
1-PRO-PROX.SG

Now consider plural suffixes, which agree with the plurality of the possessor, and **not** with the plurality of the referent. For example, the 2nd person plural pronoun ***kisto****nnoon* is composed of the stem and the plural possessor agreement *-nnoon,* (4)a. The plural markers *-iksi or -istsi,* which are usually used to indicate plurality of the referent cannot be suffixed to pronouns (4)b. Regular nouns, including body-part Ns, show a different pattern. While the absence of the referent plural marker (here *-ists*) leads to ungrammaticality (5)a, the presence of both the possessive plural and the referent plural marker is licit (5)b-c. The absence of referential plural marking in Blackfoot pronouns is consistent with the idea that they lacks a DP layer to host referent plural agreement.

(4) a. *k-iistó-nnoon*
2-PRO-12PL
'we, us'

b. **k-iistó-nnoon-****ists***
2-PRO -12PL -PL
'we, us'

(5) a. **k-istó-m-inoon*
2-body-POSS-12PL
['our body']

b. *k-istó-m-inoon-****ists***
2-body- POSS-12PL-PL
'our bodies'

c. *kistoonnoon* *kistominoon****ists*** *aisttsi-ya*
k-istoo-nnoon k-isto-m-inoon-ists a-isttsii-wa
2-PRO-12PL 2-body-POSS-21PL.PL IMPF-hurt-3
'Our bodies are hurting'

Finally, we turn to proximate/obviative marking, the right-peripheral suffixes on the inflected pronominal stem. Across Algonquian, the proximate/obviative distinction makes it possible to distinguish two 3rd persons on the person hierarchy. More specifically for Blackfoot, the proximate/obviative contrast encodes *point of view* (Bliss 2005). In the V-domain, point-of-view marking is typically associated with Aspect (as indicated by the fact that Aspect is also known as *Viewpoint aspect*), a functional projection below IP. Given the parallel between N- and V-projections, we conjecture that proximate/ obviative marking in the N-domain is associated with a point of view marker positioned below PhiP (the nominal counterpart to IP). If so, then proximate/obviative marking on pronouns is consistent with our analysis according to which Blackfoot pronouns are PhiPs. Thus, the internal composition of Blackfoot pronouns is compatible with the claim that they belong to the category Phi. In particulate, they do not contain morphemes associated with positions higher than PhiP.

2.2 A-binding properties of Blackfoot pronouns

In the Déchaine & Wiltschko pronoun typology, PhiPs are analyzed as variables, and so can be predicates or arguments. Blackfoot pronouns, which we analyze as PhiPs, are predicted to participate in A-syntax, and they do: they occur in either subject or object position. Here we discuss their occurrence in object position; see Wiltschko et al. (2011) for discussion of pronouns in subject position. Relevant is the fact that, in reflexive contexts, there are two possibilities: a detransitivised V-stem is reflexive-marked (6a) with *-hsi*; or a transitive V-stem co-occurs with a pronoun, which is construed as reflexive, (6b).

(6) a. *Nitsamo**hsi**.*
nit-amo-hsI
1-see-REFL
'I saw myself'

b. *Nitoo'ohtsipoyi* ***nistoo***
nit-oht-i'poyi n-iistoo
1-LINK-speak 1-PRO
'I talked about myself.'

Déchaine & Wiltschko (2002) also show that while pro-PhiPs can function as bound variables, pro-DPs can't. The bound variable reading can be seen with VP-ellipsis (Reinhart 1983). Consider the English sentence in (7), where the 2nd conjunct can be interpreted in two ways. It allows for the reading 'I like Mary'. This is the strict identity reading: the object of the elided constituent is interpreted as identical to the object of the 1st conjunct. In addition, the 2nd conjunct allows for the reading 'I like myself'. This is the bound variable reading (also called sloppy identity reading): the object of the elided constituent is not identical to the object in the 1st conjunct. Observe that Blackfoot pronouns allow for a bound variable interpretation, (8). Moreover, the bound variable construal is the only one available. Conversely, Blackfoot 3rd person pronouns don't support an indexical construal, and so are not compatible with a pointing gesture, (9)a. Instead a demonstrative is used, (9)b.

(7) *Mary likes herself, and I do too.*
= (i) 'Mary likes **Mary**, and I like **Mary**' STRICT IDENTITY
= (ii) 'Mary likes **herself**, and I like **myself**' SLOPPY IDENTITY

(8) *Nitoo'ohtsipoyi* ***nistoo*** *kistoo* *ni'toyi*
nit-oht-i'poyi n-iistoo, k-iistoo ni'to-yi
1-LINK-speak 1-PRO 2-PRO same-OBV
≠ (i) 'I talked about me and you talked about me' STRICT
= (ii) 'I talked about myself and you talked about yourself' SLOPPY

(9) a. ****oostoyi*** *ani*
o-iisto-yi waani
3-PRO-OBV say
[Intended: 'He [pointing] said it']

b. ***Anna*** *ani*
ann-wa waanii
DEM.ANIM.SG say
'He [pointing] said it'

2.3 A'-binding properties of Blackfoot pronouns

Since arguments participate in A'-syntax, we expect Blackfoot PhiP pronouns to also participate in A'-syntax. This is indeed the case. Unsurprisingly, Blackfoot pronouns can be used as topics, (10). They also are compatible with contrastive focus, as in (11), where the speaker corrects an earlier statement by the addressee. For purposes of comparison with Plains Cree, we also note that Blackfoot pronouns are compatible with the additive particle *ohkat-* 'also' (12).

(10) ***Oostoyi*** *iikspita.*
o-iisto-yi iik-sspii-t-aa
3-PRO-OBV INT-be.tall-PERS-AI
'As for him, he's tall'

(11) *Tsa,* ***oostoyi*** *ipisatskiita.*
tsa o-iisto-yi ipisatsikiit-aa
no 3-PRO-OBV make.sweets-AI
'No, SHE cooked sweets.' (he didn't, SHE did).

(12) ***Niisto*** *nitohkatsspita*
N-iisto nit-ohkat-sspitaa
1-PRO 1-also-be.tall
'Myself, I am also tall.'

2.3 Blackfoot pronouns and predication

Unlike their Plains Cree counterparts (cf. §3.4), in equative constructions, Blackfoot pronouns do not allow for a possessive construal (13). We hypothesize that the possessive construal requires a DP layer which, according to our proposal, is missing in Blackfoot pronouns. The latter establishes a clear distributional difference between Blackfoot and Plains Cree pronouns consistent with our claim that they differ in their categorial identity.

(13) a. ***niistoo*** *nistooan*
n-iisto n-isttoán
1-PRO 1-knife
'Me, its my knife.'

b. **isstoan* ***nistoo***
isttoán n-iisto
knife 1-PRO
[Intended: 'The knife is mine']

3. Plains Cree Independent Pronouns

We now discuss the internal syntax of Plains Cree pronouns (§3.1), their A-binding and A'-binding properties (§§3.2-3), and their occurrence in predicative contexts (§3.4).

3.1 Internal syntax of Plains Cree pronouns

In considering the internal syntax of Plains Cree pronouns, we look at the pronoun stems, prefixal person marking, suffixal plural agreement and obviation. As shown in Table 2, Plains Cree pronouns are formed with two distinct stems: *-îya* 'self' and *-îsta* 'too'. The stem *-îya* is cognate with Proto-Algonquian 'self' *-ilawa*, with Proto-Algonquian **l* corresponding to Plains Cree *y* (Haas 1967; Wolfart 1973:8*a,* 38b), (14). As for the additive stem *-îsta*, we conjecture that this Plains Cree form may have arisen from the additive enclitic *asici*, cited in Wolfart and Ahenakew (1998:14) as an indeclinable particle (IPC) glossed as 'also, in addition, along with, together with' (15)a. We speculate that the *-îsta* pronoun paradigm comes from a combination of the *-îya* pronoun stem with the **-asita* enclitic, (15)b. We assume that the surface form of *-îsta* pronouns reflects the application of vowel apocope and deletion, (15)c.

TABLE 2: PLAINS CREE PRONOUN PARADIGMS

	PLAIN PRONOUN *-îya* 'self'	ADDITIVE PRONOUN *-îsta* 'too'
1	*n-**îya***	*n-**îsta***
1PL	*n-**îya**-nân*	*n-**îsta**-nân*
2	*k-**îya***	*k-**îsta***
21PL	*k-**îya**-naw*	*k-**îsta**-naw*
2PL	*k-**îya**-wâw*	*k-**îsta**-wâw*
3	*w-**îya***	*w-**îsta***

(14)

	Proto-Algonquian	Plains Cree
'I'	**n-**îla**-wa*	*n-**îya***
'we (exclusive)'	**n-**îla**-we-nân*	*n-**îya**-nân*

(15)

a. *asic-i* (asit-i; too-PRT) < **-asit-* < **-asit-a*

b. **n-îya-asita* < **n-îyas'ta* < *n-îsta*
1-self-too 1-self.too 1-too ('me too')

c. VOWEL APOCOPE: V1 + V2 → V1 (Wolfart 1973:81*a*)
VOWEL DELETION: i → ∅

The person proclitic marking on pronouns parallels that of dependent Ns in taking the short form of the person prefix (*n-*, *k-*, *w-*) rather than the long form (*ni(t)-*, *ki(t)-*, *o(t)-*), of which the *t* is epenthetic in Plains Cree. In Plains Cree, the short/long distinction is morphologically conditioned: while vowel-initial independent Ns take the short form, vowel-initial dependent N take the long form, and trigger *t*-epenthesis. This is shown in Table 2. Consonant-initial Ns,

whether dependent or independent, surface with the same form of the proclitic, namely *ni-*, *ki-*, and *o-*. Also, dependent Ns that denote body-parts cannot be inflected with a plural possessor; these gaps correspond to the shaded cells in Table 3.

TABLE 3: PLAINS CREE DEPENDENT & INDEPENDENT INANIMATE N-STEMS (NI)

	DEPENDENT NI		INDEPENDENT NI	
	V-initial *-îki* 'dwelling'	C-Initial *-stikwân* 'head'	V-initial *astotin* 'hat'	C-Initial *maskisin* 'shoe'
1	*n-**îki***	*ni-**stikwân***	*nit-**astotin***	*ni-**maskisin***
1PL	*n-**îki**-nân*		*nit-**astotin**-inân*	*ni-**maskisin**-inân*
2	*k-**îki***	*ki-**stikwân***	*kit-**astotin***	*ki-**maskisin***
21PL	*k-**îki**-naw*		*kit-**astotin**-inaw*	*ki-**maskisin**-inaw*
2PL	*k-**îki**-wâw*		*kit-**astotin**-iwâw*	*ki-**maskisin**-iwâw*
3	*w-**îki***	*o-**stikwân***	*ot-**astotin***	*o-**maskisin***
3PL	*w-**îki**-wâw*		*ot-**astotin**-iwâw*	*o-**maskisin**-iwâw*

It is likely that *-îya* 'self' is a reduced form of *-îyaw* 'body'. While *-îya* 'self' permits plural possessors (16)a,*-îyaw* 'body' does not (17)a. In Plains Cree, it is generally the case that body part nouns are incompatible with plural possessors; see *-stikwân* 'head' in Table 3. We take the fact that *-îya* 'self' supports plural possessors to indicate that the pronoun stem has been grammaticized. And neither *-îya* 'self' or *-îyaw* 'body' permit plural marking of the head noun (16)-(17)b. This restriction holds of all inanimate dependent nouns. As for obviation, recall that Blackfoot pronouns inflect for obviation; this isn't possible in Plains Cree. Thus, while a 3rd person pronoun cannot be inflected for obviation (18), a possessed animate N must be (19). We take this contrast to reflect that fact that pronoun stems, as with all body part Ns in Plains Cree, are inanimate N-stems; as such, they predictably fail to trigger obviation.

(16) a. *k-**îya**-naw*
2-self-12PL
'we, us'

b. **k-**îya**-naw-a*
2-self-12PL-PL

(17) a. **k-**îyaw**-inaw*
2-body-12PL
['our body']

b. **k-**îyaw**-inaw-a*
2-body-12PL-PL
['our bodies']

(18) a. *w-**îya***
3-self
's/he, him/her'

b. **w-**îya-wa***
3-self-OBV

(19) a. **o-**__mâmâ__*
3-mother

b. *o-**__mâmâ__-wa*
3-mother-OBV
'her/his mother'

3.3. A-binding properties of Plains Cree pronouns

Plains Cree pronouns can't occur in argument positions (A-positions). Specifically, they can't be used as reflexive pronouns. Thus, the only way to express the reflexive relation is via the detransitivising reflexive suffix *-iso*, (20)a. Expressing the reflexive relation via the combination of a pronoun with a transitive (VTI) stem — which is well-formed in Blackfoot (see above) and Fox (Dahlstrom 1988) — isn't possible in Plains Cree, as shown in (20)b. And consistent with the inability to support the reflexive construal, Plains Cree pronouns likewise don't support bound variable anaphora (21)a. Instead, the entire clause must be repeated, (21)b. Recall that only pro-PhiPs support bound variable anaphora. Thus, we take the inability of Plains Cree pronouns to support bound variable anaphora to reflect their pro-DP status.

(20) a. *niwâpam'__sô__n*
ni-wâpam-iso-n
1-see-REFL-LCL
'I saw myself' (AMK 307)

b. **ni-wâpahtên* ***nîya***
ni-wâpahtê-n n-îya
1-see.VTI-LCL 1-PRO
[Intended: 'I saw myself'] (AMK 310)

(21) a. **ê-'tâmêy'msoyân* *êkwa* ***kîya***
ê-atâmêyim-iso-yân êkwa k-îya
C-blame-REFL-1 and 2-SELF
[INTENDED: 'I blame myself and you blame yourself'] (DJ 382)

b. *ê-'tâmêy'mso__yân__* *êkwa* *ê-'tâmêy'mso__yan__*
ê-atâmêyim-iso-yân êkwa ê-atâmêyim-iso-yan
C-blame-REFL-1 and C-blame-REFL-2
'I blame myself and you blame yourself' (DJ 388)

Consistent with their pro-DP status, 1st and 2nd person pronouns are indexical, and so can be used in discourse-initial matrix clauses (22)a. In contrast, 3rd person pronouns are discourse anaphoric, and aren't felicitous in such contexts (22)b. Instead, they are supplemented by a demonstrative, (22)c.

(22) a. ***nîya*** *nimâcihton*
1-self 1-be.mean.VAI-LCL
'I am mean' OR 'Me, I am mean' (AMK 477)

b. ***wîya** *mâcihtâw*
w-îya mâcihtâ-w
3-SELF be.mean.VAI-3
[Intended: 'S/he is mean'] (ID 292)

c. ***wiy'âna** *mâcihtâw*
w-îya ana mâcihtâ-w
3-SELF DEM be.mean.VAI-3
'As for her/him, s/he is mean; that one is mean' (ID 294)

3.3. A'-binding properties of Plains Cree pronouns

As pro-DPs, Plains Cree pronouns predictably occur in A'-position to mark topic and focus. The latter are information structure positions at the left-periphery of the clause (Russell & Reinholtz 1995, Dahlstrom 1988); such positions aren't restricted to particular thematic roles or grammatical functions; for this reason, they are called "non-argument" (A') positions. Plains Cree *-îya* pronouns occur as topic (23) or focus (24). In Plains Cree, a topic is compatible with the independent mode (23), while focus usually occurs with the kâ-conjunct (24). (On the latter see Blain 1997. For discussion of the interaction of clause-typing and pronominal forms in Plains Cree, see Déchaine et al. 2011).

(23) a. *John* ***wîya*** *miyêhtam* *ekw'anima*
John w-îya miyêhtam ekw'anima
John 3-self like.VTI DEM
'As for John, he likes that' (2010.07.20, (24); 2011.10.19, (4))
CONSULTANT'S COMMENT: "Maybe I don't like duck, but John does"

b. ***nîya*** *nimîyêhtên* *ekw'anima*
n-îya ni-mîyêhtê-n ekw'anima
1-self 1-like.VTI-LCL DEM
'As for me, I like that' (AMK 450)

(24) a. ***wîya*** *ôma* *kâ-miyêhta* *ê-mêtawêt*
w-îya ôma kâ-miyêhta ê-mêtawê-t
3-self DEM C-like.VTI C-play.VAI-3
'That person is the one who likes to play' (AMK 453)

b. ***nîya*** *ôma* *kâ-miyêhtamân* *ê-mêtawêyân*
n-îya ôma kâ-miyêhta-mân ê-mêtawê-yân
1-self DEM C-like.VTI-1 C-play.VAI-1
'I'm the one who likes to play' (ID 479)

And as with additive particles in other languages (Krifka 1998; Rullmann 2003), the additive pronoun *-îsta* marks contrastive topics, (25). (See Déchaine et al. 2011 for details.)

(25) *êkwa ana **wîsta** mîna, omôhkoman, mitoni misâw*
êkwa ana w-îsta mîna o-môhkoman mitoni misâ-w
and DEM 3.too also 3-knife.NI DEG be.big.VII-3
'… and his knife is also big.' (AMK 461)

3.3 Plains Cree pronouns and predication

Plains Cree nominal predication involves a [Predicate Subject] order (Déchaine 1997), and pronouns can occur in either position: as subject as in (26)a, or as predicate. In the latter position, pronouns are ambiguous between an equative reading (26)b or a possessor reading (26)c. We take the ambiguity of Plains Cree pronouns to be indicative of structural ambiguity. On the equative reading, the pronoun is directly inserted into the D position, (27)a. On the possessor reading, the internal structure of the pronoun parallels that of a possessed N-stem, (27)b.

(26) a. *okimaw **nîya***
okkima n-îya
chief 1-SELF
'I'm the chief'

b. ***nîy'ôma***
n-îya ôma
1-PRO DEM
'It's me'
[2011.10.19/10]

c. ***nîya** ôma*
n-îya ôma
1-PRO DEM
'It's mine'
[2011.10.19/11]

(27) a. [[$_{D}$ ***n-îya***] [$_{PHI}$ …] [$_{N}$ …]]

b. [[$_{D}$ ***n-***] [$_{PHI}$ …] [$_{N}$ ***-îya***]]

4. Conclusion

Applying the D/Phi/N analysis to Blackfoot and Cree pronouns yields the following results. In both languages, pronouns participate in A'-syntax (functioning as topic or focus), but present syntactic differences elsewhere in the grammar. As PhiPs, Blackfoot pronouns participate in A-syntax and support bound variable anaphora, but don't support a possessor construal. As DPs, Plains Cree pronouns don't participate in A-syntax, don't support bound variable anaphora, but do support a possessor construal.

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Imposing Preferences on Discourse: Imperatives and Other Commands

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1 Introduction

In English, commands can be issued either with imperatives or with so-called performative declarative modals. Although both constructions can be used to achieve essentially the same effect, they do not behave the same within a discourse. In particular, they diverge with respect to the felicity of certain followup utterances. Imperatives never permit direct challenges of truth or falsity (1), whereas declarative modals do (2), in at least some contexts.

(1) A: Take out the trash!
B: #That's true! / #That's false! (after Iatridou 2008: ex. 43–44)

(2) A: You must take out the trash!
B: ✓That's true! / ✓That's false!

Several previous accounts of imperative semantics have failed to adequately explain this contrast. In §2, I briefly address these previous attempts and argue that only an approach that defines imperatives as imposing preferences can elegantly explain the distinction. I also introduce the concept that such preferences are encoded in imperatives as the *illocutionary relation* of the clause: a function that takes as its arguments the current discourse context and a proposition, and returns an updated, structured context (following Murray 2010).

In §3, I introduce challenge tests (based on Beaver et al. 2009; Roberts et al. 2009) that go beyond the simple responses given in (1) and (2). These tests are also indicative of *at-issue status*, a characteristic of a proposition in a given discourse context. §4 applies direct challenges to both imperatives and performative declarative modals, and §5 applies indirect challenges. The results of these tests show that the at-issue content of the two constructions is not equivalent, explaining their different discourse properties. Finally, in §6, I extend the concept of discourse relevance (Simons et al. 2011) to cover imperatives. Creating a unified definition of relevance has implications for further work on at-issue status and the behavior of clauses in discourse.

2 Imperatives as Preferences

There have been three major previous approaches to imperative semantics. Each has a different perspective on the relationship between imperatives and declara-

tives. Looking solely at the juxtaposition of (1) and (2), it is apparent that the two clause types have commonalities (they can both issue a command) yet also differ (they are not interchangeable within a discourse). Thus, a theory of imperative semantics that neither equates nor completely dissociates imperatives and declaratives should yield the best result.

One view of imperatives assimilates them to declaratives. For example, Schwager (2006) gives an account of imperative semantics which is fundamentally a modal declarative semantics, albeit with some additional stipulations. This approach overlooks certain basic characteristics of imperatives, such as the fact that they are never evaluable in terms of truth or falsity. Imperatives are not claims about the way the world is or will be; commands can be disobeyed.

(3) Jump up and down! $\not\models$ *the addressee jumps up and down*

On the other end of the spectrum, an analysis of imperatives as properties completely dissociates them from declaratives, both semantically and pragmatically (Pak et al. 2006; Portner 2005; 2007; Zanuttini 2008). Under this view, declaratives contribute to the Common Ground, whereas imperatives only contribute to the To-Do Lists of individual interlocutors. In such a system, there would have to be a way to issue a command in each of two isolated pragmatic subsystems.

A third approach treats imperatives as preferences (e.g. Starr 2010). A semantic preference ranks propositions or sets of worlds. Representing imperatives with this type of semantic object predicts their similarities and differences with declaratives. Imperatives differ from declaratives because they are not themselves propositions, but they are still relatable to declaratives since their semantic type is composed out of propositions.

Implementing imperatives as preferences under a Common Ground (or Context Set) model of discourse (Stalnaker 1979) means that imperatives do not eliminate possible worlds. Nevertheless, imperatives do contribute information to the discourse; the context has new structure imposed upon it, even if overall it contains the same possible worlds. The structure imposed by the imperative is a preference: worlds that satisfy the content of the command are "better".

Unlike in previous preference models, I argue that the imposition of a preference is performed by the illocutionary relation in imperatives. Establishing a preference is one possible reflex of the overall purpose of illocutionary relations: to impose structure on a context, given a proposition. Throughout the paper, I will refer to commanded actions as the (propositional) content of the imperative, denoted p. The imperative illocutionary relation applied to p will be denoted Pref(p), and is indicative of the overall meaning of an imperative clause, without reference to the discourse context. As applied to the imperative in (3), this notation corresponds to the following:

(4) Jump up and down!
p = the addressee jumps up and down
Pref(*p*) = the preference that *the addressee jumps up and down*
$C_1 = \text{Pref}_{C_0}(p)$ = the discourse context, structured such that worlds in which *the addressee jumps up and down* are preferred

3 Introduction to Challenge Tests

Having established that there is a propositional component to imperatives, we can now turn to tests that diagnose characteristics of propositions. In particular, I will focus on two types of tests, *direct* and *indirect challenges* (Roberts et al. 2009; Beaver et al. 2009), which each target a different class of propositional content. I argue that all overtly expressed propositions can be classified as either *at-issue* or *not-at-issue*. At-issue content is the main point of an utterance, and furthers resolution of the discourse topic. Direct challengeability is a positive indicator of at-issueness. Not-at-issue content is additional content within an utterance, including but not limited to presuppositions, evidentials, and implicatures. Indirect challengeability is a hallmark of not-at-issue content. As we will see, not all content is challengeable; non-propositional content (such as illocutionary relations) resists challenges of either type.

3.1 Direct challenges

Direct challenges are typically anaphoric to the previous utterance, and affirm or deny truth or falsity. Some of the simplest direct challenges are "yes", "no", "that's true", and "that's false". They can be continued by a repetition of affirmed content or an explanation for rejecting content.

(5) A: John took out the trash.
B1: Yes. He did take out the trash.
B2: That's false. He only took out the recycling.

Whatever content is anaphorically targeted by a direct challenge is "susceptible of direct affirmation or denial," and therefore is at-issue (Beaver et al. 2009). In (5), we can conclude that the proposition *John took out the trash*, as asserted in the initial utterance, is at-issue. This is expected, since the utterance is monoclausal and only encodes a single proposition. In more complex constructions, the test distinguishes the at-issue proposition(s) from other content.

(6) A: Jill, who lost something on the flight, likes to travel by train.
p = Jill likes to travel by train, *q = Jill lost something on the flight*
(after Roberts et al. 2009: ex. 3)

B1: No, that's false. Jill hates traveling by train.
effect: p is rejected, q is accepted

B2: No, that's false. #Jill didn't lose anything on the flight.
effect: q cannot be directly rejected

conclusion: p is an at-issue proposition in A, q is not

The application of direct challenge tests to (6) shows that the proposition regarding Jill's travel preferences is at-issue, while the non-restrictive relative clause about the object she lost is not. If the proposition expressed by the relative clause is not true, the interlocutor is not without recourse, but must use a different strategy in order to issue a successful challenge.

3.2 Indirect challenges

Indirect challenges may be used on content that direct challenges fail to target, such as the relative clause in (6) above. If the indirect challenge succeeds, it indicates that the targeted proposition is not-at-issue. One of the best-known indirect challenges is the "Hey, wait a minute!" test, first proposed in Shanon (1976).

(7) A: Jill, who lost something on the flight, likes to travel by train.
p = *Jill likes to travel by train*, q = *Jill lost something on the flight*

B1: Hey, wait a minute, Jill didn't lose anything on the flight.
effect: p is suspended, q is rejected

B2: #Hey, wait a minute, Jill doesn't like to travel by train.
effect: p and q are neither accepted nor rejected

The response B1 in (7) has the intended effect of rejecting the content of the relative clause, the proposition q. However, it makes no claim about the truth or falsity of p, the at-issue proposition in the A utterance. Evaluation of p becomes suspended, and must be taken up later in the discourse. This effect of suspension is what the phrase "Hey, wait a minute" achieves. Note also that trying to apply an indirect challenge to an at-issue proposition is infelicitous. The reason for this is that the suspension maneuver is superfluous, or is attempting to suspend discussion of a non-existent topic. Removing the phrase "Hey, wait a minute" from B2 leaves a direct challenge to p, which we saw was felicitous in (6).

4 Applying Direct Challenge Tests

Recall that imperatives cannot be directly challenged in terms of truth or falsity. The unsuccessful challenges given in (1) contain propositional anaphora, which contributes to their failure for one of two reasons: either there is no suitable antecedent for the propositional anaphor *that*, or there is an antecedent, but its truth or falsity cannot be determined on the basis of the prior discourse. Since imperatives encode preferences, which are composed out of propositions, there is propositional content within imperatives, and thus a potential antecedent. Enriching the challenges by spelling out this proposition does not improve them in any way; *p* cannot be said to be true or false immediately following an imperative.

(8) A: Take out the trash!
p = the addressee takes out the trash

B1: #That's true! I (will) take out the trash.
B2: #That's false! I won't / don't take out the trash.

There are also felicitous, yet seemingly direct, responses to imperatives. Such statements of compliance or refusal to carry out an imperative command can also be diagnosed by providing further followup.

(9) B3: OK, I will (take out the trash)!
B4: No, I won't (take out the trash)!

B3–B4 are felicitous because they avoid claiming whether *p* is true or false within the current context. The followups in (8) show that doing so is not possible, which is a sign that there are both *p*- and ¬*p*-worlds in the Context Set. The followups in (9) allow for this possibility, and only claim whether speaker B plans to make *p* true or false in a future context. These plain statements of compliance or refusal are just some of the simplest cases of a broader class of felicitous, qualitative comments about the proposition *p* (10).

(10) B5: No, that's not what I'm going to do.
B6: No, that's a bad idea.

Note that the claims regarding *p* in (9), not just their means of introduction, make these followups felicitous. Appending *OK* or *no* to anaphoric challenges does not improve them.

(11) B7: #OK, that's true. / #OK, that's right.
B8: #No, that's false. / #No, that's wrong.[1]

The effectiveness of these various direct challenge strategies leads to the following conclusions. Propositional anaphors in direct challenges cannot target Pref(*p*),

because it is not propositional; they must target *p*. However, it is indeterminate whether *p* is true or false. Thus the only statements that can be made about *p* are qualitative ones, or predictions about its truth or falsity in a future context.[2]

Now let us consider the felicitous direct challenges to performative declarative modal commands. What is the target of such challenges when they are successful? The A utterance in (12) appears to only encode a single proposition: *it is necessary that the addressee takes out the trash*. The more basic proposition, *the addressee takes out the trash*, cannot be targeted even if we make the unlikely assumption that the modal indicates logical necessity, rather than epistemic or deontic necessity. As with the imperatives above, we can confirm this by enriching the B responses with additional followup material.

(12) A: You must take out the trash!
p = it is necessary that the addressee takes out the trash
q = the addressee takes out the trash

B1: That's true. I saw it on the chore chart.[3]
B2: That's false. I don't have to until next week.

B3: That's true. #I (will) take out the trash.
B4: That's false. #I won't / don't take out the trash.

The followups in B3–4 demonstrate that the challenge is unsuccessful if it attempts to target the non-modal proposition *q*. Also, note that the followup in B2 is felicitous because it remains modally subordinated to the A utterance. Rephrasing it as "I won't until next week" makes the response just as infelicitous as B4. These results converge upon the fact that direct challenges to performative declarative modals exclusively target a modal proposition.

All of the data above, in light of the fact that direct challengeability indicates at-issueness, give a solid picture of what propositions are at-issue in both imperatives and performative declarative modals. The infelicity of the direct challenges to imperatives in (8) demonstrates that it is impossible to challenge the overall contribution of the imperative, Pref(*p*). The felicity of followups that target the proposition *p* is dependent upon whether they attempt to evaluate the truth or falsity of *p* based on the prior discourse; followups which do succeed indicate that *p* itself is at-issue in imperatives. Additionally, the modal proposition encoded in performative declarative modals is the only at-issue proposition in the clause, as it alone can be targeted by anaphoric direct challenges. §5 will examine whether indirect challenges yield converse results, and whether they can target Pref(*p*).

5 Applying Indirect Challenge Tests

Recall from §3.2 that the success of an indirect challenge indicates that its target is not-at-issue. Applying the "Hey, wait a minute" indirect challenge test to an imperative appears to yield the exact opposite results as direct challenge tests.

(13) A: Take out the trash!
p = the addressee takes out the trash

B1: #Hey, wait a minute, I won't take out the trash.
B2: Hey, wait a minute, I don't have to take out the trash.
B3: Hey, wait a minute, you don't want me to take out the trash.

However, on closer examination, B2–3 of (13) target neither *p* nor Pref(*p*), but novel propositions related to *p*. The result of B1 in (13) is not spurious, but is as expected; an indirect challenge of *p* itself fails because *p* is an at-issue proposition.

Constructing indirect challenges to target Pref(*p*) is somewhat more difficult. The resulting followups are considerably more awkward, if not downright infelicitous. As indirect challenges, like direct challenges, are supposed to be diagnostic of a subclass of propositions, this result is unsurprising.

(14) Take out the trash!
Pref(*p*) = the preference that *the addressee takes out the trash*

B1: #Hey, wait a minute, it is not preferred that I take out the trash.
B2: #Hey, wait a minute, it's not best for me to take out the trash.
B3: #Hey, wait a minute, you didn't impose a preference for me to take out the trash.

When applied to performative declarative modal commands, indirect challenges yield no new insights.

(15) A: You must take out the trash!
p = it is necessary that the addressee takes out the trash

B1: #Hey, wait a minute, I won't take out the trash.
B2: #Hey, wait a minute, it's not best for me to take out the trash.

Nevertheless, they do confirm the conclusion drawn from the direct challenge data, namely that there is a single, at-issue proposition encoded in the clause. With no not-at-issue content in the clause, indirect challenges uniformly fail against performative declarative modals.

Thus the primary difference between performative declarative modals and imperatives is that the modal proposition cannot be decomposed, at least from the

perspective of challenge tests. Although the overall contribution of an imperative is non-propositional, it has a propositional subcomponent that is at-issue, and can therefore be targeted by direct challenges. The preference expressed by an imperative is reliant on its illocutionary relation. In the following section, I will examine how the preferential illocutionary relation of imperatives is parallel to that of other clause types.

6 Illocutionary Relations and Relevance

Recall that illocutionary relations are two-place functions that take as their arguments the current discourse context and a proposition, and return an updated, structured context (Murray 2010). I have argued that the preference relation found in imperatives is a function of this type. As such, it is possible to compare it with the illocutionary relations of other clause types, and I will show that they form a natural class.

The role of an illocutionary relation is to relate propositional material to the context, and to enrich the context with further structure. The type of structure imposed can vary, and is related to clause type. Declaratives canonically make assertions by imposing an intersection relation. Following the utterance of an assertion, the new context is the intersection of the old context with the set of all *p*-worlds. Interrogatives canonically ask questions, which are represented semantically as a set of answers, or a set of sets of worlds. The partitioning of the context into two or more answers is the additional structure provided by the interrogative illocutionary relation. Imperatives canonically issue commands, which as we have already seen are represented by the preference relation. The structure imposed by a preference can be viewed as lying somewhere between that of a question and an assertion. It partitions the common ground into two sets and ranks one set above the other without eliminating any elements of the old context.

These properties of clauses play a significant role in the definition of *discourse relevance* given in Simons et al. (2011), even though their account makes no direct appeal to the concept of illocutionary relation. An utterance is considered to be relevant if it makes a fruitful contribution towards the current discourse topic. Simons et al. (2011) defines the discourse topic formally as the Question Under Discussion, and defines relevance with respect to it.

(16) A clause or utterance is said to be relevant if it furthers the resolution of the Question Under Discussion (QUD), "a semantic question (i.e. a set of alternative propositions) which corresponds to the current discourse topic." (Simons et al. 2011:7).

They continue by unpacking and formalizing what counts as furthering the resolution of the QUD for assertions and questions. In both cases, what must be evaluated

against the QUD to determine relevance is a potential answer, i.e. a proposition.

(17) *Relevance for assertions and questions* (after Simons et al. 2011: ex. 13)
   a. An assertion is relevant to a QUD iff it contextually entails a partial or complete answer to the QUD.
   b. A question is relevant to a QUD iff it has an answer which contextually entails a partial or complete answer to the QUD.

They do not provide a definition of relevance for commands. Earlier work by Roberts (2004) gives a preliminary definition of imperative relevance, but its formulation is much less robust than those in (17), and is not suited to performing a semantic computation of relevance.

(18) *Preliminary definition of imperative relevance* (Roberts 2004)
"A move *m* is Relevant…if *m* is…an imperative whose realization would plausibly help to answer *q*."

A stronger definition is desirable, and possible given what the challenge test results have revealed about the nature of Pref() in imperatives. I have formulated a definition of imperative relevance (19) that incorporates the concept of preference and is parallel in form to the definitions for other clause types given in (17).

(19) *Extension to commands*
A command is relevant to a QUD iff it prefers an outcome which contextually entails a partial or complete answer to the QUD.

This extension places imperatives within a unified paradigm of tests for relevance. In fact, we now have three definitions of relevance that in some way appeal to the illocutionary relation of the clause type that canonically performs that discourse function. Since illocutionary relations are all of the same semantic type, it is possible to formulate a new, general definition of relevance for all clause types.

(20) *Generalized definition of relevance*
An utterance is relevant to a QUD if the propositional argument of its illocutionary relation (contextually) entails a partial or complete answer to the QUD.

In addition to providing clause-specific definitions for relevance, Simons et al. (2011) also defines at-issueness in terms of relevance (21).

(21) *Definition of at-issueness in terms of relevance*
A proposition *p* is at-issue relative to a question Q iff ?*p* is relevant to Q.

However, the form of this definition makes use of only one of the three sub-cases of the paradigm of relevance tests, namely that of questions (and actually only that

of yes/no questions). This extra step moves the test for at-issueness further away from the actual utterances that comprise the discourse, since in the majority of cases, the yes/no question ?p is not an utterance under consideration.

However, by exploiting the generalized definition of relevance, it is possible to recast the definition of at-issueness in a way that directly tests material from the discourse. I propose the following definition to do just that:

(22) *Generalized definition of at-issueness*
A proposition p is at-issue if it is the propositional argument of the illocutionary relation of a relevant utterance.

In more informal terms, a proposition is at-issue if it makes an utterance relevant.

The generalized definition of at-issueness matches the results of the challenge diagnostics for at-issue status. For imperatives, their propositional content is always an at-issue proposition. The overall contribution of the imperative, Pref(p), is non-propositional and has no at-issue status. For performative declarative modals, they assert a modal proposition. Since that proposition, and that proposition alone, is the argument of the illocutionary relation of assertion, it is the only at-issue content in the declarative modal. As in imperatives, it is impossible to challenge the illocutionary relation in declaratives because it is of the wrong semantic type. Only propositional content which contributes to the discourse via an illocutionary relation is at-issue, and only at-issue content is directly challengeable.

7 Conclusions

I have examined the properties of two types of commands in English: imperatives and performative declarative modals. Their different behaviors within discourse initially posed a puzzle, as they seem to achieve roughly the same effect. However, by subjecting them to a series of challenge tests, I have shown that they have systematic semantic differences that predict their divergent behavior.

First, I explained why imperatives are not truth-evaluable. They do not structure the context in a way such that only p or $\neg p$-worlds remain. Their overall contribution is non-propositional, and they make no claim regarding the truth or falsity of p. This distribution of meaning in imperatives is the reason why direct challenges against imperatives fail.

I also applied indirect challenge tests to imperatives. Although they appeared to give the converse results to direct challenges, they were not actually targeting the same material. When these challenges were reformulated to target either the propositional or preferential content of imperatives, they failed. Since an imperative preference cannot be challenged in any way, it is neither at-issue nor not-at-issue. This is to be expected, since it is an illocutionary relation, which is non-propositional, and at-issue status is a characteristic of propositions.

In general, the challenge tests presented above have divided content into three classes: that which is directly challengeable, that which is indirectly challengeable, and that which cannot be challenged. As summarized in the table in (23), directly challengeable content is at-issue, indirectly challengeable content is not-at-issue, and unchallengeable content is neither.

(23)

	at-issue	not-at-issue	no at-issue status
direct challenge	✓	✗	✗
indirect challenge	✗	✓	✗

Finally, I compared imperatives to other clause types in terms of their illocutionary relations. By identifying Pref() as the illocutionary relation of imperatives, it was possible to align imperatives with declaratives and interrogatives in a paradigm of discourse relevance. Furthermore, this made it possible to generalize across illocutionary relations and create new, unified definitions of both relevance and at-issueness. The new definition of at-issueness matches exactly with the empirical data from the challenge tests presented.

Thus, by decomposing the content of imperatives, it is possible to see how they are similar to performative declarative modal commands, yet crucially different. The apparent puzzle of imperatives in discourse is not paradoxical. It is simply due to the fact that imperatives divide their semantic contribution between illocutionary and propositional content. The fact that illocutionary relations of all clause types are unchallengeable allows us to see that imperatives are not anomalous when compared to declaratives and interrogatives, but merely another member of a natural class.

Notes

[1]The second challenge in B8 is lexically ambiguous, and could be interpreted as being a felicitous comment about *p* if *wrong* is taken to mean 'morally wrong' rather than 'false'. Also note that the inclusion of *true* or *false* in these examples enforces a propositional anaphora reading. VP anaphora is possible, and indeed felicitous:

(i) B1′: OK, I will do that!
B2′: No, I won't do that!

[2]There is no general prohibition about asserting *p* or ¬*p* immediately after an imperative (or at any stage of a discourse), but the inclusion of *yes*, *OK*, or *no* has an anaphoric effect similar to *that*, and thereby presupposes a prior assertion of *p*. This subtle difference in phrasing has quite robust effects on felicity.

(ii) A: Do your homework!
B1: ✓I am doing my homework.
B2: #Yes, I am doing my homework.

[3]It should be noted that Schwager (2006) contends that the challenges in (12) are not felicitous if

the modal sentence is being used performatively, i.e. as a command rather than assertion of existing obligation. There is no question that, "Stating a norm is not the same as creating a norm," (Platzack 2007), but it also seems clear that performative declarative modals can do either, while imperatives can only do the latter. Resolving this ambiguity in performative declarative modals is an extremely subtle judgment; it is not apparent that the two uses can be differentiated by prosody, and Schwager provides no other tests for performativity.

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Early Advantages of Language Acquisition: a Divided Visual Approach

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1 Introduction

1.1 Background

Lennerberg's critical period hypothesis (CPH) claimed that human beings have an optimal biological period for language acquisition. (Lennerberg, 1967) Earlier research on critical period hypothesis had showed a correlation between age and pronunciation rating. (Oyama, 1976; Fldge, 1995) Fledge, Munro, and McKay's research in 1995 showed that there is a perceived pronunciation difference between late English – Italian bilinguals. This means that people who arrived in Canada earlier tend to have better pronunciation of English. However, if people arrived late in Canada, they tend to have an accented second language. Also, Johnson and Newport's research also confirmed the same result. They reported that Koreans who arrived in America at the young age have likely chances of producing grammatical sentences compared to those who arrived in America late. These results confirmed that earlier speakers of a second language might have the advantage of acquiring native-like proficiency.

While the CPH focuses on the optimal period where human beings acquire languages, some arguments have been made to claim that linguistic experience might be the important factor that affects one's language proficiency. (Johnson and Newport, 1989) Research on semantic categorization has raised an important issue regarding a late bilingual's experience in the second language. For example, Gathercole et al. (2010) reported that late bilinguals (native in Arabic and second language in English) displayed more interlanguage effects. However, early bilinguals were found to have more complete representation of semantic relationships in both languages. The study suggests that longer time exposure to a second language might reinforce the development of the second language. Furthermore, the research on infants' perception of Mandarin Chinese and English has shown that early exposure to Mandarin Chinese might help 10 month-old American babies to develop perceptual advantages of Mandarin Chinese. The results showed a training effect after the researchers exposed 10 month-old American babies to Mandarin Chinese; they found that the American babies' perception of Mandarin Chinese became similar to those 10 month-old native Mandarin babies. (Kuhl, Tsao & Liu, 2006) Thus, these findings suggest

that linguistic experience and the language environment might play a significant role in developing languages.

On the other hand, recent neurolinguistic research has found that early bilinguals' processing of both languages is different from late bilinguals in terms of hemispheric differences in the brain. Past research on bilingual speakers' brain processing of both languages had demonstrated that early bilinguals tend to have bilateral activation in producing sentences in both languages. (Hull and Vaid, 2007) Some research even found that some brain areas of early bilinguals, such as Broca's area, the dorsolateral prefrontal cortex, and the right superior parietal cortex were activated during the production in the first and second languages, but for late and non-proficient speakers, it was only found some activation in the left hemisphere, such as left prefrontal areas. (Pinel & Dahaene, 2009) This implies that early bilinguals might have more native-like processing of their second language, but late bilinguals will need more cognitive effort, like processing the second language in the working memory located in the left hemisphere, in order to produce sentences in L2. Thus, these findings have suggested that age of acquisition actually makes a difference for bilinguals in neurological aspects of language processing.

1.2 Research Questions

The present research investigates the behavioral performance of the word identification task, which designed for 16 Mandarin-English speaking subjects, who differed in age of arrival in Vancouver, Canada. We attempt to uncover the hemispheric differences of these bilinguals' language processing. The present paper intends to answer the following question:

1) Does age of arrival matter when a person processes his/her first language and the second language?
2) Are there shared or separate systems in bilingual processing of two (native) languages?
3) Is bilinguals' processing of the second language similar to that of the native language? Does age of arrival in a foreign country exhibit any hemispheric difference?

2 Methodology

2.1 Participants

There were originally 25 participants selected for the purpose of the experiment. Due to language difficulties, 9 were excluded from the study because of the inability to read or understand Chinese characters. The other 16 participants (mean age of 21.8 yrs old; with 9 males and 7 females) either had been educated in Canada for at least four years in a row, or had obtained a certified Canadian university degree. In additional, all participants are bilingual in both English and

Mandarin Chinese, although the degrees of fluency in either language vary across individuals; it allows a distinctive research outcome to be collected.

The 16 subjects were divided into two sub-categories, with 8 considered early bilinguals and the other 8 considered late. The difference between early and late bilingual is the time (age) of arrival in Canada. Participants who arrived in Canada before and include grade seven were considered early bilinguals because of the maturational factor—the beginning of puberty. People who arrived in Canada at grade eight or later would be considered late bilingual due to Lennerberg's hypothesis of critical period (1967): that at a certain period in time human's ability to acquire language starts to decline.

2.2 Stimuli

The experiment contains two separate blocks of stimulus. One stimulus consists of English words, while the other in Mandarin Chinese characters. All words in the list of the stimuli were randomly extracted from bilingual dictionaries or the researchers' own mental lexicon. The English stimulus contains 30 three-letter or four-letter monosyllabic words (e.g. *pet, hot, odd,* or *date*). The word list consisted of regular words; neither exceptional words (words that don't follow standard pronunciation rules, e.g. *colonel*) nor pseudo-words (words that are made up, e.g. *arn*) were presented.

The Mandarin Chinese stimulus also consisted of sixty words that were mixed of easy to recognize words with fewer strokes (e.g. 山 (mountain), 水 (water), or 土 (earth)), and difficult to recognize words with multiple-complex strokes (e.g. 懋 (diligent [in literature]), 顯, (bright), and 難 (Difficult)). Due to a few of the participants' preference in simplified Chinese characters, a simplified version of stimulus was created by converting the word list from traditional characters into simplified characters.

2.3 Variables

The independent variables in the study are as follows: 1) bilingual status: (early, late), 2) Age of arrival (numbers), and brain lateralization (left hemisphere, right hemisphere). The words appeared on the left would be considered as right hemisphere advantage (RHA). The words appeared on the right would be considered as left hemisphere advantage (LHA). The dependent variables are accuracy and reaction time. Accuracy was measured in percentage (%), and the reaction time would be measured in seconds (s). Accuracy was calculated based on the amount of correctness divided by 60. For instance, in a block, if a participant gets 30 items correct out of 60, then his/her accuracy would be 50 %. Reaction time would be measured by a stop watch; it is the time measured within the presence of the stimulus and the onset of the response by the participant.

2.4 Procedure

The divided visual techniques examined the lateralization of the brain functions. That is, in this study it is to see which hemisphere is more dominant in processing English, Mandarin Chinese, or both. Therefore, as mentioned before, two blocks have been created to evaluate this issue. By using Microsoft PowerPoint, we placed a word on either the left side or the right side, and the word will expect to flash by quickly within 0.05 seconds. To do this, we use the built-in animation function to let the word flash quickly on either right or left.

The 16 participants completed all of the experiments individually in school library, school cafeteria, or the researcher's home. Within the experiment, there are two English blocks and two Mandarin Chinese blocks. If the subjects received particular stimulus in English, then they would have to report what they have seen from the screen.

The subjects were seated in front of a computer with the stimulus displayed on the screen. The instruction was explained by the experimenters and displayed on the screen. The experimenters informed the participants what they had to do when they saw a work flashed by quickly on either left or right. Then, the participants would have to call out the words appeared.

The participants would complete one practice trial. During the first trial, correction was provided if the participants did not follow the correct procedure. When the participants were ready to go, numbers would appear in the center of the screen to count down. Following that, the stimulus would appear in 50 milliseconds on the right hand side or on the left hand side. One of the researchers would have to record the responses from the participants, and the other two would have to measure the reaction time by a stopwatch and click the slides. The following is the sample screen that the participant would see if they were in the experiment:

Figure 1—Sample stimulus procedure for English block

3 Results

The results were calculated on the basis of the number of accurate responses made by the 16 subjects. The following tables (1 and 2) show the rate of accuracy and the reaction time from these bilingual subjects.

Table 1 shows the results from the present word identification experiments; it shows that early bilinguals have 76% average rate of accuracy if Chinese word stimuli were presented. Also, early bilinguals have 77% accuracy rate for RHA

(Right Hemisphere Advantage) and 76% for LHA (Left Hemisphere Advantage). Hence, there is no clear lateralization for early bilinguals because the difference between RHA and LHA is 1%. On the same manner, late bilinguals have 81% average rate of accuracy then 79% for RHA and 84% for LHA. Moreover, the average reaction time for early bilinguals is slower than late bilinguals, which are 0.909 second and 0.776 seconds. The reaction time for RHA of early bilinguals is 0.971 and for LHA is 0.841, which is 0.13 seconds difference. For the late bilinguals the reaction time for difference brain lateralization is 0.793 seconds are for RHA and 0.758 for LHA.

Table 1 – Accuracy rate (in %) and Reaction time (in seconds) in Chinese

Chinese - Accuracy				Chinese – Reaction Time		
	Average	RHA	LHA	Average	RHA	LHA
Early	76%	77%	76%	0.909 s	0.971 s	0.841 s
Late	81%	79%	84%	0.776 s	0.793 s	0.758 s

Table 2 finalizes the results from the English portion of the recognition task. It can be seen that generally early bilinguals performed better than late bilinguals in terms of the average accuracy (71%>49%) and the average reaction time (0.821 s < 1.313). In terms of hemispheric advantages, it can be seen that early bilinguals have better LHA than RHA, which are 78% and 65 % respectively. Similarly, for reaction time, early bilinguals have faster LHA than RHA, which are 0.815 s and 0.827 respectively. Moreover, although late bilinguals performed lower than early bilinguals, which, in average only 49 % for accuracy and 1.313 for the reaction time, late bilinguals also displayed some hemispheric differences in processing English. For accuracy, LHA is 51%, whereas RHA is 48%. For the reaction time, LHA is 1.193 s, but 1.571 s.

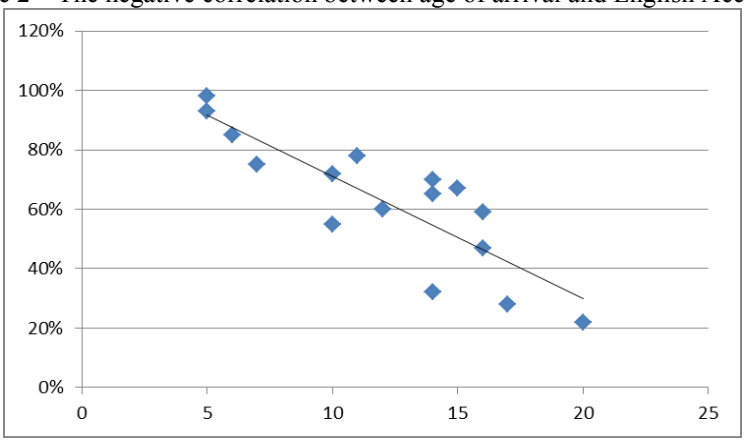
Table 2 –Accuracy rate (in %) and Reaction time (in seconds) in English

English - Accuracy				English – Reaction Time		
	Average	RHA	LHA	Average	RHA	LHA
Early	71%	65%	78%	0.821 s	0.827 s	0.815 s
Late	49%	48%	51%	1.313 s	1.571 s	1.193 s

The relationship between language proficiency and age of arrival is also of our interest; therefore, we have run a simple ANOVA regression analysis to see whether these early arrivals have the advantages of English. Table 3 has provided a clear view of the regression relationship. It is clear that the there is a

negative correlation between age of arrival and the English accuracy rate. This suggests that the earlier a participant arrived in Canada, the better they did on the English word identification task. Such relationship has been represented in Figure 2 below. We would like to further analyze our data; however, because we only have limited knowledge of statistical analysis, we were not able to further interpret the results extracted from Microsoft Excel. If any academic researchers are interested in the data, we open to any suggestion and would love to provide the original data for future studies.

Figure 2 – The negative correlation between age of arrival and English Accuracy



4 Discussion

From the results of the present research, we are able to conclude that early bilinguals who had arrived in Canada before the 7th grade would generally have better accuracy rate and faster decision time at the word recognition tasks using the divided visual field technique. This suggests that age of arrival may affect the processing of the second language spoken by either early and late bilinguals. One of the reasons explaining this situation is that the brain plasticity of early bilinguals has not been fossilized yet. Unlike the late bilinguals, their age of arrival in the English-speaking country was late, so it is possible that their brains have lost the plasticity to acquire the native-like input; hence, their attention to the English stimuli was slower in comparison to the early ones. On the other hand, while early bilinguals were acquiring English, they could still be able to develop their L1- Mandarin Chinese and L2 –English at the same time. This is probably the reason why the early bilinguals' accuracy to the English and Chinese stimuli does not expose large differences.

Table 3 – Simple Regression Analysis

Regression Statistics	
Multiple R	0.889653098
R Square	0.791482634
Adjusted R Square	0.774106187
Standard Error	0.11268634
Observations	16

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.578392895	0.578393	45.54916	2.04681E-05
Residual	15	0.152378533	0.012698		
Total	16	0.730771429			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.149850292	0.082901709	13.87004	9.48E-09	0.969222985	1.330477598	0.969222985	1.330477598
Age of Arrival	-0.045328597	0.006716331	-6.74901	2.05E-05	-0.059962224	-0.030694969	-0.059962224	-0.030694969

Also, due to previous theories claiming that early bilinguals' ability of acquisition was not biologically blocked while acquiring the second language, which is consistent with the previous study (Kuhl, Tsao & Liu, 2006), they were able to use their intuition to make faster decision than late bilinguals for the word recognition task even if the words were flashed at a very fast speed.

In terms of hemispherical differences, consistent with past studies, it is highly possible that the early bilinguals process both languages bilaterally. (Hull & Vaid, 2007) However, at this stage, we are unable to conclude that the bilinguals only have left hemispheric advantages while recognizing the words in both languages. It is because, on one hand, the late bilinguals' behavioral performance of the English and Mandarin Chinese tasks are apparently not consistent in comparison to the early bilinguals. This means that the late bilinguals do not resemble the early bilinguals' processing speed and accuracy. On the other hand, for these late bilinguals, having the left hemispheric advantage of processing languages does not deny the possibility of the other side. There might be other factors that affect the results of the study. Future research might have to make use of the functional imaging techniques to examine the exact locations where the language is being processed in the bilinguals' brains.

Interestingly, we have found a negative correlation between age of arrival and the English language proficiency. Consistent with the study done Flege, Munro, MacKay in 1995, the behavioral performance of the bilinguals' English in the present study highly resembles the degree of accented English speech rated by the native speaker of English. This may suggest the possibility of interconnection between speech intelligibility and language performance. Future studies may go toward the direction for examining the relationships between language performance, hemispheric difference, and accents.

5 Conclusion, Limitation and Future Direction

In the current study, there are several limitations that should be acknowledged. First of all, with respect to the experimental design, due to lack of programming knowledge, it is hard for us to come up with a well-developed program to test our hypothesis. Instead, a simple Powerpoint slideshow has been used. There have been several disadvantages while we were running the slideshow: first, the computer might be frozen unexpectedly. Secondly, the words might not align very well. Thirdly, there might be lack of precision in calculating the presence time of stimuli. Thus, to minimize the problem, we used the same computer (laptop) all the way through.

Also, regardless of the technical difficulties, the testing environment might not be consistent. The experiment was conducted in several random places, such as school cafeteria, silent library rooms, or the participants' room. It was because it is hard to ask all the 25 participants to come to the laboratory for the short

experiment. Therefore, the environment might be the issue that affects our reliability of the study.

Finally, the stimuli chosen for the study were not controlled. That is, although for English, 3-letter words are chosen, it was hard for us to make sure if all the bilingual subjects know the stimuli presented. For Mandarin Chinese, some rare words were chosen for the experiment; so, it might be the factor that lowers the accuracy of our results. Especially for early bilinguals, few words were not frequently seen in daily life, and that might be the confounding factor why early bilinguals scored lowered in Mandarin Chinese. Although this is the case, we found that there were only 2 Chinese words that are not commonly seen, so hopefully this still keeps the reliability of our study.

In conclusion, we have found that the early bilinguals tend to process both languages bilaterally; however, at the stage, we are unable to firmly conclude the interrelationship between accuracy, reaction time, and hemispheric advantages without using the neuroimaging techniques. Interestingly, from our study, we found that there is a negative correlation between accuracy and age of arrival, which may shed light on the theory of critical period. Although there are some methodological flaws, we are still open to any academic research suggestions and future research possibilities.

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A Unified Analysis of Blackfoot *it-*[*]

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1 Introduction

This paper addresses the syntax and semantics of the prefix *it-*, which is pervasive in the grammar of Blackfoot.[1]

(1) N-it-ít-ooyi ann-yi itáísooyo'pi.
1-*it*-*it*-eat DEM-INAN table
"I ate at the table."

The first instance of *it-* in (1) is part of the pronominal subject, and the second licenses the locative expression "at the table." The question addressed in this paper is whether the different instances of *it-* are homophones or the same lexical item whose contribution depends on its morphosyntactic environment. The view argued for is the latter, that *it-* is a single lexical item, and specifically that *it-* is a Determiner whose semantic contribution is spatiotemporal domain restriction. Further, I argue that variation in the behaviour of *it-* is not inherent to the lexical item itself, but rather, arises as a consequence of the type of expression that it associates with, which may be a person, location or time.

2 Two Different Lexical Items?

Reference works on Blackfoot identify two different *it-* forms in the grammar, a pronominal form and a preverbal form (e.g. Frantz 2009).

2.1 Pronominal *it-*

Pronominal *it-* is typically not considered an independent morpheme, but part of the paradigm of long-form proclitics:

(2) a. Nít-ihpiyi.
1-dance
"I danced."

b. Kít-ihpiyi.
2-dance
"You danced."

c. …ot-ihpíyi-hsi
3-dance-CONJ
"…(when) s/he danced"

As shown in (2), proclitics mark the grammatical subject on verbs, and they also mark the possessor on nouns. In certain morphosyntactic contexts, *it-* is absent from the proclitics and the short form proclitics are used instead:

(3) a. n-ínsst-wa
1-sister-PROX
"my sister"

b. k-ínsst-wa
2-sister-PROX
"your sister"

c. w-ínsst-yi
3-sister-OBV
"his/her sister"

The proposal advocated for in this paper is that the long-form proclitics can be decomposed into two meaningful parts: the same person marker that constitutes the short-form proclitics plus an independent morpheme *it-*. The two series of proclitics, with their proposed morphological composition are given in Table 1.

Table 1 Long and short form proclitics

	1st	2nd	3rd
long form	*n-it-*	*k-it-*	*w-it- ⌈ot-⌋*[2]
short form	*n-*	*k-*	*w-*

2.2 Preverbal *it-*

Frantz (2009) classifies *it-* as a "linker," a preverbal element that specifies the oblique grammatical relation of a nominal expression. The relation specified by *it-* can be either locative or temporal. Regarding the former, VPs modified by an overt[3] locative expression require preverbal *it-*, as shown in (4).

(4) a. Yáák-*(it)-ipsst-ii-ooyi-wa om-yi ksikokóóyiss.
FUT-*it*-inside-PST-eat-PROX DEM-INAN tent
"S/he ate in that tent."

With overt temporal expressions, *it-* is optional. When used, *it-* gives the temporal expression a flavour of specificity or boundedness.

(5) An-wa Anna (it)-isttóhkohpii matónni.
DEM-PROX A (*it*)-fall.down yesterday
"Anna fell down (at a certain time) yesterday."

3 Unifying *it-*

I propose that the pronominal and preverbal uses of *it-* are not instances of homophony, but rather, instances of the same lexical item associating with different syntactic categories. More specifically, I claim that *it-* has the syntactic category of a Determiner (D) and that it can associate with arguments denoting persons, locations, or times.

The historical development of pronominal and preverbal *it-* respectively supports the hypothesis that they are a single lexical item in the synchronic grammar. According to Proulx (1989), the long and short forms of the Blackfoot proclitics reconstruct to the following two sets of Proto-Algonquian prefixes:

(6) a. **net-* (1st)
**ket-* (2nd)
**wet-* (3rd)

b. **n-* and **w-*
**k-*
**w-*

(Proulx 1989)

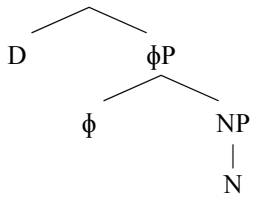
The short form proclitics were much more restricted in their distribution in Proto-Algonquian than in contemporary Blackfoot, appearing only in the context of inalienable possession. Unlike the proclitics, preverbal *it-* has undergone significant sound change and reconstructs to Proto-Algonquian **eɬ-* (Proulx 1989). My proposal is that the compositionality of the proclitics in Blackfoot results from reanalysis following phonological merger. Specifically, once the preverb *it-* became indistinguishable from the *–it-* of the long-form proclitics, the proclitics were reanalysed as bimorphemic, consisting of *n-/k-/w-* plus *it-*. This reanalysis led to a redistribution of the long and short forms conditioned by the syntax and semantics of *it-*.

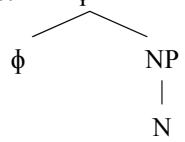
4 Pronominal *it-* is a Determiner

In this section, I present evidence that pronominal *it-* is a Determiner that provides spatiotemporal domain restriction. The analysis is a summary of proposals developed by Bliss and Gruber (2011).

4.1 The syntax of pronominal *it-*

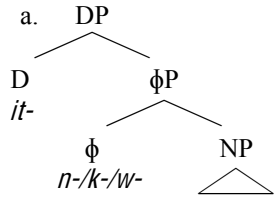
The point of departure for the analysis is Déchaine and Wiltschko's (2002) claim that proforms can be morphosyntactically complex and vary in their categorical status. We assume the structures in (7) as possible representations of proforms.

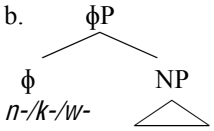
(7) a.


b.


c.


Regarding the Blackfoot proclitics, we analyse the long form proclitics as morphologically complex pro-DPs with the structure in (7a), and the short form proclitics as morphologically simplex pro-ϕPs with the structure in (7b). We assume that, in both forms, *n-/k-/w-* functions as a marker of person, and as such, is merged as a ϕ head. In the long forms, *it-* is merged as a D head, and the person marker *n-/k-/w-* is linearized[4] to precede *it-*. This is depicted in (8).

(8) a. 

b. 

Evidence for the categorical status of the long and short form proclitics comes from their binding-theoretic properties. Following Déchaine and Wiltschko (2002), we assume that pro-ϕPs, but not pro-DPs, can function as bound variables. The prediction, then, is that if *it-* is a D head, then the short but not the long form proclitics can behave as bound variables. This prediction is borne out.

(9) Nit-ikáákomimm-a n-iksísst-wa ki anna Apánii ni'tóyi.
1-love-1:3 1-mother-3 & DEM A. be.same
"I love my mother and Apanii does too."
✓STRICT → A. loves my mother
✓SLOPPY→ A. loves her own mother

(10) Nit-ikááhsi'tsi-'p nit-ipisátsskitaan-yi ki anna Apánii ni'tóyi.
1-like-1:INAN 1-cake-INAN & DEM A. same
'I like my cake and Apanii does too."
✓STRICT → Apanii likes my cake
*SLOPPY → not: Apanii likes her own cake.

In (9), the short form proclitic functions as the possessor in the matrix clause and both the strict and sloppy readings of the pronoun are available. In (10), however, the long form proclitic is used, and here the sloppy reading, in which the pronoun is interpreted as a bound variable, is ruled out. This supports the conclusion that the long-form proclitics are pro-DPs, with a D head *it-*.

4.2 The semantics of pronominal *it-*

We adopt Gillon's (2006, 2009) claim that the core semantic function of D is to restrict the domain of entities to a contextually salient subset. Regarding the proclitics, this would entail *it-* providing domain restriction over the person(s) denoted in ϕP. However, personal pronouns, especially first and second person, refer to salient individuals. Our claim is that domain restriction over persons involves picking out contextually salient stages, whereby STAGE refers to a temporal slice of an individual, or an individual at a given time (to be distinguished from an individual in their maximal temporal extendedness) (Musan 1995, cf. also Carlson 1980). Thus, whereas the short form proclitics are temporally unrestricted, the long form proclitics are temporally restricted by *it-*,

and refer to a stage of a person, or a person at a point in time. The prediction, then, is that the short and long form proclitics should show distributional differences conditioned by temporality. This prediction is borne out; the short but not the long forms are found in temporally-unbounded morphosyntactic contexts, such as inalienable possession and perfect predicates.

First regarding inalienable possession, we consider this to be a non-transitory relation between two entities, which holds at all times irrespective of context. As such, it is temporally-unbounded, and as predicted, requires the short form proclitic possessor, as in (11). Conversely, alienable possession can be thought of as a transitory relation, dependent on a specific context at a specific time, and as predicted, it requires the long form proclitic possessor, as in (12).

(11) a. n-iksísst-wa
1-mother-PROX
"My mother"

b. *n-it-iksísst-wa
1-*it*-mother-PROX
intended: "My mother"

(12) a. *n-ááattsistaa-m-wa
1-rabbit-POSS-PROX
intended: "My rabbit"

b. n-it-ááattsistaa-m-wa
1-*it*-rabbit-POSS-PROX
"My rabbit"

Interestingly, inalienable relations can be coerced into alienable ones via *it-*, lending further support to the claim that *it-* contributes temporal restriction.

(13) a. amo n-o'tokáán
DEM 1-hair
"my (own) hair"

b. amo n-it-w-o'tokáán
DEM 1-*it*-3-hair
"my (clipping of his) hair"

Turning now to the perfect, we assume that perfect tense asserts the existence of a time interval that precedes the utterance time (von Stechow 1999; Iatriadou et al 2002) and denotes that the eventuality denoted by the predicate is contained within this time interval and has current relevance to the subject (McCoard 1978). As such, the property denoted by the perfect predicate can be considered an I(ndividual)-level property, permanently attributed to the individual denoted by the subject. As an I-level property, the perfect predicate is temporally unbounded, and as predicted, it is ungrammatical with the long-form proclitics.

(14) a. K-ikáá-yo'kaa.
2-PERF-sleep
"You have slept."

b. *K-it-ikáá-yo'kaa.
2-*it*-PERF-sleep
intended: "You have slept."

To summarize, I have shown in this section that the long and short form proclitics are categorically distinct; the short forms are pro-ϕPs and the long forms are pro-DPs. Under this analysis, *it-* functions as a D head that provides

domain restriction by picking out the contextually relevant stage(s) of an individual. In the following section, I extend this analysis to preverbal *it-*.

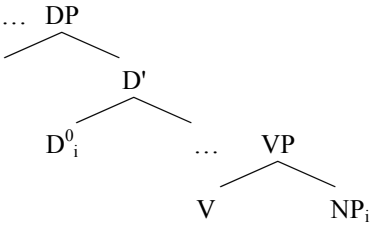
5 Extending the Analysis: Preverbal *it-* is a Determiner

In this section, I argue that, like pronominal *it-*, preverbal *it-* has the syntax and semantics of a Determiner that provides spatiotemporal domain restriction.

5.1 The syntax of preverbal *it-*

The role that preverbal *it-* plays in licensing spatiotemporal arguments suggests that *it-* is a Determiner. Unlike determiners in English, which are typically string-adjacent to the NPs they associate with, preverbal *it-* appears within the verbal complex and associates with a spatiotemporal expression outside the verb. I adopt Sportiche's (1998) "partitioned-DP" hypothesis as a way of modelling this. One of the main insights behind this theory is that selectional restrictions on arguments are based on lexical properties of nouns, rather than those of functional heads such as determiners. Based on this, Sportiche proposes that NPs, not DPs, occupy theta positions, and that the D heads that associate with NPs appear within the extended verbal projection, akin to AGR heads.

(15)



(Wiltschko 2002)

This model is appealing for a polysynthetic language like Blackfoot, which has extensive verb morphology and pro-drop. Wiltschko (2002) motivates this theory as an alternative to Baker's (1996) account of polysynthesis in Mohawk, and Johns (2008) extends it to *wh*-question phenomena in Algonquian. Extending this, I propose that verb agreement occupies D with thematic arguments in Blackfoot.

Further, I propose that, whereas with thematic arguments, agreement occupies D, with spatiotemporal arguments, *it-* occupies D. One piece of evidence for this comes from the complementarity of *it-* and verb agreement (Bliss 2007). Nominal expressions licensed by *it-* cannot control verb agreement.

(16) Nit-ít-itap-ohkipistaa(*-t-a-wa) k-íksisst-(w)a.
1-*it*-toward-drive.a.team-(*TA-1:3-PROX) 2-mother-PROX
"I drove (a team of horses) to your mother."

5.2 The semantics of preverbal *it-*

I argue that, like its pronominal counterpart, preverbal *it-* contributes domain restriction. More specifically, *it-* restricts the spatiotemporality of the eventuality denoted by the predicate to a contextually salient place or time. In a general sense, it restricts the eventuality to a ***stage***, or locates the eventuality at a bounded place or time, as shown in (17) and (18).

(17) a. Nit-(*it)-ááhksa-issaot-ooyi.
1-always-outside-eat
"I always eat outside."

b. Nit-*(it)-ááhksa-issaot-ooyi anna w-ookóówa-yi.
1-*it*-always-outside-eat DEM 3-house-INAN
"I always eat outside, at his place."

In (17a), a spatial expression –*issaot-* "outside" appears within the verbal complex, but *it-* is ungrammatical. My claim is that the ungrammaticality of *it-* results from the fact that the location is unbounded; it has no boundaries. In (17b), on the other hand, the expression *ánna ookóówayi* "at his place," provides spatial boundaries for the event, and here *it-* is not only grammatical but required. Similarly in (18), *it-* provides temporal boundaries for the event, restricting it to a contextually-salient time yesterday.

(18) An-wa Anna (it)-isttóhkohpii matónni.
DEM-PROX A (*it*)-fall.down yesterday
Anna fell down (at a specific time) yesterday."

6 Locative versus Temporal *it-*

The behaviour of *it-* varies depending on whether it is used with locative or temporal reference. This is analysed as a predicted consequence of the inherent difference between locative and temporal arguments.

6.1 Locative *it-*

As noted, when used with spatial reference, *it-* requires an overt locative expression. The data in (19) and (20) clearly illustrate this.

(19) a. Nit-(*it)-ááhksa-sstss-ihkitaa.
1-always-over.fire-cook
"I always cook over a fire."

(20) a. Nit-*(it)-ááhksa-sstss-ihkitaa pakóyittsi.
1-*it*-always-over.fire-cook fire
"I always cook over a fire."

In (19), an adverbial prefix on the verb –***sstss***- "over fire," provides a spatial coordinate for the event, but *it-* is ungrammatical. In (20), an overt nominal expression *pakóyittsi* "fire" is added to the sentence, and *it-* is required for the locative reading of the nominal.

The nominal expression need not be specific; (21) shows that *it-* can refer to non-specific locations.

(21) Nit-íkssta nit-ááhk-it-ipsst-yo'kaa-hsi ksikokóówa-yi.
1-want 1-NONFACT-*it*-inside-sleep-CONJ tent-INAN
"I want to sleep in a tent."
✓WIDE SCOPE READING: *There is a tent I want to sleep in.*
✓NARROW SCOPE READING: *I want to sleep in some tent.*

Arguably, even when the locative expression associated with *it-* is non-specific, it still provides spatial boundaries. For example, in (21), the sleeping event is not spatially unbounded, but takes place within the boundaries of a tent.

6.2 Temporal *it-*

Unlike its distribution with locative reference, *it-* is optional with predicates modified by a temporal expression. The precise contribution of *it-* with temporal expressions is somewhat difficult to characterize, but as a first pass, it seems to pick out a specific interval within the temporal expression, or bounds the event to exactly the time referenced by the temporal expression. This is shown in (22).

(22) a. Ann-wa Leo á-yo'kaa matónni.
DEM-PROX L IMPF-sleep yesterday
'Leo slept yesterday."

b. Ann-wa Leo it-á-yo'kaa matónni
DEM-PROX L *it*-IMPF-sleep yesterday
"Leo slept (at a certain time) yesterday"
OR "Yesterday was when Leo slept."

There are a number of distributional facts that support the idea that *it-* contributes boundedness or specificity when used with temporal reference. First, grammatical constructions and/or discourse contexts that specifically make reference to the time of an eventuality require *it-*. Two examples of such contexts are given below. In (23), the time of the event is questioned and the

answer requires *it-*. In the (24), an eventive predicate is embedded under the demonstrative predicate *ánnikayi* "that is when," and *it-* is again required.

(23) Q: Tsá anistsíí itsistóóhkohpiiwáátsiks?
"When did s/he fall down?"

A: Matónni *(it)-istóóhkohpii.
yesterday *it*-fall.down
"S/he fell down yesterday."

(24) Ánnikayi *(it)-á-yo'kaa (kíipo)
that.is.when *it*-IMPF-sleep (ten)
"That's when he sleeps, (at 10)."

A second observation regarding temporal *it-* involves its use with stative predicates. Here, *it-* picks out the beginning or the endpoint of the state, yielding either an inchoative or result-state reading.

(25) a. Ann-wa Beth iik-ók-i'taki matónni.
DEM-PROX B. INTS-bad-feel yesterday
"Beth was really mad yesterday."

b. Ann-wa Beth it-iik-ók-i'taki matónni.
DEM-PROX B. *it*-INTS-bad-feel yesterday
"Beth got really mad yesterday."

(26) a. Ii-síksinattsi ísspoohtsi (nisó-o'takohssin).
IC-be.dark sky (four-hour)
"The sky was dark (for four hours)."

b. It-siksinattsi ísspoohtsi (natóki-o'takohssin)
it-be.dark sky (two-hour)
"The sky got dark (in two hours)." (Meagan Louie, p.c)

In the (b) examples, *it-* appears on the verb and functions to pick out a specific time, the beginning or the end of the duration during which the state holds.

The final distributional fact regarding temporal *it-* involves its use with negation. The generalization is that *it-* must scope over negation. This is observed by comparing the distribution of *it-* with two negative prefixes, *máát-* (clausal negation) and *sa-* (predicate negation), cf. Louie (2007). With the former, *it-* is ungrammatical, but with the latter, *it-* is required.

(27) a. Nit-máát-(*it)-oowaata oma mamíí nátoki-ksistsikóyi-istsi.
1-NEG-eat DEM fish two-day-PL
"I didn't eat that fish for two days"
(It is not the case that I ate that fish for two days)
Context: I would never eat the same meal for any two days

b. Nit-*(it)-sa-óówaata oma mamíí nátoki-ksistsikóyi-istsi.
1-*it*-NEG-eat DEM fish two-day-PL
"I didn't eat that fish for two days"
(There were two days for which I didn't eat that fish)
Context: I took medication that prevented me from eating a fish I caught for two particular days.

As is clear from the paraphrases and contexts of use for the sentences in (27), only when the temporal expression scopes over negation and as a result refers to a specific time, can *it-* be used grammatically.

6.3 Time arguments versus locative expressions

As we've seen, the distribution of *it-* varies depending on whether it has locative or temporal reference. When used with locative reference, *it-* requires an overt nominal expression, but when used temporally, *it-* necessarily refers to a specific or bounded time. How can this asymmetry between locative and temporal uses of *it-* be accounted for? I claim that the asymmetry falls out from a distinction between locative versus temporal arguments. Note that, regardless of whether *it-* is used with locative or temporal reference, it consistently provides domain restriction. Locative *it-* contributes domain restriction by licensing an otherwise illicit locative expression that provides spatial boundaries for the eventuality denoted by the predicate. Temporal *it-* contributes domain restriction by defining the boundaries within the temporal parameters of the eventuality.

It seems, then, that the spatial parameters of an eventuality require explicit definition (via an overt locative expression, in the case of Blackfoot), but temporal parameters are inherent to the eventuality itself. To capture this difference between spaces and times, I appeal to the idea that the semantic make-up of a predicate includes an abstract time argument (cf. Musan 1995, 1999). This time argument supplies the temporal parameters (the domain), which is subject to be bounded (/restricted), via *it-*. Crucially, I assume that predicates do not encode an abstract location argument, but rather, that spatial parameters are defined by discourse context and/or grammatical expressions that make reference to location.

This distinction between the semantic encoding of temporal versus spatial parameters provides us with a model to capture the differences between the temporal versus locative uses of *it-*. Specifically, when *it-* is used with temporal

reference, it is associated with the abstract time argument (cf. Gruber 2011), but when it is used with locative reference, there is no abstract location argument with which it can associate, so *it-* is associated with the locative expression itself. This accounts for the asymmetric distribution of *it-* with locative versus temporal reference. Locative *it-* requires an overt expression to provide spatial parameters for domain restriction, whereas temporal *it-* can restrict the domain of the temporal parameters provided by the abstract time argument.

Consistent with the idea that domain restriction differs for temporal versus locative arguments is the observation that the two types can co-occur, and when they do, they seem to function independently, rather than providing a single spatiotemporal boundary for the eventuality denoted by the predicate:

(28) (Matónni) it-it-istóóhkohpiiyi omi otsitawááwaahkahpiyaa.
yesterday *it-it-*fall.down DEM playground
"(Yesterday/that) was when s/he fell down at the playground."

In (28), preverbal *it-* appears twice on the verb, once to restrict the temporal domain, and once to restrict the spatial domain.

7 Conclusion

I have argued in this paper that the two distinct uses of Blackfoot *it-*, pronominal *it-* and preverbal *it-*, are not homophones, but rather a single lexical item. More specifically, I have claimed that *it-* has the syntactic category of a Determiner (D) and that it has the core semantic property of Determiners, namely domain restriction. Domain restriction, in this context, is spatiotemporal; the function of *it-* is to pick out a contextually salient *stage* (place or time) of an individual or eventuality. Variation in the distribution of *it-* arises from what it associates with. Pronominal *it-* associates with individuals, whereas preverbal *it-* associates with either the abstract time argument or an overt locative expression.

Notes

* Blackfoot is an endangered Algonquian language spoken by <10,000 people in Southern Alberta and Montana. Many thanks to Rachel Ermineskin and Beatrice Bullshields for sharing their language with me, as well as Bettina Gruber, Meagan Louie, Hotze Rullmann, Sonja Thoma, James Thompson, and Martina Wiltschko for insightful discussion on this project. All errors are my own.

[1] Unless otherwise cited, data are from the author's fieldwork with native speakers of the Siksiká and Kainá dialects. Abbreviations are as follows: 1,2,3 = 1st, 2nd, 3rd person; AI = animate intransitive; CONJ(unct); DEM(onstrative); FUT(ure); HORIZ(ontal surface); IC = initial change; IMPERS(onal); IMPF = imperfective; INAN(imate); INTS = intensive; NEG(ation); NOM(inalizer); NONFACT(ive); PERF(ect); PL(ural); POSS(essive); PRN = pronoun; PROX(imate); SG = singular; TA = transitive animate.

[2] The surface realization of /w+it/ as [ot] is the result of regular phonological process (Frantz 2009).

[3] In this context "overt … expression" refers to nominal (or nominalized) expressions that are not incorporated into the verbal complex.
[4] It is still unclear what mechanism accounts for the linearization of long forms. A possible solution is local dislocation at PF in the sense of Embick and Noyer (2001).

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Emotive Content, Scope, and Donkey Demonstratives

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1 Introduction

1.1 Stress and Coreference

As was pointed out by Akmajian and Jackendoff (1970), stress on a pronoun can have a profound effect on its reference (and coreference). The starting point of this paper is the symmetrical effect of this stress on the coreference of pronouns, definite descriptions, and demonstrative determiners. As seen in (1), stress on these elements forces disjoint reference.[1]

(1) Jack$_i$ kissed Mary.

a. I hate him$_i$	d. I hate HIM$_{\#i/j}$	(pronoun)
b. I hate the creep$_i$	e. I hate the CREEP$_{\#i/j}$	(definite)
c. I hate that creep$_i$	f. I hate THAT creep$_{\#i/j}$	(demonstrative)

But an asymmetry arises in the case of stress on the nominal complement of a demonstrative determiner. Unlike the cases in (1), stress on the nominal of a complex demonstrative does not force disjoint reference, (2).

(2) Jack$_i$ kissed Mary. I hate that JERK$_i$.

I will refer to these cases as *stressed demonstrative nominals*, or *SDNs*.

1.2 Stress and binding

Much like the coreference paradigm seen in (1), stress on pronouns, definite descriptions, and demonstrative determiners disallows a bound variable interpretation in the scope of a quantifier, (3).

(3) Every student$_i$ was so disorganized that ...

a. she$_i$ failed the class.	d. SHE$_{*i/j}$ failed the class.
b. the idiot$_i$ failed the class.	e. the IDIOT$_{*i/j}$ failed the class.
c. that student$_i$ failed the class.	f. THAT student$_{*i/j}$ failed the class.

Surprisingly, in this case the asymmetry between SDNs and other definite DPs disappears. Stress on pronouns, definites, and demonstrative nominals alike precludes a bound variable reading, (4).

(4) Every student$_i$ was so disorganized that that IDIOT$_{*i/j}$ failed the class.

These observations bring us to the central puzzle of this paper. Given that stress on the nominal of a demonstrative does not generally require disjoint reference, as in (2), why is disjoint reference required when the there is a potentially binding quantifier, as in (4)?

The paper is organized as follows: Section 2 shows that this stress is not a case of focus and points out theoretical and interpretational issues with treating it as such. Section 3 looks back at our original puzzle and brings to bear data from donkey-anaphora. Section 4 provides an analysis of stressed demonstratives in terms of *expressive indices* (Potts 2007) and Section 5 concludes.

2 Emphatic Stress is not Focal Stress

Many cases of stress in the literature are instances of focus (see e.g. Jackendoff 1972; Rooth 1985; Selkirk 1995; Schwarzschild 1999). In this section, however, I demonstrate that the stressed demonstrative nominals we are concerned with are not instances of focus. We first turn to general interpretive considerations and then to undesirable theoretical consequences of treating SDNs as a case of focus.

A more accurate generalization concerning coreference and focal stress than that given in the introduction is that such stress implicates the negation of contrasting propositions. In the (b) continuation of (5), but not the (a) continuation, the pronoun *him* has a focal stress.

(5) John$_i$ is not coming.
   a. Megan spoke to him$_i$ at the theater.
   b. #Megan spoke to HIM$_i$ at the theater.

The inference, in the focused case, is that there is some other salient individual that Megan did not speak to at the theater. The # judgment reflects some difficulty supporting this inference in a null context, but such coreference becomes acceptable when a contrast is explicitly expressed, as in (6).

(6) John$_i$ and Mary$_j$ aren't coming.
   a. Megan spoke to HIM$_i$ at the theater and HER$_j$ in the park.

Focal stress on the demonstrative determiner is much the same, (7).

(7) John$_i$ is not coming.
   a. Megan spoke to that jerk$_i$ at the theater.
   b. #Megan spoke to [THAT jerk]$_i$ at the theater.

Here the the inference is that there is a salient contrasting individual, who is a jerk, that Megan did not speak to.[2]

But with the stressed demonstrative nominal in (8) there is no inference of a negated alternative, there is no contrast in reference. Instead there is an inference that the speaker is really upset with John.

(8) John$_i$ is not coming.

a. Megan spoke to that JERK$_i$ at the THEater [3]

As to theoretical implications, consider the influential theory of accent placement from Schwarzschild (1999). On Schwarzschild's theory an entity-denoting utterance counts as given if and only if it has a coreferential antecedent. The placement of F-marking in Schwarzschild's system is determined largely by two competing ranked constraints, GIVENness, and AvoidF:

GIVENness:	If a constituent is not F-marked it must be GIVEN
AvoidF:	F-mark as little as possible without violating GIVENness

A key observation about SDNs is that they can be coreferential, on which reading they certainly count as given. F-marking of coreferential SDNs will never be necessary to satisfy GIVENness, and will universally be less optimal than omitting such F-marking.

These considerations strongly support the claim that the stress on SDNs is not an instance of focus. In Section 4 I present a proposal to treat this stress as a context changing operator in line with Potts (2007), but first we turn to the effect of stress on donkey anaphora.

3 Donkey Anaphora

Recall the puzzle from section 1: Why is it that, while stress on the nominal of a demonstrative does not generally require disjoint reference, (9), the same stress *does* require disjoint reference in the presence of a potentially binding quantifier, (10)?

(9) Jack$_i$ kissed Mary. I hate that JERK$_i$.

(10) Every student$_i$ was so disorganized that that IDIOT$_{*i/j}$ failed the class.

Here I bring evidence to bear on this question from donkey anaphora, a class of examples which share properties with both the bound-variable and discourse anaphoric cases (see e.g. Lewis 1975; Heim 1990; Elbourne 2005).

In donkey sentences an anaphoric element co-varies not with a quantified antecedent, but with an antecedent dependent on a quantified element. In (11) we see that a pronoun, a definite description, and a complex demonstrative can be

donkey anaphoric elements. The antecedent in this case is the indefinite NP *a senator* within the relative clause. This indefinite NP in turn is dependent on the quantified subject, in that the identity of the senator varies depending on the intern under question. In this way the reference of the anaphoric element co-varies with the identity of the intern in question.

(11) Every intern who works for a senator$_i$ ...
  a. ends up disliking him$_i$.
  b. ends up disliking the creep$_i$.
  c. ends up disliking that creep$_i$.

Just as with coreference, (1), and binding, (3), stress on pronouns, definite descriptions, and demonstrative determiners blocks the covarying donkey-anaphoric interpretation.

(12) Every intern who works for a senator$_i$ ...
  a. ends up disliking HIM$_{*i/j}$.
  b. ends up disliking the CREEP$_{*i/j}$.
  c. ends up disliking THAT creep$_{*i/j}$.

In the donkey sentences another asymmetry emerges. Just as the other stressed DPs, SDNs are blocked from covarying in donkey sentences. But they *can* be coreferential with their antecedent so long as that antecedent takes wide scope,(13).

(13) Every intern who works for a senator$_i$ ends up disliking that CREEP$_i$.

On this reading of (13) all of the interns under discussion work for the same senator.[4]

(14) $\exists x.\ x$ a senator. $\forall y.[y$ an intern & y works-for $x] \rightarrow y$ ends-up-disliking x.

Interestingly the same pattern arises when the demonstrative nominal is modified by an expressive adjective as in (15).

(15) Every intern who works for a senator ends up disliking that fucking creep.

Here, even without stress on the demonstrative nominal we get co-reference only when the indefinite scopes high, the demonstrative cannot covary. We can also now be sure that the restriction on covariance is in dependent ofn the demonstrative determiner since the a definite determiner can be a donkey anaphoric in the same context, (16).

(16) Every intern who works for a senator ends up disliking the fucking creep.

We have the paradigm in (17) where the *expressive* nominal type covers both stressed demonstrative nominals and nominals modified by expressive adjectives.

(17)

		determiner	
		the	*that*
nominal-type	non-expressive	covary	covary
	expressive	covary	no

It is only the combination of the demonstrative determiner with an expressive nominal that blocks covariance, neither alone is sufficient to rule it out.

4 Expressive Indices

Potts (2007) provides a theory of expressive elements like *damn* and *fucking* that relies on a construct called an *expressive index*. Expressive indices are triples of the form $\langle a\ \mathbf{I}\ b\rangle$, where a and b are in the domain of entities, and $\mathbf{I}$ is an subinterval of $[-1,+1]$. The index $\langle a\ \mathbf{I}\ b\rangle$ conveys that a's emotional attitude towards b is characterized by interval $\mathbf{I}$. Polarity in the intervals correspond to polarity of the emotional state, and narrower intervals correspond to more intense emotional states.

On Potts' theory a discourse context includes a set E of these expressive indices which provides a kind of emotional setting against which the discourse takes place. Settings of this kind can contain at most one expressive object $\langle a\ \mathbf{I}\ b\rangle$ for every salient pair of entities a and b. The utterance of an expressive element like *fucking* updates the discourse's emotional setting by narrowing the interval of an expressive index.

For stressed demonstrative nominals I assume that the stress is the surface realization of an abstract expressive morpheme *EMPH*. I propose that *EMPH* has the same syntax as an expressive adjective (e.g. *fucking*).[5] *EMPH* will overwrite indices that have the speaker as the evaluator and the referent of the demonstrative as object of evaluation. For example the SDN *that JERK* in (3a) will generate a new context in which the neutral expressive index $\langle$**[speaker]** **[-1,1]** **[Jack]**$\rangle$ is overwritten by a negative index like $\langle$**[speaker]** **[-1,-.5]** **[Jack]**$\rangle$.

4.1 Compositional details

Our ontology includes the basic types for entities and truth-values. It also includes a basic expressive type ε, along with a domain D_ε. Complex types are built up from the basic types in the usual way with the exception that complex expressive types all have the form $\langle \sigma, \varepsilon \rangle$ where σ is a descriptive (non-expressive) type.

Assign the expressive denotation in (18) to emphatic stress.

(18) $[\![\textbf{EMPH}]\!]^c = \lambda x_e.$ c′ such that
- i. $\langle \text{S } \mathbf{I} \, [\![\mathbf{x}]\!]^c \rangle \in \text{c}$
- ii. $\langle \text{S } \mathbf{I}' \, [\![\mathbf{x}]\!]^c \rangle \in \text{c}'$
- iii. $\mathbf{I}' \sqsubseteq \mathbf{I}$
- iv. $\mathbf{I}' \sqsubseteq [\text{-}1, 0]$

EMPH takes an individual argument x with a context c and returns a distinct output context c' such that the expressive index defined by pair $\langle$Speaker, $x\rangle$ in c' has a narrower interval than that of the corresponding index c. The individual argument is required to identify which expressive index is overwritten. It is also required in the remainder of the composition. Composing with the expressive element must not consume it. This is ensured by our composition rule for expressives, (19).

(19) Where α is of type $\langle \sigma, \varepsilon \rangle$ and β is of type σ:

$$[\![\alpha]\!]^c \bullet [\![\beta]\!]^c = [\![\beta]\!]^{[\![\alpha]\!]^c([\![\beta]\!]^c)} \qquad \text{(based on Potts 2007)}$$

Composing an expressive functional type with its descriptive argument returns that argument under a new context, the content of which is determined by the denotation of the particular expressive element.

With the denotation in (18) and the composition rule in (19) we can observe the composition of the discourse anaphoric SDN in (2) (repeated in (20)).

(20) Jack$_i$ kissed Mary. I hate [that [EMPH jerk]]$_i$.

(21) $[\![\textbf{that}]\!] = \lambda P_{\langle d\langle e,t\rangle\rangle}.\ \iota x_e \ s.t.\ P(x)(d).$
Defined iff $\exists! x_e \exists d_d.\ x$ is salient & $(P(x)(d))$.

(22) $[\![\textbf{jerk}]\!] = \lambda d_d . \lambda x_e.\ x$ is a jerk to degree d.

EMPH must enter the composition after the DP has produced an entity for it to take as argument, but the structure indicated in (20) has it internal to the DP. This mismatch between syntactic surface position and point of composition is a general property of expressive adjectives. We will simply state that $[\![\textbf{det EA N}]\!] = [\![\textbf{EA}]\!]([\![\textbf{det N}]\!])$. So first the unmodified DP composes, (23). Assuming that (23) evaluates to Jack then (22) holds.

(23) $[\![\textbf{that}]\!]^c([\![\textbf{jerk}]\!]^c) = \iota x$ s.t. x is a jerk to degree d.
Defined iff $\exists! x_e \exists d_d.\ x$ is salient & x is a jerk to degree d.

(24) $[\![\textbf{EMPH}]\!]^c([\![\textbf{that-jerk}]\!]^c) = [\![\textbf{that-jerk}]\!]^{c'}$ where where c' differs from c at most in that $\langle$Speaker [-1, 0] Jack$\rangle \in E' \in c'$

4.2 Forcing a referential interpretation

What insight does the analysis of *EMPH* as a context changing expressive element provide to the lack of a covarying reading? We saw above that with an individual referent as the argument of *EMPH* the context changes from c to c' such that a particular expressive index in c' is at least as narrow as the corresponding index in c.

With a covarying argument, function application might proceed in one of two ways: (i) sequentially iterating through values of the argument or (ii) in parallel taking the set of potential values of the argument as a single input. I will argue that while the sequential function application is an available implementation of bound variable interpretation, the parallel function application is not, rather it implements an interpretation of plurality. This plurality is compatible with definite and plural demonstrative determiners (e.g.*those*) of a singular demonstrative determiner, but not with the feature specification of singular demonstrative determiners.

Since a singular demonstrative cannot implement a plurality interpretation it is restricted to sequential function application. As I show in the next section, this sequential function application yeilds an interpretation indistinguishable from a referential interpretation.

Sequential function application Sequential function application will iterate through the possible values for the covarying argument. For each potential input value the expressive element will output an updated context. But this process has no memory for interim context states, and so there is no chain of transitions from input context $c \rightarrow c' \rightarrow c''$. Instead the input context remains constant, it is always the c parameter of the evaluation function on the expressive element itself. Overwriting this input context successively leaves no record of previous changes, so the context change $c \rightarrow c''$ overwrites the previous change $c \rightarrow c'$.

Regardless of the number of values that the covarying argument cycles through the ultimate output context will differ from the original input context c by at most a single expressive index. And as we saw above, that context update is exactly the context update that we get from passing a single referential argument to an expressive element. The interpretations are indistinguishable.

Parallel function application Parallel function application constitutes passing the set of all possible values of the covarying argument to the expressive. This will produce a set of output contexts, C^{out}. Now the evaluation function is not defined to be parameterized to a set of contexts, but recall that all of these output contexts will differ only in their expressive setting. More specifically, they will differ in

that for any pair of entities a and b there will be at most one context $c^{ab} \in C^{out}$ for which the interval I^{ab} of the corresponding expressive index $\langle$a $\mathbf{I}^{ab}$ b$\rangle$ will be different, in fact narrower, than that of its counterpart in the input context. For all other contexts in C^{out}, that particular expressive index for that particular pair of entities will be identical to its counterpart in the input context.

Given this, we can define an intersection operator for the expressive settings in C^{out} reducing the set of contexts to a single context as below:

(25) Context intersection: For any two contexts c' and $c'' \in C^{out}$,
$\cup_C (c', c'') = c'''$ such that:
For any corresponding expressive indices $e'_{ab} \in c'$, and $e''_{ab} \in c''$
If interval $I'_{ab} \sqsubseteq I''_{ab}$:
Then e'_{ab} is in $E''' \in c'''$.
Else: e''_{ab} is in $E''' \in c'''$.

Parallel function application and plurality Parallel function application is necessary for the interpretation of plural expressives, (26).

(26) Dave and John claimed they were sick but Margot saw those BASTARDS at the theater.

On a standard treatment of plurals (Link 1983) the domain of individuals D_e is enriched to include plural individuals such that if *John* is in D_e and if *Mary* is in D_e then the individual $John \oplus Mary$ is in D_e. The intuitive relation holds that *John* is a subpart of $John \oplus Mary$, and *Mary* is as well. In the sentence in (26) the expressive NP will take the plural individual $Dave \oplus John$ as its argument.

One question for current purposes is whether plural individuals are allowed as the object of evaluation in an expressive index. This amounts to the question of whether collective readings are available with plural expressives. The sentence in (26) appears to only admit a distributive reading. The sentence conveys that the speaker holds a negative attitude toward John individually and to Mary individually. There is no reading which conveys something like *the speaker has a negative attitude toward John and Mary only when they are together.*

This suggests that plural individuals are not suitable objects for inclusion in an expressive index. Rather a plural expressive updates a context to overwrite each of the expressive indices in the expressive setting that contains the speaker as judge and one of the atoms of the plural entity as object of evaluation. This is done, I propose, precisely through the parallel function application strategy outlined above. The input to the expressive function is a set containing the atoms of the plural individual, the output set of contexts then undergoes the context intersection described in (25) resulting in an appropriately updated single context.

I further propose that the parallel function application strategy is only available to plurals, and is dependent on the presence of a plurality feature. As such, it

can be implemented with plural demonstratives, e.g. *those bastards*, and definite descriptions, which are compatible with plural or singular features, but it cannot be implemented with singular demonstratives like *that* or *this* whose features are incompatible with plurality.

For demonstratives this leaves only the serial function application strategy, which leads to an interpretation indistinguishable from a disjoint indexing. Alternatively demonstratives can be coreferent to an antecedent that does not vary either by virtue of being extra-sentential, as in the disjoint reference case, or by taking scope above the universal quantifier. This second option, in which the embedded indefinite QRs above the subject, is the coreferential reading of stressed demonstrative nominals.

When bound by a quantificational subject, sequential function application goes through, resulting in a disjoint interpretation. No sentence internal antecedents are available to take scope over the quantifier.

For definites, it seems, sequential function application is not necessary. Consider (27).

(27) Every intern who works for a senator dislikes the fucking creep.

Here the definite description *the fucking creep* is interpreted as covarying despite the presence of the expressive adjective *fucking*. This suggests that it must not be implementing sequential function application. I suggest that the plurality feature is inserted into this derivation, perhaps triggered by the aggregation required by the quantifier. Encountering no feature mismatch, since the definite description is compatible with plurality, the definite description is interpreted through parallel function application.

Simple pejoratives What about pejorative demonstratives without stress like *that creep*? The claim is that they can covary, but if *creep* is an expressive element, and if parallel function application requires a plurality feature, then there is no way in the current system to caputure their covarying interpretation. Lacking features compatible with plurality the demonstrative will have to undergo serial function application, which as we saw above does not result in a covarying reading.

One possibility is that pejorative NPs like *bastard* and *creep* are descriptive, rather than expressive, elements. Should this be the case then demonstratives that lack emphatic stress or an expressive adjective would not change the context of the interpretation, but would rather provide some condition or predication on the identity of the referent. It is especially clear that these nominals need to serve as descriptive elements in the case of copular sentences in which case they can be embedded (28) or directly challenged (29).

(28) Mary said John is a bastard.

(29) A: John is a bastard.
B: No he's not.

One might have expected that pejorative nominals were themselves context changing expressive items. But these examples demonstrate that even inherently pejorative nominals are descriptive elements in predicate positions. What then of pejorative nominals in argument positions? Given the need for descriptive denotations in (28) and (29) the simplest assumption is that they remain descriptive. Another logically available option is that pejorative nominals *are* expressive in argument DPs and there is some systematic mapping between a nominal's descriptive and expressive denotation.

There are a number of arguments against the expressive analysis of simple pejorative DPs. The first is simply an appeal to parsimony. We need these nominals to be descriptive in some cases and we need determiners to be descriptive in many cases. As such there is a higher (and as yet unmet) burden of proof for the expressive analysis of argument DPs. The descriptive analysis should be preferred on these grounds.

The second argument comes from the analysis of emphatic stress in the previous sections. That analysis, plus an assumption that bare pejorative nominals are descriptive, predicts the observed relationships between stress and coreference in complex demonstratives. If even bare pejoratives are treated as expressive elements we require further machinery to understand these relationships.

The last argument comes from deniability. Unlike pejorative predicates, pejoratives in definite and demonstrative DPs are not deniable, (30), which may at first glance lend support to an expressive analysis.

(30) A: The bastard left early
B: Not true! $\approx$ *He didn't leave early*
B′: Not true! $\not\approx$ *He's not a bastard*

But this non-deniability is not a property exclusive to pejoratives, it is a general property of definite DPs, as seen in (31).

(31) A: The doctor left early
B: Not true! $\approx$ *He didn't leave early*
B′: Not true! $\not\approx$ *He's not a doctor*

Since *doctor* has none of the hallmarks of expressiveness aside from this non-deniability, I conclude that non-deniability is not an argument against a descriptive analysis. Further, that the pejorative and non-pejorative appear to pattern identically in this case constitutes a weak argument *in favor* of a descriptive analysis.

5 Conclusions, Open Questions

This paper was an investigation into the effects of stress on the interpretation of definite DPs. Stress on pronouns, definite descriptions, and the demonstrative determiner *that* was seen to block bound variable, donkey anaphoric, and simple coreferent interpretations. A standard focus based analysis of this stress was assumed.

Stress on demonstrative nominals does not block coreference, though it does block a bound variable interpretation. In donkey sentences covariation is again blocked, but an unexpected coreferential reading is available in which the indefinite antecedent takes widest scope. Stress on demonstrative nominals was shown to be distinct from focus stress, instead being interpreted as emphasis. This stress was analyzed as the realization of an abstract morpheme *EMPH* with the semantics of an expressive adjective like *fucking*. This analysis adopts the framework for expressive semantics proposed in Potts (2007).

EMPH in a demonstrative DP updates the context by narrowing the interval on the expressive index that has the speaker as evaluator and the referent as object of evaluation. This update works as expected for coreferential uses of demonstrative DPs. For covarying uses of demonstrative DPs such context update can occur one of two ways. It was argued that a *serial* function application strategy is the cannonical composition strategy for bound variables. The overwriting process takes only a single context as input, and has no memory to store internal states. Because of this, the output of this strategy overwrites at most one expressive index, just as a corefferential DP does. A *parallel* function application strategy, in which indices corresponding to all potential referential values of a DP are updated at once, was argued to be the cannonical composition strategy for *plurals*, and in fact dependent on a plurality feature.

There is still the question of why EMPH can appear in complex demonstratives but not on definite descriptions. I speculatively suggest that the demonstrative determiner is more or less a complete pronominal element, not relying on properties of its nominal complement, like the presence of stress, to be coreferential. Definite determiners are relatively deficient and do require support from their nominal, specifically encoded through prosodic environment, in order to be coreferential. More than this is left to future work.

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Notes

[1]As discussed briefly in Section 2, the correct generalization is not that disjoint reference is forced, but rather that the stress in (1) carries a strong presupposition of contrast. What is crucial here is that there is an asymmetry between (1) and (2).

[2]Definite descriptions behave somewhat differently. When stressed they cease being coreferential and instead determine reference through uniqueness of their descriptive content (Umbach 2002; Beller 2011).

(32) John$_i$ is not coming. Megan spoke to the JERK$_{*i/j}$ at the theater.

[3]The stress on the demonstrative nominal in this case, where the demonstrative is not sentence final, seems to require stress on the last content word in the sentence, where the default main stress would fall in a neutral sentence. Without this final (nuclear) stress the interpretation of the demonstrative is as a correction, and is amenable to analysis as a sub-word-level focus as in Artstein (2004)

[4]Some speakers find it easier to get this wide scope indefinite reading with the complex article *a certain*.

[5]It is clear that *EMPH* has a somewhat narrower distribution than other adjectives, for one, it cannot normally appear in definite descriptions. I remain open to the possibility that this is not a fact about its syntax.

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WH *the Hell*-Questions with and without *the Hell*

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1 Introduction

The behavior of WH-*the hell* expressions has been examined in the generative literature since the very influential work of Pesetsky (1987), who introduces a typology of WH-expressions in terms related to discourse. One of the remarkable observations he makes regarding such expressions is that the element *the hell* cannot be attached to *which*, which is taken to support his view that WH-*the hell* expressions are never linked to discourse, which is assumed by many linguists in analyzing properties of WH-*the hell* expressions.

In this paper, I show that Pesetsky's analysis of WH-*the hell* expressions is undesirable by providing various kinds of WH-expressions which behave like WH-*the hell* expressions in certain respects. To be exact, I show that WH-*the hell* expressions can be linked to discourse just like other WH-expressions. I would also like to suggest that what is special about WH-*the hell* expressions is that they involve contrastive focus.

2 Peculiarities of WH-*the Hell* Expressions

In this section, I briefly summarize Pesetsky's idea of D-linking and sketch the two main properties of WH-*the hell* expressions.

2.1 Pesetsky's typology of WH-expressions and non-D-linkability of WH-*the hell* expressions

Pesetsky (1987) introduces a typology of WH-expressions in terms related to discourse. He suggests that certain WH-expressions are linked to discourse (D-linked) in the sense that appropriate answers for them are necessarily drawn from the set of candidates provided in the previous discourse. Representative cases are expressions involving *which*. He claims that WH-expressions such as

who and *what* are ambiguous, so they are D-linked in some cases and not D-linked in other cases, depending on the contexts where they are employed.

He further claims that some WH-expressions are never D-linkable and they are represented by WH-*the hell* expressions. Observe the following question.

(1) What the hell book did you read that in?
(Pesetsky (1987: 111))

This question contains a WH-*the hell* expression. Such questions are typically uttered to express the speaker's strong emotion. It is quite reasonable to assume that the speaker is emotionally affected when not having the idea as to the exact value of the item or individual being asked about.

One remarkable peculiarities of WH-*the hell* expressions is the incompatibility of *the hell* with *which*, a D-linked expression, as shown here.

(2) *Which the hell book did you read that in?
(Pesetsky (1987: 111))

This incompatibility lends strong support to Pesetsky's analysis of WH-*the hell* expressions as non-D-linkable items.

2.2 The failure of WH-*the hell* expressions to remain in-situ

Pesetsky observes another oddity found with WH-*the hell* expressions. As the following contrast shows, they cannot remain in-situ.

(3) a. Who the hell caught what?
b. *Who caught what the hell?
(Pesetsky (1987: 125))

He assumes that WH-*the hell* expressions take scope via movement but they cannot resort to unselective binding, which he assumes is only available to D-linked WH-expressions. He also assumes that scope taking of these expressions with recourse to movement must take place overtly.

These are their notable properties. In the next section I critically examine Pesetsky's treatment of such expressions as non-D-linkable elements.

3 WH-*the Hell* Expressions as D-Linked Elements

Pesetsky's analysis of WH-*the hell* expressions as invariably non-D-linked elements is widely accepted in the generative literature. Here I critically examine his treatment by providing cases which cast doubt on it and show that they can be D-linked and the combination of *which* and *the hell* is allowed.

3.1 Questions with "aggressively D-linked" WH-expressions

Pesetsky's idea seems to be that WH-*the hell* expressions being characterized as non-D-linkable is related to the speaker expressing a strong emotion. Admittedly, it would be easy to imagine a situation where someone experiences a strong emotion and utters a WH-*the hell* question, due to the complete absence of a contextually defined set of candidates from which to pick a felicitous answer.

There are cases, however, where the speaker is emotionally affected but the WH-expressions involved are D-linked. Observe the following examples:

(4) a. I know that we need to install transistor A, transistor B, and transistor C, and I know that these three holes are for transistors, but I'll be damned if I can figure out from the instructions *where what* goes!
(Pesetsky (1987: 109))
b. I know that among all the disasters in the kitchen, Jane scorched the beans and Lydia put salt in the tea: but what did who break? I know that someone did something, so stop evading my question.
(Bolinger (1978: 108))

In both of these questions, the WH-expressions involved are clearly D-linked, owing to proper contextualization, which, according to Pesetsky, is the reason that the otherwise present superiority effects in the sense of Chomsky (1973) are absent despite their configurations, where the structurally higher WH-expression stays in-situ.[1] Another thing that these questions have in common is that the speakers asking them express some kind of "aggression" on a par with WH-*the hell* questions. In (4a) the speaker voices irritation by employing expressions such as *I'll be damned* and in (4b) *stop evading my question*. Thus, Pesetsky's own example and Bolinger's one can both be said to involve what might be called "aggressively D-linked" WH-expressions, showing that strong emotions associated with WH-*the hell* expressions do not lend support to the view of them as non-D-linked elements.

3.2 The source of aggression

A question arises as to the source of the "aggressive" emotion or attitude that is expressed with WH-*the hell* questions and ones like (4). I would like to suggest that the aggression comes from the interaction of two properties which are shared by these questions. One shared property is that the speakers are completely certain that there is a positive value to the questions they ask, never expecting negative answers, and the other common feature is that the correct answer that they know exists for sure is unavailable to them.

The first common property is rather obvious in the "aggressively D-linked" questions. In (4a) the speaker knows for certain that each of the contextually specified transistors goes to one of the holes mentioned in discourse. In (4b), the speaker asserts that he or she knows that someone did something. As for WH-*the hell* questions, consider the following set of questions.

(5) a. Who saw John on the way home?
b. Who the hell saw John on the way home?
(Szabolcsi and Zwarts (1993: 261))

According to Szabolcsi and Zwarts (1993), the two questions in (5) are different from each other in meaning. (5a) can be readily answered by *nobody*, but (5b) can only be asked if there is undeniable evidence that someone saw John. Thus, the speaker of a WH-*the hell* question knows that there is a positive answer to it.

The second common feature is the unavailability of the correct answer to the speaker, which is also straightforward. The contexts where the questions in (4) are asked suggest that the speakers do not know the correct answers. As for WH-*the hell* questions, it has been observed that speakers asking these questions do not have the correct answer.

(6) a. * It's entirely obvious why the hell he left.
b. It's a complete mystery why the hell he left.
(Huang and Ochi (2004))

As the above contrasts show, the asker of a WH-*the hell* question generally does not know what the correct answer is.

Given these two properties, it is fairly easy to see how askers of "aggressively D-linked" WH-questions and "aggressively non-D-linked" ones are emotionally affected. The speakers are certain that the questions have a positive answer, but they cannot get it (maybe because of the unclear instructions as in (4a) or some evasive answer on the part of the hearer as in (4b)). This can be a quite stressful situation, possibly to the point where the asker becomes emotionally affected and "aggressive". In sum, we have seen that the "aggressive" attitude found with WH-*the hell* questions has nothing to do with D-linking.

3.3 D-linking WH-*the hell* expressions

Here I show cases where WH-*the hell* expressions are D-linked. Recall that the WH-expressions in (4) are D-linked. Pesetsky's treatment analysis predicts that they are disallowed in such examples as (4). In these examples, however, it is possible to replace the WH-expression in sentence initial position with their WH-*the hell* counterparts.

(7) a. I know that we need to install transistor A, transistor B, and transistor C, and I know that these three holes are for transistors, but I'll be damned if I can figure out from the instructions ***where the hell*** *what* goes!
b. I know that among all the disasters in the kitchen, Jane scorched the beans and Lydia put salt in the tea: but **what the hell** did who break? I know that someone did something, so stop evading my question.

The questions in (7) do not sound worse than the ones in (4). This indicates that WH-*the hell* expressions are D-linkable, contrary to Pesetsky's analysis. Similar examples are provided below.

(8) a. Who the hell has the card? (When playing Old Maid, a card game.)
b What the hell is the right answer? (When trying to answer a multiple choice question, like the one in MVA/DMV law test, or in a quizshow.)
c. Who the hell is the fastest runner on our team?
d. Who the hell among you saw the movie?
e. Who the hell in the audience is the singer looking at?
f. Who the hell is the most powerful character in this game?
g. Who the hell from the company can you trust?

In these examples, too, the provided contextualization forces the D-linked interpretation of WH-*the hell* expressions, which does not render the examples unacceptable, despite Pesetsky's expectation.

In fact, the D-linkability of WH-*the hell* expressions is not surprising, once we take Japanese *ittai* WH-questions into consideration. Consider the following set of *ittai* WH-questions.

(9) Mary-wa John-ni ittai nani-o ageta-no?
Mary-TOP John-DAT the hell what-ACC gave-Q
'Q Mary gave John what the hell?'
(Pesetsky (1987: 111))

(10) a. Boku-wa [$_{CP}$ dare-ga kita-ka] sitteiru.
I-TOP who-NOM came-Q know
'I know Q who came.'
b.*Boku-wa [$_{CP}$ ittai dare-ga kita-ka] sitteiru.
I-TOP the hell who-NOM came-Q know
'I know Q who the hell came.'
c. Boku-wa [$_{CP}$ ittai dare-ga kita-ka] siranai.
I-TOP the hell who-NOM came-Q know-not
'I don't know Q who the hell came.'

(9) contains *ittai*, a Japanese counterpart of *the hell*, and it expresses the speaker's strong attitude. Just like in English, the presence of *ittai* is compatible

only with the situation where the speaker has no idea as to what the appropriate answer can be to the question, illustrated in (10).

Note that it is possible to D-link *ittai* WH-expressions.

(11) Kimi-wa susi-to tempura-to sasimi-no nakade
you-TOP sushi-and tempura-and sashimi-GEN among
ittai dore-o tabeta-no?
the hell which-ACC ate-Q
'Which the hell did you eat, sushi, tempura, or sashimi?'

As this question shows, the combination for *ittai* 'the hell' and *dore* 'which' is allowed. This indicates that *the hell* in WH-*the hell* expressions should not be treated as the sign of non-D-linkedness.[2]

In sum, we have seen that it is empirically undesirable to analyze WH-*the hell* expressions based on the notion of D-linking, which is also irrelevant to the characterization of *ittai* WH-expressions.

3.4 The source of **which the hell*

Now our task is to find a way to capture the incompatibility of *which* and *the hell* without mentioning the notion of D-linking.

One way to do this task is already suggested in Merchant (2002), who observes that *the hell* attaches only to heads and never to phrases, as in the following:

(12) a. What the hell book was he reading!?
b. What the hell kind of a doctor is she, anyhow!?
(13) a. *What book the hell was he reading!?
b. *What kind of a doctor the hell is she, anyhow!?
(Merchant (2002))

In the examples in (12), which are fine, *the hell* attaches to *what*, the head of DP, but in (13) it accompanies the whole DP, hence the degraded status. The same point has been made in Ginzburg and Sag (2000), who observe the following:

(14) a. *[How many books the hell] did they read _?
b. *[Ho many the hell books] did they read _?
c. [How the hell many books] did they read _?
(Ginzburg and Sag (2000: 229))

Given this, I assume the following.

(15) a. *The hell* modifies only heads.
b. *Which* is a phrase, not a head.[3]

Then the incompatibility of *which* and *the hell* can be ruled out due to the categorial mismatch of the former, which is not a head, and the latter, which is supposed to attach only to a head.

Treating *which* not as a head but as a phrase is independently motivated. Radford (2004) examines the behavior of the element *else* and shows that it modifies not phrases but heads. Consider the following paradigm.

(16) a. Who else?
b. *How many people else?
c. *Which else?
(Radford (2004: 144))

As (16a) shows, *else* can modify WH-words like *who*, but as in (16b), it fails to modify WH-phrases like *how many people*. Given this, the deviance in (16c) can be captured by assuming that *which* is a phrase, which is what Radford, too, suggests. Note that *what the hell* and *who the hell* can be modified by *else*.

(17) a. What the hell else did John buy?
b. Who the hell else did John invite?

Since *else* modifies only heads, these two WH-expressions are heads, which in turn supports our view.

In sum, the deviance found with the combination of *which* and *the hell* is an effect of a head modifier attaching to a phrase, rather than the clash between a D-linked element and a non-D-linked one.

3.5 An acceptable combination of *which* and *the hell*

Given what we have seen, it is expected that if there is an inherently D-linked WH-word, it should go together with *the hell*, unlike Pesetsky's prediction. Here I would like to report the existence of such a WH-word.

WH-expressions are not just employed in interrogatives but in other cases as well. Among them is the WH-*ever* concessive construction as in the following.

(18) a. Whatever you tell her, it's unlikely that she will believe you.
b. Whoever was to blame, it was not the actor.
(Declerck (1991: 444))

These WH-*ever* expressions are compatible with *else*, as in the following.

(19) a. Whatever else you do, don't argue with Brian about politics!
(Leech, Cruickshank, and Ivanić (2005: 719))

b. Whoever else objects, I do not.
(Egawa (1991: 87))

We have seen that *else* attaches only to words. This suggests that WH-*ever* expressions are words. Given this, it is expected that they can have *the hell* attached, on a par with *else.* Consider the following example.

(20) Whatever the hell you do, don't listen to that guy.

Though some speakers do not tolerate *the hell* accompanying a non-interrogative WH-expression, most speakers do accept such a combination as in (20).
Let us now turn to cases with an D-linked WH-*ever* expression, as in (21).[4]

(21) Whichever you chose, you'll be happy.

This element can be accompanied by *else*, as the following example indicates.

(22) Whichever else you pick, you must pay for it.

This indicates that *whichever* is a word, unlike *which*, leading to the expectation that *whichever* is compatible with *the hell*, which is confirmed, as shown in (23)

(23) Whichever the hell you pick, you must pay for it.

Given this, it is clear that the presence of *the hell* in a WH-expression does not make it automatically non-D-linked. Thus, non-D-linkedness is not the true nature of WH-*the hell* expressions.

4 The True Property of WH-*the Hell* Expressions

What we have seen so far tells us that non-D-linkability is not the key to characterizing the behavior of WH-*the hell* expressions. The question here is, what IS the key? I attempt to answer it in this section.

4.1 The failure to be in-situ

Another property of WH-*the hell* expressions is their failure to remain in-situ. Note that these expressions refuse to be in-situ even when they are D-linked.

(24) a. *I know that we need to install transistor A, transistor B, and transistor C, and I know that these three holes are for transistors, but I'll be damned if I can figure out from the instructions *where* ***what the hell*** goes!

b. *I know that among all the disasters in the kitchen, Jane scorched the beans and Lydia put salt in the tea: but what did **who the hell** break? I know that someone did something, so stop evading my question.

These examples involve WH-expressions which are forced to be D-linked on a par with (4), but they are far worse. What makes them different is that they have in-situ WH-*the hell* expressions. Unlike other WH-expressions, it is impossible to have these expressions in-situ, whether they are D-linked or not.

Similar effects are noted with *ittai* WH-expressions in Yanagida (1995).

(25) a. ?*Taroo-wa [$_{VP}$ hayaku ittai nani-o yonda]-no?
Taroo-TOP fast the-hell what-ACC read-Q
'Q Taroo [$_{VP}$ fast read what the hell]?'

b. Taroo-wa ittai nani-o [$_{VP}$ hayaku t yonda]-no?
Taroo-TOP the-hell what-ACC fast read-Q
'Q Taroo what the hell [$_{VP}$ fast read t]?'

This contrast shows that the *ittai* WH-expression must precede the VP adverb, which suggests that it cannot remain in-situ, just like WH-*the hell* expressions. The core property shared by both of them is the failure to be in-situ.

4.2 Contrastive focus

Here I would like to consider the core property of WH-*the hell* and *ittai* WH. The failure to be in-situ is not just a peculiarity shared by some vulgar expressions. It is well known that WH-expressions in Slavic languages generally refuse to stay in-situ. Bošković (2002), based on the observation that Slavic WH-movement takes place in the same way as contrastively focused non-WH-expressions, assumes that Slavic WH-expressions undergo movement to the focus projection. I assume that this view can be applied to WH-*the hell* and *ittai* WH. In particular, I assume that the focus projection is located above IP in English and above VP in Japanese. In the following I show that these WH-expressions involve contrastive focus interpretation.

Recall that the speaker uttering a WH-*the hell* question is certain about the existence of a positive answer but is unable to get it. A typical situation for uttering such a question would be like the one in (26), which is followed by (27).

(26) A: Did you meet Adam? B: No.
A: Did you meet Bill? B: No.
A: Oh, you must have met Carl B: No, I didn't.
(27) Who the hell did you meet, then?

In (26) Speaker A asks Speaker B about the identity of the person whom B met and receives a series of negative answers, despite strongly expecting a positive answer. Following (26), A can felicitously utter (27), intending to ask the identity of the individual whom B did meet, not the ones whom B did not meet.

In a similar situation, (28) is felicitous in Japanese.

(28) Zyaa, kimi-wa ittai dare-ni atta no?
then you-TOP the hell who-DAT met Q
'Who the hell did you meet, then?'

This also asks who the addressee met, rather than whom he or she did not meet. It is natural to consider these WH-expressions as involving contrastive focus.

4.3 WH-*the hell* type questions without *the hell*

We have so far dealt with questions with WH-*the hell* expressions. Here I present questions without such expressions that behave like the ones with them.

The point of (27) is to identify who B did meet, in contrast to who B did not meet. Thus instead of (27) the speaker may ask in the following way.

(29) Who DID you meet, then?

Here, the auxiliary is stressed, indicating that the speaker is clearly expecting a positive answer, just like (27).

Questions like (29) disallow WH-in-situ in them, as shown in (30).

(30) a.?*Who DID buy what?
b.?*Who thinks that John DID buy what?

The deviance here is straightforward, since WH-expressions in these questions are contrastively focused, required to undergo focus movement. This supports our analysis of WH-*the hell* expressions as contrastively focused elements.

The situation is the same in Japanese. Consider the following paradigm.

(31) Zyaa, kimi-wa DARE-NI-WA atta no?
then you-TOP who-DAT-CONTRAST met Q
'Who (as opposed to others) did you meet, then?'
(32) a. ?*Taroo-wa [$_{VP}$ hayaku NANI-WA yonda]-no?
Taroo-TOP fast what-CONTRAST read-Q
'Q Taroo [$_{VP}$ fast read what (as opposed to others)]?'
b. Taroo-wa NANI-WA [$_{VP}$ hayaku t yonda]-no?
Taroo-TOP what-CONTRAST fast read-Q
'Q Taroo what (as opposed others) [$_{VP}$ fast read t]?'

Instead of (28), one may employ (31), where the WH-element is accompanied by the particle *wa*, which is stressed and forces a contrastive reading, as noted in Kuno (1973), Hara (2006), and Vermeulen (2009), among others. Hoji (1985) and Miyagawa (1987) observe that the particle can accompany a WH-element only when it has such a construal. (31) involves a contrastively focused WH-expression. As Yanagida (1995) notes, contrastively focused *wa*-phrases fail to be in-situ, exemplified in (32). The behavior of these elements supports the view that contrastive focus is the core property of WH-*the hell* and *ittai*-WH.

5 Concluding Remarks

In this paper I showed that WH-*the hell* expressions is D-linkable just like *ittai* WH-expressions and suggested that they both involve contrastive focus, which is supported by the behavior of other contrastively focused WH-expressions.

Notes

[1] Chomsky's (1973: 264) definition of the superiority condition is as follows.
(i) No rule can involve *X, Y* in the structure
...X...[$_{\alpha}$...Z...-WYV...]...
where the rule applies ambiguously to Z and Y and Z is superior to Y
Pesetsky (1987: 104) restates it in the following way.
(ii) In a multiple interrogation, where a wh-phrase is in Comp and another is in situ, the S-structure trace of the phrase in Comp must c-command the S-structure position of the wh-in-situ.

[2] Den Dikken and Giannakidou (2002) argue that WH-*the hell* expressions are not veridical and should be treated as polarity items such as *any*, which is largely motivated by the contrast like (6), suggesting that deviance in (2) is a consequence of them being polarity items. But the paradigm in (5) shows that they are indeed veridical, and the behavior of *ittai* casts doubt on such an analysis.

[3] Ginzburg and Sag also claim that *the hell* modifies only WH-words but not WH-expressions and they judge the combination of *which* and *the hell* when they are adjacent.
(i) *[Which book the hell] did they read _?
(ii) [[Which the hell] book] did they read _?
(Ginzburg and Sag (2000: 229))
They assume that *which* is a word, not a phrase. Thus, the categorical status of this WH-expression varies from speaker to speaker. I focus on the speakers to whom it is a phrase.

[4] WH-*ever* expressions can be used in interrogative contexts as well, in which case they are interpreted on a par with WH-*the hell* expressions. It is reported in Konishi (1989: 634) that the interrogative use of *whichever* is possible.
(i) Whichever did you choose?
Similar examples are provided in some English-Japanese dictionaries published in Japan. However, (i) is almost unanimously rejected by the native speakers of English that I consulted.

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The Processing of Korean Reflexive *Caki* by Heritage Speakers and L2 Learners

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1 Introduction

This study investigates the acquisition and processing of the Korean long-distance binding anaphor *caki* by heritage speakers of Korean, compared to English-speaking L2 learners and native speakers. The interpretation of reflexives such as *–self* in English, *caki* in Korean, *zibun* in Japanese varies depending on the language (e.g., Chomsky, 1986). For example, in English, a reflexive should be locally bound by its antecedent, whereas in languages like Korean it can be bound either by a local antecedent or by a long-distance antecedent. In an English example shown below in (1), *himself* can refer only to Bill, the local antecedent, but not to John, the long-distance antecedent. On the other hand, in a Korean example shown in (2), *caki* can refer either to Bill or to John.

(1) English -*self*
John$_i$ thinks that [Bill$_j$ likes **himself**$_{*i/j}$]

(2) Korean *caki*
John$_i$ -un [Bill$_j$-i **caki**$_{i/j}$-lul cohahan-ta]-ko sayngkak-han-ta.
John-TOP [Bill-NOM self-ACC Like-DEC] think-PRE-DEC.

Due to the differences in the domain of reflexive interpretation among languages, many studies have been devoted to the acquisition of reflexives in the field of second language acquisition (e.g., Thomas, 1989). However, few studies have investigated the issue from the perspective of heritage language learning (e.g., Kim et al., 2010; Lee et al., 2009, 2010), even with the quickly growing body of heritage language learning studies showing the advantages for heritage speakers in second language acquisition.

This study investigates how Korean heritage learners develop their knowledge of the Korean reflexive *caki* compared to English-speaking L2 learners and native speakers of Korean in order to feed the discussion of heritage language learning and L2 acquisition of binding.

2 Background

2.1 Heritage Speakers

According to Valdes (2000), heritage speakers are defined as "*bilinguals who are raised in a home where a non-English language is spoken, who speak or merely understand the heritage language and who are to some degree bilingual in English and the heritage language*." They often show incomplete acquisition of the heritage language (Polinsky 1997, 2008; Montrul, 2008) compared to monolingual speakers of the language.

Recently, a large number of second language studies have been and are being devoted to the acquisition of a second language by heritage speakers due to their unique linguistic background. What then, is the interest in heritage speakers? First, the unique linguistic background of heritage speakers provides opportunities to investigate the role of input, transfer, age, dominant language influence, and socio-cultural factors (Montrul, 2008) in second language acquisition. Investigating heritage speakers' interlanguage (IL) development can lead to better understanding of second language acquisition mechanisms.

Heritage speakers are different from L2 learners in their path to their second language: (i) heritage speakers receive a significantly greater amount of input than L2 learners; (ii) heritage speakers are more exposed to oral than written input, in a more naturalistic setting, whereas L2 learners tend to obtain oral and written input in instructional settings; (iii) heritage speakers are often exposed to the second language from birth whereas L2 learners are exposed much later if the age of their first exposure matters in the ultimate attainments in L2 acquisition (Bley-Vroman, 1990; DeKeyser 2000, 2003; Hyltenstam & Abrahamsson, 2003; Long, 1990); and (iv) in terms of context or mode of language acquisition, heritage speakers' early L2 acquisition is implicit and procedural, similar to their first language acquisition whereas for L2 learners' it is more explicit and requires memorization and automatization through practice (DeKeyser, 2000).

Studies of heritage language acquisition so far have found that heritage speakers' overall performance is superior to L2 learners (Kanno et al., 2008; Lee et al., 2005; Lee et al., 2010). Heritage speakers are often observed as having a greater advantage in L2 phonology/pronunciation (e.g., Au, Knightly, Ju, & Oh, 2002), in syntax/lexical semantics (e.g., Montrul 2005; 2006; Lee et al., 2010), and in morphosyntax (Montrul, 2010). Due to these such differences, heritage speakers are believed to take potentially different developmental patterns from those of L2 learners in various aspects of the target language.

This study aims to determine heritage speakers' interpretation of reflexive *caki* compared to L2 learners in order to promote discussion on the differences between heritage speakers and L2 learners in L2 acquisition of syntax.

2.2 Korean reflexive *caki*

Korean has three kinds of reflexives; *caki, casin*, and *caki-casin*. Korean belongs to belongs to a group of languages which allows for long-distance anaphors, which is different from an English-type language where anaphors must be bound by a local antecedent (Chomsky, 1980, 1981, 1986). Let us consider the following examples:

(3) John$_{i}$ said that Bill$_{j}$ liked himself $*_{i/j}$.

(4) John$_{i}$ -un [Bill$_{j}$-i **caki** $_{i/j}$-lul cohahan-ta]-ko malhay-ss-ta.
John-TOP [Bill-NOM self-ACC Like-DEC]-COMP tell-PST-DEC.

As shown in (3), the reflexive *himself* refers only to *Bill*, the local antecedent, but not *John*, the long-distance antecedent in English. On the other hand, in Korean, the reflexive *caki* can refer either the local antecedent, *Bill* or the long distance antecedent, *John*. However, in the case of *caki*, compared to the other reflexives, *casin* and *caki-casin*, previous research has found that *caki* is interpreted as a long-distance binding anaphor than a local binding anaphor (Kang, 1998; Choi & Kim, 2007: Kim, Montrul & Yoon, 2009).

Kim et al. (2009) tested the long-distance and local interpretations of different Korean anaphors, *caki, casin* and *caki-casin* with heritage speakers of Korean comparing early and late bilinguals. They found that both early bilinguals and late bilinguals accepted the LD interpretation of *caki*, but with different degree of acceptance (80% vs. 96%, respectively). In addition, early bilinguals also accepted local binding for *caki* about half of the time, which is different from late bilinguals and native speakers (45% vs. 13%, 24%, respectively). Based on the results, Kim et al. (2009) concluded that the differences between early and late bilinguals regarding their interpretation of binding relations are due to early bilinguals' limited exposure to the language.

However, it might not be due to their limited exposure, but rather to their limited proficiency in Korean (proficiency of Korean was a confounding factor in the study). Korean proficiency test results in Kim et al.'s (2009) study showed a significant difference between early bilinguals and late bilinguals (63.9% vs. 91.2%, respectively). We cannot be sure if early bilinguals' different behavior regarding the interpretation of *caki* (that is, whether they accepted LD binding less frequently and local binding more frequently compared with late bilinguals and native speakers) is due to their limited proficiency or limited exposure.

This study investigated the interpretation of the long distance reflexive *caki* by heritage speakers and L2 learners of equal overall proficiency, addressing the following research questions:

1. Do heritage speakers show different interpretations of the long distance reflexive *caki* from native speakers of Korean?

2. Do heritage speakers show different interpretations of the long distance reflexive *caki* from L2 learners of Korean of equal proficiency?

3 The Study

3.1 Participants

A total of 66 participants were recruited for the experiment including 32 heritage speakers, 20 English-speaking L2 learners, and 14 native speakers of Korean. A description of the participants is provided in Table 1 which includes the mean age, gender, and number of participants for each proficiency level (i.e., ILR levels).

Table 1. *Participants*

P	*N*	*Mean Age*	*Gender*		*ILR Levels*					
			M	F	1+	2	2+	3	3+	4
NS	14	34	5	9						
HS	32	23	9	23	2	6	8	14	1	1
L2	20	30	15	5	4	4	6	3	2	1
Total	66	28	29	37	6	10	14	17	3	2

P: Participants; N: Number of participants; NS: Native Speakers; HS: Heritage Speakers; L2: L2 learners

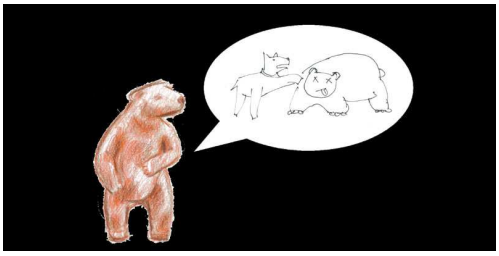
The overall oral proficiency of the participants was measured by a certified OPI tester through a phone interview, and their proficiency levels were described using the Interagency Language Roundtable (ILR) speaking scales from 0 (no proficiency) to 5 (functional native proficiency).

3.2 Materials

An experimental study using a sentence-picture matching judgment task with auditory stimuli was conducted in order to compare accuracy scores and reaction times of judgments between the groups. The experiment included four conditions: (i) long-distance binding with matched pictures (LD Correct); (ii) long-distance binding with unmatched pictures (LD Incorrect); (iii) local binding with matched pictures (Local Correct); and local binding with unmatched pictures (Local Incorrect). An example for each condition is provided below with a sentence and description of an accompanied picture.

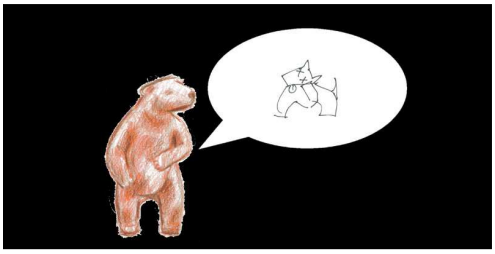
(5) Experimental conditions with examples
a. Long distance binding condition (five items for each condition)

Picture:



(i) LD Correct (with matched sentence): 곰이 [개가 자기를 때렸다고] 말한다. (A bear says [a dog hit himself]). [A bear is saying in the picture]
(ii) LD Incorrect (with unmatched sentence): *개가 [곰이 자기를 때렸다고] 말한다. (*A dog says [a bear hit himself]). [A bear is saying in the picture]

b. Local binding condition (five items for each condition)
Picture:



(i) Local Correct (with matched sentence): 곰이 [개가 자기를 때렸다고] 말한다. (A bear says [a dog hit himself]). [A bear is saying in the picture]
(ii) Local Incorrect (with unmatched sentence): *개가 [곰이 자기를 때렸다고] 말한다. (A dog says [a bear hit himself]). [A bear is saying in the picture]

In this task, the participants look at a picture and listen to a sentence containing the reflexive *caki* to determine if they match. If the participant accepts long distance binding for *caki*, he/she should push the right-side button (correct) in the LD Correct condition and push the left-side button (incorrect) for the LD Incorrect condition. If the participants also allow local binding for *caki*, he/she should also judge the Local Correct condition as right, and the Local Incorrect condition as wrong. If the participants judge the Local Correct as wrong, it can be assumed that they do not allow local binding for *caki,* which we can expect based on the previous research findings. In other words, since *caki* is interpreted more as a local anaphor, we can expect that native speakers may incorrectly judge the Local Correct as wrong. As a result, comparing the LD Correct and Local Correct, it is very likely that native speakers will make a

positive judgment with the LD Correct condition than they do with the Local Correct condition.

3.3 Procedure

The test was done as a part of a large study included in a four-hour-long Korean language test battery. The test was computer-delivered using the DMDX software package. The participants took the test individually in a quiet classroom. The participants also completed a questionnaire probing their language-learning history. Their global oral proficiency in Korean was also assessed by a certified OPI (oral proficiency interview) tester within two weeks after the data collection session.

3.4 Results

3.4.1 Judgment scores

The mean accuracy scores and standard deviation for each ILR level is provided in Table 2. (The data in Table 2 excludes the items that 85% of native speakers did not judge correctly, which is explained in detail later).

Table 2. Picture-sentence matching judgment

ILR Level	Accuracy		
	M	*SD*	*n*
1+	0.73	0.20	5
2	0.85	0.14	10
2+	0.86	0.16	13
3	0.94	0.11	17
3+	0.87	0.18	3
4	1.00	0.00	2

First, the Cronbach alpha coefficient was calculated, and a high internal reliability ($\alpha = .72$) was found. Secondly, the Spearman correlation between individual judgment scores and the ILR scale was conducted and the results revealed that there was a statistically significant correlation between them ($r=.48,\ p < .05$). In addition, the Spearman correlation between the mean judgment scores and the ILR scale was also conducted, and it was found that the mean scores were statistically significantly correlated with the ILR scale ($r = .97,$

$p < .05$). The results indicate that the learners' knowledge on the long-distance binding anaphor *caki* develops as their oral proficiency improves.

Comparing the heritage speakers and L2, a similar pattern was found in both groups for long-distance binding conditions. Both groups correctly accepted the long-distance antecedent in matched conditions and correctly rejected the long-distance antecedent in unmatched conditions, with slightly higher accuracy scores for heritage speakers. However, differences were found in the local-binding conditions. The heritage speakers accepted their local antecedent only 40% of the time in matched conditions, similar to native speakers (38%), whereas L2 learners accepted their local antecedent 70% of the time even though both groups correctly rejected their local antecedent in unmatched conditions. Such differences between the groups are shown in Figure 1.

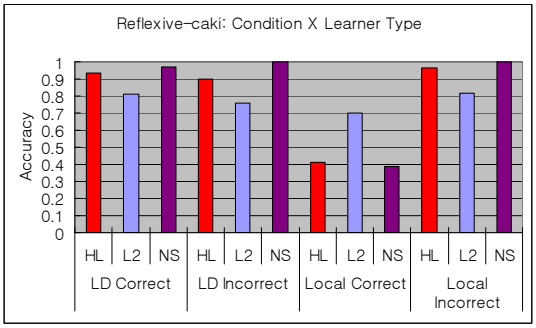


Figure 1 Comprehension of the Korean reflexive *caki*: condition by learner type

Let us consider the judgment scores in each proficiency level for each condition. First, the results on the long-distance binding conditions are shown in Figure 2.

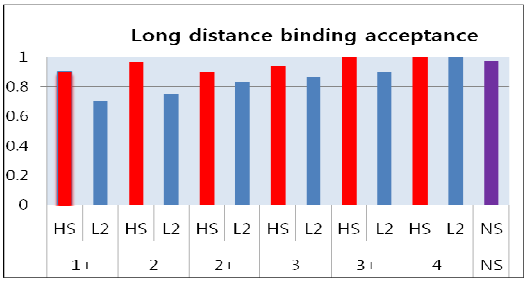


Figure 2 Long distance binding acceptance: heritage speakers and L2 learners

The heritage speakers accepted LD binding from the early stage of L2 development, which is very similar to native speakers (the heritage speakers were all born in or immigrated to the U.S. before age 7). The heritage speakers'

acceptance of LD binding is similar across proficiency levels. Compared with the L2 learners, the heritage speakers accepted LD binding more often than the L2 learners did. The L2 learners' acceptance of LD binding increased as their proficiency level increased. Accordingly, the difference between the heritage speakers and L2 learners reduced as their proficiency increased.

The results seem to indicate that the difference found in early bilinguals and late bilinguals in the acceptance of LD binding of *caki* in Kim et al. (2009) manifested here as a difference between heritage speakers and L2. When the oral proficiency is equal, there was a difference between heritage speakers and L2 learners in their acceptance of their long-distance binding interpretation for *caki* at low levels of oral proficiency (i.e., below ILR 2 in this experiment).

Secondly, the results on the local binding conditions are shown in Figure 3.

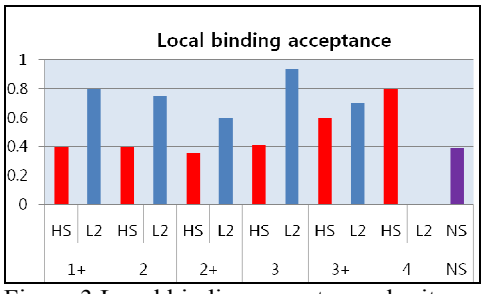


Figure 3 Local binding acceptance: heritage speakers and L2 learners

The native speakers accepted their local interpretation of *caki* only 38% of the time, conforming to the findings of previous studies (e.g., Kim et al., 2009). Compared with the L2 learners, the heritage speakers as well as the native speakers accepted their local interpretation of *caki* less frequently than the L2 learners did throughout all the proficiency levels except for ILR 4.

The heritage speakers' acceptance rates for the local interpretation of *caki* are similar to the native speakers' from the early stage of language development except for ILR 3+ and ILR 4. The results do not conform to Kim et al.'s (2009) finding that early bilinguals are different from native speakers in their acceptance of local binding found in (45% vs. 24%, respectively). It was doubtful that their different behavior might be due to limited exposure to Korean or low proficiency of Korean. However, contrary to the findings and suggestions, the present study found that the heritage speakers showed very similar behavior to the native speakers even at a low level of oral proficiency. On the other hand, the L2 learners accepted their local interpretation of *caki* more often than the heritage speakers and the native speakers except ILR 4.

3.4.2 Reaction time

The participants' response time when they made their judgments on each test item was measured and the mean reaction times for each condition and learner group are summarized and shown in Figure 4.

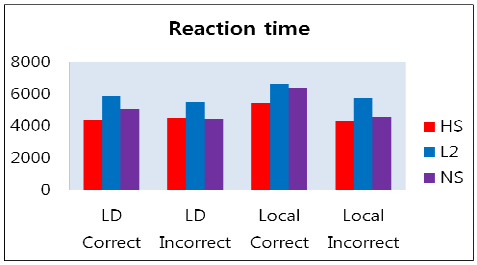


Figure 4 Reaction time: heritage speakers and L2 learners

The results showed that the overall reaction times for decisions on local-binding in matched conditions (i.e., Local Correct) were longer than those for the other conditions. This seems to indicate that the participants were hesitant to give a negative answer to these test items in order to reject their local binding interpretation for *caki*. In Korean, it is possible that *caki* can have local binding relations with appropriate contexts whereas English reflexives do not allow local binding relations in its strict sense. Without context, it seemed hard for the native speakers and the learners to reject the local binding relations for *caki* based on their previous knowledge.

Comparing learner groups, overall, the heritage speakers took a shorter time than the L2 learners in all conditions in their interpretation of *caki*. This shows greater processing demand on the L2 learners than the heritage speakers in their interpretation of binding relations of *caki.* Furthermore, in the Local Correct condition, the heritage speakers took a shorter time and were more native-like in their local interpretation of *caki* than the L2 learners.

Combing the results from the reaction time scores and judgment accuracy scores, the heritage speakers took a shorter time than the native speakers on making judgments on the binding relations, but still showed native-like judgment scores in their local interpretation of *caki*. As mentioned above, the reason for the native speakers taking more time than the heritage speakers seems to relate to preference; the native speakers seem to be more hesitant than the heritage speakers to reject their local binding interpretation of *caki*, based on their previous experience and knowledge that *caki* can be locally bound in Korean, which should be stronger than for the heritage speakers.

4 Discussion

This study invested heritage speakers' interpretation and processing of the long distance reflexive *caki* compared with native speakers' and L2 learners. The

experimental results revealed the following for each of our research questions: *1. Do heritage speakers show different interpretations of the long distance reflexive* caki *from native speakers of Korean?* The answer to this question has proven to be negative. That is, the heritage speakers showed native-like interpretation of the long distance reflexive *caki* from the very early stage of L2 development. They accepted long distance binding interpretation more frequently than local binding for *caki* similar to native speakers. These findings disprove the notion of early bilinguals' disadvantage proposed by Kim et al. (2009). In their study, the early bilinguals' (heritage speakers' in our study) accepted local binding about 45% of the time whereas late bilinguals and native speakers accepted it about 13% and 24% of the time respectively). On the contrary, the early bilinguals showed native-like behavior in their interpretation of *caki* from the early stage of L2 language development.

2. Do heritage speakers show different interpretations of the long distance reflexive caki *from L2 learners of Korean of equal proficiency?* The answer to this question has proven to be positive. The heritage speakers were more native-like than the L2 learners of equal proficiency in their interpretation of *caki*, accepting long distance binding interpretation more often than local binding. They were also faster than the L2 learners in their processing of the binding relations of *caki*. In particular, the heritage speakers showed native-like behavior at low levels of oral proficiency such as ILR 1+ (Elementary Proficiency Plus) and ILR 2 (Limited Working Proficiency). They showed more native-like behavior than L2 learners of the same oral proficiency did in their interpretation of *caki* especially at the lower levels of proficiency, supporting the findings of Lee et al. (2010). However, the L2 learners' acceptance of long-distance binding of *caki* increased as their oral proficiency increased. The findings seem to indicate that oral proficiency matters for L2 learners, not for heritage speakers in making native-like judgment on their interpretation of binding relations for *caki*.

Notice that the L2 learners' LD binding acceptance rate is quite high even at the low level of proficiency (i.e., 70%) and increases up to 100% at ILR 4. This seems to indicate the easiness of accepting binding relations in the direction from subset (English: local only) to superset (Korean: both local and LD) as suggested in previous studies (White, 1989). However, the L2 learners' local binding acceptance rate is quite high (very different from heritage speakers and native speakers) and decreases very slowly, that is, 80% - 60%, respectively, but not reaching 40%, except for one L2 learner at ILR4 who showed an acceptance rate of 0 % for local binding (see Figure 4 for details). It seems difficult for the learners of subset L1 learners to acquire superset L2 learners probably due to their conservative strategy that local binding is a possible option in Korean, so they could accept it even though it was not a preferred option.

On the other hand, also notice that the heritage speakers accepted LD binding and also preferred LD binding to local binding from an early stage of L2 development. This shows that their knowledge of Korean binding was hardly

affected by their dominant language, English, which they learned after they were exposed to Korean and did acquire some of it (even though not completely). That is, transfer from English to Korean was not detected in this population. This seems to indicate that binding knowledge of the heritage speakers who had acquired superset binding relations at an early stage of language acquisition is resistant to transfer from their dominant language, English (which they learned after L1 has been set), and maintained throughout their life with continuous input. This is reflected in their native-like preference of LD binding to local binding for *caki.* Therefore, the transfer effect from superset (English) to subset (Korean) was not revealed in the case of the heritage speakers whereas it was reflected in the case of the L2 learners whose acceptance rate for local binding was higher than the heritage speakers'.

5 Conclusion

Heritage speakers' processing of the Korean long-distance binding anaphor *caki* was investigated and compared with English-speaking L2 learners and native speakers of Korean in this study. The results showed that the heritage speakers possess native-like binding interpretation of the Korean reflexive *caki* from a very early stage of L2 development, preferring LD binding to local binding, which was different from the L2 learners. The results of this study provide additional evidence that reveal the advantages of heritage speakers over L2 learners in their acquisition and processing of syntax at lower proficiency levels in particular.

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A Note On The (Im)mobility Of Serbian Fronted Wh-Words

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1 Introduction: Background*

The hierarchical and ordering properties of the Serbian fronted wh-words (henceforth FWHs) are intriguing in many aspects of their linearity[1]. Consider the examples in (1.a-i).

(1)	a.	Vidjeo	je	ko	koga
		Saw	aux	who	whom
		"Who saw whom?"			
	b.	Vidjeo	je	koga	ko?
	c.	Vidjeo	ko	je	koga?
	d.	Vidjeo	koga	je	ko?
	e.	Vidjeo	ko	koga	je?
	f.	Vidjeo	koga	ko	je?
	g.	Ko	je	koga	Vidjeo?
	h.	Koga	je	Ko	Vidjeo?
	i.	Ko	Koga	je	Vidjeo?
	j.	Koga	Ko	je	Vidjeo?

Viewed from the perspective of how the orderings of the FWHs in Serbian is derived from their hierarchical structural positions, the orders in (1.a-i) violate transitivity relations holding among more than two syntactic objects. FWHs freely precede and follow the main verb and the auxiliary and do not seem to anchor to a specific designated structural position.

In light of these intriguing properties of the FWHs in Serbian, this paper poses and addresses the question of how can we represent the structural positions of the FWHs in Serbian in such a way that derives their flexible orderings with a low-tech derivational approach. In addressing this question, this paper proposes and defends the view that the structural positions and flexible orderings of the (fronted) wh-words in Serbian do not exhibit conclusive hallmarks of movement, hence their apparent flexible clausal mobility are not the direct by-product of movement. Using novel data from Serbian, and building on some of the observations and insights in the seminal studies of Rudin (1988a) and Bošković (1997a, 1998a, etc.), I argue that Serbian FWHs are externally merged

(by Pair Merge and Set Merge (Chomsky 2001, 2008)) in the preverbal positions they appear in. Section two provides a brief characterization of the syntax of Serbian FWHs and discusses some of the previous accounts. Section three provides and discusses evidence against a movement analysis of Serbian FWHs. Section four discusses some empirical predictions that this proposal makes. Section five concludes.

2 Syntax Of Serbian FWHs: Some Previous Accounts

2.1 FWHs in Serbian

Serbian is a Slavic language that allows multiple fronting, splitting or in-situ clustering of its wh-words, witness the examples in (2.a-c).

(2) a. Ko šta pije?
Who what drink
"Who is drinking what?"

b. Ko pije šta?
Who drink what
"Who is drinking what?"

c. Pije Ko šta?
Drink who what
"Who is drinking what?"

In this respect, Serbian language is unique in the sense that the distributions (linear orders) of its wh-words share some typological similarities with languages which front all wh-words without leaving any in-situ (e.g. Bulgarian), with languages which leave all its wh-words in-situ (Chinese) and with languages which front one wh-word and leave one in-situ (English). Unlike Bulgarian, Serbian multiple (fronted) wh-words do not constitute an impenetrable cluster (Rudin 1988)-see example in (3.a-b). They exhibit highly flexible orderings in preverbal and postverbal positions[2]-see examples in (1.a-i)[3].

(3) a. Koga je iznenada ko vidjeo ?
Whom aux suddenly who saw
"Who saw whom suddenly?"

b. Ko je iznenada koga vidjeo ?
who aux suddenly whom saw
"Who saw whom suddenly?"

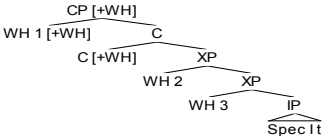
The syntactic properties of Serbian FWHs have been brought to light in a series of seminal studies in the 1980s (see Rudin 1988a, 1988b), 1990s (see Bošković 1997a, 1997b, 1997c, 1998a, 1998b), and have been refined in a series of subsequent studies, for example by Bošković (2000, 2002, 2003b) and they have

been addressed from both typological and theoretical perspectives. In what follows, I will briefly sketch and outline three prominent accounts of the syntax of Serbian FWHs that are of direct interest to the issues addressed in this paper.

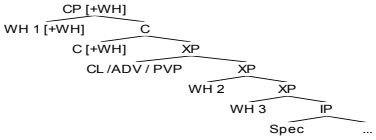
2.2 FWHs as the by-product of Adjunction and Movement

Rudin (1988a) argues that the wh-phrase which is the first in the linear order of a cluster of wh-elements moves to SpecCP, while other wh-words are adjoined to IP. I visualize this analysis by the structures in (4.a and 4.b (structures are mine)).

(4) a.



b.

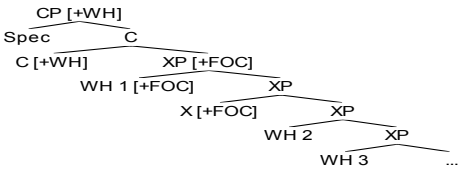


In (4.a), the movement of the first wh-phrase is an instance of familiar wh-movement to SpecCP for checking of a wh-feature in C. This analysis is supported by the fact that clitics can intervene between the first and the second wh-word, as illustrated in the structure (4.b). The analysis of Rudin (1988a) correctly predicts that the fronted wh-words are not a constituent.

2.3 FWHs as the by-product of Focus movement and wh-in-situ

The studies of Bošković (1997a, 1997b, 1997c, 1998a, 1998b) defend the view that the multiple fronting of wh-words in Serbian involves focus feature-driven movement to a position lower than the [wh]-checking position in CP. I approximate this analysis by the structure in (5- (structure is mine)).

(5)

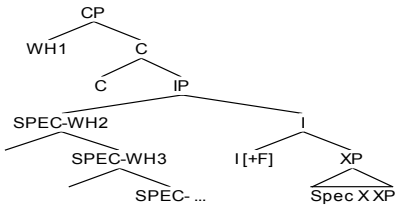


For Bošković, even the first wh-phrase does not move to SpecCP overtly, although it seems to be fronted. True wh-movement in such syntactic contexts takes place only in covert syntax, and in this sense, fronted wh-phrases count as wh-in-situ elements. This analysis derives the obviation of the superiority effects observed with fronted wh-words in Serbian.

2.4 FWHs as the by-product of tucking-in

Richard (1997, 1999) proposes that in Serbian (as an IP absorption language), the higher wh-word moves to CP, and the lower wh-words (wh2 and wh3) remain in Spec positions at the IP clausal layer. They tucking-in at the level of SpecIP. I visualize this approach by the structure in (6- (structure is mine)).

(6)



This approach accounts for the possibility of splitting the cluster of the fronted-words and it unifies some of the aspects of the accounts of Bošković (1997, 1998, 1999) and Rudin (1988a). However, it privileges the status of the first wh-word. Once the first wh-word checks its wh-feature, the second and the third wh-words can freely move. While the movement of the first wh-word is feature checking-driven movement, the movement of the second and the third wh-words is not so. This analysis predicts that the flexibility of orderings would affect only wh2 and wh3. As the Serbian data in (1a-i) shows, all Serbian FWHs are equally flexible in their re-orderings.

In what follows, I will closely examine the mobility of Serbian FWHs in light of an alternative proposal.

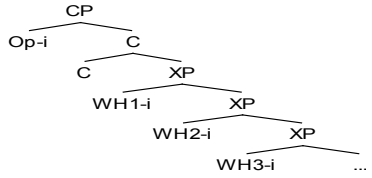
3 How Mobile Are The Serbian FWHs?

3.1 An alternative proposal

I will build on some of the observations in Rudin (1988a) and Bošković (1997a, 1997c, 2002) and argue that Serbian FWHs are merged in the positions they appear in as they do not exhibit hallmarks of movement. I concur with Rudin (1988a) that Serbian FWHs are adjoined to IP positions, and I reinterpret adjunction (postulated within the context of Principles and Parameters at the times the study of Rudin (1988a) was realised) in terms of External Merge (as conceived of in the Minimalist Program-see Chomsky 2000, 2001, 2008). However, I depart from Rudin (1988a) in proposing that the operation that adjoins Serbian FWHs to IP clausal layer is not movement. In this respect, my proposal concurs with Bošković (1997a, 1997c, 2002) in assuming that Serbian FWHs count as in-situ elements. However, I depart from Bošković (1997a, 1997c, 2002) in proposing that there is no covert LF movement and that all instances of Serbian FWHs are based generated in the positions they appear in.

I propose that the fronted wh-words in Serbian are externally merged (by Pair-Merge and Set-Merge) in the preverbal positions they appear in. They are instances of in-situ wh-words, bound by a question operator in SpecCP[4].

(7) *Pair-Merged and Set-Merged Serbian FWHs*



Under the analysis in (7), the clausal positions of the Serbian FWHs are determined in terms of local environment for syntactic operations-Merge (dynamic approach- Epstein *et al.* 1998). The flexibility of orderings that they exhibit is the by-product of these wh-words being merged on distinct spell-out cycles (Cf. Uriagereka 1999). Merge re-combines lexical items in a dynamic manner that can reset the order of the constituents on each application of Merge, mapping a dynamic transfer to Spell-Out (along the lines of Epstein *et al.* 1998, Uriagereka 1999). In what follows, I will present evidence to the view that Serbian FWHs are immobile along the lines of the proposal in (7).

3.2 Some supporting arguments

3.2.1. Sensitivity to superiority effects

One piece of evidence in support of the base generated character of the Serbian FWHs comes from its insensitivity to superiority effects. A superiority effect is basically a constraint on the surface linear order of wh-elements as initially formulated in Chomsky (1973). This constraint prohibits the extraction (movement) of one wh-element over another syntactically "superior" wh-element. This constraint has been reformulated in the Minimalist Program as the Minimal Link Condition (Chomsky 1995). This reformulation centers on the notion of attract the closest in the sense that an attracting head *a* can attract a syntactic element *b* if and only if there is no element *c* such that this element is closer to *a* than *b*. With this in mind, consider the flexible orderings of the Serbian FWHs in (8.a and b).

(8) a. Ko je koga vidjeo?
Who Aux whom saw
"Who saw whom?"

b. Koga je ko vidjeo?
Whom Aux who saw
"Who saw whom?"

Assume that there is a syntactic head X that can attract the Serbian FWHs in (8.a and b). What these examples indicate is that this head can attract either the wh-subject or the wh-object and apparently with no superiority constraints. This runs against the expectation of the Minimal Link Condition on the locality of Attract. Under this analysis the example in (8.b) is expected to be ungrammatical, which is it is not. We have two analytic options here. One is that we reformulate the Minimal Link Condition to derive anti-superiority effect. Two is to assume that there is no movement involved in (8.b) and this is why superiority effect is not induced. I adopt the second option, and as I will show below, the insensitivity of the linear orderings of the Serbian FWHs to superiority is due to the fact that their positions are not derived by movement and as such no superiority effect is violated.

That the anti-superiority effect is an indication of the lack of movement in Serbian FWHs is further suggested by the fact that it is exhibited, even on long distance dependencies. If the position of *koju* 'which' in (9) is derived by movement, (9) should be ungrammatical because if *koju* 'which' moved it would have crossed *koji nastavnik* 'which teacher' and it should have triggered a superiority violation.

(9) Koju knjigu$_i$ je koji nastavnik mislio da
Which book is which teacher thought that
Mi treba da procitamo <-$_i$> ?
We should that read-pres
"Which book does which teacher think that we should read?"

This adds to the contexts of anti-superiority effects that Serbian FWHs exhibit, and which has been initially identified by Bošković (1997c, 1998) as being only the matrix clause and the ones with short distance dependencies.

3.2.2. Sensitivity to islands effects

If the structural positions of the Serbian FWHs are not derived by movement, then we expect that this be corroborated by other (wh) movement sensitive diagnostics. As the examples in (10), (11) and (12) show, the fronting of wh-words in Serbian is insensitive to island constraints as indicated by wh-complement islands, relative clause islands and adjunct clause islands, respectively illustrated in (10), (11) and (12)[5].

(10) Kako$_i$ se Nada pita [da li je Vlada
How refl Nada wonders whether part is Vlada
Popravio bicikl <-$_i$>?]
Fixed bike
"How does Nada wonder whether Vlada fixed the bike?" *Wh-Comp.*

(11) ? Kada$_i$ se Vlada dopao [$_{CP}$ film [koji smo mi gledali<-$_i$>?]]
When refl Vlada liked movie that are he watched
"When did Vlada like the movie that he saw?" *Relative clause*

(12) ? Sta $_i$ ce Nada biti srecna [$_{CP}$ ako Vlada rzavrsi <-$_i$>?]
What will Nada be happy if Vlada finishes
"What will Nada be happy if Vlada finishes?" *Adjunct clause*

The Serbian FWHs data in (10), (11) and (12) can be readily accommodated and accounted for if we analyze the positions of the Serbian (fronted) wh-words as positions that are base generated and derived by External Merge (cf. 7).

3.2.3. Sensitivity to weak crossover effects

An additional piece of evidence in support of the analysis that Serbian FWHs are base generated in the structural positions they appear in is provided by their insensitivity to weak crossover effects. Weak crossover effects are restrictions on possible coreference (binding) between wh-phrases and pronouns (see Postal 1971). In the English example in (13.b), the movement of the subject *who* crosses over the pronoun, *his* hence the ungrammaticality.

(13) a. His$_i$ mother loves John$_i$
b. *Who$_i$ does his$_i$ mother love t_i?

(14) a. Njena $_i$ majka voli Nadju$_i$
Her mother loves Nadia
"Her mother loves Nadia."
b. Koga $_i$ njena $_i$ majka voli <-$_i$>?
Who her mother loves
"Who does her mother love?"

The Serbian example in (14.b), and which is the counterpart of the English (13.b) indicates that the Serbian wh-words are insensitive to crossover effects. The insensitivity to crossover follows if we analyze the wh-word *koga* 'who' in (14.b) as being base generated in the position it appears in and as such it does not induce and is not expected to induce crossover effects. The fact that the Serbian (fronted) wh-words are not sensitive to crossover effects reinforces their status as in-situ wh-elements.

4 Predictions And Implications

If the flexibility in the occurrences of the Serbian FWHs is not the by-product of (features-driven) movement, as seems to be indicated by the evidence discussed above, then the approach in (7) should predict that in Serbian: (i) wh-arguments

and wh-adjuncts would co-occur freely and in different orders and (ii) wh-arguments and wh-adjuncts can be coordinated. Both predictions are borne out. Consider the examples in (15.a-f).

(15)	a.	Ko	je	video	sta	kada
		Who	AUX	saw	what	when?
		"Who saw whom when?"				
	b.	Ko	je	video	kada	sta
	c.	Ko	sta	kada	je	video
	d.	Kada	sta	ko	je	video
	e.	Sta	kada	ko	je	video
	f.	Sta	ko	kada	je	video

As the examples in (15.a-f) show, the wh-adjunct *kada* "when" can occur in positions that follow, split and precede the wh-arguments. The ordering of the wh-arguments and wh-adjuncts seems to be constrained in (15a-f). This is expected, if both of wh-adjuncts and wh-argument are Merged (by Pair-Merge and Set-Merge), and none of them moves. Wh-adjuncts and adjuncts in general inherit the clausal level/projection information of the syntactic object they attach to. In this case, wh-adjuncts attach to whatever position the wh-arguments in the Serbian FWHs contexts attach to. If movement is involved in the generation of the orders in (15.a-f), scope violations would have been induced. It is a general property of adjuncts that they do not scopally interact with quantificational elements and do not establish long distance dependencies. Next, consider the examples in (16.a-d).

(16)	a.	Ko	je	video	sta	i	gde?
		Who	AUX	saw	what	and	where?
		"Who saw what and where?"					
	b.	Sta	i	gde	Ko	je	rekao?
	c.	Ko	sta	i	gde	je	rekao?
	d.	Ko	gde	i	sta	je	rekao?

In the example (16.a-d), wh-adjuncts and wh-arguments can be coordinated. This indicates that they are introduced onto the structure through the alternating application of Pair-Merge (adjunction) and Set-Merge (External Merge). For, if Internal Merge (movement) is involved in generating all the structures in (15) and (16) and the ones in (1.a-i), these structures would not be motivated without the heavy (and unsustainable) features-driven movement technology. However, if one assumes, along the lines of the proposal in (7) that the FWHs (including the instances where wh-adjuncts co-occur with wh-arguments) are syntactic objects that are merged (through Pair-Merge and Set-Merge) directly into the positions where they appear and are spelled out in a dynamic spell out way, then

the patterns in (15) and (16) follow as no surprise because Pair-Merge (for wh-adjuncts) and Set-Merge (for wh-arguments) would have applied on different cycles of Merge and Spell-out. In this respect, Merge recombines lexical items in a dynamic manner that can reset the order of the constituents on each application of Merge, mapping a dynamic transfer to Spell-Out (along the lines of Epstein *et al*. 1998).

If so, we predict that these derivational/computational hallmarks exhibited with Serbian FWHs be exhibited in constructions other than the Serbian FWHs. This is exactly what we find in idioms structure in Serbian. Consider (17.a-c).

(17) a. Sedeti kao na iglama
sit as on needles
Meaning: Be on pins and needles
(Idiomatic meaning: Have bad times/Feeling uncomfortable)

b. Kao na iglama sedeti
(Idiomatic meaning: Have bad times/Feeling uncomfortable)

c. Na iglama kao sedeti
(Idiomatic meaning: Have bad times/Feeling uncomfortable)

Idioms, in general, have the property that they cannot be licensed if one of the elements has undergone syntactic movement. However, in Serbian, different idioms constituents' orders can license idiom chunks (Cf. 17.a-c). These facts suggest that Pair-Merge interacts with Set-Merge, and adjunct wh-phrases are not probably introduced into syntactic structure only after all processes are complete-contra Stepanov (2000).

5 Conclusion

The discussion of the linear properties of the Serbian FWHs suggests that they are base generated in the clausal positions they appear in. These results, as they stand, are preliminary in nature and they can be confirmed and/or refined with further more extensive examination of the distributional and the computational properties of the Serbian FWHs and the ways in which their gap-filler dependencies are licensed. This will shed more light on the type of wh-in-situ that Serbian FWHs instantiate, namely whether they are of the Chinese wh-in-situ type, the French wh-in-situ type or other.

Notes

* I would like to thank the people who helped me shape some of the ideas in this paper into their current form by their comments, objections, discussions and suggestions. My thanks go Nancy Hedberg, Chung-hye Han, Emrah Görgülü, Susannah Kirby and audiences at WECOL 2011 and XSyn Lab at SFU for useful comments and questions. I would like also to express my gratitude to the following Serbian professional linguists (Boban Arsenijevic, Miloje Despic and Rada Trnavac)

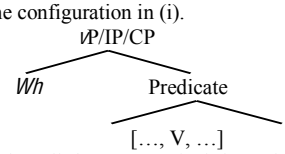
and many Serbian native speakers in Belgrade and Vancouver for their help with Serbian data and judgments. Any errors of facts or interpretation are exclusively mine and only mine.

[1] The Serbian data presented in this paper is elicited from Serbian linguists and native speakers of the Serbian variety spoken in Belgrade.

[2] For other aspects of the syntax of wh-words in Serbian (Serbo-Croatian) and other Slavic languages, see Rudin (1985, 1988a, 1988b, 1993), Dobrovie-Sorin (1994), Bošković (1997a, 1997b, 1997c, 1998a, 1998b, 2000, 2002, 2003b), Stepanov (1998), Stjepanović (1999b), Richards (2001), Gribanova (2009) and references cited therein.

[4] One immediate question that emerges with this proposal is how theta relations are computed and licensed since the occurrences of the Serbian FWHs elements are all assumed to be base generated in the positions they appear in. In the spirit of Chomsky (1995), my proposal steps on a clear cut distinction between the ways Theta and Case requirements are satisfied. Case requirements are of a morphological nature, have no semantic import and can be satisfied in a features checking/licensing configuration. Theta requirement, on the other hand, is semantic in nature, it expresses a relation (rather than a feature) that holds between a predicate and an argument. This difference indicates that the two requirements can be satisfied in different manners. In my proposal in (7), Theta relations and Case are computed in an argument predicate configuration and mediated through Merge, along the lines of the configuration in (i).

(i)



I assume that all the grammatical dependencies are MERGE-created-sisterhood relations (Epstein *et al.* 1998), and in this respect a predicate configuration expresses a sisterhood relation that is very local. The theta relations and Case between an argument and V is calculated in this configuration. The predicate and the argument establish a relation/chain (co-indexing) upon the application of Merge and as such allows the computation of the thematic relations. This analysis caters for the options of generating expressions (flexibly) in *v*P and non-*v*P positions. This is in line with the Minimalist Program (Chomsky 1995) direction of relocating parts of theta theory to the transformational component (i.e. Merge in the Minimalist Program) and away from the deep structure as was assumed in the Government and Binding framework. The Government and Binding hypothesis that deep structure is the domain in which thematic functions get defined is re-analyzed in the Minimalist Program as a condition on phrase formation.

[5] The judgments of the Serbian native speakers about the (in)-sensitivity of Serbian FWHs to island effects are not all stable as there seems to be a considerable degree of variation. At the time this paper is written, a large scale magnitude estimation study is underway to examine the statistical variations in these (in-)stable judgments as a research issue in and of itself.

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The Bare Necessities Suffice-Deriving Multiple Uses of Bavarian 'Bloß'

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1 Introduction

In the Miesbach Bavarian[1] (MB) dialect of German (SG), the uninflected particle *bloß* (≈'bare, only') has multiple uses; (1) as a focus particle (FPRT), (2) as a conjunctional adverb (CADV) and (3) as a discourse particle (DPRT).

(1) FPRT I trink meistens *bloß* a WASSER[2]
I drink mostly bloß det water
Mostly, I drink *only* water *(...not, tea,coffee, juice /nothing more exciting)*

(2) CADV I would like to come to your party…
I muaß *bloß* leida ARBAN
I have.to bloß unfortunately work
'*It's just that/ only*-I have to work'

(3) DPRT Mach *BLOß* dei Arbat!
Make bloß your work
'Do your work!' (*emphatic)*

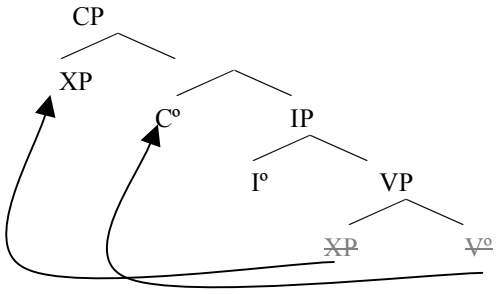
In this paper I address the question whether each instantiation of *bloß* in (1-3) is a different particle, i.e. a different lexical entry, or whether all uses can be derived from one lexical item. I propose that CADV and DPRT *bloß* in imperatives can be derived via merging FPRT *bloß* at IP. DPRT *bloß* in wh-questions is derived by adjunction of the FPRT to the wh-phrase. *Bloß* takes scope before obligatory Xº and XP movement in German matrix clauses, accounting for the sentence-wide (propositional) scope of the particle.

In German/Bavarian matrix clauses, the finite verb always appears in second position (V2), due to verb movement from Vº to Cº (4). SpecCP (in declaratives)

[1] Miesbach Bavarian is a middle Bavarian dialectal variant spoken south of Munich. The claims have been tested for this dialect, but I assume that the generalizations carry over to Standard German as well. Unless otherwise noted, data are from author's own fieldwork.
[2] Stress indicated by CAPS, an approximation of the particle meaning is in *italics* in the gloss.

is obligatorily filled with an XP, often the subject, but not necessarily so (cf. den Besten 1983).

(4)



2 Several lexical entries for bloß?

For the data in (1-3), *bloß* in each case is typically considered a different lexical entry in reference grammars (Duden 2006) and by many authors (e.g. Meibauer 1994). Distinctions between different types of particles in those accounts are generally based on interpretation and distribution.

2.1 *FPRT* bloß

FPRTs are thought to associate with a focussed element in their c-command domain (Jackendoff 1972). They quantify over alternatives of that domain (Rooth 1996), as shown in (5): other (salient) alternatives are excluded by *bloß*.

(5) I trink *bloß* [a WASSER]$_{\text{DOMAIN}}$
I drink bloß DET water
I drink *only* water *(not juice, coffee, .../nothing more exciting than water)*

As the gloss in (5) suggest, *bloß* can, depending on context, also have a scalar interpretation (*nothing more exciting than water)*. I assume here that the scalar/exclusive variation with *bloß* (like with English ‚only') is not due to separate lexical items, but that the exlusive interpretation can be derived from a scalar use. Excluded alternatives are those which are higher-ranked members of a discourse-contextually determined scale; under such an analysis, full exclusion is only apparent, and depends on the vagueness of the scale (Klinedinst 2004; Beaver 2004).

2.2 *CADV* bloß

CADVs are taken to be clausal connectors with a distribution typical of adverbials (Thurmair 1989); that is, they can appear after the finite verb (6a) or

in SpecCP (6b). In both positions, *bloß* is interpreted as a conjunction, connecting previous utterances or discourse antecedents to the *bloß* modified one.

(6) I would like to come to your party…
a. I muaß *bloß* leida ARBAN
I have bloß unfortunately work
'*It's just that/ only*-I have to work'

b. *bloß* muaß I leida ARBAN
I have bloß unfortunately work
'*It's just that/ only*-I have to work'

CADV *bloß* connects to a discourse antecedent with a similar interpretation as 'but'.

2.3 *DPRT* bloß

DPRTs (a.k.a. modal particles) are assumed to express speaker attitude; they appear (string-linearly) integrated in the sentence (after the finite verb). Just like CADV, they have propositional scope (Thurmair 1989).

(7) Gib BLOß am Andreas n SCHLISSL
Give bloß DET andreas DET key
'Give Andreas the key!' (*emphatic)*

In imperatives, DPRT *bloß* is always stressed. It gives imperatives special emphasis (7), which sometimes is described as threatening (e.g. Thurmair 1989).

3 Deriving CADV and DPRT *bloß*

In the following I show that the so-called CADV and DPRT are essentially special uses of the FPRT *bloß*. I begin by spelling out my assumptions about FPRTs in 3.1, then I show how, with the basic ingredients presented in that section, the CADV and DPRT uses are derivable (in 3.2, 3.3).

3.1 *Background assumptions about* bloß

3.1.1 *Focus and bloß interact in a modular way*

In the literature, two main alternative assumptions about the interaction of particles and focus can be found; (i) FPRT induce focus structure (e.g. Bayer 1996, Jacobs 1983), or (ii) FPRT interact with already present focus structure (e.g. Sudhoff 2009). I adopt the second view in this paper. (8) shows that the

effect of stress on the object in (a) and (b) is the same, i.e. the object is focused, regardless of the particle *bloß*.

(8) a. I trink [a WASSER]$_{DOMAIN}$
I drink DET water
I drink water *(not juice, coffee, tea,…)*

b. I trink *bloß* [a WASSER]$_{DOMAIN}$
I drink bloß DET water
I drink *only* water *(not juice, coffee, tea,…)*

bloß adds extra meaning but it is optional, just like a typical adjunct. The meaning component that is added is exclusive, i.e. of all the alternatives evoked by focus, the only alternative that holds is the one modified by *bloß*.
The next sub-section shows that *bloß* itself can be stressed, with focus effect.

3.1.2 *Stress on bloß*
The particle can be stressed, with added focus on *bloß* (9).

(9) I trink *BLOß* a Wasser
I drink bloß DET water
I drink water *alone/by itself. (not water and juice, water and coffee,…)*

The contribution of focus (via stress) on *bloß* leads to an *alone/by itself* reading. This is accomplished via generation of focus alternatives for *bloß*. The alternative set is the same contrast set as for yes/no questions (Hamblin (1973, also Romero & Han 2001). This is shown informally in (10).

(10) $[\text{BLOß}]^{F}$ = { bloß ,¬ bloß }

When stressed *BLOß* adjoins to a focus domain D[3], the effect is *bloß* D vs. ¬*bloß* D. For (9) BLOß a Wasser is contrasted with ¬ BLOß Wasser, implicating 'water by itself' vs. 'water and something else'.

(11) shows that the effect of stress on the particle adds a focus component, and is not merely emphatic stress; (11b) and (11c) differ in truth conditions, showing that stress on *bloß* is correlated with added focus[4].

(11) a. I trink *BLOß* a Wasser
I drink bloß DET water

[3] I assume that the DP is deaccented to avoid stress clash.
[4] This data also is evidence that the FPRT forms a constituent with the associated DP (against Büring & Hartmann (2001).

I drink water *alone/by itself. (not water and juice, water and coffee,…)*

b. *BLOß* a Wasser trink I ned
I drink NEG bloß DET water
I don't drink water *alone/by itself.*

c. *bloß* a WASSER trink I ned
I drink NEG bloß DET water
Water is the only thing I don't drink.

3.2. Deriving CADV *bloß*

With the background assumptions above in place, I want to show in the following that the so-called conjunctional adverb is a special use of the FPRT *bloß*. My main claim is that the CADV use of bloß is the effect of *bloß* adjunction to IP (12).

(12) CADV= bloß→ IP

Iº VP

Recall that the finite verb has to move to Cº, and SpecCP has to be filled with an XP. The effect of *bloß* adjunction to IP is that the modified IP (the proposition) is marked as the only one that holds/is relevant in the given discourse context (13). That is, the speaker marks the proposition as the only relevant one for her, among all the possible propositions she could have uttered.

(13) I would like to come to your party…
I muaß *bloß* leida ARBAN
I have bloß unfortunately work
'*It's just that/ only*-I have to work'

(14) shows that the apparent syntactic integration into the sentence is the effect of obligatory verb and XP movement after *bloß* adjunction.

(14) a. I muaß *bloß* leida
b. *bloß* $_{IP}$[leida ~~I~~$_{Subject}$ arban ~~muaßº~~$_{Verb}$]

There may be other propositions a speaker could chose to utter in a given discourse, in order to add to the common ground (15b).

(15) a. A: Are you coming to my party?

B: I muaß leida ARBAN
I have.to unfortunately work
'Unfortunately I have to work'

b. {I have to work, my dog needs to go to hospital, the soccer world cup finale is on, there is no bus to your place, I am tired…}

bloß adjunction to the given IP marks that the proposition uttered is the only only one to hold among other possible propostions.

Evidence for IP adjunction comes from indefinite subjects (3.2.1.) and adverbs (3.2.2.).

3.2.1 Bloß *and indefinite subjects*
One piece of evidence for IP adjunction of CADV *bloß* is provided by definite subjects. Definite subjects are located in IP (Diesing1992). *bloß* with CADV interpretation is higher than the definite subject 'da Andreas' (16).

(16) a. We'd like to come for dinner next wednesday
Es muaß *bloß* der Andreas na eher furt, because…
it must bloß DET andreas then earlier gone
'*It's just* that Andreas has to leave earlier then.'

b. *Es muaß der Andreas *bloß* na eher furt, ….

If the indefinite subject is placed below *bloß*, the result is ungrammatical as shown in (16b).

3.2.2 Bloß *and adverbs*
Additional evidence for the high IP adjunction of *bloß* comes from adverb ordering. Speaker oriented adverbs, such as 'unfortunately' c-command the subject (Frey & Pittner 1998). *Bloß* in turn adjoins higher than a speaker-oriented adverb (*leider* 'unfortunately') when it has CADV interpretation (16a). Crucially, it cannot be interpreted in this position as a FPRT with 'narrow' focus on a DP (*mei Arbat* in (16a)). If *bloß* is to be interpreted as FPRT with narrow focus on 'my work', the particle has to appear below the speaker-oriented adverb (17b).

(17) a. I hob *bloß* leida mei ARBAT im Kopf
I have bloß unfortunately my work in.DET head
'*It's just that* unfortunately I have my work on my mind'
* 'I have only my work on my mind'

b. #I hob leida *bloß* mei ARBAT im Kopf
intended: 'It's just, that unfortunately I have my work on my mind.'
'I have *only* my work on my mind'

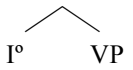
To sum up the findings of this section, despite the sentence-wide, conjunctional interpretation, the linear distribution of *bloß* within the sentence is accounted for, and it was shown that no separate lexical entry for the CADV *bloß* is necessary.

3.3. Deriving DPRT *bloß*

In this section I will show that the so-called discourse particle *bloß* is also a special use of the FPRT *bloß*.

3.3.1 *DPRT* bloß *in imperatives*
DPRT in imperatives is the effect of stressed *BLOß* adjoined to IP, shown in (18).

(18) DPRT= BLOß→ IP



Imperative *bloß* is always stressed, when it is interpreted as DPRT; if unstressed, it is a CADV (19b).

(19) a. Gib *BLOß* am Andreas n SCHLISSL
Give bloß DET andreas DET key
'Give Andreas the key!' (*emphatic/of all things to do, p is the only one you should do)*

b. Gib *bloß* am Andreas n SCHLISSL
Give bloß DET andreas DET key
'*Only,* Give Andreas the key!'

Recall that stress and focus on *bloß* leads to an alternative set containing two members; *bloß* and ¬ *bloß*. It is this focus on *bloß* that leads to the special emphasis of the imperative.
The emphatic meaning is derived as follows: *bloß* adjoins to the IP (20). This singles it out as the only IP (i.e. proposition) to hold in the discourse context (its interpretation is that of CADV. cf. 19b). Among the propositions the speaker could have uttered to add to the common ground, the *bloß* marked one ins the only one to hold. Stress on the particle (20b) adds the special emphasis via introduction of the alternative set, which is the same as on Y/N questions, as shown above (10, 11) .

(20) a *bloß* $_{IP}$[am Andreas den Schlissl gib]
b. [BLOß]^{F} $_{IP}$[am Andreas den Schlissl gib]

3.3.2 *DPRT* bloß *in wh-questions*
bloß is also found in wh-questions, where it adds an element of emphasis to the wh-word (can't –find-the–value question, Obenauer 2004).

(21) I frog mi wo da ANDREAS *bloß* scho wieda is?
I ask myself where DEt A bloß already again is
'I wonder *just* where Andreas is?'

I propose that DPRT *bloß* in wh-questions is deriveable via adjunction of the FPRT to a wh-phrase before it moves (cf. Bayer &Obenauer 2010) (22).

(22) bloß→ WhP
△
wh°

No alternatives for the wh-variable can be generated, so adjunction of *bloß* in this case yields the typical "I just don't know" interpretation. This is effect is due to *bloß* trying to (unsuccessfully) pick out a value to exclude. Evidence for *bloß* adjunction directly to the wh-phrase before movement comes from (i) definite subjects (23) and (ii) locative adjuncts (24).

(23) I frog mi wo da ANDREAS *bloß* scho wieda is?
I ask myself where DEt A bloß already again is
'I wonder *just* where Andreas is?'

Bloß is possible below the definite subject 'da Andreas' in (23), suggesting it is adjoined within IP. L

Locative adjuncts are base generated above the highest ranked argument (i.e. above vP) (Frey & Pittner 1998). Repetitive *wieda* 'again' is adjoined to vP (Pittner 2003). (24) shows that *bloß* has to be higher than *wieder* with a locative wh-word, i.e. it is ungrammatical if it occurs below .

(24) …*wo da ANDREAS scho wieder *bloß* is?

Additional evidence stems from the observation that *bloß* can be pied-piped along with the (emphatically stressed) wh-word to SpecCP (cf. Emphatic topicalization, Bayer 2001) (25).

(25) WO bloß is da Andreas scho wieda?

Where bloß is DET A already again
'*Just* where *the hell* is Andreas again?'

To sum up this section, no lexically specified DPRT is needed to account for the interpretation of *BLOß* in imperatives and wh-questions. Adjunction of FPRT *bloß* to IP, and the effects of focus on the particle suffice to account for the observed readings with imperatives. Adjunction of FPRT *bloß* to a wh-phrase derives the observable interpretations in wh-questions.

4 Summary and outlook

The main claim of this paper is that no separate lexical items for CADV and DPRT need to exist in order to account for the data. The proposed account relies on independently necessary movement that is already well established for Bavarian/German (Vº-Cº, XP to Spec CP, wh-movement) to derive the linear order. In brief comparison to other analyses, the present one is most economical; proposals which analyze DPRT as merged within IP (e.g. Grosz 2005, Coniglio 2009, Bayer & Obenauer 2010), all have to make special assumptions. On the one hand, either LF movement to the C–domain (e.g. Zimmermann 2004 for *wohl*) has to be assumed in order to account for the propositional interpretation of DPRTs. Or, on the other hand, different feature specifications for each DPRT are proposed (Bayer 2008, Bayer& Obenauer 2010), to get sentence-wide/ propositional scope.
The present analysis needs no special feature specification or LF movement for *bloß* to get it to a sentential/propositional scope bearing position; *bloß* is already in a propositional scope position, albeit before other, independently necessary movement takes place. Table (I) sums up the findings.

Table 1: Deriving CADV and DPRT *bloß*

bloß: traditionally called	…when its **distribution** is…
CADV	*bloß*→ IP Iº VP
DPRT	*BLOß*→ IP Iº VP
DPRT	*bloß*→ WhP △

Lastly I would like to suggest that maybe even the FPRT *bloß* is derivable. Claims already exist in the literature that FPRT and focus proper interact in a modular way, i.e. focus structure exists independently/ is not introduced by

FPRTs (e.g. Sudhoff 2009). In this light, I suggest that one underlying *bloß* suffices to derive FPRT, CADV and DPRT uses. The core semantics of *bloß* is *'bare'* (i.e. it is an exclusive operator, a 'stripper'). A proposed lexical entry for *bloß* is shown in (26).

(26) √*bloß*

Roots don't show c-selectional properties, or other categorial properties (Borer 2004, Wiltschko 2006). This can account for the variable adjunction of bloß (to IP, to wh-variables, and to DPs). Evidence for absence of categorial information for √*bloß* comes from its ability to enter into word formation processes in the context of categorizing affixes (27).

(27) a.	[v √bloß]$_v$	b. [a √bloß]$_a$	c. [a √bloß]$_a$
	ent-*blöß*-en	*bloß*-fuassad	da *bloß*-e Gedanke
	PREF-BARE-INF	BARE-footed	DET BARE-ADJ thought
	'to strip'	'barefoot'	' the sheer thought'

Further in-depth research will show whether these suggestions are on the right track.

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Passives and Two Types of Mandarin Applicative Structures

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1 Introduction: Two Types of Mandarin Applicatives

In this paper, I discuss two types of Mandarin applicatives and their interaction with the so-called Mandarin long passives. The two types of applicatives are shown in (1). (1a) is a recipient applicative. There is a possessive relation between the indirect object (IO) and the direct object (DO). Therefore this is semantically a low applicative in the sense of Pylkkanen (2002). (1b) is an affective applicative. There is no overt possessive relation between the IO and the DO. IO is linked to the event containing DO with an affective relation. The reading of this sentence is: Zhangsan was affected by the fact that Laotian made a joke on him.

(1) a. *recipient*
Zhangsan song le Lisi shu.
Zhangsan send-PERF Lisi book
"Zhangsan sent Lisi books."

b. *affective*
Laotian kai le Zhangsan yige wanxiao.
God make-PERF Zhangsan one-CL joke
"The god made a joke on Zhangsan"

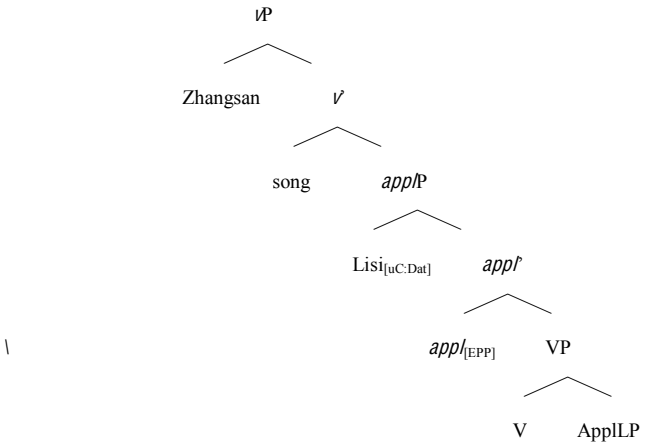
This paper is organized in this way: I present my analysis of the two types of applicatives in Section 2; in section 3 I will discuss the passives in Mandarin, focusing on the passivization pattern of the two types of applicatives; in section 4, I review my analysis of the passivization pattern of applicatives in short passives; in section 5, I present my analysis of the pattern in long passives. Section 6 concludes the presentation.

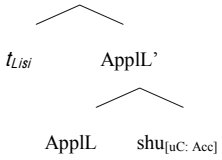
2 Derivation of Recipient and Affective Applicatives (Li 2011)

2.1 Recipient applicatives

As mentioned in Section 1, Mandarin recipient applicatives are instances of low applicatives. The derivation of (1a) is shown in (2). I follow Citko (2011) in positing the light *appl* head as a structural dative case licenser. The DO *shu* "book" is base-merged with the ApplL head, and the IO *Lisi* is base-merged at [Spec, ApplLP]. Upon Merge of the light *appl*, the IO agrees with it to check φ-features and the dative case. The IO also checks the EPP feature on *appl* by moving to [Spec, *appl*]. At this point, all the features on the IO are checked. The IO is frozen in [Spec, *appl*]. The next step in the derivation is Merge of *v*. Since the IO is frozen, the DO becomes the only possible goal in the searching domain of the *v* probe. It then enters Agree relation with *v* to license case.

(2) Derivation of (1a)

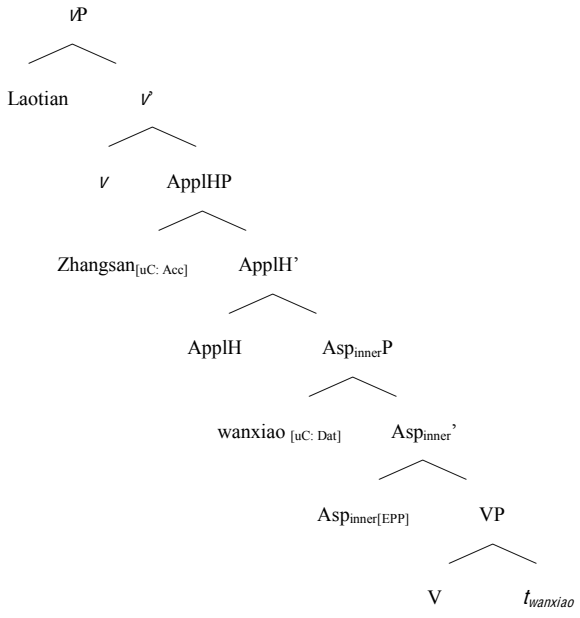




2.2 Affective applicatives

The derivation of (1b) is shown in (3). In Li (2011) I argued that the VP event in affective applicatives is bounded. It is telic at the level of situation type and perfective at the level of viewpoint aspect. The boundedness is licensed by the Asp_{inner}. The DO agrees with it. The DO moves to [Spec, Asp_{inner}] to check EPP. The IO is base generated in [Spec, ApplHP]. IO agrees with light *v* to license the accusative case.

(3) Derivation of (1b)



3 Two Types of Mandarin Passives

In this section, I discuss the Mandarin passives. Following Huang (2009 et al.), I show that there are two types of passives in Mandarin. I also show the

interaction between the two types of passives and the two types of applicatives.

There are two types of passives in Mandarin: a long one, which involves an agent, as shown in (4a), the agent is *Lisi*; a short one as shown in (4b), which does not have overt agent.

(4) a. Zhangsan bei Lisi da-le. *Long passive*
Zhangsan BEI Lisi hit-le
"Zhangsan was hit by Lisi."

b. Zhangsan bei da-le. *Short passive*
Zhangsan BEI hit-le
"Zhangsan was hit."

3.1 Asymmetry in Long and Short Passives

As noticed by Huang (2009 et al.) there is asymmetry between long and short passives. He claims that Mandarin long passives are derived from A'-movement while short passives are derived from A-movement. In particular, he shows that Mandarin long passives demonstrate certain A' properties. As (5) shows, long passives have long distance dependencies. They also demonstrate island sensitivity as in (6). In addition, a resumptive pronoun is allowed, which means reconstruction, a typical A' property, is possible in long passives, as in (7).

(5) long distance dependencies
nei-feng xin bei wo jiao Lisi qing Wangwu tuo ta meimei ji-zou-le.
that-CL letter BEI me tell Lisi ask Wangwu entrust his sister send-le
"That letter was "told-LS-to-ask-WW-get-his-sister-to-send" by me."

(6) island sensitivity
*Zhangsan bei wo tongzhi Lisi ba zanmei __ de shu dou mai-zou-le.
Zhangsan BEI me inform Lisi ba praise (him) de book all buy-away-le
"Zhangsan had me inform Lisi to buy up all the books that praise [him]."

(7) resumptive pronoun
Zhangsan$_i$ bei Lisi da-le ta$_i$ yi-xia.
Zhangsan BEI Lisi hit-le him once
"Zhangsan was hit once by Lisi."

One the other hand, short passives do not demonstrate the A' properties in long passives. It does not allow long distance dependencies, as in (8). Resumptive pronouns are also not allowed in short passives (9), which means reconstruction is impossible in short passives. I follow Huang (2009 et al.) in that short passives are instances of A-movement.

(8) *nei-feng xin bei jiao Lisi qing Wangwu tuo ta meimei ji-zou le.
that-CL letter BEI tell Lisi ask Wangwu request his sister send le

(9) *Zhangsan bei da-le ta yi-xia.
Zhangsan BEI hit-le him once
"Zhangsan was hit once."

3.2 Asymmetry in Passivization Pattern of Two Types of Applicatives[1]

There is asymmetry with respect to the passivization patterns of two types of applicatives in both short and long passives. In short passives, recipient applicatives allow passivization of the DO but not the IO as in (10a). Affective applicatives allow passivization of the IO but the DO as in (10b)

(10) a. recipient applicatives in short passives
Shu bei song le Lisi. (*DO can be short-passivized*)
Books BEI send-PERF Lisi
"Books were sent to Lisi."

*Lisi bei song le shu. (*IO cannot be short-passivized*)
Lisi BEI send-PERF books.
"Lisi were sent some books."

b. affective applicatives in short passives

*Pingguo bei chi le Lisi. (*DO cannot be short-passivized*)
Apples BEI eat-PERF Lisi.
"Apples were eaten on Lisi."

Lisi bei chi le pingguo. (*IO can be short-passivized*)
Lisi BEI eat-PERF apples.
"Lisi had the apples eaten (by somebody)."

In long passives, recipient applicatives also only allow the passivization of the DO as in (11a). Affective applicatives, in opposite, only allow the passivization of the IO as in (11b).

(11) a. recipient applicatives in long passives
Naben shu bei Zhangsan song le Lisi. (*DO can be passivized*)
That-CL book BEI Zhangsan sent-PERF Lisi
"That book was sent to Lisi by Zhangsan."

*Lisi bei Zhangsan song le naben shu. (*IO cannot be passivized*)
Lisi BEI Zhangsan sent-PERF that-CL book.
"Lisi were sent that book by Zhangsan."

b. affective applicatives in long passives
*Pingguo bei Zhangsan chi le Lisi. (*DO cannot be passivized*)
Apples BEI Zhangsan eat-PERF Lisi.
"The apples were eaten by Zhangsan."

Lisi bei Zhangsan chi le pingguo. (*IO can be passivized*)
Lisi BEI Zhangsan eat-PERF apples.
"Lisi had the apples eaten by Zhangsan."

A short summary, as shown in (12): in both short and long passives, recipient applicatives only allow the passivization of the DO while affective applicatives only allow the passivization of the IO. The passivization patterns are exactly the same in both short and long passives, although short and long passives are structurally different.

(12) Table 1: a summary of passivization patterns of Mandarin applicatives

	short passives	long passives
Recipient IO	*	*
Recipient DO	✓	✓
Affective IO	✓	✓
Affective DO	*	*

4 Analysis of Passivization Pattern in Short Passives

I review my analysis of the passivization pattern in short passives (Li 2011) in this section. Short passives are analyzed in the same way as a passive structure in English. It is derived from A-movement, the passive subject agrees with T to license case since the light *v* is defective, as in (13).

(13) $[_{TP}$ DP [T $[_{vP}$ *v* $[_{VP}$ V $t_{DP}]$]]]]

4.1 Derivation of Recipient Applicatives in Short Passives

In a recipient applicative, the IO agrees with light *appl*. All the features on the IO is valued by light *appl*. The IO gets frozen in [Spec, *appl*P]. DO agrees with light *v* to license case. When a recipient applicative is passivized, the light *v* is defective. The DO instead agrees with T to license the nominative case. The DO also moves to [Spec, TP] to check EPP. The IO is invisible to the T probe, since its features are valued via agreeing with light *appl*. Therefore only the DO can be passivized. The derivation is shown in (14).

(14) $[_{TP}$ DO [T $[_{vP}$ *v* $[_{applP}$ IO [*appl* $[_{VP}$ V $[_{ApplLP}$ t_{IO} [ApplL $t_{DO}]]]]]]]]$

4.2 Derivation of Affective Applicatives in Short Passives

On the other hand, in an affective applicative, DO agrees with Asp_{inner}. The DO ends up in [Spec, Asp_{inner}P] to check the EPP feature. IO agrees with light *v*. When an affective applicative is passivized, the light *v* is defective.

In this case, the IO is the closest goal in the c-command domain of the T probe. Therefore the IO agrees with T. The DO is not able to agree with T without violating the Minimal Link Condition. The derivation is shown in (15).

(15) [$_{TP}$ IO [T [$_{vP}$ *v* [$_{ApplHP}$ *t*IO [ApplH [$_{AspinnerP}$ DO [Asp$_{inner}$ [$_{VP}$ V *t*DO]]]]]]]]

To summarized, the discussion above shows that in both recipient and affective applicatives, only the object which agrees with light v can be passivized in short passives.

5 Analysis of Passivization Pattern in Long Passives

5.1 Comments on Huang's (2009 et al.) Analysis of Long Passives

Huang's (2009 et al.) analysis of Mandarin long passives is very similar to a derivation of tough construction. The passive subject is base generated in the matrix clause. An null operator, which is coindexed with the passive subject is base generated in the gap position in the embedded clause. An null operator is coindexed with the passive subject. The null operator moves to [Spec, CP] in the embedded clause. The derivation is shown in (16).

(16)
[$_{CP}$[C[$_{TP}$Zhangsan$_i$[T[$_{vP}$*t*$_{Zhangsan}$[BEI[$_{CP}$Op$_i$[C[$_{TP}$Lisi[T[$_{vP}$*t*$_{Lisi}$[*v*[$_{VP}$da *t*$_{op}$]]]]]]]]]

However, there is something that Huang's analysis fails to account for several properties of long passives. The first property is the scope ambiguity demonstrated in long passives. Following Fox (2000), Scope bearing elements, namely quantifiers, may only raise or lower to the closest "clause-denoting expression" which dominates them. Therefore, Huang's analysis predicts that there should be no scope ambiguity in long passives, since the two scope bearing elements are separated by a clause boundary. However, as (17) shows long passives sometimes demonstrate scope ambiguity. The first reading for (17) is: For every x such that x is a man, there is one single woman y such that every x is captured by y. The second reading (17) is: For every x such that x is a man, there is a different woman

such that she captured x.

(17) meige nanren dou bei yige nvren zhuazou le
every man all BEI one-CL woman capture-away PERF

More importantly, Huang's analysis also fails to account for the passivization patterns of applicatives in long passives. Essentially, in Huang's analysis predicts that both the IO and the DO can be long-passivized in both applicatives, since nothing blocks the base-generation of the two objects in the matrix clause. There is neither anything that blocks the operator movement in the embedded clause. Huang's analysis needs some modification, which will be the topic of the next section.

5.2 Revise Huang's (2009 et al.) analysis

I revise Huang's analysis in the following way: The passive subject is generated twice in the derivation: one in the matrix clause; another in the embedded clause. The passive subject in the embedded clause moves from its argument position to embedded [Spec, CP]. The copy of the passive subject in the embedded clause is later deleted according to Formal Feature Elimination (FFE) cited below in (18) (Nunes 2004). The derivation is shown in (19).

(18) *Formal Feature Elimination*

> Given the sequence of pairs σ = <(F, P)1, (F, P)2,…,(F, P)n such that σ is the output of Linearize, F is a set of Formal Features and P is a set of phonological features, delete the minimal number of features of each set of formal features in order for σ to satisfy Full Interpretation at PF.
>
> (Nunes 2004: 31-32)

(19)[$_{CP}$[C[$_{TP}$Zhangsan$_i$[T[$_{vP}$$t_{Zhangsan}$[BEI[$_{CP}$~~Zhangsan$_i$~~[C[$_{TP}$Lisi[T[$_{vP}$$t_{Lisi}$[$_{v'}$[$_{VP}$da ~~Zhangsan$_i$~~]]]]]]]]]]]]

5.3 Derive the Asymmetry in Long Passives

Now we are ready to analyze the passivization pattern in long passives. If we take a closer look, The A'-movement of passivization of applicatives in long passives demonstrate the same asymmetry as their A-movement in short passives. This suggests that the A' movement in long passives carries certain A-property: only the object which agrees with light *v* to value φ-features undergoes long-passivization.

My analysis is based on Miyagawa's (2009) idea. EPP feature is activated by agreement (either φ-feature agreement or focus/topic agreement) to establish functional relation above the lexical domain (*v*P). Therefore I extend Miyagawa's proposal: the edge of *v*P is also involved in establishing functional relation. The EPP feature on *v* in Mandarin needs to be activated by φ-feature agreement.

Consequently, the asymmetry demonstrated in the long-passivization patterns of Mandarin applicatives can be solved. In a recipient applicative, Only DO has φ-feature agreement with the embedded light *v*. Therefore only the DO is able to activate the EPP on the edge of the light *v*. As a result, in a recipient applicative only the DO can move to [Spec, CP] in the embedded clause to be long-passivized as shown in (20). Similarly, in an affective applicative, only the IO has φ-feature agreement with light *v*. Therefore only the IO is able to be extracted from the *v*P phase in the embedded clause to be long-passivized as shown in (21).

(20) $[_{CP}[C[_{TP}\ DO_i[T[_{vP}t_{IO}\ [BEI[_{CP}\ \sout{DO_i}[C[_{TP}\ DP_{subj}\ [T[_{vP}\sout{DO_i}[_{v'}\ t_{DPsubj}\ [v\ [_{applP}$ IO $[appl\ [_{VP}$ V $[_{ApplLP}\ t_{IO}$ [ApplL $\sout{DO_i}$]]]]]]]]]]]]]]]

(21)$[_{CP}[C[_{TP}\ IO_i[T[_{vP}t_{IO}[BEI[_{CP}\sout{IO_i}[C[_{TP}DP_{subj}[T[_{vP}\ \sout{IO_i}\ [v'\ t_{DPsubj}\ [v\ [ApplHP$ $\sout{IO_i}$-$[_{AspinnerP}$ DO $[Asp_{inner}\ [_{VP}$ V t_{DO}]]]]]]]]]]]]]]]]

6 Conclusion

In this paper, I showed that Mandarin has two types of applicatives: recipient applicative (low) and affective applicative (high). Mandarin has two types of passives: short passives and long passives. Short passives are derived from A-movement. Long passives are derived from A'-movement.

However, long passives also demonstrate certain A-property. There is asymmetry in the passivization pattern of two types of Mandarin applicatives. Only the object which agrees with light *v* could be passivized.

Following Miyagawa (2009), I argued that the EPP feature on functional heads in Mandarin needs to be activated via φ-feature agreement. The EPP is dependent on φ-feature agreement. The asymmetry of passivization pattern is essentially derived from the φ-feature agreement with light *v*.

Notes

[1] The examples in this section are cited from Huang (2009 et al.) pp.124~133.

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A Psycholinguistic Investigation of Reference Resolution in Bangla*

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1 Introduction

We report a sentence completion experiment investigating the processing of anaphoric pronouns and demonstrative pronouns in Bangla. In this experiment, we tested whether anaphoric pronouns are interpreted differently than demonstrative pronouns. The broad question we are interested in is how comprehenders interpret different kinds of referring expressions, and to what extent the constraints guiding the interpretation process of particular forms are the same or different across languages. These issues also have implications for our understanding of the notion of 'salience.

Previous research on reference resolution has shown that there is a close connection between different referring forms and how salient / accessible / prominent the intended referent is, i.e., how prominently the intended referent is represented in the minds of the discourse participants (Ariel (1990)'s Accessibility Hierarchy, Gundel, Hedberg & Zacharski (1993)'s Givenness Hierarchy, among others). Although there are differences between the specific accounts (e.g. the implicational nature of Givenness Hierarchy), they share the common insight that the most reduced referring expressions are used refer to more salient referents and that fuller forms are used for less salient referents. A partial hierarchy is shown below:

Null > Pronouns > Demonstratives > full NPs…
More accessible referents……..……less accessible referents

When considering the notion of salience, a key question that comes up is what linguistic factors influence the salience of referents. A number of factors have been proposed in earlier work, including grammatical role and linear order. For example, in English, agentive subjects have been claimed to be more salient than non-subjects (Chafe, 1976; Stevenson *et al.* 1994). In some other languages

(e.g., Turkish, Hindi) the word order has been shown to influence reference resolution. For example, in Turkish, Turan (1998) proposes that the grammatical role correlates with reference salience. A similar claim has been made for Hindi (Prasad and Strube, 2000). They show that grammatical function is a crucial factor for determining referent salience (Prasad and Strube, 2000: 2).

In sum, referent salience has been proposed to be influenced by several factors, including grammatical function of the antecedent and its linear position/word order. Most of these accounts seem to assume that a single factor is crucial for determining referent salience. In contrast, others have suggested that multiple factors can play a role, e.g. Arnold (1998) and Kaiser (2003). More specifically, the *form-specific multiple constraints* approach (Kaiser, 2003; Kaiser and Trueswell, 2008, Kaiser and Vihman 2008) claims that multiple factors can influence how a particular anaphoric form 'finds' its antecedent and that these factors can be weighted differently for different anaphoric forms. Thus, anaphoric forms "can differ in the degree of sensitivity they exhibit to the syntactic role and linear position of potential antecedents" (Kaiser & Trueswell 2008: 742). For example, one form may be more sensitive to the linear position of the antecedent, while another form is more sensitive to the grammatical role. This approach is supported by various online and offline experiments in Finnish and Estonian involving pronouns and demonstratives after sentences with canonical SVO and noncanonical OVS word order. In particular, the results show that anaphoric pronouns in both Finnish and Estonian are primarily sensitive to the grammatical role of the antecedent and prefer subjects, whereas demonstratives (when used anaphorically to refer to human antecedents), are sensitive to both word order and grammatical role. In sum, these findings argue against single factor approaches, suggesting that they are not sufficient for explaining the properties of reference resolution in languages.

In this paper, we investigate reference resolution patterns in Bangla/Bengali, an Indo-Aryan language spoken in the state of West Bengal, Tripura in India and in Bangladesh. The typological properties of Bangla mean that it is well-suited for contributing to our understanding of reference resolution cross-linguistically. Like Finnish and Estonian, Bangla has flexible word order, and thus allows us to investigate how grammatical role vs. linear order influence reference resolution. In addition, Bangla has a rich paradigm of referential forms. Here, we focus on the anaphoric personal pronoun *Se(Ta)* and the distal demonstrative pronoun *o(Ta)*, described in more detail in Section 1.1 below. In section 1.2, we discuss the word order patterns of Bangla. Section 2 presents the psycholinguistic sentence-continuation experiment that we conducted to investigate the interpretation of *o(Ta)* and *Se(Ta)* in Bangla. The results are presented in Section 3, and Section 4 consists of the general discussion and conclusions.

1.1 Bangla pronouns

The anaphoric paradigm of Bangla allows both the anaphoric pronoun *SeTa* and the demonstrative pronoun *oTa* to refer to non-human and inanimate referents. Human counterparts have honorific forms. Table 1 shows the pronominal system for the referring expressions relevant to the present discussion.

Table 1. Referring expressions in Bangla (excluding plural, oblique and other pronouns in the paradigm)

Referring expressions	Human		Non-Human and Inanimate
	non-honorific	honorific	
Anaphoric pronoun (3rd P.)	*Se*	*tini*	*SeTa*
Demonstrative pronoun: distal	*o(i)*	*uni*	*oTa*

The precise linguistic categorization of *SeTa* and *oTa* has been controversial (see e.g. Bagchi 1994, Dasgupta 1992 for detailed discussion). We will not attempt a detailed categorization of these forms in this paper due to space limitations. What is of relevance to us is that both forms can be used to refer to non-human animal antecedents as well as inanimate antecedents, and both forms can also be used discourse-deictically. For example, as shown in ex.(1a-b), both *SeTa* and *oTa* can be used to refer to animals. In addition, as can be seen in ex.(1c-d), both forms can also be used discourse-deictically, to refer to previously mentioned events. (In these examples, we translate the discourse-deictic uses with the English demonstrative 'this', but this is not necessarily the correct English translation for all cases of *oTa/SeTa*.)

(1) Kukur-Ta EkTa beRal-ke taRa-korlo
dog-cla one cat-acc chased
"*The dog chased a cat.*"

a. Anaphoric use of *SeTa*:
SeTa paliye gElo.
SeTa ran-away
"*<u>It</u> ran away.*"

b. Anaphoric use of *oTa*
taRa-kheye *oTa* dokan-e Dhuke-poRlo
Having-been-chased *oTa* shop-loc entered
"*<u>It</u> entered the shop, after being chased.*"

c. Discourse-deictic use of *SeTa*
SeTa dekhe nira bhOy-pelo
SeTa having-seen Nira got-scared
"*Having seen <u>this</u>, Nira got scared.*"

d. Discourse-deictic use of *oTa*

oTa	khubi	Sabhabik	bEpar
oTa	very	natural	thing

"*This is a natural thing.*"

In prior work on Bagla, *SeTa* is often regarded as more anaphoric than *oTa*, which is regarded as primarily deictic (Bagchi 1994, Dasgupta 1992, Sengupta 1999). Following this, we will refer to *SeTa* as an anaphoric pronoun and *oTa* as a demonstrative pronoun. However, as can be seen in ex.(1), both forms can be used anaphorically as well discourse-deictically. Thus, our aim is to gain a better understanding of their referential biases, e.g. is one form used discourse-deictically more often than the other? Furthermore, we want to investigate whether, when used anaphorically, these forms prefer the preceding subject or the preceding object, and whether they are sensitive to the linear order of the subject and object. As mentioned in Section 1, prior work in other languages has led to mixed effects regarding the effects of word order on reference resolution.

1.2 Word order in Bangla

Like other Indic languages, Bangla has relatively free word order, which is influenced by discourse factors. However, the canonical word order is SOV. It is commonly agreed that subjects in sentences with canonical SOV order are used to refer to discourse-old entities (Sengupta 1999, Choudhury 2010), i.e., entities that have already been mentioned in prior discourse, such as the 'dog' in ex.(2.b). The preverbal object in the SOV word order refers to discourse-new entities, such as the 'cat' in ex(2.b).

(2) a.

Nira	dekhlo	dokaner	kache	EkTa[2]	kukur	ghurchhe.
nira	saw	shop-gen	near	one	dog	wandering

"*Nira saw that a dog is wandering around near a shop.*"

b.

kukur-Ta	EkTa	beRal-ke	taRa-korlo.
dog-cla	one	cat-acc	chased

"*The dog chased a cat.*"

In contrast, a sentence-initial object in OSV word order is interpreted as discourse-old information, as in (3.b). The subject in the non-canonical immediate preverbal position (3.b) is interpreted as discourse-new information.

(3) a.

show-te	EkTa	bebun	khEla-dEkhacchilo.
show-loc	one	baboon	was- performing

"*A baboon was performing in the show.*"

b. bebun-Ta-ke EkTa Simpanji chulke dicchilo
baboon-cla-acc one chimpanzee scratch giving-was
"*A chimp was scratching the baboon.*"

2 Experiment

2.1 Design, method

A sentence-completion task was used to investigate how word order and grammatical roles influence the interpretation of *oTa* and *SeTa*. Each target item consisted of a short three-sentence narrative. Referential form (*SeTa* vs. *oTa*) and word order (SOV vs. OSV) were crossed to create four conditions, as in (4).

(4) a. OSV.oTa
beRal-Ta-ke EkTa kukur taRa-korlo oTa…
cat-cla-acc one dog chased *oTa*
"A dog chased the cat."

b. OSV.SeTa
beRal-Ta-ke EkTa kukur taRa-korlo. SeTa…
cat-cla-acc one dog chased *SeTa*
"A dog chased the cat."

c. SOV.oTa
kukur-Ta EkTa beRal-ke taRa-korlo. oTa…
dog-cla one cat-acc chased *oTa*
"The dog chased a cat."

d. SOV.SeTa
kukur-Ta EkTa beRal-ke taRa-korlo. SeTa…
dog-cla one cat-acc chased *SeTa*
"The dog chased a cat."

To avoid having to deal with complications resulting from honorific marking on referential expressions, we restricted our items to non-human animate nouns, i.e. animals. The study included 24 target items and 14 filler[3] items. Fillers contained a mix of human and animal entities, and contained both SOV and OSV sentences, similar to the targets. A sample target in the canonical SOV word order condition is in (5). A sample target with OSV order is given in (6).

(5) a. [Introductory sentence]
nira mangSer-dokane mangSo kinchilo
Nira meat-gen shop-loc meat buying-was
"*Nira was buying meat at a meat-shop.*"

b. [Introduces an animal, e.g. 'dog']
o dekhlo dokaner-kache EkTa kukur ghurchhe
she saw near-the-shop one dog wandering
"*She saw that a dog is wandering around near a shop.*"

c. [Critical sentence, here with SOV order]
kukur-Ta EkTa beRal-ke taRa korlo
dog-cla one cat-acc chase did
"*The dog chased a cat.*"

d. [prompt word]
SeTa/oTa…
It/that…

(6) a. [Introductory sentence: same as (5a)].

b. [Introduces an animal, e.g. 'cat']
o dekhlo dokaner-kache EkTa beRal ghurchhe
she saw near-the-shop one cat wandering
"*She saw that a cat is wandering around near a shop.*"

c. [Critical sentence, here with OSV order]
beRal-Ta-ke EkTa kukur taRa korlo
cat-cla-acc one dog chase did
'A dog chased the cat.'

d. [prompt word]
SeTa/oTa…
It/that

Each mini-story starts with an introductory sentence that mentioned a human referent, e.g., *Nira* in (5a.). The second sentence introduces the first animal referent, e.g., *EkTa kukur* 'a dog' in (5.b.). In most of the target items, this referent occurs in an embedded unergative clause which the discourse-introducing human referent 'sees' or 'hears'. The third sentence (5.c.) is the critical sentence, and had canonical SOV order (ex.(5) or non-canonical OSV order (ex.(6)). In all cases, one of the arguments is discourse-new (mentioned for the first time, e.g., 'cat' in (5.c.)), and the other is discourse-old (e.g. 'dog' in

(5.c.)), by virtue of having been mentioned in the immediately preceding sentence. The discourse-old referent always occurred in sentence-initial position, and the discourse-new referent occurred in the immediately preverbal position. In other words, SOV order was used when the subject was discourse-old and the object was discourse-new. OSV order was used when the object was discourse-old and the subject was discourse-new. This design is important, because it allowed us to ensure that both SOV and OSV order are felicitous (see discussion in Section 1.2 about the word order properties of Bangla).

Crucially, as can be seen in (5) and (6), the propositional content of the critical SOV/OVS sentence (sentence c) remains consistent within an item (the dog chases the cat, not vice versa). This allows us to avoid confounds that could result from changing the meaning of the critical sentence between conditions.

2.2 Participants

24 adult native speakers of Bangla volunteered for participation in the experiment. The internet survey program *Qualtrics* was used for collecting data. Participants were instructed to read the mini-stories and to provide a natural-sounding continuation starting with the prompt word. Participants typed in their responses on the webpage. We analyzed whether participants used the prompt word to refer to the preceding subject or object, or something else. In other words, did participants interpret the prompt anaphor as referring to the preceding subject or object, or did they use it discourse-deictically? In a discourse-deictic use, participants usually avoided making any distinct choice of the referents, instead refers to the event described in the third sentence (e.g., a discourse-deictic use as in 'it was quite funny', or 'having seen it, …'). The data was coded by two native speakers of Bangla.[4]

3 Results

Table 2: Percentages of subject-referring, object-referring and discourse-deictic continuations in the four conditions. (Numbers in parenthesis show the actual number of continuations out of the 72 continuations for each condition.)
deictic continuations in each condition.

	Subject cont.	Object cont.	Discourse-deictic cont.	Unclear	Others
OSV.oTa	18% (13)	47% (34)	29% (21)	3% (2)	3% (2)
OSV.SeTa	21% (15)	28% (20)	49%(35)	2% (2)	0%
SOV.oTa	11% (8)	54%(39)	29%(21)	5%(4)	1%(1)
SOV.SeTa	11% (8)	45%(32)	40%(29)	0%	4%(3)

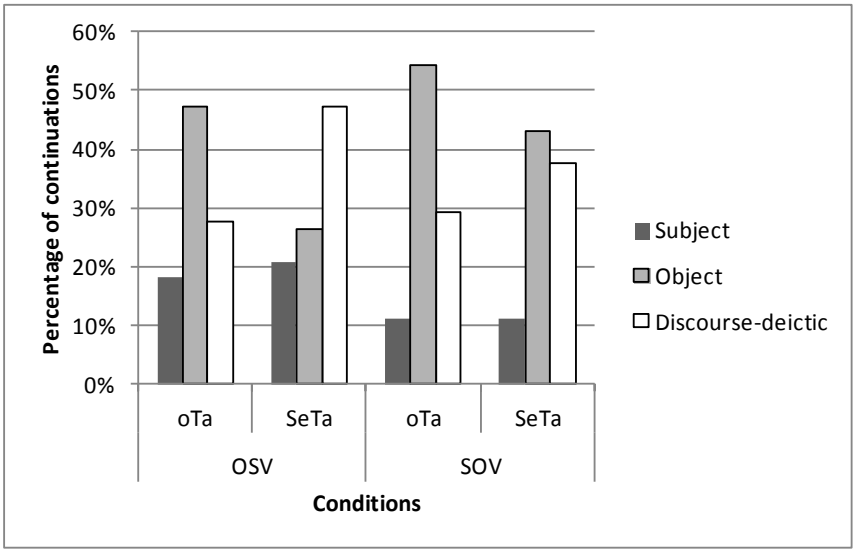

Figure 1: Percentages of subject-referring, object-referring and discourse-deictic continuations in each of the four conditions

As can be seen in Table 2 and Figure 1, for the demonstrative *oTa,* the most frequent continuation refers to the preceding object, regardless of whether the word order in the preceding sentence was SOV or OSV. The anaphoric form *SeTa* shows a more complex pattern that appears to be dependent on word order: the SOV.SeTa condition shows competition between the preceding object and discourse-deictic usage, whereas the OSV.SeTa condition shows mostly discourse-deictic continuations.

Interestingly, none of the conditions show a clear preference to continue by talking about the preceding subject: The rate of subject continuations is always below 25%. At first glance, this might seem surprising in view of earlier work, which often found that subjects are highly salient and likely antecedents for subsequent pronouns. However, we attribute the relatively higher rate of object continuations (and low rate of subject continuations) to the bias that participants showed for talking about the *result* of the event described in the (c) sentence (e.g. *The dog chased the cat. It ran away,* where running away is the result of/caused by the act of chasing). Prior work on English and German has shown that object reference is associated with result continuations, and thus it is not surprising for us to find more object continuations than subject continuations if people tend to provide result continuations (Kehler *et al.* 2008, Rohde 2008, Kaiser 2011). We are currently in the process of conducting a more detailed coherence-relation analysis of our data to explore this issue further.

3.1 Statistical analyses and discussion

To assess the statistical significance of the patterns that can be seen in the graphs, we used analysis of variance (ANOVA) with two factors: anaphoric form (*SeTa* vs *oTa*) and word order (SOV vs OSV). We ran separate ANOVAs on the object-continuation data, the subject-continuation data and the discourse-deictic continuation data.

2.2.1 Object continuations

We found a significant main effect of anaphor type on the rate of object continuations: *oTa* triggers significantly more object continuations than *SeTa* [$F1$ (1, 23) = 10.403, $p < 0.05$; $F2$ (1, 23) = 6.749, $p < 0.05$]. There is also a marginal main effect of word order [$F1$ (1, 23) = 3.045, $p = 0.09$; $F2$ (1, 23) = 5.230, $p < 0.05$], with SOV order resulting in marginally more object continuations than OSV order. There was no significant interaction.

To determine whether the object preference of the demonstrative *oTa* is significantly higher from chance, one-sample *t*-Tests were performed in each condition. In these one-sample t-test analyses, we only included trials where *oTa* referred to the object, subject or was used discourse-deictically, and thus the chance likelihood of reference to any one of these three options was assumed to be 1/3, i.e., 0.333. We find that the rate of object continuations with *oTa* after both SOV and OSV order indeed is significantly higher than chance. On average, the demonstrative *oTa* shows a significant preference for the object in SOV word order [M = .5416, SE =.077, $t(23) = 2.957$, $p < 0.05$] and in OSV word order [M = .4722, SE =.069, $t(23) = 2.342$, $p < 0.05$]. In other words, *oTa* prefers the preceding object. Furthermore, this effect is equally strong regardless of whether the word order is SOV or OSV: Planned comparisons between the demonstrative and the word order show that word order does not play a significant role in object continuation with *oTa*. Paired *t*-Tests reveal that there is no significant difference between SOV.oTa and OSV.oTa [$t1$ (23) = -1.155, $p = 0.26$; $t2(23) = -.84$, $p = 0.41$].

2.2.2 Discourse-deictic continuations

Turning now to the discourse-deictic usage, we find a main effect of anaphor type, [$F1$ (1, 23) = 12.944, $p < 0.01$, $F2$ (1, 23) = 4.383, $p < 0.05$)] with *SeTa* triggering significantly more discourse-deictic uses than *oTa*. No main effect of the word order was noticed [$F1$ (1, 23) = .812, $p = 0.37$; $F2$ (1, 23) = .506, $p = 0.4$]. No significant interaction between the word order and the anaphor was found. One-sample *t*-Tests were performed in each condition. We find that *SeTa* has a marginal higher-than-chance probability of triggering discourse-deictic use after OSV order, (M = .486, SE =.38, $t(23) = 2.01$, $p = 0.056$) but definitely not after SOV order (M = .375, SE =.073, $t(23) = .384$, $p = 0.18$). Also, planned

comparison between the pronoun and the word order show that word order does not play any significant role in influence the proportion of discourse-deictic continuations with *SeTa* [$t1$ (23) = 1.141, p = .26; $t2$ (23) = .901, p = .37].

2.2.3 Subject continuations

When we turn to the proportion of subject continuations, we find no main effects of anaphor type, word order, and no interaction. As can be seen in Table 2 and Figure 1, subject continuations occur only infrequently in our data. Planned comparisons also confirm that the four conditions do not differ significantly in the proportion of subject continuations.

In sum, we see that the demonstrative *oTa* is Bangla shows a significant object preference irrespective of the word order. The pronominal *SeTa* shows an overall preference for the discourse-deictic use, which seems to be higher after after OSV word order than after SOV order. At least numerically, after SOV order, *SeTa* seems to trigger competition between the preceding object and discourse-deictic usage.

4 General Discussion and Conclusion

We address two questions in this study: (i) Given that both *SeTa* and *oTa* can be used anaphorically and discourse-deictically, do they differ in how likely they are to be interpreted anaphorically vs. discourse-deictically? (ii) How does word order influence their interpretation? The results show that the choice of the referent by the demonstrative pronoun *oTa* is influenced by the syntactic role of the antecedent: *oTa* prefers the object of the previous sentence regardless of word order. In contrast, the anaphoric pronoun *SeTa* is more sensitive to word order: It exhibits a marginal preference for discourse-deictic usage only in the OSV word order, and in SOV word order it is split between the choice of the object and the discourse-deictic use. This clearly shows that these two referential expressions behave asymmetrically. The predictions of the form-specific multiple constraint approach are supported by the data. However, the finding is different from that is reported for Finnish (Kaiser, 2003; Kaiser and Trueswell, 2008) and Estonian (Kaiser and Vihman, 2006). In these two languages, the pronouns were found to be sensitive to grammatical role while the demonstrative were sensitive to both grammatical role and word order.

Interestingly, our findings for Bangla shows a different pattern: we again find asymmetries, but this time there's one form that is sensitive mostly to grammatical role (*oTa*) and another form, *SeTa*, that is marginally sensitive to word order and in fact results mostly in discourse-deictic continuations. This pattern is clearly different from what was obtained in Finnish and Estonian, and highlights a key assumption of the form-specific multiple-constraints approach, namely that different anaphoric forms will 'care about' different types of

information. Thus, although the results differ from what has been observed in other languages, the form-specific approach is flexible enough to allow us to capture this variation. Of course, an important question for future research has to do with the limits of cross-linguistic variation. Based on the current work, we conclude that by looking into more diverse languages, we gain a better understanding of the extent of crosslinguistic variation. Another important question for future work concerns the deeper reasons underlying the referential biases of *SeTa* and *oTa* – for example, *why* should *SeTa* be more likely to be used discourse-deictically than *oTa*? We hope to investigate this in future work.

The results of this experiment also have possible implications for paradigm shift. Bangla (and its cognate neighbors like Assamese and Oriya) differs from the majority of Indic languages in terms of the division in the pronominal system. As mentioned earlier, Bangla has a tripartite division in the pronominal system where an anaphoric pronoun exists alongside two deictic demonstrative pronouns: proximal and distal. In the majority of Indic languages, the anaphoric form is absent due to a merge of the distal demonstrative and the anaphoric pronoun. Thus, in these languages the distal demonstrative is used anaphorically. For example in Hindi, the distal demonstrative pronouns *woh* is used for both anaphoric and deictic purposes. This pattern also exists in Bangla. Particularly with human referents, use of the distal demonstrative for anaphoric reference is very common. In our study we also found that participants referred to the object by using the distal demonstrative *oTa* more often than with *SeTa*. On the other hand, the use of the anaphoric pronoun *SeTa* was more biased to the discourse-deictic use, and in some conditions showed competition between the discourse-deictic use and the anaphoric use. This suggests that the participants were more certain about using *oTa* for anaphoric use than *SeTa*. These findings fit with the idea that the distal demonstrative in Bangla is shifting towards a primarily anaphoric (pronominal) function. Although this is an interesting observation, a large scale study is required to test this hypothesis more directly.

Notes

[1]*We thank the audience at WECOL 2011 for useful questions and feedback. Thanks go to Tista Bagchi, Probal Dasgupta, Roumyana Pancheva, Andrew Simpson and the USC Language Processing Lab group for suggestions and comments in the earlier stages of the project.

[2] *EkTa* 'one' functions similarly to the English indefinite article, and marks discourse-new referents.

[3] Fillers contained combinations of animal-animal, human-animal and animal-human pairs.

[4] Inter-coder agreement was calculated for the two coders. The coders disagreed on 16% of the total items (46/288 items). Only the primary coder's responses were used to calculate the results presented here. However, even if the 16% of trials where the coders disagreed are left out, we still obtain similar data patterns as those presented here.

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Vowel Harmony in Farsi
An Optimality Theory Analysis

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1 Introduction

The main objective of this paper is to investigate vowel harmony in Farsi[1] within the Optimality Theory (OT) framework. The phenomenon under study varies according to register: vowel harmony is seen in colloquial speech but not in formal speech. The analysis of the vowel system in Farsi is often based on either quality[2] or quantity[3] features. Samareh (1977), Najafi (2001) and Pisowicz (1985) argue that the vowel system in Farsi is quality based and quantity is not contrastive. Some studies (e.g., Windfuhr 1979, Hayes 1979) consider the system to be quantity based. Toosarvandani (2004) suggests a synthetic analysis including both quality and quantity features to categorize the vowel inventory in Farsi. Rohany Rahbar (2009) claims that the distinction between vowels is based on tense and lax features. This study adopts the quality-based analysis proposed by Samareh (1977) as it provides an efficient system for a comprehensive OT analysis.

The aim of this study is to account for the phonological alternations previously noticed giving an analysis within OT. My analysis provides a description of vowel harmony in colloquial speech, offers a set of alignment, faithfulness and markedness constraints to describe the surface form of colloquial variant, and draws conclusions for general theoretical issues within OT. This paper is organized as follows: section 2 surveys the arguments in the literature in favor of vowel harmony; section 3 presents the generalization of data which alternates phonologically across morpheme boundaries (e.g. imperative form) and within stems in colloquial speech; section 4 analyzes the data involving harmony with respect to vowel backness and height, followed by a general conclusion in section 5.

2 Previous Literature

Several studies have been conducted on the vowel harmony in Farsi; though primarily from a ruled-based perspective. To account for this phenomenon, Toosarvandani (2004:247) posits an underlying vowel system that combines both quality and quantity features. Under this analysis, it is possible to show the

height assimilation for both /e/ and /o/ of *be-bi:n* → *bi-bi:n* 'see' and *be-gu* → *bo-gu: / bu-gu:* 'say' as shown in figure (1):

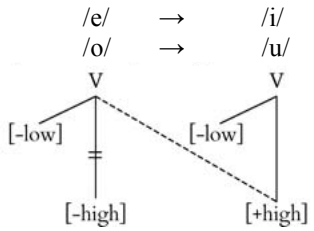

Figure 1 Synthetic Analysis Height Alternation Rule

Moreover, the low vowels /a/ and /ɑ/ undergo a backness alternation for such words as *baha:r* → *baha:r* 'spring' as illustrated below in figure (2):

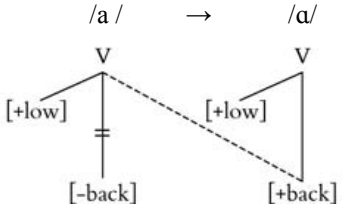

Figure 2 Synthetic Analysis Backness Alternation Rule

In addition, Toosarvandani (2004:248) considers the quantity feature of short vowel lengthening in the environment of closed or open and unstressed syllables in figure (3):

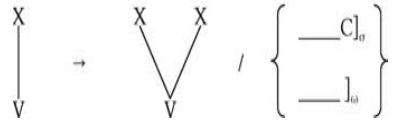

Figure 3 Synthetic Analysis Lengthening Rule

In contrast, Rohany Rahbar (2009) suggests that vowel harmony in Farsi is a phonological process which supports a qualitative or featural analysis, arguing an analysis under the framework of Modified Contrastive Specification. Harmony patterns in Farsi require a categorization of vowels based only on quality features such as tense and lax. Therefore, both quality and quantity features are not required to be active. She argues that the data in (1a) undergo place[4] and height assimilation. Dataset (1b) illustrates that the system does not undergo assimilation. As seen, the low vowels are not involved in the process of height assimilation. However, low vowels undergo place assimilation within the

stem in the environment of laryngeal consonants *a → a / C−ʔ, h a* as shown in (1c).

(1) Farsi (Rohany Rahbar 2009:9–12)

	Imperative	Gloss	kind of assimilation
a)	be-gu → bu-gu	'say'	place, height
	be-ʃin → bi-ʃin	'sit'	height
	be-xor → bo-xor	'eat'	place
b)	be-xar → be-xar *ba-xar	'buy'	no assimilation
	be-zɑr → be-zɑr *bɑ-zɑr	'put'	no assimilation
c)	maʔɑʃ → mɑʔɑʃ	'livelihood'	place
	bahɑr → bɑhɑr	'spring'	place

Given the data, she argues that there should be a feature that can account for vowels of all height. She suggests tense and lax features to categorize the vowels. Therefore, tense vowels /i/, /u/, /ɑ/ are considered the triggers of harmony, while lax vowels /e/, /a/, /o/ are the targets of harmony.

A review of the previous studies brings up the following questions: (a) If we assume, as does Rohany Rahbar (2009), that height features and backness feature are not involved in the categorization of vowels, how is it possible to recognize quality assimilation in vowels, whether this is regarded as height harmony or backness[5] harmony? (b) Is it necessary to involve both quality and quantity features as proposed by Toosarvandani (2004)?

3 Data

The vowel inventory in Farsi consists of six vowels /i/, /e/, /æ/, /o/, /u/ and /a/. Following the categorization proposed by Barshiri (1991) and Najafi (2001), Farsi vowels are differentiated by the height of the tongue (high, mid, low) and by the place in the mouth (front or back). The binary feature specifications are given in (2):

(2) Vowel inventory in Farsi

	e	o	æ	i	u	a
high	-	-	-	+	+	-
low	-	-	+	-	-	+
back	-	+	-	-	+	+
round	-	+	-	-	+	-

The assimilation of vowels is one of the differences that distinguish formal Farsi from the colloquial variety. The following datasets provide examples of vowel harmony across morphemes boundaries and within the stem, for example

in the following words with CV.CV(C) structures. The major types of vowel harmony are illustrated by the forms in (3).

(3) Major harmony types in Farsi (Rohany Rahbar 2009:9–12)

	Formal	Colloquial	Gloss
a)	be-bin	bi-bin	'see'
b)	kelid	kilid	'key'
c)	be-ro	bo-ro	'go'
d)	ʤelo	ʤolo	'front'
e)	be-gu	bu-gu	'say'
f)	sogut	sugut	'falling'
g)	bæhar	bahar	'spring'
h)	mæʔaʃ	maʔaʃ	'livelihood'
i)	be-bænd	be-bænd	'close'
j)	be-zar	be-zar	'put'

The examples above illustrate that the verbal prefix /*be-*/ [6](present imperative) combines with the present root of the verb to form the imperative form. The imperative form exists in both formal and colloquial speech. The examples (3a-e) illustrate that the vowel /e/ has three allomorphs /i/, /o/ and /u/ in (3a, b), (3c, d) and (3e) respectively. In example (3f) the [+mid, + back] vowel /o/ appears in the formal while [+high, +back] vowel /u/ in colloquial. Examples (3g) and (3h) illustrate that [+front, +low] vowel /æ/ appears in formal versus [+back, +low] vowel /a/ in colloquial form before /h/ and /ʔ/. Contrast these examples with (3i) and (3j), where the vowels in both forms are identical.

We have seen that in colloquial Farsi, alternation in the quality of the vowels is relatively common. It is proposed that in general the vowel /e/ is present underlyingly. Thus, the existence of non-changing forms in both formal and colloquial speech in (3i) and (3j) provides evidence that the vowel /e/ is present in the UR. Moreover, the same examples are evidence for UR of /æ/ because /æ/ remains unchanged in colloquial speech. It is further proposed that /u/ is the UR rather than /o/. The existence of CuCu construction in Farsi argues for /u/ to be present underlyingly. The words with CuCu construction *susu* 'glimmer' are never pronounced as CoCu even in formal speech (Rohany Rahbar 2009). Finally, in order to show that the imperative prefix /be-/ is the UR, rather than /b/ with a /e/ as an epenthetic vowel, one can examine a root which begins with vowels. Since consecutive vowels are prohibited in Farsi, vowel clusters are required to be split; this is accomplished by inserting the glide /y/. The following examples *be-avar* → *bi-yavar* 'bring' and *be-a* → *bi-ya* 'come' are the evidence to support /be-/ as the UR for the segment because the vowel /e/ surfaces in both formal and colloquial forms. However, in colloquial speech the prefix vowel /e/, in the verbs starting with a vowel, undergoes harmony unlike the verbs starting with a consonant. It is important to note that while the study of differences

between two kinds of verb construction lies outside the scope of this paper, a complete analysis of this process requires additional examination in future study, and therefore I do not include that data here.

In this paper, it is proposed that the vowel system in Farsi undergoes harmony in which a root vowel spreads the height or backness features to the preceding vowel. It is further proposed that non-low (mid or high) vowels are involved in the process of height harmony, backness harmony or both. Following Rohany Rahbar (2009), it is assumed the spreading of height feature does not apply when the roots have vowels with [+low] features. However, [+low] vowel /a/ spreads the [+back] feature to the preceding low vowel /æ/ in the environment of laryngeals. The process of backness and height harmony can account for the presented data within the framework of OT.

4 Analysis

4.1 Backness Harmony

The vowel system of Farsi exhibits several patterns of vowel harmony including height and backness harmony. While height harmony involves raising mid vowels to high vowels, low vowels do not participate in this process. However, in the process of backness harmony both non-low and low vowels are involved dependent upon the environment. Thus, the following sections are organized according to the domains in which vowel harmony takes place.

In this section, an analysis of the backness harmony in data (3c, d, g and h) is outlined. The data show front vowels /e/ and /æ/ are targets of harmony while back vowels /o/ and /a/ are the triggers. Evidence for the underlying presence of /e/ and /æ/ (not of /o/ or /a/ respectively) is shown by the forms in (3i, j) in which the UR of /e/ and /æ/ are the same as the surface representation (SR). Therefore, the occurrence of assimilation of /e/ and /æ/ to back vowels /o/ and /a/ respectively is supported.

The analysis of vowel harmony by Ringen and Vago (1998) assumes that harmony results from alignment constraints proposed by McCarthy and Prince (1993). In this study, it is also assumed that backness harmony in Farsi results from an alignment constraint.

(4) Align-back-L: Align (αBack, Left, αBack, Right): Align the [αback] feature of vowel on the left edge of the word with [αback] feature of the vowel on the rightmost edge of the word.

One violation is assigned for each vowel on the left edge that disagrees with the back feature of the vowel on the rightmost edge of the word. The following tableau (1) illustrates how the constraint Align-back-L operates:

Tableau 1 Align-back-L

Input:/ be-ro/		Align-back-L
☞	a. bo-ro	
	b. be-ro	*!
	c. be-ru	*!

The problem with candidates (b) and (c) is that they violate Align-back-L because the vowel /e/ on the left edge with [-back] features does not agree with the vowel /o/ and /u/ on the right edge with [+back] feature. This leaves candidate (a) as the optimal form, since it does not violate the constraint. Additional constraints are required to distinguish between candidates (b) and (c) which prohibits the input and output forms from being identical (Ringen & Vago 1998). Following faithfulness constraints proposed by McCarthy & Prince (1995), the general faithfulness constraint on [back] feature are adopted in (5):

(5) Ident-IOback: Correspondent input and output vowels have identical specifications for [αback].

As can been seen in the tableau (2), candidate (a) is the optimal output which satisfies the Align-back-L and violates the faithfulness constraint Ident-IOback. The losing candidate (b) is less harmonic than (a) by violating the Align-back-L constraint and then results Align-back-L ranked higher than Ident-IOback:

Tableau 2 Align-back-L >> Ident-IOback

Input:/ be-ro/		Align-back-L	Ident-IOback
☞	a. bo-ro		*
	b. be-ro	*!	

Consider next a root with the [+high, +back] vowel /u/ as in (3e). Parallel to candidate (a) in tableau (2), we see that candidates (a) and (b) in tableau (3), in which the [+back] feature of the prefix vowel agrees with the [+back] feature of the root vowel, are optimal. However, candidate (c) is fatally ruled out because it violates the higher ranked constraint.

Tableau 3 Align-back-L >> Ident-IOback

Input:/ be-gu/		Align-back-L	Ident-IOback
☞	a. bu-gu		*
	b. bo-gu		*
	c. be-gu	*!	

In sum, having both candidates (a) and (b) requires another constraint to recognize the height feature of vowels which will be discussed in the next section.

We now turn to forms with interaction of low vowels in (3g-j) which show the need for additional constraints. We have seen that the low vowels are involved in the backness harmony in the environment followed by laryngeals; otherwise the input and output are identical and remained unchanged. Following Rohany Rahbar (2009) assumption, this process involves only low vowels and laryngeal consonants (e.g., *bæhar* 'spring') not across other vowels and consonants (e.g., *tihu* 'partridge'*, tæbar* 'lineage'). She assumes that one possibility to account for this process is that laryngeals and low vowels both are [+ low] in the feature geometry, and then the assimilation is possible in this environment. However, it is important to note that only the [+low, +back] vowel is involved in this process. In order to prevent the output with [+low, - back] feature in the environment of laryngeals, a markedness constraint is required. Following Kager (1999), there should be a context sensitive markedness constraint which prohibits the surfacing of the marked vowel with binary features of [+low,-back] before /ʔ/ or /h/. This constraint supports the contrast in low vowels along the front-back dimension in the specific environment.

(6) *æʔ,h : No /æ/ before laryngeals /ʔ/ or /h/.

We saw above that Align-back-L ranked higher than Ident-IOback. The following tableau in (3) illustrates the account of roots with low vowels and laryngeals.

Tableau 3 *æʔ,h >> Ident-IOback

Input:/bæhar/	*æʔ,h	Ident-IOback
☞ a. bahar		*
b. bæhar	*!	

The optimal candidate (a) in tableau (3) incurs a violation of Ident-IOback while it satisfies *æʔ,h. Candidate (b) violates the highest ranked constraint fatally, and thus ruled out. Having the candidate (a) as an optimal output, outranks *æʔ,h over Ident-IOback. Moreover, it is necessary to identify the ranking between Align-back-L and *æʔ,h by the tableau (4) below:

Tableau 4 *æʔ,h >>Align-back-L

Input:/ ba-æm/'together'	*æʔ,h	Align-back-L
☞ a. ba-hæm		*
b. bæ-hæm	*!	

We see that the tableau (4) shows crucial ranking between the constraints. The losing candidate (b) contains /æ/ before /h/, fatally violating the markedness constraint. Leaving the candidate (a) as an optimal output, outranks *æʔ,h over Align-back-L. The summary tableau with full ranking for backness harmony is presented in the tableau (5) as follow:

Tableau 5 *æʔ,h >> Align-back-L >> Ident-IOback

Input:/mæʔaʃ/	*æʔ,h	Align-back-L	Ident-IOback
☞ a. maʔaʃ			*
b. mæʔaʃ	*!	*	
c. meʔaʃ		*!	

We have seen that the constraints discussed so far account for the backness harmony. In the tableau (5), it is apparent that the losing candidate (b) is ruled out in two respects. It contains /æ/ before /ʔ/, fatally violating the highest ranked constraint. It violates Align-back-L as well, as the vowels in the output fail to agree the [back] feature. Candidate (c) violates crucially Align-back-L constraints, and thus it is ruled out. Having the candidate (a) as an optimal output supports the ranking of the constraint with respect to backness harmony.

4.2 Height Harmony

The data presented in (3a, b and f) show the vowels /e/ and /o/ are targets of harmony while the vowels /i/ and /u/ are the triggers. It is assumed that /e/ (and not /i/) is underlyingly present. In addition, the evidence for an UR of /o/ is supported by the existence of words with a CuCu construction in Farsi, such as *susu* 'glimmer'. The words with CuCu construction are never pronounced CoCu in colloquial Farsi. Therefore, the process of assimilation /e/ and /o/ to high vowels /i/ and /u/ is supported.

The constraints discussed up to this point account for vowels undergoing backness harmony. The data presented in (3a, b and f) illustrate the need for further constraints to account for height and roundness. Following McCarthy and Prince (1993), I propose an analysis of height harmony assuming an alignment constraint. This constraint, as given in (7), assigns a violation for each vowel that disagrees with the height feature of the vowel.

(7) Align-high-L: Align (αHigh, Left, αHigh, Left): Align the [αhigh] feature of vowel on the left edge of the word with [αhigh] feature of the vowel on the rightmost edge of the word.

In addition, in order to prevent vowels which agree in height but are not optimal, it is necessary to assume a faithfulness constraint requiring output vowels to be identical with the vowels of input. Given the identity constraints of

McCarthy & Prince (1995), a general faithfulness constraint on [high] feature is adopted in (8) functions in the tableau (6):

(8) Ident-IOhigh: Correspondent input and output vowels have identical specifications for [αhigh].

Tableau 6 Align-high-L >> Ident-IOhigh

Input: /be-gu/	Align-high-L	Ident-IOhigh
☞ a. bu-gu		*
b. be-gu	*!	
c. be-ge		*
d. bo-gu	*!	

Up to this point forms with only height or only backness harmony are analyzed. Given the constraints proposed, some outputs such as candidates (a) and (b) in the tableau (2) and candidate (a) and (c) in the above tableau satisfy the higher constraint but only one of them is optimal. We turn now to consider the forms in which roundness feature is involved in addition to height and backness features. As is observed in the tableau (6), candidate (a) as the optimal output satisfies the Align-high-L and violates the faithfulness constraint Ident-IOhigh. Candidate (b) violates the Align-high-L constraints and therefore is ruled out; resulting in Align-high-L outranks Ident-IOhigh. However, candidate (c) illustrates that it requires an additional highly ranked constraint in order to prevent surfacing as an optimal output. This constraint as a markesness constraint will assign a violation for each vowel that disagrees with the roundness feature of the vowel.

(9) +RdSpread: Spread the [+round] feature of the vowel on the right edge of the word to the vowel on the left edge of the word.

Tableau 7 +RdSpread >> Align-high-L >> Ident-IOhigh

Input: /be-gu/	+RdSpread	Align-high-L	Ident-IOhigh
☞ a. bu-gu			*
b. be-gu	*!	*	
c. be-ge	*!*		*
d. bo-gu		*!	

The analysis of backness and height harmony in colloquial Farsi shows that the faithfulness constraints on harmonic vowels are not highly ranked, and then these constraints will eliminate surfacing a faithful output root vowel. The following accounts of data as in Tableaux (8) and (9) present a summary of backness and height harmony with faithfulness, alignment and markedness constraints as follow.

Tableau 8 +RdSpread>>*æʔ,h>>Align-back-L, Align-high-L>>Ident-IOhigh >> Ident-IOback

Input: /be-ro/	+RdSpread	*æʔ,h	Align back-L	Align high-L	Ident-IO high	Ident-IO back
☞ a. bo-ro						*
b. be-ro	*!		*			*
c. bo-ru			*!	*		*
d. be-re	*!*					*

The pattern of harmony in Farsi is well predicted by these constraints. Candidates (b) and (d) lose by violating the highly ranked constraint crucially. Candidate (c) violates the alignment constraint. Leaving the candidate (a) as optimal output supports the ranking of constraints proposed here.

Tableau 9 +RdSpread>>*æʔ,h>>Align-back-L, Align-high-L>>Ident-IOhigh >> Ident-IOback

Input: /bæhar/	+RdSpread	*æʔ,h	Align back-L	Align high-L	Ident-IO high	Ident-IO back
☞a. bahar						*
b. bæhar		*!	*			
c. behar			*!	*	*	

To complete the discussion of harmony in Farsi, it is observed that candidate (b) is eliminated by the undominated constraint *æʔ,h, as it contains the vowel /æ/ preceding /h/. Remaining candidates (a) and (c) satisfy highly ranked constraints +RdSpread and *æʔ,h, therefore both are moved for further evaluation by the next constraint in the hierarchy, Align-back-L. Candidate (c) violated both of the alignment constraints and Ident-IOhigh. Resulting candidate (a) as an optimal output violates only the lowest ranked constraint. Given the constraints proposed in this paper, the constraints are universal but they are also violable. Each candidate violates a list of universal constraints, but simultaneously satisfies the higher ranked constraints.

5 Conclusion

In this paper, colloquial speech form in Farsi is analyzed within the framework of Optimality Theory. It is proposed that in an OT analysis, a set of universal and violable constraints are able to explain the surface forms in a language. One feature of the theory is that different rankings of the constraints in each language allows for phonological variation. Under the present analysis, the proposed constraints differentiate between colloquial speech, which undergoes the process of vowel harmony, and formal speech, which does not. Harmony in the vowel system of Farsi involves the interaction of certain constraints by their

categorization of alignment, faithfulness and markedness. The use of an OT analysis is more logical and simple than the classical rule-based analysis in which several rules are needed in order to account for the whole system. In addition, OT offers two major advantages. First, OT defines surface representation (output), rather than underlying representation (input). Second, OT distinguishes the 'trigger' of changes from the actual changes. (Kager1999).

The imperative forms presented here contain a root with an onset consonant in CV(C) construction *bin* 'see'. For future study, one may look at different root structures with an initial vowel VCVC. In these forms, in order to split the initial vowel clusters when combined with the imperative prefix /be-/ (cf. *be-avar* → *bi-yavar* 'bring), an epenthetic glide consonant /y/ in inserted. However, unlike the verbs with CV(C) structure, in which the prefix vowel /e/ remains unchanged, in VCVC forms the prefix vowel /e/ changes to a high vowel /i/. Furthermore, only bisyllabic words CV.CV(C) are investigated in the present study. The case of a trisyllabic words CV.CV.CV(C) *be-ne.vis* → *bi-bi.vis* 'write' requires further examination with respect to harmony pattern.

Notes

[1] Persian is an Iranian language widely spoken in Iran, Afghanistan and Tajikistan. The Persian dialects are generally divided into Farsi (spoken in Iran), Dari (spoken in Afghanistan) and Tajik (spoken in Tajikistan). This paper looks at the major dialect of formal Farsi used in the city of Tehran and the colloquial Farsi spoken in daily life.

[2] Quality features refer to articulatory features such as height, backness and roundedness.

[3] Quantity features refer to the length or duration of the vowel.

[4] Place assimilation proposed by Rohany Rahbar (2009) refers to change in backness feature.

[5] Place assimilation (cf. Rohany Rahbar 2009) is referred to here as backness harmony.

[6] The present subjunctive construction is also formed with the prefix *be-/bo-*added to the present stem, which also receives the personal endings like *be-r-æm* subjuctive-verb stem-1sg (Mahootian 1997: 248).

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Penguins Become Sparrows: Gradient Acceptability in the Control Verb "Class"

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1 The Generative Story on Raising and Control

Raising (R) and control (C) verbs can show up in some, but not all, of the same surface strings. On the generative story, this is because a single string might map onto one of two distinct underlying structures. For instance, sentences like (1) or (2) correspond to a R analysis (the (a) cases), in which some matrix NP started out in the embedded clause, but then raised up to matrix position. But these sentences also correspond to a C analysis (the (b) cases), in which a matrix NP is coindexed with a PRO in the embedded clause.

(1) Sandy$_i$ gorped to like syntax
  a. SubjectR (SR): …[t_i to like syntax] e.g. *seem, tend*
  b. SubjectC (SC): …[PRO$_i$ to like syntax] *try, claim*
(2) Sandy gorped Ted$_i$ to teach syntax
  a. ObjectR (OR): …[t_i to teach syntax] *want, need*
  b. ObjectC (OC): …[PRO$_i$ to teach syntax] *ask, tell*

Different behaviors in the two classes of verbs then fall out naturally as a result of the fact that C verbs—but not R verbs—are claimed to consistently theta-mark their arguments. For instance, OR verbs can embed any internally felicitous CP, while OC verbs generally require an animate embedded subject (3). Similarly, OR verbs can embed expletive subjects, but OC verbs cannot (4). Essentially these same patterns also hold true for SR and SC.

(3) Sandy wanted/needed/#asked/#told [the lecture to be about GB]
(4) Ted wanted/needed/*asked/*told [there to be more examples]

Thus, the generative account predicts that C verbs should be universally bad when they co-occur with inanimate or expletive arguments. The trouble with this prediction is that you don't have to poke very far into any given corpus to find counterexamples. The sentences in (5)—from CHILDES, COCA, and the BNC—show SC verbs with inanimate subjects. And a simple Google search indicates that SC and OC verbs are often used with expletive arguments (6).

(5) a. it's [= page in book] trying to rip… (CHILDES: zenbr)
b. you can feel it [= metal] trying to pull your magnets down. (ibid: briet3)
c. It [= movie] doesn't know what it wants to be. (COCA: CNN 2011)
d. …it's lent its electrons to the fluorines cos it wants to get rid of them and the fluorines wanted to take them… (BNC: FMR 348)

(6) a. "it's trying to rain" (22,700 hits), "it tried to rain" (25,700 hits)
b. "it wants to rain" (66,100 hits), "it wanted to rain" (24,000 hits)
c. "ask it to rain" (305,000 hits), "asked it to rain" (41,600 hits)
d. "tell it to rain" (2,460,000 hits), "told it to rain" (540,000 hits)

If the generative prediction is wrong (and it seems to be), when and why can C verbs drop their semantic restrictions? In this paper, I'll claim that R and C verbs fall into two classes, but that each class is based on an argument structure frame and a prototypical exemplar, not *t* vs. PRO. As evidence, I'll present some research showing that adults judge OC verbs with expletive objects to be more acceptable than SC verbs with expletive subjects. Then I'll discuss some research indicating that having a verb "prototype" facilitates learning, and show that the verb *want* is the prototype for each of the classes I propose.

2 Experiment 1: Control Verbs with Expletive Arguments

To test how speakers judge C verbs appearing with expletive arguments, I conducted a Likert scale (1-6) judgment task with 35 English-speaking adults, who took part in an electronic questionnaire (Kirby, 2011). Along with various filler items, adults saw 16 test items, each of which included a SC (*promise, try*) or OC verb (*allow, force*) and an expletive NP (*it, there*). Example test items appear in Table 2. For each item, speakers were asked to judge whether it was 'okay' (6) or 'weird' (1) "for English as it is normally spoken."

Results indicated that all items got at least some "okay" responses—that is, ratings of 4, 5, or 6. (Mean ratings by verb appear in Table 1.) However, when I compared ratings on SC and OC verbs, I found that adults rated OC items as significantly more acceptable than SC items (Welch's two-sample $t(548.99) = -9.08$, $p < .001$). In other words, speakers find OC verbs with expletive objects to be significantly better than SC verbs with expletive subjects. I've recently replicated this pattern with a different set of C verbs and with different methodologies (Kirby and Han, submitted), so it appears to be a robust effect.

Table 1 "Okay" responses and mean judgments (out of 6) by verb

Class	Verb	"Okay" (4, 5, 6) Responses	Mean Rating
OC	allow	67.9%	4.071
	force	54.3%	3.571
SC	promise	47.1%	3.293
	try	12.9%	1.957

Table 2 Mean judgments (out of 6) by item (Exp.1)

Item	Mean
The coach allowed there to be another practice	4.457
The keg allowed there to be enough beer for the event	4.229
The researcher allowed it to be proven that red wine is healthy	3.914
The icing allowed it to be a surprise that the cake was chocolate	3.686
The budget forced there to be another tuition increase	4.343
The manager forced there to be a discounted price	3.543
The dean forced it to be necessary to study a foreign language	3.743
The doctor forced it to be shown that the tumor was cancerous	2.657
There promised to be several articles on the topic	4.543
There promised to be a lot of surfers at the beach	4.400
It promised to be required that every tent come with a sleeping bag	2.314
It promised to be necessary that the professor earn more money	1.914
There tried to be enough textbooks for the course	1.943
There tried to be 5 customers at the table	1.829
It tried to be encouraged that the play only run for 2 hours	2.571
It tried to be possible for the cashier) to accept credit cards	1.486

3 Learning (and Generalizing) Argument Structure

3.1 Construction grammar: A mini-intro (see also Goldberg, 2003, 2006)

The crucial observation in construction grammar (CG) is that there are constructions—form-meaning pairings—which exist at all levels. These range from the smallest level of bound morphemes or words, up to the level of abstract phrasal patterns like the argument structures that R and C verbs appear in.

CG is a monostratal theory of syntax, which means that there are no underlying levels in a derivation (e.g. movement) and no empty categories (*t*, PRO). These assumptions remove the fundamental distinctions assumed between R and C in the generative literature. Instead, the "knowledge of language" that adult speakers have is knowledge of the constructions relevant for their language.

Without movement and PRO, what constructions do we predict to see within the so-called classes of "raising" and "control"? First, there will be the group of what I'll call *subject-focus embedded infinitivals* (SEIs; (7)). SEIs are verbs appearing in the frame *NP V to VP*. Notice that this will subsume the classes of SR and SC. SEIs are predicted to contrast with the group of *object-focus embedded infinitivals* (OEIs; (8)): verbs appearing in the frame *NP V NP to VP*, which will subsume the classes of OR and OC.

(7) Subject-focus embedded infinitivals (SEIs)
  a. *Form:* NP V to VP (e.g. *Jill tended/tried to kiss Jack*)
  b. *Generative classes subsumed:* subject raising, subject control

(8) Object-focus embedded infinitivals (OEIs)
a. *Form:* NP V NP to VP (e.g. *Jack needed/told Jill to behave*)
b. *Generative classes subsumed:* object raising, object control

3.2 Prototypes guide verb learning

Goldberg et al. (2004) investigated how children learn argument structure by examining the speech of 28 children and 15 mothers in the Bates corpus. From these transcripts, they pulled out any utterance that corresponded to a Verb-Location (VL) pattern, a V-Object-L (VOL) pattern, or a VOO pattern, and then checked which verbs appeared in each of the three structures. For each pattern examined, Goldberg et al. found that a single verb accounted for most of the tokens, in both children's and mothers' speech: for VL, *go* was the most frequent verb (54% children/39% mothers); for VOL, *put* was the most frequent (31/38%); and for VOL, *give* was the most frequent (~30/20%). They hypothesized that perhaps it was this high frequency of a single verb in the input that gave rise to a meaning-form link for the entire argument structure.

To test this hypothesis, the authors conducted a novel verb learning experiment with English-speaking children (Casenhiser and Goldberg, 2005). In this experiment, children ages 5-7 heard 5 novel verbs in a novel argument structure (SOV). Additionally, each novel verb carried a novel morphological ending, *-o* (e.g. *The king the ball moop-o-ed*). Each utterance was presented along with a video depicting some scene of appearance: for instance, a dot showing up on a puppet's nose, or a ball rolling onto stage from out of sight.

There were three training conditions. In the *control* condition, children watched the videos without sound (and thus weren't exposed to the novel verbs or structure). In a *skewed* condition, kids heard one of the novel verbs eight times, and the other four verbs two times each (8-2-2-2-2). Finally, in a more *balanced* condition, kids heard three of the novel verbs four times each, and the other two verbs twice each (4-4-4-2-2). In the test phase, children heard new novel verbs in the same SOV-o structure, and were asked to pick which scene was being described from between two minimally different videos. The target video depicted a scene of appearance (e.g. a flower breaking through dirt to grow upwards), while the distractor video showed a related scene with no aspect of appearance (a flower growing upwards but remaining continuously in view).

The results showed, predictably, that children in the control condition performed at chance. Those in the balanced condition performed better than chance, but the highest learning advantage was found for kids in the skewed condition. This replicated findings from a nearly identical verb learning study conducted with adults (Goldberg et al., 2004).

Goldberg and her colleagues concluded that high token frequency facilitates learning of constructional meanings, and suggested that having a highly frequent verb "prototype" makes it easier to learn the argument structure in which *related*

verbs can also appear. Notice that here, "highly frequent" means four times more frequent than the next most commonly encountered verb.

3.3 Prototype theory: A mini-intro (see, e.g., Rosch et al., 1976)

Prototype theory was developed in cognitive psychology to describe how people group items into categories or classes. In a given category, there will often be a *prototype* that serves as the 'best exemplar' of the class—it is central, and often correlated with the most commonly encountered member.

For instance, if you ask people to describe the features that typify the class of "birds," they will usually answer that birds have feathers or wings, that they lay eggs, and that they can fly. A very prototypical bird, then, would be something like a robin or a sparrow. However, other member of the bird class—including ostriches and penguins—do *not* have all of these features, and thus won't be prototypical exemplars. A bird that can't fly is clearly a peripheral member of the class (Table 3).

Table 3 Features of prototypical and peripheral birds

Bird trait:	**Has wings**	**Lays eggs**	**Can fly**	**Exemplar**
Sparrows	✓	✓	✓	Prototypical
Penguins	✓	✓		Peripheral

Given this discussion, and the findings from Goldberg and her colleagues, we might ask whether there are prototype verbs within the classes of raising and control? My answer to this question will be *yes*—so long as we continue to think about them as being the SEI and OEI constructions presented in (7)-(8) above.

4 Experiment 2: SEI and OEI Prototypes

To find the prototype verbs, I used Clan to conduct a search of all the American English corpora in the CHILDES (MacWhinney, 2000) database (see Kirby, to appear). I looked for child and adult uses of what I expected would be the most frequent SEI (*seem, tend, want, try*) and OEI verbs (*want, need, ask, tell*), followed by infinitival *to*. Then I went through the returns by hand and counted all instances of SEI and OEI utterances. The results from this experiment appear in Table 4.

Table 4 Token frequency by speaker and verb (Exp. 2)

SEI Verb	**Adult**	**Child**	**OEI Verb**	**Adult**	**Child**
want	**10883**	**6110**	**want**	**2987**	**689**
try	1320	669	tell	304	70
seem	81	15	ask	128	9
tend	4	1	need	60	19

As you can see, the verb *want* is the most frequent verb in each construction: it is between 5 and 10 times more frequent than the next most frequent verb (depending on whether you include instance of *wanna* in the count[1]). This means that *want* is the prototype for both SEI and OEI constructions—but it shows different behaviors in each class. As a result, the SEI prototype is a verb that shows control-style behavior (9), while the OEI prototype is a verb that shows raising-style behavior (10).

(9) SEI (SR, SC) prototype
    a. *Form:* NP wants to VP
    b. *Behavior:* subject control
(10) OEI (OR, OC) prototype
    a. *Form:* NP wants NP to VP
    b. *Behavior:* object raising

Recall that Goldberg and her colleagues found a learning advantage for a verb that was four times more frequent than the next most frequent verb. Given that *want* is 5-10 times more frequent, it seems reasonable to assume that speakers could learn SEI and OEI constructions based on the *want* prototypes. As a result, though, OC verbs will be linked to an OR prototype, and we should not be surprised to see speakers generalizing these verbs in the direction of raising behavior. In contrast, SC verbs are linked to a SC prototype, and speakers should therefore be much less willing to allow raising behavior with this group. These are exactly the right predictions for Experiment 1.

In short, the generative claim that speakers organize these verbs into a class of "raising" verbs that functions distinctly from a class of "control" verbs appears to be wrong. Instead, speakers seem to group SR, SC, OR, and OC verbs into larger SEI and OEI classes (Table 5).

Table 5 Verb classes (claimed vs. found)

	Generative claim	**Found here**
Class 1	Raising constructions (SR + OR)	SEI constructions (SR + SC)
Class 2	Control constructions (SC + OC)	OEI constructions (OR + OC)

4.1 *Want* as a prototype

So what does it mean for *want* to function as a prototype? Here is where the discussion of birds again becomes relevant. Table 6 shows OR *want* as the prototype for the OEI class. The cue to this class is verbs appearing in the *NP V NP to VP* frame. In the prototypical case, there will not be any semantic relationship between the matrix verb and the following NP. This is the "sparrows" case. OC verbs like *force* and *allow* are still members of the OEI

class, but—unlike the prototype—these verbs usually *do* participate in a semantic relationship with the following NP. These peripheral exemplars are the "penguins" of the OEI class.

Table 6 OR *want* as the OEI prototype

OEI trait:	***NP V NP to VP***	**No V-NP relationship**	**Exemplar**
OR (*want*)	✓	✓	Prototypical
OC (*force*)	✓		Peripheral

The situation in the SEI class is analogous, but flipped (Table 7). Here, the cue to the class is verbs appearing in the *NP V to VP* frame. But now the prototypical case is one in which the matrix verb is semantically related to the matrix NP subject. SR verbs like *seem* and *tend* are therefore peripheral exemplars of the SEI class, since they do not participate in this relationship.

Table 7 SC *want* as the SEI prototype

SEI trait:	***NP V to VP***	**NP-V relationship**	**Exemplar**
SC (*want*)	✓	✓	Prototypical
SR (*seem*)	✓		Peripheral

Why were speakers in Experiment 1 relatively willing to allow OC verbs to appear with expletive objects? I would like to suggest that this is a case of "penguins becoming sparrows." In short, OC verbs' behavior may occasionally overgeneralize in the direction of the highly frequent OR prototype for the OEI class. In contrast, speakers will be much less willing to allow SC verbs to take expletive subjects, since the "sparrow" for the SEI class is also a SC verb.

However, as noted above, this behavior was still occasionally allowed in Experiment 1. It is also apparent from the spontaneous data in (5) and (6) that speakers sometimes drop the usual semantic restrictions on the subject of a SC verb in their everyday speech. Why should this be—why should speakers generalize what we think of as a *peripheral* exemplar of the class?

I have two suggestions as to what might be happening here. First, I believe that this sort of linguistic phenomenon is a natural result of the fluid nature of classes. Each of the proposed classes—both SEI and OEI—represents a continuum between prototypical and peripheral exemplars (Kirby, 2011). Any verb belonging to one of these classes will occupy some point (or segment) along that continuum, and many—if not most—will have significant flexibility in their allowed behaviors.

Secondly, saying that the SEI verb *want* is a "SC" verb only means that it falls somewhere on the control end of the continuum. But where? The sentences below show *want* co-occurring with an inanimate subject (11a) and with an expletive subject (11b). On my judgments, these sentences aren't that bad—and they are significantly better than they would be if they instead contained SC *try*.

In short, *want* may not fall all the way to the control end of the continuum—but wherever it does fall, that is what it sets as the prototypical behaviors for the rest of the verbs in the SEI class.

(11) a. These apples want to be in the fridge.
(cf. *These apples try to be in the fridge)
b. It looks like it wants to rain.
(cf. ??It looks like it's trying to rain)

5 Discussion

This research supports the claim that "there are virtually no typically Control verbs which, if the conditions are appropriate, will not show some properties of Raising" (Ruwet, 1991, p. 59). So if these verbs do not form two dichotomous classes, what do we do with the notions of "raising" and "control"?

Raising-style *behavior* and control-style *behavior* certainly exist, and the subclasses of SR, SC, OR, and OC appear to be empirically grounded and useful to linguists who wish to characterize the typical semantic behaviors of individual matrix verbs appearing in SEI and OEI frames. However, speakers appear to organize these verbs into larger SEI and OEI classes, rather than grouping the two types of raising constructions together, separate from the two types of control constructions. These proposed supercategories allow for significant fluidity between the "raising" and "control" ends of the spectrum in each class, but especially in the OEI class.

Given these continua, I propose that three major phenomena likely contribute to whether a given verb will participate in raising-style or control-style behaviors. First, the verb's usual behavior definitely matters: is this verb normally a SR, SC, OR, or OC verb? Crucially, though, this behavior is probabilistic, and must be defined over many utterances; a single exemplar will not suffice. Second, the prototype for the class matters: does the verb belong to a class with a SC or OR prototype? Those verbs linked to a raising-style prototype (i.e. those verbs in the OEI class) should show more flexibility in their behavior. Third, and finally, how *entrenched* is the verb? This will also play a role.

One measure that appears to correlate with entrenchment is token frequency: seeing a verb frequently in one frame appears to lower its tendency or ability to appear in other frames. Several researchers (e.g. Theakston, 2004, Ambridge et al. 2008) have found that when speakers are presented with "ungrammatical" utterances, they will rate those items containing low-frequency verbs to be more acceptable than those items which include high-frequency verbs. This is a strong indication that token frequency correlates with entrenchment. This phenomenon is clearly relevant to Experiment 1 presented here, as the SC and OC utterances that speakers were asked to rate are considered to be "ungrammatical" on many generative analyses.

The second issue related to entrenchment is the matter of the range of argument structure frames that a given verb usually appears in: verbs that appear in a wider variety of frames should be less entrenched in any one of those frames, as compared to verbs which normally appear in only one frame. For instance, some (but not all) OC verbs can also appear in the non-OC *for-to* frame shown in (12a). Notice that this same frame also accommodates a number of OR verbs (12b). It turns out that those OC verbs that can appear in this frame are also judged to be more acceptable when appearing in the types of structures tested in Experiment 1, whereas *tell* is judged to be relatively unacceptable (Kirby and Han, submitted).

(12) a. Sandy asked/?ordered/?urged/*told for Ted to teach syntax.
b. Sandy wanted/needed/expected for Ted to teach syntax.

6 Conclusions

There are two major take-home points that I would like you to have gotten from this paper. First, it is clear that OC verbs can 'drop' a theta role more easily than SC verbs. This appears to be an effect which is robust across verbs, across speakers, and across methodologies. Any explanatorily adequate account of control verbs will have to explain why this observed split exists between OC and SC verbs.

Second, construction grammar and prototype theory provide one strong explanation for why OC verbs are more acceptable with expletive arguments than are SC verbs. I know that the notion of SEI and OEI constructions is a very different—and unorthodox[2]—way to divide up "raising and control" verbs, but this account seems to make the right predictions, given the kinds of corpus and experimental data I've presented here.

This account also explains the observation that some predicates (e.g. *begin*) seem to function as both R and C verbs (e.g. Postal, 1974, Perlmutter, 1979). On the present account, this is due to the fact that R-style or C-style behavior is set on an utterance-by-utterance basis, depending on how closely a verb aligns with the prototype for the class.

My account also clearly bears on attempts to unify R and C into a single class (see Kirby et al., 2010), but it remains distinct from those attempts in two key ways. First, I do still assume that these verbs fall into two classes—they're just not the ones that have previously been claimed. And second, each class is based around a prototypical exemplar, rather than any monolithic, unifying set of behaviors.

Notes

[1] Adult use of SEI *want* included 5130 instances of unreduced *want to* and 5753 instances of reduced *wanna* (or similar). Child use included 2911 instances of *want to* and 3199 instances of *wanna*.
[2] However, it should be noted that this particular two-way split is not unprecedented. Among many others, see Bresnan (1982), Pollard and Sag (1994), and O'Grady (2005).

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The Subject Condition and its Crosslinguistic Variation*

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1 Introduction

The Subject Condition (SC) has been approached from various perspectives (see, among others, Ishii 1997, Nunes and Uriagereka 2000, Stepanov 2001, Boeckx 2008, and Gallego and Uriagereka 2007), but these analyses coincide in one respect, *i.e.*, the SC effects are due to derived subject positions, which result in so called "freezing effects." Chomsky (2008: 147) challenges this view based on the internal/external argument contrast between (1) and (2), claiming that base subject positions matter for the SC effects:

(1) a. ***Of which car** did [the driver ***t***] cause a scandal?
    b. ***Of which car** did [the picture ***t***] cause a scandal?
(2) a. **Of which car** was [the driver ***t***] awarded a prize?
    b. **Of which car** was [the picture ***t***] awarded a prize?

In (1), the *wh*-phrase *of which car* is extracted from the external argument; the result is deviant. In (2), on the other hand, the *wh*-phrase is extracted from the subject which originates as an internal argument; the result is acceptable. Chomsky argues that this internal/external argument contrast with the SC constitutes evidence for his theory of phase.

There have appeared arguments against Chomsky's empirical generalization about the internal/external argument contrast, which undermines his phase-based analysis of the SC and supports the traditional "freezing" approach. First, Omaki (2006) and Boeckx (2008) report that many speakers they consulted regard examples like (2) as degraded. Second, when *which*-N phrases are replaced by simplex *wh*-phrases like *who(m)* and *what* as in (3), the internal/external argument contrast disappears or at least becomes less clear even for those who see the contrast between (1) and (2):

(3) a. ***Of whom** did [the picture ***t***] cause a scandal?
    b. ***Of whom** was [the picture ***t***] awarded a prize?

Third, the sentential subject constraint holds even with an internal argument subject as shown in (4):[1]

(4) ***Which teacher*** was [that the principal would fire ***t***] expected by the reporters?

These English facts strongly suggest that the internal/external argument contrast does not exist, or at least the contrast is not so entirely clear as predicted by Chomsky's (2008) new theory of phase.[2]

This paper argues that unlike in English, Chomsky's generalization about the internal/external argument contrast with the SC *does* hold in Japanese. Assuming the traditional "freezing" approach to the SC, I will argue that Japanese has a way of bypassing the "freezing effect" in terms of remnant movement due to the availability of "A-scrambling" to the embedding VP edge only when extraction takes place out of an internal argument. This accounts for the crosslinguistic variation with the SC between English and Japanese. The organization of this paper is as follows. Section 2 shows that contrary to the widely accepted view that Japanese lacks the SC effects, there are cases in Japanese where the SC effects appear. I will argue that the presence/absence of the SC effects is an instance of the internal/external argument contrast. Section 3 introduces theoretical assumptions in this paper. Section 4 proposes a remnant movement analysis of the SC in Japanese. Section 5 makes concluding remarks.

2 The Internal/External Argument Contrast with the Subject Condition in Japanese

Based on examples like (5), it has been widely assumed that there is a crosslinguistic variation with the SC; while languages like English show the SC effect, Japanese does not (see, among others, Kayne 1984, Lasnik and Saito 1992, Ishii 1997, and Saito and Fukui 1998):

(5) a. ? **Dare-ni** [John-ga [[Mary-ga ***t*** atta] koto]-ga mondai-da to]
who-DAT John-NOM Mary-NOM met fact-NOM problem-is that
omotteru] no
think Q
Lit. 'Who, John thinks that [the fact that Mary met t] is a problem.'

b. ? **Dare-ni** [John-ga [[Mary-ga ***t*** himitu-o bakuro sita] koto]-ga
who-DAT John-NOM Mary-NOM secret-ACC disclosed fact-NOM
akiraka-da to] omotteru] no
clear-is that think Q
Lit. 'Who, John thinks that [the fact that Mary disclosed the secret to t] is clear.'

In (5), *dare-ni* 'who-DAT' is scrambled out of the embedded subject. The results are slightly degraded, but this is due to the fact that they involve extraction out

of the complex NP. Crucially, there is no subject-object asymmetry with respect to extraction; if a phrase is scrambled out of an object phrase, as shown in (6), the result is as degraded as that of extraction out of a subject phrase in (5):

(6) ?**Dare-ni** [John-ga [[Mary-ga ***t*** atta] koto]-o mondai-ni siteiru] no
who-DAT John-NOM Mary-NOM met fact-ACC problem-into making Q
Lit. 'Who, John is making an issue out of [the fact that Mary met t].'

Contrary to this widely accepted view, I observe that there are cases in Japanese where the SC effects *do* appear, as shown in (7):

(7) a.?* **Dare-ni** [John-ga [[Mary-ga ***t*** atta] koto]-ga Bill-ni dameezi-o
who-DAT John-NOM Mary-NOM met fact-NOM Bill-DAT damage-ACC
ataeta to] omotteiru] no
gave that think Q
Lit. 'Who, John thinks that [the fact that Mary met t] inflicted damage on Bill.'

b.?* **Dare-ni** [John-ga [[Mary-ga ***t*** himitu-o bakuro sita] koto]-ga
who-DAT John-NOM Mary-NOM secret-ACC disclosed fact-NOM
kaisya-ni sonsitu-o motarasita to] omotteiru] no
company-DAT loss-ACC brought that think Q
Lit. 'Who, John thinks that [the fact that Mary disclosed the secret to t] inflicted loss on the company.'

In (7), *dare-ni* 'who-DAT' is scrambled out of the embedded subject; the result is deviant or at least more degraded than (5). The difference between (5) and (7) resides in the type of the embedded predicate. The embedded predicates *ataeta* 'gave' and *motarasita* 'brought' in (7) are transitive; the embedded subject phrases in (7) are external arguments. I argue that the embedded predicates *mondai-da* 'is a problem' and *akiraka-da* 'is clear' in (5) are unaccusative and their sole arguments originate as internal arguments. Hence, the contrast between (5) and (7) shows that Chomsky's empirical generalization about the internal/external argument contrast with the SC *does* hold in Japanese.

This view that the predicates in (5) are unaccusative is supported by the following facts. First, there is lexical semantic evidence. According to Kishimoto (2005), stative predicates in Japanese are unaccusative; the predicates in (5), *mondai-da* 'is a problem' and *akiraka-da* 'is clear', are stative, and hence unaccusative. Second, this view is also supported by Kageyama's (1993) case marker drop test. Kageyama argues that the case marker of an internal argument can drop whereas that of an external argument cannot. This case marker drop test indicates that the predicates in (5) are unaccusative, since *-ga*, which is assigned to their sole argument, can drop as shown in (8):

(8) a. Kimi-wa [[John-ga dono hon-o katta koto]**-ga/*wa/**∅
you-TOP John-NOM which-book-ACC bought fact**-NOM/*TOP/**∅
mondai-da to] nageiteiru/kuyandeiru no
problem-is that deplore/regret Q
Lit. 'Which book do you deplore/regret that [the fact that John bought t] is a problem?'

b. Kimi-wa [[John-ga nani-o nusunda koto]**-ga/*wa/**∅ akiraka-da
you-TOP John-NOM what-ACC stole fact-**NOM/*TOP/**∅ clear-is
to] nageiteiru/kuyandeiru no
that deplore/regret Q
Lit. 'What do you deplore/regret that [the fact that John stole t] is clear?'

In (8), the nominative case marker *-ga* of the embedded subject phrase can drop. It should be noted that the deleted marker cannot be the topic marker *-wa*, since the embedded subject phrase can only be marked by *-ga* but not by *-wa*.[3]

3 Theoretical Assumptions

Section 2 has shown that the contrast between (5) and (7) is an instance of the internal/external argument contrast with the SC. Before we turn to its analysis, a few remarks should be made about theoretical assumptions in this paper.

First, the discussion to follow assumes the traditional probe theory, which claims that there is no feature inheritance mechanism; C has an edge-feature, and T has an Agree-feature. Another assumption is that derivational steps are strictly cyclic, and thus C and T do not probe "in parallel."

Second, this paper assumes the traditional "freezing" approach to the SC; the Spec of T is a "frozen" position. Hence, subextraction of an element out of the subject phrase in the Spec of T is prohibited.

Third, I assume with, among others, Grewendorf (2003) and Abels (2007a, b) that there is a hierarchy of movement types which regulates the order of application of movement operations globally, *i.e.* across cycles or phases, including remnant movements. Although their hierarchies are different from each other, they agree that so called "non-A-movement" is higher in the hierarchy than "A-movement," which includes Case-driven movement and Japanese short distance (clause internal) scrambling, as shown in (9):

(9) Non-A-movement > A-movement

Following Abels (2007b), I claim that remnant movements are constrained by the antisymmetric ordering between movement types (10) together with the Minimal Link Condition (11):[4]

(10) Antisymmetric Ordering
Movement of type X can be followed by remnant movement of type Y unless Y is a lower type than X.

(11) The Minimal Link Condition (MLC)
H (K) attracts α only if there is no β, β is closer to H(K) than α, such that H(K) attracts β. (Chomsky 1995: 311)

The antisymmetric ordering can correctly rule in remnant movement cases like (12a) and rule out remnant movement cases like (12b) (Abels 2007a: 7):

(12) a. A-movement -> Remnant non-A-movement
It is known [[$_{AP}$ how likely t_1 to win]$_2$ Oscar$_1$ is t_2].
b. Non-A-movement -> Remnant A-movement
*[A picture of t_1]$_2$ is known [which king$_1$ to have been sold t_2].

Müller's generalization, which requires that remnant creating movement and remnant movement should not be of the same type as exemplified by (13), follows from the MLC (Müller 1998: 201):

(13) *Wh*-movement -> Remnant *wh*-movement
* [Which book about t_1]$_2$ don't you know [who$_1$ to read t_2]?

4 A Remnant Movement Analysis

This section proposes a remnant movement analysis of the internal/external argument contrast with the SC in Japanese. Let us first explicate Japanese scrambling. It is pointed out by Saito (1992; 2003) that short-distance (or clause-internal) scrambling can be "A-movement" whereas long distance scrambling is necessarily "A'-movement." This is supported by the fact that short-distance scrambling can license anaphoric and bound variable interpretations as shown in (14, 15) whereas long-distance scrambling cannot as shown in (16, 17):[5]

(14)?[**Karera**-o$_i$ [[**otagai**$_i$-no sensei]-ga t_i hihansita]] (koto)
they-ACC **each other**-GEN teacher-NOM criticized (fact)
Lit. 'Them$_i$, [each other's teachers] criticized t$_i$.'

(15) **Dono hon-ni-mo$_i$** [[**sono hon$_i$**-no tyosya]-ga t_i keti-o tuketa]]
which book-to-even that book-GEN author-NOM gave-criticism
Lit. 'Every book$_i$, [its$_i$ author criticized t$_i$].'

(16)*[**Karera**-o$_i$ [[**otagai**$_i$-no sensei]-ga [Tanaka-ga t_i hihansita to]
they-ACC each other-GEN teacher-NOM Tanaka-NOM criticized that itta]] (koto)
said (fact)
Lit. 'Them$_i$, [each other's teachers] said that Tanaka criticized t$_i$.'

(17)?***Dono hon-ni-mo**$_i$ [[**sono hon**$_i$-no tyosya]-ga [Hanako-ga t_i
which book-to-even that book-GEN author-NOM Hanako-NOM
keti-o tuketa to] itta
gave-criticism that said
Lit. 'Every book$_i$, its$_i$ author said that Hanako criticized t_i.'

I observe, however, that long-distance scrambling can license anaphoric and bound variable interpretations when the pronoun appears within a matrix indirect object as shown in (18-21):[6]

(18) [**Karera**-o$_i$ [John-ga [**otagai**$_i$-no sensei]-ni [PRO t_i homeru yooni]
they-ACC John-NOM **each other**-GEN teacher-DAT praise to
itta]] (koto)
told (fact)
Lit. 'Them$_i$, John told [each other$_i$'s teachers] to praise t_i.'

(19)?[**Karera**-o$_i$ [John-ga [**otagai**$_i$-no sensei]-ni [Mary-ga t_i hihansiteiru
they-ACC John-NOM **each other**-GEN teacher-DAT Mary-NOM criticize
to] tugeguti sita]] (koto)
that told (fact)
Lit. 'Them$_i$, John told [each other$_i$'s teachers] that Mary is criticizing t_i.'

(20) **Dono hon-ni-mo**$_i$ [John-ga [**sono hon**$_i$**-no** tyosya]-ni [PRO t_i
which book-to-even John-NOM **that book**-GEN author-DAT
keti-o tukeru yooni] itta]
gave-criticism to told
Lit. 'Every book$_i$, John told its$_i$ author to criticize t_i.'

(21)?**Dono hon-ni-mo**$_i$ [John-ga [**sono hon**$_i$**-no** tyosya]-ni [Mary-ga t_i
which book-to-even John-NOM **that book**-GEN author-DAT Mary-NOM
keti-o tuketa to] itta]
gave-criticism that said
Lit. 'Every book$_i$, John told its$_i$ author that Hanako criticized t_i.'

The contrast between (16, 17) and (18-21) follows if we assume that long-distance scrambling may go through an "A-position" in the matrix VP domain as its intermediate landing site, which we assume is the matrix VP adjoined position for expository purposes. Let us consider the anaphoric relation facts (16) and (18) as examples, which are derived as in (22) and (23) respectively:

(22) [**Karera**-o$_i$ [[**otagai**$_i$-no sensei]-ga$_j$ [$_{vP}$ t_j [$_{VP}$ ***t′***$_i$ [$_{VP}$ [Tanaka-ga t_i
they-ACC **each other**-GEN teacher-NOM Tanaka-NOM
hihansita to] itta]]]]] (koto)
criticized that said (fact)

(23) [**Karera**-o$_i$ [John-ga$_j$ [$_{vP}$ t_j [$_{VP}$ ***t′***$_i$ [$_{VP}$ [**otagai**$_i$-no sensei]-ni [PRO t_i
they-ACC John-NOM **each other**-GEN teacher-DAT

homeru yooni] itta]]]]] (koto)
praise to told (fact)

In (22), scrambling of *karera-o* 'they-ACC' from the matrix VP adjoined position to the sentence initial position, which is necessarily "A'-movement," cannot license the anaphor *otagai* 'each other' within the matrix subject phrase. In (23), on the other hand, scrambling to the matrix VP adjoined position can be "A-movement." This "A-movement" crosses over the matrix indirect object phrase containing *otagai* 'each other', which licenses the anaphoric interpretation. The variable binding facts can be accounted for in the same way.

Turning now to the internal/external argument contrast with the SC in Japanese, there is no way of deriving either (5) or (7) in terms of scrambling out of a derived subject position (the Spec of T) due to the "freezing effect." There is, however, an alternative derivation of (5) in terms of remnant movement. The remnant movement derivation of (5a), for example, proceeds as below:

(24) a. "A-scrambling" of *dare-ni* 'who-DAT' to the Embedding VP Edge
[$_{v}$P [$_{VP}$ **dare-ni$_1$** [$_{VP}$ [Mary-ga ***t$_1$*** atta koto] mondai-da]] *v*]
who-DAT Mary-NOM met fact problem-is

b. Remnant "A-movement" of the Subject Phrase to the Spec of T
[$_{TP}$ **[Mary-ga *t$_1$* atta koto]-ga$_2$** [[$_{v}$P [$_{VP}$ dare-ni$_1$ [$_{VP}$ ***t$_2$*** mondai-da]] ...
Mary-NOM met fact-NOM who-DAT problem-is

c. [**dare-ni$_1$** [John-ga [[$_{TP}$ [Mary-ga *t$_1$* atta koto]-ga$_2$ [[$_{v}$P [$_{VP}$ ***t′$_1$*** [$_{VP}$ *t$_2$* ...
who-DAT John-NOM Mary-NOM met fact-NOM

In (24a), scrambling of *dare-ni* 'who-DAT' from its original position to the matrix VP adjoined position can be "A-movement." This "A-movement" is followed by remnant "A-movement" of the subject phrase *Mary-ga t$_1$ atta koto* 'the fact that Mary met *t$_1$*' to the Spec of T as shown in (24b). It should be noted that this subject raising does not violate the Phase Impenetrability Condition if we assume its less strict version advocated by Chomsky (2001; 2004), since it allows T to probe into the complement domain of *v**/*v* even if both *v**P and *v*P count as phases (Legate 2003). This derivation does not violate the antisymmetric ordering (10), since both of the movement operations count as "A-movement." Scrambling of *dare-ni* 'who-DAT' out of the subject in (24a) does not violate the Minimal Link Condition (11) on the following grounds. Remnant movement of the subject is triggered by the φ-features of T. It is debatable whether scrambling is triggered by some feature, as argued by Miyagawa (1997), or scrambling is not triggered by any feature, as argued by Fukui (1993) and Saito and Fukui (1998). If scrambling is triggered by some feature, it is controversial what feature triggers scrambling of *dare-ni* 'who-DAT' to the matrix VP adjoined position. Putting these issues aside, it is clear that this scrambling is not triggered by any φ-features. This is because given that φ-probing requires an

unvalued Case feature (Chomsky 2004; 2008), *dare-ni* 'who-DAT', which is assigned the dative case marker *-ni*, has already got its uninterpretable Case feature valued within the embedded clause; it cannot undergo any φ-feature-driven operation. Hence, scrambling of *dare-ni* 'who-DAT' and remnant movement of the subject phrase are not triggered by the same type of feature; there is no violation of the MLC. Finally, *dare-ni* 'who-DAT' undergoes scrambling from the VP adjoined position to the sentence initial position as shown in (24c). (24) does not violate either the antisymmetric ordering (10) or the Minimal Link Condition (11). (5a, b) are acceptable.[7]

Such a remnant movement derivation is not available to (7). Let us consider (7a) as an example, In order to derive (7a) in terms of remnant movement, *dare-ni* 'who-DAT' has to be scrambled out of the subject phrase in the Spec of *v**, lowering to the VP adjoined position as represented in (25):

(25) [$_{v}$*P [Mary-ga ***t*** atta koto] [VP **dare-ni** [VP Bill-ni dameezi-o ataeta]] *v**]
Mary-NOM met fact **who-DAT** Bill-DAT damage-ACC gave

Such a "countercyclic" scrambling is banned by Chomsky's (2000) No Tampering/ Extension Condition, which informally states that once a structure is built, we cannot tamper with its internal arrangement. Hence, our analysis can account for the internal/external argument contrast with the SC in Japanese.[8]

A remnant movement derivation is not available to English *wh*-movement out of a subject which originates as an internal argument. In contrast to Japanese long-distance scrambling, English *wh*-movement does not license a bound variable pronoun inside an indirect object (Barss and Lasnik 1986: 348):

(26) a. ***Which paycheck$_i$** did you deny **its$_i$** owner ***t$_i$***?
b. ***Which lion$_i$** did you show **its$_i$** trainer ***t$_i$***?

This indicates that unlike Japanese scrambling, English *wh*-movement does not go through any "A-position" in the VP domain as its intermediate landing site. Let me consider (3b) (repeated here as (27)) as an example:

(27)***Of whom** was [the picture ***t***] awarded a prize?

The remnant movement derivation of (27) is represented in (28):

(28) a. "Non-A-movement" of *of whom* to the *v*P-edge
[$_{v}$P **of whom$_1$** [*v*-was awarded [[the picture ***t$_1$***] a prize]]]
b. Remnant "A-movement" of the Subject Phrase to the Spec of T
[TP **[the picture *t$_1$*]$_2$** [T [$_{v}$P of whom$_1$ [*v*-was awarded [***t$_2$*** a prize]]]]]

This violates the antisymmetric ordering (10), since "non-A-movement" of *of whom* to the *v*P-edge is followed by remnant "A-movement" of the subject to the Spec of T, which is of a lower type than the first movement. Hence, (27) is deviant. The crosslinguistic variation between English and Japanese follows.

Finally, the internal/external argument contrast with the SC also appears with empty operator movement in Japanese, which is an "A'-movement." Among constructions which have been argued to involve empty operator movement (Kikuchi 1987, Takezawa 1987, Hoji 1990), I will consider as an example the cleft construction with a NP-Case focus (29):

(29) a. ?[***Op$_i$*** [John-ga Bill-ni [[Mary-ga ***t$_i$*** katta koto]-ga mondai da to]
John-NOM Bill-DAT Mary-NOM bought fact-NOM problem-is that
itta] no]-wa sono hon$_i$-o da
said COMP-TOP that book-ACC be
Lit. 'It is that book$_i$ that John said to Bill that [the fact that Mary bought e$_i$] is a problem.' (Ishii 1997: 143)

b. *[***Op$_i$*** [John-ga Bill-ni [[Mary-ga ***t$_i$*** katta koto]-ga Suzy-ni
John-NOM Bill-DAT Mary-NOM bought fact-NOM Suzy-DAT
dameezi-o ataeta to] itta] no]-wa sono hon$_i$ -o da
damage-ACC gave that said COMP-TOP that book-ACC be
Lit. 'It is that book$_i$ that John said to Bill that [the fact that Mary bought e$_i$] inflicted damage on Suzy.'

One might wonder why the remnant movement derivation of (29a) does not violate the antisymmetric ordering (10). I argue that since scrambling is available in Japanese, the empty operator may first undergo "A-scrambling" out of the subject phrase to the matrix VP adjoined position and then "A'-movement" into the matrix Spec of C as represented in (30):

(30) a. "A-scrambling" of the Empty Operator to the VP-edge
[$_{v}$P [VP ***Op$_1$*** [VP [Mary-ga ***t$_1$*** katta koto] mondai-da]] *v*]
Mary-NOM bought fact problem-is

b. Remnant "A-movement" of the Subject Phrase to the Spec of T
[TP **[Mary-ga ***t$_1$*** katta koto]-ga$_2$** [$_{v}$P [VP *Op*1 [VP ***t$_2$*** mondai-da]] *v*] T]
Mary-NOM bought fact-NOM problem-is

c. [***Op$_1$*** [John-ga Bill-ni [[[Mary-ga *t$_1$* katta koto]-ga$_2$ [$_{v}$P [VP ***t′$_1$***...
John-NOM Bill-DAT Mary-NOM bought fact-NOM

In (30), scrambling to the matrix VP adjoined position, which can be "A-movement," is followed by remnant "A-movement" of the subject phrase to the Spec of T; this satisfies both the antisymmetric ordering (10) and the MLC (11).

This analysis gains support from variable binding facts (31):

(31) a.*?[***Op**$_i$* [[**soko-no kaisya**$_i$**-no** syain]-ga Bill-ni [PRO ***t**$_i$* uttaeru to]
that company-GEN employee-NOM Bill-DAT sue that
yakusokusita] no]-wa [zidoosya-gaisya-o 6-sya]$_i$ da
promised COMP-TOP automobile-company-ACC 6-CL be
'It is six automobile companies$_i$ that its$_i$ employees promised Bill to sue e_i.'

b. ? [***Op**$_i$* [John-ga [**soko-no kaisya**$_i$**-no** syain-ni] [PRO ***t**$_i$* uttaeru to]
John-NOM that company-GEN employee-DAT sue that
yakusokusita] no]-wa [zidoosya-gaisya-o 6-sya]$_i$ da
promised COMP-TOP automobile-company-ACC 6-CL be
'It is six automobile companies$_i$ that John promised its$_i$ employees to sue e_i.'

In (31a), the bound variable *soko-no kaisya* 'that company' is within the subject phrase; the result is deviant. In (31b), on the other hand, the bound variable is within the indirect object; the result is acceptable. This contrast in (31) follows if the empty operator undergoes "A-scrambling" to the embedding VP adjoined position, licensing the bound variable within the indirect object in (31b), and then undergoes "A'-movement" to the Spec of C, ruling out the bound variable interpretation of *soko-no kaisya* 'that company' within the matrix subject in (31a).

5 Conclusion

This paper has first shown that unlike in English, Chomsky's generalization with the internal/external argument contrast with the SC *does* hold in Japanese. Given the "freezing" approach to the SC, I have argued that Japanese has a way of bypassing the "freezing effect" in terms of remnant movement due to the availability of "A-scrambling" to the embedding VP edge only when a subject phrase originates as an internal argument. This accounts for the crosslinguistic variation with the SC between English and Japanese.

Notes

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[1] This argument only holds if sentential subjects exist, as advocated by Delahanty (1983). See Koster (1978) for a different view.

[2] A question still remains why there is a contrast between (1) and (2) for some speakers. I leave this issue for future research.

[3] Note that verbs like *nageku* 'deplore' and *kuyamu* 'regret' are non-ECM verbs, as the degraded status of the ECM pattern (i) shows, Hence, the deleted marker in (8) cannot be the accusative case marker *-o*:

(i) John-ga [zibun-ga/??o baka-datta to] nageiteiru/kuyandeiru (koto)
John-NOM self-NOM/ACC fool-was that deplore/regret (fact)
'John$_i$ deplores/regrets that he$_i$ was foolish.'

[4] Abels (2007b) also proposes an alternative way of restricting remnant movements in terms of the asymmetric ordering, leaving open the question of whether the ordering of movement operations should be antisymmetric or asymmetric. The next section shows that the internal/external argument contrast with the SC in Japanese only follows from the antisymmetric ordering together with the MLC. If the analysis in this paper is on the right track, it presents evidence in favor of the antisymmetric ordering together with the MLC approach to the restriction on remnant movements.
[5] As pointed out by Saito (2005), it is controversial whether *otagai* 'each other' is an anaphor (Saito 2003), or contains a hidden pronoun that is subject to the licensing condition on bound pronouns as represented in *[pro [otagai]]* (Hoji 1997). Although the diagnostic tests to follow take Saito's view, we get the same result under Hoji view, though we have to use a quantificational expression as the antecedent of *otagai* 'each other' in diagnostic tests under the latter view.
[6] (19, 21), where the embedded subject is overt, sound less natural than (18, 20), where scrambling takes place out of a control complement. It should be noted, however, that there is a clear contrast between (16, 17) and (19, 21), which the present discussion takes as crucial.
[7] Note in passing that under the asymmetric ordering among movement types (see footnote 4), derivations like (24), where two operations of the same type are involved, would always be excluded, which is undesirable.
[8] If an element is allowed to undergo "A-scrambling" to the matrix VP edge, however, a question arises why scrambling from the matrix VP edge to the matrix TP edge, which counts as short-distance scrambling, is necessarily "A'-movement," since, as argued by, among others, Saito (1992; 2003), short-distance scrambling to the TP edge can be either "A-movement" or "A'-movement." If scrambling from the matrix VP edge to the matrix TP edge could be "A-movement," our analysis would allow an element to undergo "A-scrambling" out of a CP complement successive cyclically, leading to unwanted overgeneration. In order to avoid overgeneration, I claim that A-scrambling to the TP edge is lower in hierarchy than the other A-movements including A-scrambling to the VP edge, revising the hierarchy of movement types (9) into (i):
(i) Non-A-movement > A-movement > A-scrambling to TP-edge

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Deriving Nominal Reference

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1 Introduction: What are nouns?

The traditional definition of Ns as "names for things, people, and places" is formalized by Baker (2003), who argues that N has a referential index: its basic type is <e> and it can shift to <e,t>. On another view, all lexical categories are predicative and property-denoting (Williams 1983), so N denotes a property; the basic type of N is <e,t> and it can shift to <e>. A third view claims N can be referential *or* property denoting, with some analyses claiming the semantic type of N varies within a language (Matushansky 2010; Partee 1986), and others claiming it varies across languages (Chierchia 1998; Dayal 1999). Thus, semantically, there are different ways of deriving nominal reference. This indeterminacy is mirrored in syntactic analyses, which differ according to whether they treat N as inherently referential or not. We distinguish two broad approaches: inherent versus derived referentiality. Inherent referentiality claims Ns are the locus of referentiality (Baker 2003), so roots are pre-specified as N (1a). Under derived referentiality, the locus of referentiality is D (Longobardi 2001), and a lexeme such as *dog* is labeled N in the context of D (Fries 1952), (1b).* We argue that derived referentiality is the way to go: N denotes a property; its basic type is <e,t>, and bare Ns are predicative, (2a). This has consequences for the analysis of argument bare Ns, which have a DP shell (2b), with D overt or covert (Longobardi 2001). We first consider the implications of inherent and derived referentiality for the analysis of bare Ns (§2). We then present evidence for the claim that nominal arguments are DPs, and show that covert D is either paradigmatically or pragmatically conditioned (§3). We close with a discussion of the consequences of our proposal (§4).

(1) a. $[_{N}$ dog] b. $[_{D}$ [dog]]

(2) a. $[_{NP/PRED}$ N] b. $[_{DP/ARG}$ D N]

2 Bare nouns as predicates and arguments

Derived and inherent referentiality make different predictions about the behavior of bare Ns in predicate and argument contexts. Contrary to what is predicted by inherent referentiality, the presence of a copula is **not** conditioned by predicative contexts, and no language has a dedicated Pred head for N predicates.

2.1 Testing inherent referentiality: what it predicts about bare nouns

Inherent referentiality comes in two flavors: semantic and syntactic. The semantic version (Chierchia 1984) assumes that only V is a predicate, and type-shifts N and A with a predicativization operator, instantiated by the copula. A counter-example to predicativization is the fact that not all predicative contexts require an overt copula; the solution is to posit a (possibly null) copula with all non-V predicates. The syntactic version of inherent referentiality (Baker 2003) assumes that only V has an external argument, and posits two distinct syntactic predicative heads: one with N ($Pred_1$), and one with A ($Pred_2$). A counter-example to the Pred analysis is that no language has a dedicated Pred head for N. The solution offered is to posit a (possibly null) $Pred_1$ head for all N predicates. Having sketched out the logic of the analyses that adopt inherent referentiality, we now assess their empirical coverage.

2.1.1 Copula not conditioned by predicative contexts

The semantic version of inherent referentiality predicts a copula is needed to type-shift non-V predicates. But the distribution of the copula, rather than being conditioned by predicative contexts, is conditioned by tense or aspect. We present examples from English and Russian. In English, an overt copula is required in finite matrix clauses (3), but is absent in non-finite matrix clauses (4), and in small clauses, (5). The generalization is that the copula is forced by tense (Déchaine 1993); in the absence of tense, bare N predicates are fine. This is consistent with the claim that N is a predicate "by itself". In a Chierchia-style analysis, a copula is always present, even in (4-5). But this doesn't capture the fact that there is an aspectual contrast conditioned by the presence versus absence of the copula. This is seen with stage-level predicates embedded under verbs of perception: they may be bare (6a) or appear with a copula (6b), sometimes called activity *be* (Déchaine 1995; Partee 1986). In the latter context, they undergo an aspectual shift and are eventive. A third argument against inherent referentiality comes from Russian (Pereltsvaig 2007), where a bare N predicate occurs in the non-past (7a), but a copula is obligatory in the past (7b). A predicativization analysis must posit a null 'non-past' copula.

(3) *Lucy **is president**. Lucy **was president**. Lucy will **be president**.*

(4) *Lucy **president**! No way.* (cf. **Lucy **be president**!*)

(5) *They elected Lucy **president**. (*They elected Lucy **be president**.)*

(6) a. *I've already seen* [*Lucy **sick***] *for three days*.
b. *I've already seen* [*Lucy **be sick***] *for three days*.

(7) a. *Vy **učitel'nica***
you teacher.FEM.SG
'You are a teacher'

b. *Vy **byli učitel'nica***
you were teacher.FEM.SG
'You were a teacher'

2.1.2 No dedicated Predicative head for nominal predicates

Turning to the syntactic version of inherent referentiality, Baker's (2003) analysis predicts that, in predicative contexts, a $Pred_N$ head specialized for N predication will introduce N. However, no natural language seems to have $Pred_N$. To show this, we discuss data from Edo, Mandarin, and Shona. Baker observes that Edo has two distinct copulas: low-tone *rè* ($Pred_1$) occurs with N predicates (8a); H-tone *yé* ($Pred_2$) occurs with A predicates (8b). But $Pred_1$ (*re*) also occurs with equative DPs, in which case it bears high-tone, (9). The alternation between L- and H-tone is tonal inflection on the copula *re*, so this means that there is no dedicated $Pred_1$ for N predicates. Mandarin is another language that Baker describes as having a dedicated $Pred_N$. The facts are more complex: N predicates require the copula *shi* (10a), while A and P predicates permit it (10b-c). And when *shi* is optional, its presence is associated with focus. Significantly, *shi* is **not** restricted to N predicates, but also occurs with A and P predicates. Baker (2003:165) describes Bantu languages as having a dedicated $Pred_N$. But the facts are more complicated; for example, in Shona (southern Bantu), features of the subject **and** the predicate condition the copula. This is unexpected in a Baker-style analysis. To see this, consider the Shona examples in (11), which shows there is no $Pred_N$ in Shona. With an N predicate, with an overt 3rd person, there is no copula (11a). But if the subject is null, there is a high-tone copula (11b). And with a 1st or 2nd person subject, the auxiliary *-ri* surfaces (11c). This auxiliary is also used with locative predicates (11d).

(8) a. *Òzó **rè** òkpìá.*
Ozo is man
'Ozo is a man' (Baker 2003:165 (146a))

b. *Né!né òkpìá **yé** mòsèmòsé.*
the man is beautiful
'The man is beautiful' (Baker 2003:111 (30b))

(9) a. *Ùyì Ò-**ré** né!né ÒkhaÈmwÈn.*
Uyi 3-be the chief
'Uyi is the chief' (Baker 2003:111 (30a))

b. *Èvbáré Ò-**ré** Òzó lé.*
food 3-be Ozo cook
'It's food that Ozo cooked' (Baker 2003:111, (93))

(10) a. **tā hùshì* — *tā **shì** hùshì*
3SG nurse — 3SG COP nurse
's/he is a nurse'

b. *tā hěn pàng* — *tā **shì** hěn pàng*
3SG DEG fat — 3SG COP DEG fat
's/he is very fat — 's/he IS very fat'

c. *tā zài hǎi-bīan*
3SG at seaside
's/he is at the seaside'

*tā **shì** zài hǎi-bīan*
3SG COP at sea-side
's/he IS at the seaside'

(11) a. *Mùfárò mù-tùngàmìr-ìr-ì*
M. CL1-lead-APPL-NOM
'M. is a leader'

b. *M**ú**-tùngàmìr-ìr-ì*
H.CL1-lead-APPL-NOM
'S/he is a leader'

c. *Ndì-**rì** mù-tùngàmìr-ìr-ì*
1SG-AUX CL1-lead-APPL-NOM
'I am a leader'

d. *Mùfárò à-**rì** mù-mbà*
M. 3SG-AUX LOC.CL17 house
'M. is in the house'

2.2 Testing derived referentiality: what it predicts about bare nouns

Derived referentiality comes in two flavors: semantic and syntactic. In the semantic version (Stowell 1991), NP is a predicate and argument-typing of N is via type-shifting. Evidence for type-shifting comes from (in)definiteness contrasts of bare N arguments. (We return to this in §3.) A counterexample to this is that some languages lack bare N predicates. The syntactic version of derived referentiality is that D types N as an argument. With this as background, we now assess the empirical coverage of derived referentiality.

2.2.1 Some languages prohibit bare N arguments

Derived referentiality predicts that argument expressions surface with D. This pattern is attested in many languages. For example, in French, argument positions require an overt D, whether definite or indefinite, (12). Bare Ns are only licit in predicative contexts, (13). The same contrast is found in English: argument contexts prohibit bare Ns (14); elsewhere, bare Ns are licit, (15).

(12) a. ***Femme** a vu **chat***
woman saw cat
BARE N

b. {***Une***, ***la***} *femme a vu* {***un***, ***le***} *chat*
a / the woman saw a / the cat
(IN)DEF.

(13) a. MATRIX PRED.
*Lucie est **avocate***
Lucie is lawyer

b. EXCLAMATIVE
*Quel **imbecile**!*
what imbecile

c. VOCATIVE
***Chéri**, où es-tu?*
dear where are you

d. COMPLEX PRED.
*faire **appel** au bon sens*
make appeal to.the good sense

(14) a. ***Woman** saw **cat***
BARE N

b. {***A***, ***The***} *woman saw* {***a***, ***the***} *cat*
(IN)DEF.

(15) a. MATRIX PRED.
*Lucy is **boss***

b. EXCLAMATIVE
*What **foolishness**!*

c. VOCATIVE
***Dude**, where are you?*

d. COMPLEX PRED.
*make **way** for the Queen*

2.2.2 In some languages, D alternates with N-to-D movement

In some languages, overt D alternates with N-to-D movement. For example, in Italian, with definite DPs, D is obligatory if no other material fills that position (Longobardi 1994). As shown in the left-hand column of (16), overt D occurs with pre-N modifiers and possessors, and also proper Ns. But if N raises to D, then no determiner is necessary; this is shown in the right-hand column of (16). The alternation between overt D and N-to-D movement is expected under derived referentiality, which holds that nominal arguments are DPs.

(16)		[**D** (Adj/Poss) N]	[[$\mathbf{D_N}$] (Adj/Poss) t_N]
	a.	***l****'antica Roma*	***Roma*** *antica*
		the ancient Rome	Rome ancient
	b.	***il*** *mio Gianni*	***Gianni*** *mio*
		the my Gianni	Gianni my
	c.	***Il*** *Gianni mi ha telefonato*	***Gianni*** *mi ha telefonato*
		the Gianni me called.up	Gianni me called.up

2.2.3 Bare N predicates are the elsewhere case

Derived referentiality predicts bare N predicates are the elsewhere case. English N predication is often presented as a counterexample, as N predicates require the presence of indefinite D: compare **Lucy is **lawyer*** to *Lucy is **a lawyer***. A closer look confirms that English bare N predication is, in optimality-theoretic terms, the emergence of the unmarked. Observe that bare N predicates are possible with kind-denoting Ns (17), and with singleton kinds (18). The latter correspond to office-denoting Ns. English N predicates occur with an indefinite D when the predicate denotes a property of an individual, (19). Stowell (1991) argues that the indefinite D converts kind-denoting Ns into properties of individuals. Thus, there is no prohibition against bare N predicates in English; rather, N predicates that denote properties of individuals must appear with an indefinite D.

(17) a. *This is **water***.
b. *You are **woman**, I am **man*** (lyrics, Merrill & Styne)
c. *I am **woman**, hear me roar* (lyrics, H. Reddy & R. Burton)

(18) a. *Doug is **department head***
b. *Obama is **president***
c. *William will be **king***

(19) a. *You're **a woman**, I'm **a man*** (lyrics, Applegate, van Haaren & Hendrik)
b. *Doug is **(*an*) ***efficient department head***
c. *Obama is **(*a*) ***controversial president***
d. *William will be **(*a*) ***popular king***

2.2.4 The distinction between nominal and equative predication is universal
Derived referentiality predicts NP and DP will occur in predicative contexts, but that their denotations will differ, (20). NP supports nominal predication, namely a function from individual to truth-values. DP supports equative predication, namely the identity function $x=y$. These two kinds of predication have a syntactic correlate (Moro 1997): in subject-initial languages, nominal predication doesn't support predicate fronting, but equative predication does. This contrast is seen in French, which supports bare N predicates in a wider range of contexts than English does, (21). English also shows a division between NP/DP predication: predicate fronting is not possible with kind-denoting and singleton-kind bare N predicates (22), but is fine with equative predication such as is found with demonstrative, definite, possessive, and wh DPs, (23). To sum up, derived referentiality claims arguments are DPs, and this is consistent with the following: (i) some languages prohibit bare N arguments; (ii) D alternates with N-to-D; (iii) bare N predicates are the elsewhere case; (iv) predicate fronting is sensitive to the contrast between nominal and equative predication.

(20)		[DP$_{<e>}$ **NP$_{<e,t>}$**]	[DP$_{<e>}$ **DP$_{<e>}$**]
(21)	a.	*Lucie est* ***avocate***	cf. ****Avocate*** *est Lucie*
		Lucie is lawyer	lawyer is Lucie
	b.	*Lucie est* ***l'avocate***	cf. ***L'avocate*** *est Lucie*
		Lucy is the lawyer	the lawyer is Lucie
(22)	a.	*I am* ***woman***	cf. ****Woman*** *is me*
	b.	*Lucy is* ***boss***	cf. ****Boss*** *is Lucy*
(23)	a.	*I'm* ***that woman***	cf. ***That woman*** *is me*
	b.	*Lucy is* ***the boss***	cf. ***The boss*** *is Lucy*
	c.	*Lucy is* ***my best friend***	cf. ***My best friend*** *is Lucy*
	d.	*You're* ***what kind of doctor****?*	cf. ***What kind of doctor*** *are you?*

3 The distribution of (c)overt D

Derived referentiality claims that N is predicative and that nominal arguments are DPs. Consequently, bare N arguments always have a covert D-layer. We now address the question of how covert D can be detected.

N, as a property-denoting expression of type <e,t>, groups with other lexical categories, as in Table 1. In contrast, nominal arguments are DPs; they are individual-denoting expressions of type <e> (Partee 2007). These assumptions about the syntax-semantics mapping are the basis for the DP hypothesis, (24).

TABLE 1: SYNTAX-SEMANTICS MAPPING

SYNTACTIC LABEL	TYPE	NAME
NP, VP, AP, PP	<e,t>	predicate
DP	<e>	individual

(24) ***The DP Hypothesis***: If all argument are DPs, then bare Ns in argument position must be DPs with a covert D.

The distribution of bare Ns supports the DP hypothesis. To see this, look at Table 2: column (a) gives a typological sample, column (b) gives a sample within the same language family (Romance); column (c) gives diachronic stages of the same language (French). Typologically, the baseline is languages such as Lillooet that disallow bare N arguments altogether (Matthewson 1998). Next are languages such as Italian, which permit bare N only if they are indefinite bare plurals in object position (Chierchia 1998; Longobardi 1994; 2001). Next is English, which permits bare Ns only if they are bare plurals (Carlson 1977). Next is Hebrew that permits indefinite bare singulars and plurals (Doron 2003). And next are languages such as Russian (Pereltsvaig 2008) and Shona that freely permit both definite and indefinite bare Ns. Now look at column (b), which shows that the same distribution is found within Romance: French disallows bare N arguments, Italian permits bare plural objects, Spanish and Romanian permit bare plurals (Dobrovie-Sorin, Bleam, and Espinal 2006) Brazilian Portuguese permits indefinite bare singulars and plurals (Schmitt and Munn 2002), and Latin permits definite and indefinite bare Ns (Stark 2008). As column (c) shows, historical stages of the same language show the same progression: Modern French disallows bare N arguments, Middle French permits bare plural objects, Old French permits bare plurals, Early Old French permits indefinite bare singulars and plurals, and Latin permits definite and indefinite bare Ns (Dufresne and Tremblay in preparation). We now show that the distributional patterns in Table 2 are the effect of two mechanisms: paradigmatically conditioned covert D, and pragmatically conditioned covert D.

TABLE 2: TYPOLOGICAL DISTRIBUTION OF BARE NS

LANGUAGE SAMPLE				INDEFINITE		
(a)	(b)	(c)			PLURAL	
TYPOLOGY	ROMANCE	FRENCH	DEFINITE	SINGULAR	SUBJECT	OBJECT
Lillooet	French	Mod. Fr.	overt D	overt D	overt D	overt D
Italian	Italian	Mid. Fr.	overt D	overt D	overt D	bare N
English	Sp,, Rom.	Old Fr.	overt D	overt D	bare N	bare N
Hebrew	Br. Prot.	Early OF	overt D	bare N	bare N	bare N
Russ.,Shona	Latin	Latin	bare N	bare N	bare N	bare N

3.1 Paradigmatically conditioned covert D

$D_{\varnothing}$ enters into a paradigmatic contrast with overt D, as in Table 3. By structuralist criteria, $D_{\varnothing}$ is a null morpheme associated with a syntactic position. Consider the English paradigm in Table 4: $D_{\varnothing}$ codes indefinite plurals, and overt Ds code all other contrasts. Number-neutral Ds code indefinite/definite (*some*/*the*). Singular Ds code indefinite (*a*) and definite, with the latter

contrasting proximate/distal (*this*/*that*). Plural definite Ds also contrast proximate/ distal (*these*/*those*). Italian null $D_{\varnothing}$ is more restricted, permitting only bare plural objects, Table 5. In Hebrew, which has a paradigmatic contrast between an overt definite D (*ha*-) and a covert number-neutral indefinite $D_{\varnothing}$, bare Ns are predictably indefinite, Table 6.

TABLE 3: PARADIGMATICALLY RESOLVED $D_{\varnothing}$

LANGUAGE	DEFINITE	INDEFINITE		
		SINGULAR	PLURAL	
			SUBJECT	OBJECT
Italian	overt D	overt D	overt D	$D_{\varnothing}$
English	overt D	overt D	$D_{\varnothing}$	$D_{\varnothing}$
Hebrew	overt D	$D_{\varnothing}$	$D_{\varnothing}$	$D_{\varnothing}$

TABLE 4: ENGLISH D PARADIGM

SPECIFICATION		FORM	SG	PL
NUMBER-NEUTRAL	INDEFINITE	*some*	*some girl*	*some girls*
	DEFINITE	*the*	*the girl*	*the girls*
SINGULAR	INDEFINITE	*a*	*a girl*	**a girls*
	DEFINITE, PROX	*this*	*this girl*	**this girls*
	DEFINITE, DISTAL	*that*	*that girl*	* *that girls*
PLURAL	**INDEFINITE, PL**	**$D_{\varnothing}$**	***$D_{\varnothing}$ *girl***	***$D_{\varnothing}$ girls***
	DEFINITE, PROX	*these*	**these girl*	*these girls*
	DEFINITE, DISTAL	*those*	**those girl*	*those girls*

TABLE 5: BARE PLURALS IN ENGLISH AND ITALIAN

	ENGLISH	ITALIAN
SUBJ TRANS	***Beavers** build dams*	****Castori** construiscono dighe* beavers build dams (L94:40a)
SUBJ INTRANS	***Dogs** are in the yard*	****Cani** stavano seduti sul mio prato* dogs were sitting on my lawn (L94:40b)
	***Linguists** are clever*	****Linguisti** sono bravi* linguists are clever (Ch98:386)
OBJ TRANS	*I eat **potatoes***	*Mangio **patate*** I eat/am eating potatoes (L94:12b)
	*Leo exterminates **rats***	*Leo stermina **ratti*** Leo exterminates rats (Ch98:394)

TABLE 6: HEBREW D PARADIGM

SPECIFICATION		FORM	SG	PL
NUMBER-NEUTRAL	DEFINITE	*ha-*	*ha-namer* 'the tiger'	*ha-nemerim* 'the tigers'
	INDEFINITE	**$D_{\varnothing}$**	**$D_{\varnothing}$ *namer*** 'tiger'	**$D_{\varnothing}$ *nemerim*** 'tigers'

3.2 Pragmatically conditioned covert D: Shona

It is instructive to compare Hebrew, which has a **paradigmatically** conditioned indefinite $D_{\varnothing}$, with Shona, which we argue has a **pragmatically** conditioned D. While Hebrew bare Ns are never construed as definite, Shona bare Ns can be construed as definite **or** indefinite; see Table 7. In the present analysis, this kind of ambiguity arises if a language lacks overt D altogether, in which case the construal of bare N arguments is pragmatically conditioned.

TABLE 7: HEBREW VERSUS SHONA BARE N

HEBREW BARE N	SHONA BARE N
namer *ša'ag* = '**A** tiger roared'	&***Ìmbwá*** *ì-rì kù-tsèng-à* ***bònzó***
ra'iti ***namer*** = 'I saw **a** tiger'	C9.dog C9-AUX INF-chew-FV bone
	'**A/the** dog is chewing **a/the** bone'

We adopt Krifka's (2003) classification of (in)definite contexts: (i) an indefinite introduces a new entity or makes a characterizing statement about sets of entities/situations; (ii) a definite refers to a salient/unique object, or refers to kinds; (iii) either an indefinite or a definite is felicitous with reference to specimens of kinds. As shown in Table 8, English uses an overt indefinite (*a/an*) or definite (*the*) D in these contexts. If Shona bare Ns are freely construed as (in)definite, we correctly predict that they will be felicitous in these contexts.

TABLE 8: CONTEXTS FOR (IN)DEFINITENESS: ENGLISH VERSUS SHONA

	ENGLISH OVERT D	SHONA BARE N
NEW ENTITY	***A*** *potato rolled out of the bag*	***Ìmbwá*** *ì-rì kù-tsèng-à* ***bònzó*** C9.dog C9-AUX INF-chew bone '**A** dog is chewing **a** bone'
CHARAC-TERIZING STATEMENT	***A*** *gentleman opens doors*	***Mwàná*** *à-nò-rémékédzá* *và-bérékì* C1.child 3SG-HAB-respect C2.PL-parent '**A** child respects [his/her] parents'
SALIENT OBJECT	***The*** *potato rolled out of the bag*	***Ìmbwá*** *ì-rì kù-tsèng-à* ***bònzó*** C9.dog C9-AUX INF-chew bone '**The** dog is chewing **the** bone'
REFERENCE TO KINDS	***The*** *potato is from South America* *Shockley invented* ***the*** *transistor*	*Mwàrí à-kà-sík-á* ***nyìkà*** god 3SG-PAST-create-FV world 'God created **the** world'
SPECIMEN OF KIND	{***A***, ***The***} *potato contains iron*	***Gùdò*** *rì-né* *mvèré* C5.baboon C5-have C9.fur '**A** baboon has fur'

In many languages, bare N indefinites are scopeless. In English, an overt indefinite (marked by *a* or *some*) can take wide scope, but a bare plural is scopeless, (25). In Mandarin (Rullmann and You 2003), an overt indefinite (marked by *yiben* 'one.CL') can take wide scope, but a bare N is scopeless, (26).

Such scopeless bare Ns are analyzed as property-denoting expressions that have undergone abstract semantic incorporation (McNally 1992). But not all bare Ns are scopeless. Our analysis predicts that the scopeless-ness of paradigmatically conditioned bare Ns reflects blocking: another form can express the wide-scope reading, so argument bare Ns only have narrow scope. This also (correctly) predicts that pragmatically conditioned bare Ns, such as in Shona, can take wide scope, and this independent of the presence of object agreement (27). In addition to being scope-taking, Shona bare N arguments support anaphora: (28a) shows subject pronominalization, (28b) object pronominalization. We take this to be indicative of the presence of a DP-shell. Again, languages differ according to whether their bare N arguments support anaphora: Hindi bare Ns don't (Dayal 1999), but Mandarin bare Ns do (Rullmann and You 2003).)

(25) a. &*Everyone read **a book** on caterpillars.* ∀>∃, ∃>∀
b. &*Everyone read **some books** on caterpillars.* ∀>∃, ∃>∀
c. *Everyone read **books** on caterpillars.* ∀>∃

(26) a. &*Meige ren dou du guo **yiben** guanyu youchong de **shu***
every.CL person all read ASP one.CL on caterpillar MOD book
'Everyone read a book on caterpillar' ∀>∃, ∃>∀
b. *Meige ren dou du guo guanyu youchong de **shu***
every.CL person all read ASP on caterpillar MOD book
'Everyone read a book on caterpillar' ∀>∃

(27) a. &*Mù-kómáná w-ògà w-ògà à-kà-óná **mù-síkáná***
C1-boy C1-all C1-all 3SG-PST-see C1.girl
'Each/every boy saw a girl' ∀>∃, ∃>∀
b. &*Mù-kómáná w-ògà w-ògà à-kà-**mù**-óná **mù-síkáná***
C1-boy C1-all C1-all 3SG-PST-OBJ-see C1.girl
'Each/every boy saw a girl' ∀>∃, ∃>∀

(28) a. *Mùfáró à-óná **ìmbwá**.* *__Ì__-rí kù-fámbá.*
M. 3SG-see dog SP-AUX INF-walk
'Mufaro saw **a dog** [just now]. **It** is walking.'
b. *Mùfáró à-kà-óná **ìmbwá**.* *Ìní nd-à-kà-__ì__-óná=wò.*
M. SP-PST-see dog 1SG 1SG-REC-PST-OBJ-see=also
'Mufaro saw **a dog**. I saw **it** too.'

4. Conclusion and consequences

We have argued that derived referentiality is empirically and conceptually superior to inherent referentiality. Derived referentiality prohibits bare N arguments and requires D for N arguments, ruling out (29a), *contra* Chierchia (1998). We have proposed that the abstract D that accompanies bare N arguments differs according to whether it is paradigmatically or pragmatically

conditioned. Our analysis posits two kinds of abstract D: paradigmatically conditioned D is a null morpheme $D_{\varnothing}$, (29b); pragmatically conditioned D is a covert syntactic position D, (29c). Our findings indicate the two abstract Ds differ in distribution and interpretation. (See Ghomeshi et al. (2009) for related discussion). The diagnostics used include the distribution of N predicates, the D paradigm, (in)definiteness contrasts, and scopal behavior. There remains the question of how derived referentiality (the DP hypothesis) compares with the DP/NP macro-parameter (Boskovic 2005), which claims some languages lack a D-layer. We leave this for future research.

(29) a. *[$_{ARG}$ N] b. [$_{ARG}$ $D_{\varnothing}$ N] c. [$_{ARG}$ D N]

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Idioms and Emphasis: The Case of the *V the N out of NP* Construction[1]

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1 Idioms as Constructions

Idioms have always been a test ground for syntactic analyses. In the early days of generative grammar, idioms were problematic because idioms often have the same surface structures as other non-idiomatic phrases but do not normally allow syntactic operations (passive formation, left-dislocation, topicalization and others), and even when one of these operations is possible the idiomatic meaning is often lost. That seems to suggest that an idiom itself constitutes a lexical item, but on that assumption one has to allow for a lexical insertion whereby a complex structure such as a VP-idiom can be inserted under a V node, which in turn makes it difficult to account for the rare cases where some idioms can undergo some syntactic operations (with their idiomatic meaning intact). Fraser's (1970) taxonomy of idioms based on the degree of their syntactic flexibility is one of the attempts to address these issues. (See Jackendoff (1995) for discussion of these views on idioms.)

We think that these problems will be better dealt with by giving greater informative weight on the words contained in the idiom. We take a closer look at a single constructional idiom which we call "the *V the N out of NP* Construction" and propose its new compositional analysis. Here are some of the examples of the construction.

(1) a. She beat the hell/daylights out of me.
b. She scared the hell/daylights out of me.

It typically appears with verbs of physical or psychological impact (Suzuki 2010) but is not limited to them. Hoeksema and Napoli (2008) say you can not only embarrass, terrify, and whack the hell out of one, but you can also impress, enjoy, and bore the hell out of one. The interest of this idiom also lies in the fact that the deletion of either the object NP or the following PP renders the whole sentence ungrammatical.

(2) a. *She beat/scared the hell.

b. *She beat/scared out of me.

This shows that the NP *the hell* or *the daylights* in the object position is not licensed by the verb and hence is a fake object, and, as Hoeksema and Napoli (2008) observes, the object of the complex preposition *out of* bears a thematic role. This is a piece of corroborating evidence for Jackendoff's (1997) analysis of this idiom as a construction similar to the resultative construction because the fake object will need the construction for it to be licensed. But this also gives rise to another question: why the *V the N out of NP* Construction has an activity interpretation when a resultative sentence usually has a telic/accomplishment interpretation.

We would suggest solutions to these questions in this paper. First, we shall determine the lexical meaning and the function that the fake objects such as *the hell* and *the daylights* have in this particular idiom, and secondly, how the idiom has come to have an activity interpretation when its surface form is that of the (normally telic) resultative construction. We will also take a look at a Japanese clause-introducing particle that typically receives a hyperbolic interpretation.

2 Some Previous Studies

2.1 Jackendoff 1997

Jackendoff (1997: 171) makes a passing reference to this construction and this is the first place we stop to take a look. He lists the idioms in (3) and characterizes them as cases of "idiomatic specializations of the resultative construction."

(3) a. cut my visit short
b. I cried my eyes out.
c. knock yourself out ('work too hard')
d. you scared the daylights out of me

The resultative is regarded as a constructional idiom, "a match of syntactic and conceptual structure that is not determined by the head verb" (Jackendoff 1997: 171). He analyzes the resultative construction as in (4), where (4a) is the syntactic structure and (4b) is the interpretation.

(4) a. [$_{VP}$ V NP PP/AP]
b. 'cause NP to go PP/to become AP, by V-ing (NP)'

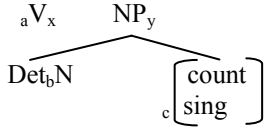
The form-meaning pairing in (4) is directly stored in the lexicon, as we see in the following quote.

> Under this approach to the resultative, the construction is listed in the lexicon just like an ordinary idiom, except that it happens to have no phonological structure: it is a structure of the form <0, SS, CS>, where SS happens to be a whole VP.
>
> (Jackendoff 1997: 172) [2]

And he argues that the relation between the resultative and the specializations like (3) are the same as "that between subordinate and superordinate concepts such as *robin* and *bird*" (Jackendoff 1997: 173) where both concepts must be stored in memory (i.e., the lexicon).

However, the analysis in (4) predicts an incorrect interpretation (something like 'you caused the daylights to go out of me by scaring') for (3d). Even if the interpretation was something like 'you caused me to be scared by scaring me,' we have no clue as to the role that *the daylights* plays in (3d). Also, if, as Jackendoff says, the *V the N out of NP* Construction is "listed in the lexicon just like an ordinary idiom," then, given his analysis of an ordinary idiom in (5), we would expect an analysis of (3d) such as (6).

(5) $bury_a$ the_b $hatchet_c$ (Jackendoff 1997: 168)[3]



$[\text{reconcile } ([\ ]_A, [\text{disagreement}]_y)]_x$

(6) a. $scare_a$ the_b $daylights_c$ $out\ of_d$ NP_e
b. ${}_aV_x\ {}_cNP\ [{}_dP\ {}_eNP_y]_z$
c. [cause ([ ]$_A$, NP_y) to become very scared]$_x$

But the ${}_eNP_y$ is inside the resultative phrase $[{}_dP\ {}_eNP_y]_z$ in (6b), and this is not the same structure as (4a). There must be some way to account for this structural difference if (6a) is a specialization of the resultative construction. Also, (6b) somehow has to be overridden in the interpretation in (6c) because ${}_eNP_y$ refers to the entity which undergoes the change and thus cannot be part of the result expressed by the resultative phrase. Furthermore, the *V the N out of NP* Construction has a hyperbolic interpretation which is not derivable from (6c). Of course, we can just disregard (as does Jackendoff (2002)) the contributions of the component parts of the VP as in (7), but again we do not know how the 'excessively' meaning has been derived from the surface form.

(7) a. [$_{VP}$ v NP PRT]: V pro's head/butt off, V pro's heart out
b. 'V excessively' (Jackendoff 2002: 173)

Note also that there is no reference to aspect either in (6) or (7) and, consequently, no way to account for the aspectual shift from the normally

telic/accomplishment interpretation of the resultative construction to the activity interpretation of the *V the N out of NP* Construction.

2.2 Hoeksema and Napoli 2008

More than a decade after Jackendoff's pioneering work, Hoeksema and Napoli (2008) take another, more data-oriented look at the *V the N out of NP* Construction. They analyze two similar sentences in (8). They both have a hyperbolic interpretation but the statuses of the PPs are different. In (8b), *out of* denotes a physical path, but that is not the case in (8a). *The hell out of* can be deleted in (8a) without ungrammaticality, while only *the hell* can be deleted in (8b). These observations justify the distinction in (8).

(8) a. B-construction: *They beat the hell out of him.*
b. G-construction: *Let's get the hell out of here.*

The B-construction is the one relevant here. Hoeksema and Napoli's argument can be summarized in three points: (i) *the hell* in (8a) is not an argument of the verb and the actual thematic argument is the NP in the prepositional phrase; (ii) the object position directly behind the verb can be occupied not only by *the hell* but other definite swearwords such as *the devil, the shit, the heck*, etc.; (iii) the B-construction originally derives from a caused-motion construction describing some form of exorcism (as in *knock the devil out of a person*). They also suggest another source of the B-construction, *scare the life out of NP*, with *life* in the N slot, and add that a word for life is often used for emphasis, as is one for death (*These sermons bore me to death,* cited in Hoeksema and Napoli 2008: 372-3).

Their analysis is not without its problems. For example, although they suggest that the B-construction originates from a description of a scene of exorcism, *the devil* in (9a) is not a fake object while *the hell* in (8a) is, so they have to provide an account of how *the devil* has come to lose its thematic argument-hood, but they do not. Also, the 'exorcist' caused-motion is used metaphorically in (9b), although it does not have any idiomatic or hyperbolic interpretation. These examples seem to suggest that exorcism might not have been the direct source of the construction.

(9) a. Moth. Mother Lord, Lord, husband, he's raving destracted. /…/ Fath. Father I'll go and get a horse whip, I'll whip the *devil out of* you, yes I will. (COHA 1812)
b. With the aid of a younger priest, Damien Karras (Jason Miller), Merris tries to *drive the devil out of Regan's body* but succumbs to the strain. (*USA Today* 1990, in COCA)

Yet another complaint we have about their analysis is that it does not provide an interpretive mechanism of the idiomatic hyperbolic interpretation associated with the B-construction. The closest they've come to a proposal of an interpretive mechanism is shown in the following quote.

> With the B-construction, the force of the expletive is simply emphasis. When an editor tells an author 'We're going to sell the hell out of this book', nothing nasty is implied. Quite generally, the expletive is not related to the attitude of the speaker toward the listener. (Hoeksema and Napoli 2008: 363)

They say the expletive is for emphasis, but since the emphasis interpretation is activated only when the expletive appears in the B-construction, there must be some way where the literal meaning of the expletive is somehow blocked in it. Hence, their contribution is mostly the long list of the nouns that can replace *hell* and the verbs that can replace *beat* in (8a).

2.3 Espinal and Mateu 2010

Still another recent research on an idiomatic hyperbolic construction is Espinal and Mateu's (2010) analysis of the *V pro's head off* construction. They share with us an interest in the compositional nature of the construction and also in the aspectual mismatch between the accomplishment expected from the form of the sentence and the activity interpretation actually derived.[4] They also note that the activity interpretation is derived from the whole VP idiom and therefore is in conflict with its compositionality (Espinal and Mateu 2010: 1405). Their solution to the conflict is a stipulation of a metaphorical relation between the intensity of an activity (such as laughing) and the emotionally extreme situation described by the idioms in question (e.g., *laugh one's head off*). Their proposal is quite simply (10).[5]

(10) (AN EXTREME) INTENSITY IS (AN EXCESSIVE) CHANGE OF LOCATION

As Gibbs (1994: 9) says, metaphors "constrain the way we think and speak of our ordinary lives," and (10) suggests that we often think of an intensity in terms of change of location. We will show in a later section that this is not an isolated example and a particle with the same semantic import can be found in Japanese.

Although Espinal and Mateu's argument is reasonable, it does not apply to the *V the N out of NP* Construction. For example, beating the hell out of someone does not involve any change of location, excessive or otherwise. With the B-construction, it is the swearwords in the object position that induce an excessiveness interpretation. We might also note that body parts in the body-part *off* construction retain their literal meaning so they must be given a thematic role (for example, a theme role), which account for the incompatibility of this

construction with an NP object behind a P in (11).

(11) a. He cried his eyes out (*of him).
b. He laughed his head off (*him).

But this is not the case with the B-construction, as we saw above when discussing Hoeksema and Napoli (2008). The definite NP following the verb in the B-construction is a fake object and does not have a thematic role. The thematic-role-less object NP acts as a sort of intensifier in the B-construction, and this is corroborated by the similar intensification with *hell* in (12).

(12) a. a *hell* of a lot of NP, not a hope in *hell*, what the *hell*, … (Israel 2006)
b. Then her old man came in, and he kicked me the *hell* out, and I never saw her again…. (COCA 1957)

Swearwords such as *hell* are inherently emphatic. It is not so much the metaphor in (10) that induces an idiomatic hyperbolic interpretation of the *V the N out of NP* Construction, as the presence of such a swearword in it.

3 The Analysis of the *V the N out of NP* Construction

3.1 Compositionality

In this section, we argue for the following two points: (i) *the daylights* as the object of a verb lost its literal meaning ('consciousness' or 'life') at some point in the development of this construction and came to assume the role of an intensifier ('excessively'), which made it possible for one to substitute it for *the hell* and other swearwords (because swearwords do not literally refer to what they describe); (ii) this functional shift has made it possible for verbs that denote something other than physical/psychological impact to appear in this construction and have an intensifying interpretation 'V excessively.' These points are illustrated in the two example sets below.

First, we take a look at the emergence of *hell* and other swearwords in this construction. We see in the examples in (13) from *Oxford English Dictionary* that the first tokens of *the daylights* and *the hell* are found in contexts where physical impact is applied to someone. Note that there is no literal content with *the daylights* or *the hell* in these examples. The emergence of *the hell* in place of *the daylights* in the first two decades in the 20th century seems to indicate that *the daylights* lost its literal meaning around that time.

(13) 1848: We'll catch the fever and ager, …and that'll *shake the day-lights out o'* us.
1922: His old fellow *welted hell out of* him.
1944: If I could find a stick I'd grab it and *beat the daylights out of* you.

The first example of *the hell* with *scare* is from the early 1930s, as in (14), and given the time difference between the examples in (13) and those in (14), it seems natural for us to suppose that there must have been a semantic transfer from the 'impact' in the physical domain to that in the psychological domain.

(14) a. 1933: "You *scared the hell out of* me, sneaky," she said. (COHA)
b. 1944: who clutched at your arm and *scared the daylights out of* you by shrieking "Mister! he's cheating me!" (COHA)
c. 1951: Though they *scared the daylights out of* me, I contempted [*sic*] them. (OED)

From these examples, the semantic transfer of the kind suggested seems to have been at work in the first half of the 20th century.

Second, we see from the data in Hoeksema and Napoli (2008) that the V, the N, and the NP slots in the *V the N out of NP* Construction can be filled by all manners of items of these categories. The verb slot is not limited to verbs of physical/psychological impact; other semantically unrelated verbs may appear in this construction.

(15) a. Verbs: *admire, advertize, amuse, annoy, badmouth, bash, batter, beat, belt, bend, … whip, worry.* (Hoeksema and Napoli 2008: 357)
b. Nouns: *a living hell, hell, Satan, spots, he Beelzebub, the bejeebies, …. the living hell.* (Hoeksema and Napoli 2008: 360)

(15a) suggests a further semantic extension from the verbs with an "impact" sense to the verbs that involve almost any kind of activity, and (15b) shows that almost any swearword with excessive meaning can occupy the N slot.

The picture that emerges from these observations is the following: *the daylights* ceased to have its literal content and came to act as a word of emphasis in this construction. *The hell* and other swearwords, which are also bleached semantically and do not have a literal content, were able to replace *the daylights* on the strength of their functional similarity. These noun phrases refer to the excessive degree to which the activity denoted by the verb has been carried out, and the whole *the N out of NP* sequence has come to serve as a sort of intensifier. Once this string has assumed the role of intensifier that delimits the extent of some activity, all sorts of verbs that allow a possible activity interpretation come to be used in this construction.

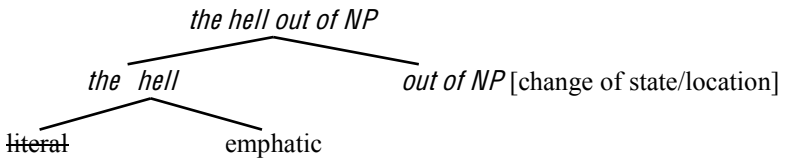
3.2 The hyperbolic interpretation and swearwords

Given the above discussion about the emergence of swearwords in the N slot, we need to ask why only swearwords appear in that position. In this section, we

will discuss how the scalar interpretation inherent in swearwords makes the hyperbolic interpretation of the construction possible.

As we saw in section 2.3, Espinal and Mateu (2010) develops a cognitive approach to this question by introducing a metaphor in (10) [(AN EXTREME) INTENSITY IS (AN EXCESSIVE) CHANGE OF LOCATION]. Again, as we said there, their metaphor-based solution to the hyperbolic interpretation cannot be directly applied to the *V the N out of NP* Construction. The inherently emphatic sense associated with swearwords can be represented along with their literal denotation as in (16).

(16)



The analysis in (16) maintains that the emphatic sense is chosen (and the literal sense blocked) when one of the swearwords in (15b) is combined with the complex preposition *out of* to produce a hyperbolic interpretation of the construction as a whole. This allows for a possibility that the N might have a literal sense in contexts like *In the old days they would cut the guts out of a chicken*, in which *the guts* has a literal sense. But note that *the N* is not referential in the emphatic sense (i.e., as part of the construction). This analysis is then compatible with the observation made by Hoeksema and Napoli (2008) that *the N* cannot be a thematic argument, and also accounts for the fact that the construction is not normally passivizable.[6]

3.3 The aspectual shift from accomplishment to activity

We have been talking intuitively about the activity interpretation associated with the *V the N out of NP* Construction, and this intuition is attested in (17) and (18).

(17) a. He beat/scared the daylights/hell out of me *for five minutes*.
b. ? He beat/scared the daylights/hell out of me *in five minutes*.

(18) a. John *was annoying the hell out of* me.
b. And then if they knew – I think someone said that, Well, we all knew that O.J. *was beating the hell out of* Nicole. (COCA)

As we see in (17), the *in/for* test shows the activity interpretation for the construction, and this is further supported by the examples from COCA, where the verbs in this construction are grammatically marked as progressive. Our contention has been that there is a form-function mismatch between the

achievement interpretation expected from the form of the *V the N out of NP* Construction, on the one hand, and the activity interpretation actually associated with it on the other.

This is in contrast to McGinnis' (2002: 668) analysis of idioms as aspectually systematic and compositional. In (19), for example, she argues that the contrast in acceptability can be attributed not to the semantics of the VP idiom (which means 'die' anyway) but to the presence of the definite direct object.[7]

(19) a. Hermione was dying for weeks.
b. #Hermione was kicking the bucket for weeks.

If her observations are correct, then how is it that the *V the N out of NP* Construction does not have the accomplishment interpretation normally associated with the resultative structure? The answer, we suggest, lies in the lack of referentiality of the direct object *the N*. The non-referential direct object only carries the emphatic sense with it and does not count as a syntactic argument.

Now that *the N* has been shown to only carry the emphatic sense in this construction, we show how it allows us to derive an activity interpretation from the structure normally associated with accomplishment. We use the idea of "conflation" developed in McIntyre (2004), which is represented as "&" in (20), and "EXTENT" is the emphatic sense associated with *the hell*.

(20) [x ACT] CAUSE [y BECOME out of z]
→ [x ACT] CAUSE [the hell out of z]
→ [x ACT] & [<EXTENT y> z]
→ [x ACT <EXTENT y> ON z]

What (20) asserts is that *the hell out of NP* used to be a resultative secondary predicate, but the presence of *the hell* turns it into an emphatic modifier added onto the activity component of the accomplishment event structure. This solution is better than other proposals we saw in Section 2 because it accounts for the hyperbolic interpretation of the structure normally associated with a resultative interpretation and also because it accounts for the aspectual shift from accomplishment to activity. (Also, when *the N* does not express emphasis, as in the case of *the guts* above, we do not get the "EXTENT" and so the sentence is interpreted as an accomplishment.)

4 *-Hodo* in Japanese and its Hyperbolic Interpretation

In this section we take a brief look at the adverbial introduced by *–hodo* ('to such an extent'). Consider the examples in (21).

(21) a. Natsuko ga [ki -wo ushinau *hodo*] sake-wo nonda
Natsuko SUB mind ACC lose 'to such an extent' sake-ACC drank
"Natsuko drank herself silly with sake"
b. ??Natsuko ga [hoho ga honnori irozuku *hodo*] sake-wo nonda
Natsuko SUB cheeks SUB a bit color 'to such an extent' sake-ACC drank
"Natsuko drank sake and her cheeks are now slightly red."
(cf. Imoto 2003: 4)

As Imoto (2003) correctly observes, an adverbial formation with *–hodo* requires a causal relation between the events before and after the *–hodo*. (21a) is acceptable because there is a sequential relation between Natsuko's excessive drinking in the main clause and her unconscious state described in the *–hodo* clause. (21b) is not as good because the event described by the *–hodo* clause is not "excessive consequence" of the event in the main clause. That is, we need two components to get the correct semantics of a *–hodo* clause: (i) the event in the *-hodo* clause has to be sequentially related to the main clause event, and (ii) the former event has to be an "excessive consequence" of the latter.

This would lead us to predict that a *–hodo* clause must be able to function in the same way as *the N out of NP* component of the *V the N out of NP* Construction, which satisfies (i) and (ii). However, we cannot translate the construction into a *–hodo* clause, as shown in (22).

(22) *Kare ha watashi kara [jigoku ga deru *hodo*] konwaku saseta
He TOP me from [hell go out to such an extent] annoy made
"He annoyed the hell out of me."

We need a further constrastive study on the difference between the *–hodo* clause and the *the N out of NP* secondary predicate structure of the construction to see why (22) should be unacceptable, but note that *–hodo* can take 'death' as its complement just as the hyperbolic resultative can.

(23) a. I am bored *to death*.
b. (Watashi-wa) *shinu-hodo* taikutsu-shita.
I -TOP die 'to such an extent' was bored (cf. Imoto 2003: 9)

Thus, the *V the N out of NP* Construction does not correspond to a *–hodo* clause while the hyperbolic resultative construction does. This seems to suggest that the former construction forms a closer form-meaning pairing than the latter, resultative construction. In any case, we would like to argue that these data show that the *V the N out of NP* Construction is not just an idiomatic specialization of the resultative structure but is (or has become) distinct from it.[8]

5 Conclusion

As we saw in Section 1, syntactic/semantic idiosyncrasies that idioms display could be better explained by analyzing their constituent parts in greater detail. We did just that with the *V the N out of NP* Construction, and the main points are summarized in (24). We leave the relation between idioms and constructions for further research.

(24) a. The lexical meaning of *the daylights* became bleached, and a variety of swearwords that have emphatic status have come into the object position instead of *the daylight.*
b. The aspectual type shift mechanism allows the activity reading to be imposed on the whole sentence.

Notes

[1] The word "construction" in "the *V the N out of NP* Construction" is to be understood as a sequence of words that has an idiomatic meaning (here hyperbolic) but with some slots for variables.
[2] In Jackendoff's framework (in its late 1990s version), a construction is a word-like object with three elements structured into a whole: <PS, SS, CS>, where PS is a phonological structure, SS is a syntactic structure, and CS is a conceptual structure.
[3] In this diagram we omit the Phonological Structure for *bury the hatchet.*
[4] We are not quite sure whether the "compositionality" of an idiom in their paper is meant to suggest we can isolate some components of the idiomatic meaning that correspond to some parts of the idiom, that is, the analyzability of the idiom (e.g., *beans* corresponds to 'secret information' in the idiom *spill the beans* 'divulge secret information'). As Nicols (1995) observes, an adjectival modification of some part of an idiom is often interpreted globally, which means that such an idiom is not really compositional.
[5] A much earlier proposal of this kind of analysis is given in Sawada (2000): the surface form of body-part *off* construction in (ia) is given its idiomatic interpretation in (ib). He also gives a sketchy pragmatic mechanism in (ii) and (iii) that accounts for the preferred hyperbolic interpretation.
(i) a. [EVENT NP_i V] RESULT-IN [EVENT one_i's body part coming off]
b. [EVENT NP_i V] GO-AS-FAR-AS [EVENT one_i's body part may come off]
(ii) Interpretive mechanism
(i) Avoid an interpretation against the knowledge of body part integrity.
(ii) Seek another way of interpretation, if available.
(iii) Rule of construal for intensification: Interpret the postverbal sequence as an intensifying complex.
[6] Thanks to Adele Goldberg for making us aware of the relation between the referentiality of *the N* and the passivizability of the construction.
[7] The examples are attributed to a paper by Marantz that we haven't taken a look at.
[8] The body-part *off* construction can be translated into Japanese by using this particle. Thus, *Kare-wa meno-tama-ga tobideru*-hodo *odoroita* ('He was surprised to such an extent that his eyeballs (almost) popped out of his sockets', or 'He was scared out of his wits' in idiomatic English) is acceptable. This would be further support for Espinal and Mateu's (2010) metaphor-based analysis.

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Features of Stops and Affricates in Athabaskan Languages

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1 Athabaskan consonant inventories and classes

1.1 The status quo

The typical Athabaskan consonant inventory contains a three-way contrast between voiceless unaspirated, voiceless aspirated and ejective stops and affricates, as well as contrasts between voiced and voiceless fricatives. Both sets of contrasts are found at most of the places of articulation that are used in the language, as seen in the inventory of consonants in Upper Tanana in (1). (Throughout this article, data has been retranscribed using symbols of the International Phonetic Alphabet, but is otherwise unchanged from its original presentation except to correct typographical errors.)

(1) Upper Tanana consonants (Minoura 1994)

Obstruents								
Stops/affricates								
"Plain"	(p)	t	tɬ	tθ	ts	tʃ	k	ʔ
"Aspirated"		t^h	$tɬ^h$	$tθ^h$	ts^h	$tʃ^h$	k^h	
"Glottalized"		t'	tɬ'	tθ'	ts'	tʃ'	k'	
Fricatives								
"Fortis"			ɬ	θ	s	ʃ	x	h
"Lenis"			ɬ̬	θ̬	s̬	ʃʲ, ʃ	x̬	
Sonorants								
Voiced	m	n	l	ð		j		
Voiceless	h^w							[h]

(1) also shows the traditional presentation of an Athabaskan consonant inventory, where manner differences between stops and affricates are treated as "place" differences, and consonants differing in phonation only are listed in different rows, rather than the same cell, as in the IPA.

Rice 1994 has proposed the set of laryngeal features in (2) as a pan-Athabaskan property. According to this proposal, aspirated stops and affricates pattern

together and are classed as [+spread glottis], whereas voiceless unaspirated stops/affricates and voiceless fricatives are unspecified for laryngeal features:

(2) Laryngeal features for Athabaskan consonants (Rice 1994)

	[spread glottis]	[constricted glottis]	[voiced]
t, ts			
t^h, ts^h	+		
t', ts'		+	
s			
z			+

One phenomenon which supports (2) comes from an alternation between voiceless unaspirated affricates and voiceless fricatives in syllable-final position posited by Leer 1979 for Proto-Athabaskan. Reflexes of this alternation are found in daughter languages such as Koyukon, which Rice illustrates with the data in (3). The underlying verb stem contains a stop or affricate, which spirantizes in word-final position, as shown in the first three imperfective rows. The final row of (3) contains a /t/-final stem, which does not spirantize in the imperfective because there is no corresponding fricative at that place of articulation in Koyukon, like Upper Tanana shown in (1) and other Athabaskan languages. The perfective forms, on the other hand, contain the Koyukon reflex of **-ŋ* perfective underlyingly, which separates the stem from word-final position and thus protects the stem-final stop/affricate from spirantizing.

(3) Koyukon voiceless unaspirated stop ~ voiceless fricative alternations

stem	imperfective	perfective	
/-ʔɔtɬ/	-ʔɔɬ	-ʔɔtɬ	'chew'
/-pæts/	-pæs	-pæts	'cook by boiling'
/-lɔq/	-lɔχ	-lɔq	'die' (pl. subject)
/-lut/	-lut	-lut	'scrape'

Note in (3) that stops and affricates pattern together for this alternation.

1.2 A proposed revision to the status quo

Following Bird 2002, a revision to the status quo concerning Athabaskan consonant classes has recently been proposed by McDonough and Wood 2008:

(4) "The revised Athabaskan inventory" (McDonough and Wood 2008:446)

	Bilabial	Alveolar	Alveo-palatal	Velar	Labio-velar	Glottal
Simplex stops	p	t		k		ʔ
Affricates		tx		kx	k^w	
		ts ts^h	ʧ $ʧ^h$			
		tɬ $tɬ^h$				
Ejectives		t'				
		ts'	ʧ'			
Fricatives		s z	ʃ ʒ	ɣ x		(h)

(4) is presented as:

> a sample Athabaskan inventory as we see it…We suggest that this is likely a more accurate representation of the phonemic contrasts in the Athabaskan languages…in this inventory, there are no aspirated plain stops. (p. 446)

Instead, they suggest that the voiceless aspirated stops are affricates in the usual case. In their model, the basic division in an Athabaskan consonant inventory is between "simplex stops" ("…the unaspirated plosives (/p t k q/)") and "complex stops" (aspirated and ejective stops and affricates).

In support of the proposed model in (4), McDonough and Wood 2008 present new data from several Athabaskan languages (Dëne Sųłiné, Dogrib, North Slavey, Tsilhqut'in) and integrate this data with results from previous work on Navajo (McDonough and Ladefoged 1993, McDonough 2003). Their findings appear to be all the more striking in that the five languages discussed in their article are drawn from three branches of Athabaskan, regardless of whether the classification in Goddard 1996 (proposed by Keren Rice, with eight first-level branches of Athabaskan) or that of Leer 2006-2010 (with six first-level branches of Athabaskan) is used. However, it should be noted that methodological problems limit the conclusions that can be drawn from the study by McDonough and Wood 2008. The data were collected via speaker- rather than linguist-designed wordlists:

> We did not control for position in word or morpheme category (stem versus prefix)…Using wordlists constructed by the consultants resulted in uneven distributions of the segments in the languages across the study. (p. 434)

Also, for Dëne Sųłiné, Dogrib, North Slavey, and Tsilhqut'in, data was collected from small numbers of speakers of each language (see (5)). The claims made about each language may thus be speaker-idiosyncratic (Ladefoged 2003).

In the remainder of this article I will review the evidence for two of the proposed features of the revised Athabaskan inventory in (4), the patterning of ejectives with voiceless aspirates and the realization/interpretation of aspirated stops as affricates. I will suggest that neither proposal is well-supported.

2 Ejective VOT

McDonough and Wood 2008 suggest that Athabaskan ejectives typically have long VOT:

> a VOT or release burst division in the data in this study separates unaspirated plain stops from the rest of the stops in the series… In this study, we have demonstrated that long releases are characteristic of the family in general. Long releases occur in all but the unaspirated stops. (p. 440)…[Athabaskan ejectives] have a…relatively long 'period of silence' between oral and glottal release. This production strategy has an audible effect and these ejectives are often called 'strong'…Since the 'strong' ejectives have been identified with the Athabaskan languages, we will call these strong ejectives the 'classic' Athabaskan ejective. (p. 443)

Previous to McDonough and Wood 2008, ejectives in Athabaskan languages were known to differ in VOT. (5) is a summary of quantitative ejective VOT results for stops only. The studies in (5) are difficult to compare because place of articulation is known to affect VOT (Cho and Ladefoged 1999), and different studies have investigated different places of articulation or else not reported measured place of articulation. A second difficulty is that inferential statistics are often not provided.

(5) VOT of ejective stops

language	*# speakers*	*place*	*VOT (ms.)*	*significant differences*
Navajo (McDonough and Ladefoged 1993)	7	alveolar	108	va > ej > vu
		velar	94	
Tsilhqut'in (Ham 2008)	3	alveolar, velar, uvular, labio-velar	102	va, ej > vu
Tsilhqut'in (McDonough and Wood 2008)	2	alveolar, velar	80	n.r.
Dëne Sųłiné (Hogan 1976)	1	alveolar	121*	n.r.
		velar	107	
Dëne Sųłiné (McDonough and Wood 2008)	3	n.r.	128**	n.r.

Dogrib (McDonough and Wood 2008)	1	n.r.	130**	n.r.
N. Slavey (McDonough and Wood 2008)	3	n.r.	101**	n.r.
Hupa (Gordon 1995)	3	alveolar	93	n.r.
		palatal	80	
		uvular	89	
W. Apache (Gordon et al. 2001)	8	alveolar	43**	va > ej > vu
		velar	58**	
Witsuwit'en (Hargus 2007)	11	alveolar	25***	va > ej, vu
		uvular	28***	
Dakelh (Bird 2002)	1	alveolar	31	n.r.
		velar	40	
		labio-velar	65	
Deg Xinag (Hargus in preparation)	7	alveolar	29	va > ej > vu
		velar	68	
		uvular	77	

n.r. = not reported; va = voiceless aspirate; ej = ejective; vu = voiceless unaspirate
*calculated from data provided in Table II
**estimated from graphical data
***calculated from supporting spreadsheets

It is also possible that some of the differences between the languages in (5) are due to measurement differences alone, but often authors do not provide great detail on measurement technique.

Nonetheless, some points emerge from (5) which are relevant to the proposed complex vs. simplex stop typology. Due to the lack of inferential statistics in previous studies, only one of the languages in (5) actually supports this proposal; namely Tsilhqut'in as discussed by Ham 2008, where va, ej > vu. Navajo, W. Apache and Deg Xinag all have ejectives which are intermediate in VOT between voiceless aspirates and voiceless unaspirates. Witsuwit'en is therefore unusual as the only language where ejective VOT is not significantly different from that of the voiceless unaspirates.

The difference between Witsuwit'en and Tsilhqut'in is striking given that both languages belong to the Central B.C. branch (Rice-Goddard classification) or British Columbian branch (Leer classification). This suggests that ejective VOT may be susceptible to variation. In the case of Witsuwit'en, the downriver language Gitksan (Tsimshianic family), with which Witsuwit'en likely had a long history of contact (Rigsby and Kari 1987), has also been reported as having short VOT ejectives (Ingram and Rigsby 1987), as noted in Wright, Hargus, and Davis 2002. We will not be in a position to reconstruct an "Athabaskan" type of ejective until more and better data on ejectives becomes available.

3 Aspirated stops

3.1 Are aspirated stops affricates?

McDonough and Wood 2008 also suggest that "aspirated stops are phonemic affricates in Athabaskan" (p. 428). The rationale for this view seems primarily phonetic: "all the languages in this study exhibit clearly audible velar or velarized releases in the t and k phonemes." (p. 436) They suggest that aspirated stops-as-affricates may in fact be a pan-Athabaskan phenomenon, mentioning descriptions of Dakelh, Chiricahua Apache, Slave, Chipewyan, and acoustic data from Tanacross, Navajo, and Jicarilla Apache. They also note that "the sound change of $t^{[h]}>k^{[h]}$ in Apache is a natural one—the change is actually from [tx] to [kx]" (p. 441). (This change occurred in Jicarilla and Lipan; in Kiowa Apache only before certain vowels (Hoijer 1938).)

While McDonough and Wood 2008: 441 state that "the t and k phonemes are phonemic as well as phonetic heterorganic affricates /tx/ and /kx/", they also qualify this statement: "…it may not be the case that t and k phonemes are affricates in every Athabaskan language." Citing acoustic studies of Hupa (Gordon 1995) and W. Apache (Gordon et al. 2001) which refer to aspirated stops and fail to mention that these are affricates, McDonough and Wood concede that Hupa and W. Apache may have aspirated stops instead of affricates, possibly representing "a shift away from an Athabaskan type system towards an English type system" due to contact.

In this section I would like to discuss the kind of evidence needed to demonstrate that aspirated stops are affricates in hopes of advancing the state of knowledge of this point in Athabaskan languages.

3.2 Navajo

To begin with, let us examine the phonetic evidence for Navajo /t^h/ as /tx/ more closely. A variety of sources seem to agree on this point. Harry Hoijer, in the introduction to Sapir and Hoijer 1942, writes:

> The voiceless stops t, k and k^w are strongly aspirated, the aspiration approaching the x in quality. Before back vowels, t and k have a back-palatal aspiration, before front vowels, a front-palatal aspiration. Before o, t and k are labialized.

Young and Morgan 1943:iii ff describe the voiceless aspirates in Navajo as "strongly aspirated" (e.g. "(t [t^h]) – as in English, but more strongly aspirated"). Young and Morgan 1980: xxvi describe /t^h/ as:

> a strongly aspirated phoneme produced by placing the tip of the tongue in a t-position, followed by raising the back portion of the tongue to a point of near contact with the velar area to thus produce [a] spirant…

Moreover, in their consonant inventory, [t^h] is listed with the affricates rather than stops, and is placed in the "palato-velar" rather than "alveolo-palatal" column. According to Goossen 1967:xv, ""t" is almost the same as in English, except it is heavily aspirated." In an acoustic study of Navajo, McDonough 2003:155 notes with reference to "the aspirated plain stops *t* and *k*" that:

> the aspiration as a feature of contrast on these sounds is quite distinct from the aspiration which appears on the affricates, *ch* [$tʃ^h$] and *ts* [ts^h]…I have chosen to represent the releases on the stops as velar frictives, that is as an example of the velar fricative in the same way that the *ts* and *ch* have fricative releases that are not different from the sounds *s* and *sh*...Thus, these sounds are represented [tx] and [kx]...

It would thus appear to be a well-established fact about Navajo that the voiceless aspirated alveolar stop is [tx].

However, Reichard 1945:159 notes that:

> There is a great difference in the amount of aspiration used with certain unvoiced stops and affricatives: $t^{[h]}$, $k^{[h]}$, $ts^{[h]}$, tc [$tʃ^h$]… Certain speakers exaggerate these sounds so that h becomes x, x may even become x, and the stops $t^{[h]}$, $k^{[h]}$ and affricates, $ts^{[h]}$ and tc [$tʃ^h$], sound like consonant clusters tx, kx, tsx, tcx. Navaho who do not emphasize the breathiness refer to those who do as x-speakers (x da'ani *x they say*), and mimic them by articulating the affected sounds almost as if they were coughed.

Also, Reichard 1948 drew attention to an unusual (for an Athabaskan language) infix –x- in Navajo:

> A more forceful action, a state exaggerated in size or quantity, or a pejorative may be expressed by aspirating the voiceless stem initial so strongly as to form a consonant cluster.

(McDonough 2003:86 refers to this morpheme as "augmentative or intensifier".) Reichard 1948 provides data substantiating this word formation rule for noun and verb stems which begin with a variety of places and manners of articulation: /t^h s z ts ts^h $tʃ^h$ ɬ/. Interestingly, the pair she provides for initial /t^h/ is "-$t^{[h]}$ih cover, wrap, -txih protect, conceal". (In Young and Morgan 1943:206, only /tih/ 'to spread; to cover it' is given. In Young, Morgan, and Midgette 1992, this form can be found in the entry TI'$_1$ "spread a flat flexible object".) Reichard's pair for /t^h/ interesting because it appears that /tx/ in the augmentative form contrasts with a non-affricate /t^h/. Although the exact nature of the initial stop in

'cover, wrap' is not clear from Reichard's description, it must be a stop with a weaker form of fricative release than in the augmentative form with /tx/.

At the same time, Reichard 1945:162 also noted strong aspiration by some speakers, who substitute [x] for [t]. She writes that Navajo displays:

> …differences in the force of the aspiration with which sounds like $t^{[h]}$, $k^{[h]}$, $ts^{[h]}$ and tc [$tʃ^{h}$] are articulated. These sounds are felt by all as demanding aspiration…The emphasis on aspiration is so strong in the minds of some people that they even omit t and k upon occasion. Therefore the following variations are heard; sometimes the same speakers use both…: $t^{[h]}$ádídí:n, xádídí:n pollen;…

If Reichard's *-tʰih* "cover, wrap" vs. *-txih* "protect, conceal" is a valid minimal pair, it shows that the ordinary voiceless aspirated alveolar stop does not have a fricative release which is identical to [x], at least not for all speakers.

Finally, Ladefoged and Johnson 2006:152 comment that "the Navajo aspirated stops…have a very large VOT that is quite exceptional", but do not point out that the release is a velar fricative.

3.3 Phonetic considerations

To show that the voiceless alveolar stops in their study languages have velar fricative releases, McDonough and Wood 2008 present graphs showing center of gravity "for the release periods of the t and k-phonemes for 20 ms windows…10 ms into the release, 40 ms from the end of the release, and 20 ms into the following vowel." The six graphs in their Fig. 7 compare these measures for their study languages. McDonough and Wood 2008:440 note that McDonough 2003 "found no difference between the releases of the phonemes t/tx/ and k/kx/ and the velar fricatives" in Navajo, but no such contrasts are provided by McDonough and Wood for the northern languages discussed in their article. In their Fig. 8 they provide sample spectrograms for "tx" in five varieties, and note (p. 440) "for all these tokens, there was a clear audible velar release to the t phoneme."

I suggest that this kind of spectral evidence is inadequate as proof that the segments in question have velar releases without proper control over neighboring segments. Below I present some sample data on aspirated stops and fricatives from Fort Ware Tsek'ene. (Tsek'ene is closely related to three of the languages in McDonough and Wood 2008. In the Rice-Goddard classification, Tsek'ene, Slave, Dëne Sųłiné and Dogrib all belong to the Northwest Canada branch of Athabaskan. In the Leer classification, these languages are assigned to the Eastern branch.) The consonant inventory for Fort Ware Tsek'ene is shown in (6) (largely following the traditional Athabaskan presentation):

(6) Fort Ware Tsek'ene consonants

p	t	tɬ	ts	tʃ		k	
	t^h	$tɬ^h$	ts^h	$tʃ^h$		k^h	
	t'	tɬ'	ts'	tʃ		k'	ʔ
		ɬ	s	ʃ	ç	x	h
			z	ʒ		ɣ	
m	n						
w		l			j		

If /t^h/ and /k^h/ were affricates /tx/ and /kx/, then the release portions of these stops might be expected to have centers of gravity more similar to that of [x] rather than [h].

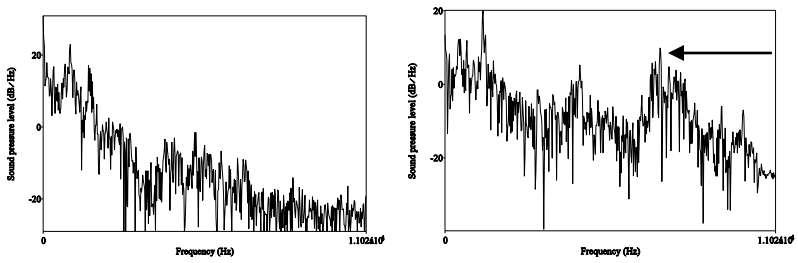
Sample spectra for Fort Ware Tsek'ene /t^h k^h x h/ are provided below. These graphs are taken from a 30 ms. window in the middle of the consonant or consonantal release for four words spoken in isolation, recorded with a male speaker at 22,050 sampling rate. The consonants are from the words in (7), where the sound of interest is word-initial and followed by /e/.

(7) Fort Ware Tsek'ene representative lexical items for /t^h k^h x h/

t^heh?ine	'he/she is pitiful'
k^he	'footwear'
xeɬ	'pack'
hèh	'now what?' (listener's response)

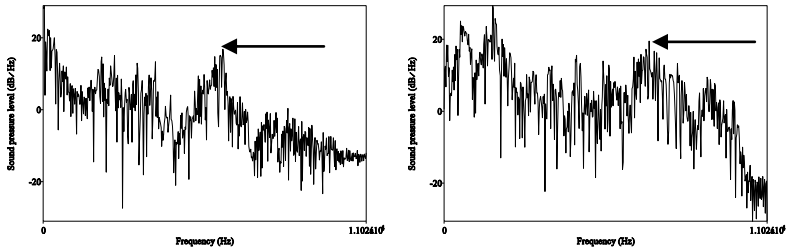
(8) displays spectra for /h/ (left) and /x/ (right). For /h/, the center of gravity in this token is 1469 Hz. The highest amplitude peaks are relatively low in the spectrum for /h/, essentially where F1 and F2 in the following vowel would be, along with a diffuse peak around 4000 Hz. [x] has a higher center of gravity, 3417 Hz. Unlike /h/, there is also an energy peak at 7200 Hz, marked in (8) with an arrow. (This is similar to Western Apache /x/, which Gordon et al. 2001:438 describe as having "a very pronounced peak in energy below 2,000 Hz and then more diffuse peaks at about 4,000 and 7,000 Hz".)

(8) Spectra of /h/ (left) and /x/ (right)



(9) displays spectra for the releases of the aspirated stops, /t^h/ (left) and /k^h/ (right). Like [x] but unlike [h], the aspiration components of these sounds contain a relatively high amplitude component at a higher frequency (6000 Hz in the token for /t^h/ and 7000 Hz for /k^h/). The center of gravity of /t^h/ is 2992 and that of /k^h/ 3470 Hz.

(9) Spectra of /t^h/ (left) and /k^h/ (right)



Although the aspirated stops and /x/ seem to have higher centers of gravity than /h/, there is an important difference between the stop aspiration in (9) and /h x/ in (8): the aspiration is the release of a stop, and the higher amplitude peaks in (9) are formant transitions from the preceding stops. McDonough 2003:155, discussing Navajo, in fact notes that the putative fricative release [x] is where one would expect to see formant transitions from a preceding stop:

> Since the principle perceptual cues to place of articulation are in the release burst of the stop and its effects on the formant structure at the beginning of the following vowel, and since the release of both stops is a velar fricative, a question arises as to where the cues for the place of articulation contrast might reside…

Thus in order for spectral evidence to be convincing, preceding place of articulation must be controlled for. Perhaps a better experiment would be a comparison of the relative intensity of aspiration in /t^h/ (or [tx]) to known instances of [x] and [h]. Because intensity can be affected by differences in loudness during the course of recording a word list, a comparison of the ratio of fricative intensity to a reference intensity within the same word, such as the following vowel, is needed. As usual, data from a variety of speakers should be collected, and results would need to be subjected to inferential statistics.

3.4 Phonological considerations

Even if it could be convincingly shown that the voiceless aspirated stop in Navajo is phonetically [tx], it is nonetheless also true that the velar fricative

release, to the extent that there is one, is still phonologically predictable from stop place of articulation. Phonological patterning with uncontroversial affricate phonemes which differ in aspiration in (5) (e.g. [ts] and [ts^h]) suggests that [tx] (if there is a velar fricative release) can and should be interpreted as a manifestation of aspiration.

4 Conclusions

In this article I have questioned the evidence for two of the points supporting the proposal that the stops/affricates in Athabaskan languages can be divided into simplex vs. complex sounds. A review of the literature shows a general lack of evidence that ejectives have long VOT, patterning with voiceless aspirated stops (except Tsilhqut'in). Convincing evidence that aspirated stops are phonetic let alone phonemic affricates has yet to be provided, even for Navajo.

In any case, nothing appears to follow from the proposed simplex/complex distinction, such as a distributional restriction. All Athabaskan languages prohibit aspirated stops in syllable-final position, and most also disallow ejectives there as well. Many allow affricates in syllable-final position. Careful cross-linguistic tabulation of final restrictions on stops and affricates may yield insights into the historical patterning of this class of segments in Athabaskan.

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An Incremental Semantics Account of the Particle *NO* in Japanese

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1 Introduction[1]

Nominalization is a process through which a non-nominal element becomes a nominal element. One way of classifying it is the distinction between the lexical nominalization as in (1) and the grammatical nominalization as in (2) (Shibatani 2009: 187, Shibatani and Bin Makhashen 2009: 22).

(1) *employ* → *employer*, *employee*

(2) *John smokes.* → *John's smoking*

The particle *no* in Japanese exhibits two types of grammatical nominalization: pronominal nominalization (3) and sentential nominalization (4).

(3) [*Tom-ga* *kat-ta* *no*]-*o* *mui-ta*.
[Tom-NOM buy-PST NO]-ACC peel-PST
'I peeled a/the one that Tom bought.'

(4) [*Tom-ga* *nai-ta* *no*]-*o* *mi-ta*.
[Tom-NOM cry-PST NO]-ACC see-PST
'I saw Tom crying.'

Some attempts have been made to handle these two functions in a uniform way (Kitagawa 2005, Kitagawa and Ross 1982, Murasugi 1991, Shibatani 2009, Tonoike 1990), but no detailed analysis has been given. Against this background, the aim of this paper is twofold. First, Section 2 motivates a uniform approach to the nominalizer *no* from diverse perspectives (i.e. methodological, functional, diachronic, crosslinguistic, and dialectal). Second, Section 3 provides a uniform account of *no* in terms of semantic incrementality. As will be stated in Section 4, the analysis can handle several issues in the nominalizer *no* (e.g. connotation), but these are addressed elsewhere (Seraku submitted) for reasons of space.

2 Motivating a uniform account

2.1 Preliminaries

This section offers reasons why the two functions of *no* in (3, 4) should be dealt with uniformly. That is, it will be clarified why it is better to assume that there is only a single item *no* than to assume that there are two different *no*s in (3, 4).

In Japanese, *no* also has a genitive function, as in (5).[2] (The genitive function is divided into several sub-types; see Nishiyama (2003: Ch.1).)

(5) *Tom-no-hon-o* *nakushi-ta.*
Tom-GEN-book-ACC lose-PST
'I lost Tom's book.'

One important question is whether the genitive function of *no* should be treated uniformly. In what follows, it will be argued that the genitive *no* in (5) should be modelled separately from the *no* in (3, 4). So, my contention is that there are two items whose form is *no*, one of them appearing in (3, 4), and the other appearing in (5). The connections between forms and functions are explicated as follows:

(6) no_1 → pronominal nominalization (e.g. (3))
no_1 → sentential nominalization (e.g. (4))
no_2 → genitive (e.g. (5))

2.2 Methodological consideration

A central issue in semantics and pragmatics is whether an attested meaning is lexically encoded (i.e. matter of semantics) or inferentially derived together with contextually supplied premises (i.e. matter of pragmatics). One methodological principle is Modified Occam's Razor: other things being equal, "senses are not to be multiplied beyond necessity" (Grice 1978: 118-9). That is, if there are multiple attested meanings of a given form, and if one of those meanings is the basis for inferring all others, then multiple lexemes should not be posited, other things being equal. The idea behind this principle is that pragmatic inference is governed by pragmatic principles, which are independently motivated for, say, deriving implicatures, and that a pragmatic, non-ambiguity account is simpler (hence, preferable) than a semantic, ambiguity account.

Given this principle of theoretical parsimony, a unitary analysis of the three functions of *no* in (3)-(5) is preferable, other things being equal. However, the subsequent sub-sections show that "other things" are not equal if attention is paid to the functional, diachronic, crosslinguistic, and dialectal aspects of the phenomena. In so doing, I shall defend the picture (6).

2.3 Functional consideration

No in (3, 4) serves as a nominalizer, while *no* in (5) does not. As for *no* in (5), nominalization does not occur, since what precedes *no* is *Tom* and *Tom* is a noun in the first place. As for *no* in (3, 4), there are several pieces of evidence for nominalization to take place.

First, nominalization is recognizable by the presence of noun phrase markers (cf. Comrie and Thompson (2007: 353)). One such marker is a case particle. As already shown in (3, 4), the accusative case particle *o* is attached to *no* in the two types of nominalization.

Second, the predicates *kat* and *nai* in (3, 4) are conjugated as an "ad-nominal" form (rather than a "conclusive" form, which is used in ending a sentence). At first sight, it is not easy to tell that the predicates in (3, 4) are in an ad-nominal form, because predicates in Contemporary Japanese have lost the morphological distinction between the conclusive/ad-nominal forms (Frellesvig 2010: §12.6.1). However, adjectival verbs still maintain the distinction, like the conclusive form *kireida* (= 'beautiful') and the ad-nominal form *kireina*. If this adjectival verb is used in the environment in question, only the ad-nominal form can be used.

(7) [*Kireina*/**kireida* *no*]-*o* *mui-ta*.
[beautiful NO]-ACC peel-PST
'I peeled a beautiful one (e.g. apple).'

(8) [*Ringo-ga* *kireina*/**kireida* *no*]-*o* *shit-teiru*.
[apple-NOM beautiful NO]-ACC know-PRS
'I know that apples are beautiful.'

This pattern is expected if we assume the *no*-headed part is nominalized.

Finally, a subject within the clause modifying a nominal (e.g. relative clause) may be marked by the genitive case particle *no*, as well as by the nominative case particle *ga*: the so-called "Nominative/Genitive Conversion" (Harada 1971). Accordingly, the nominative case particle *ga* may be replaced with the genitive case particle *no* both in the pronominal nominalization in (3) (cf. (9)) and in the sentential nominalization in (4) (cf. (10)).

(9) [*Tom-ga*/*no* *kat-ta* *no*]-*o* *mui-ta*.
[Tom-NOM/GEN buy-PST NO]-ACC peel-PST
'I peeled a/the one that Tom bought.'

(10) [*Tom-ga*/*no* *nai-ta* *no*]-*o* *mi-ta*.
[Tom-NOM/GEN cry-PST NO]-ACC see-PST
'I saw Tom crying.'

I do not present an account of why case alternation can happen in these contexts, but the above data indicates that the *no*-headed part in both (3, 4) is nominalized.

To sum up, the instances of *no* in (3, 4), but not in (5), share the nominalizing function. This meshes well with a unified approach to *no* in (3, 4) but not in (5).

2.4 Diachronic consideration

A prevalent supposition in Japanese diachronic linguistics is that the sentential nominalizer *no* derived from the pronominal nominalizer *no* (Horie 1998, Kinsui 1995, Nishina and Yoshimura 2005, Yanagida 1993, Yap et al. 2004, Yap et al. 2011, Yap and Matthews 2008, Yoshimura 2005, 2010).

A problem for the most previous studies is that no distinction is explicitly made between the pronominal nominalizer *no* and what I would call "NP+*no*", like (11) (cf. Saito and Murasugi 1990).

(11) *Tom-no*.
Tom-NO
'Tom's.'

There are reasons for distinguishing between the pronominal nominalizer *no* and the "NP+*no*". First, there is a functional difference: only the former is concerned with nominalization. Second, there is a time gap of more than 500 years between the first attested occurrence of the former (about 17th century) and that of the latter (about 12th century or earlier) (Wrona to appear). It should be stressed that I do not deny the possibility that the NP+*no* paved the way for the emergence of the pronominal nominalizer *no*; what I would like to claim is that these two *no*s constitute separate items. However, a number of previous studies have lumped the pronominal nominalizer *no* and the NP+*no* together under a single category, advocating that the sentential nominalizer *no* derives from the single category that encompasses the pronominal nominalizer *no* (cf. Nishi 2006).

An alternative view is that once the nominalizing use of single item *no* became entrenched, the pronominal/sentential nominalizing functions arose at the same time (Wrona to appear). This view is compelling for the following reasons. First, as pointed out in Nishi (2006), there are no diachronically attestable precedence relations between the pronominal nominalizer *no* and the sentential nominalizer *no*. Second, the early examples of nominalizer *no* are often ambiguous between the pronominal and the sentential nominalization: Wrona (to appear) cites the following example from *Ukiyoburo* (1809).[3]

(12)	[*Kure-ni*	*kafu-no*]-*o*	*wasure-ta*	*kara*
	[evening-TEMP	buy-NO]-ACC	forget-PST	because

a. 'Because I forgot the one I was going to buy in the evening, …'
b. 'Because I forgot that I bought something in the evening, …'

As long as this view is on the right track, a uniform approach to the pronominal nominalizer *no* in (3) and the sentential nominalizer *no* in (4) is bolstered. As for the genitive *no* like (5), it had already appeared in Old Japanese (8th century). Thus, while it is likely that the genitive *no* impinged upon the emergence of the pronominal and sentential nominalizer *no*, it is diachronically licit to assume that the genitive *no* forms a separate lexical item.

2.5 Crosslinguistic consideration

According to Lyons (1977: 443), there are three ontological statuses of entities: the first-order entities denote "persons" and "objects", the second-order entities denote "actions" and "events", and the third-order entities denote "propositions". As pointed out in Yap et al. (2011: 3), nominalization may be crosslinguistically classified in terms of this ontological distinction. For instance, the first-order entity nominalization is illustrated by Cantonese in (13), and the second-order entity nominalization is illustrated by Toqabaqita (Oceanic) in (14).

(13) *Daai*^{3} *mou*^{6} *ge*^{3} *ho*^{2} *ji*^{3} *jap*^{6} *nei*^{4}.
wear hat NO can enter
'The ones who wear hats may enter.' (Yap et al. 2011: 3)

(14) *Fasi-laa* *qoe* *qana* *baqu* *qena* *ki*
plant-NO 2SG GENP banana that PL
'Your planting (of) those bananas.' (Lichtenberk 2011: 703)

As stated in Horie (1998: 174), the two types of *no*-nominalization in Japanese may be classified in this fashion. The pronominal nominalizer *no* denotes a first-order entity in (3), whereas the sentential nominalizer *no* denotes a second-order entity in (4). The sentential nominalizer *no* may also denote a third-order entity; in (8) in §2.3, *no* denotes a proposition that apples are beautiful.

In addition, if a main predicate takes either of a noun or a (nominalized) clause as an argument, *no* may be ambiguous between a pronominal nominalizer and a sentential nominalizer. In (15), the main predicate *mi* can take either of a noun or a (nominalized) clause as a complement, and, as expected, *no* is ambiguous between the pronominal nominalizer (15a) and the sentential nominalizer (15b).

(15) [*Hashit-teiru no*]-*o* *mi-ta*.
[run-CONT NO]-ACC see-PST
a. 'I saw a person who was running.'
b. 'I saw someone running.'

Crucially, the same pattern is also observed in other languages, like Numhpuk Singho (Tibeto-Burman).

(16) [*Mam* *htu* *hpa* *wa*] *mu* *n-nga*.
[rice pound NO DEF] also NEG-have
a. 'The rice pounding machine is also not here.'
b. 'There is also no event of rice pounding.' (Morey 2011: 297)

(16a) is a case of first-order entity nominalization, and (16b) is a case of second-order entity nominalization.

The upshot is that it is crosslinguistically observed that the same morpheme is utilized for both first-order entity nominalization and second-/third-order entity nominalization. This may be taken as another motivation for a unitary approach to *no* in (3, 4).

There is a vexing problem, however. In some languages, the same morpheme has both the genitive and the nominalizing functions, as in the case of *de* in Mandarin Chinese (Simpson and Wu 2001: 251).

(17) *wo* *de* *shu*
I GEN book
'my book'

(18) *Ta* *zongshi* *ting* [*wo* *shuo* *de*].
he always listen [I speak NO]
'He always obeys me.'

This may suggest that a unified analysis of the genitive *no* and the two types of *no*-nominalization is preferable. Yet, the nominalizer *kes* in Korean, which is quite similar to the nominalizer *no* in Japanese, does not have a genitive function (Horie 1998: 178). Given this Korean data, together with the functional and diachronic considerations made in §2.3 and §2.4, a uniform treatment of the two types of *no*-nominalization in (3, 4), excluding the genitive *no* in (5), would not be unreasonable.

2.6 Dialectal consideration

The last sub-section provided a typological consideration across languages, and this sub-section turns to a typological consideration within a given language.

In Standard Japanese, the pronominal/sentential nominalizers and the genitive are all realized as *no*, as in (3)-(5). In many dialects, the pronominal/sentential nominalizers are realized as the same form but the genitive is not (Yoshimura 2005, 2010). In the Tosa dialect, the genitive is realized as *no* as illustrated by

Kochi-no in (20), but the pronominal/sentential nominalizers are both realized as *ga* as shown in (19) and (20) respectively (Yoshimura 2010: 601-3).

(19) [*Kireina hana*]-*wa nanohana de,* [*shiroi ga*]-*wa daikon zya*.
[beautiful flower]-TOP colza COP [white NO]-TOP radish COP
'The beautiful flowers are colza blossoms, and the white ones are radish.'

(20) [[*Kochi-no katsuo*]-*ga oishii ga*]-*wa honto.*
[[Kochi-GEN bonito]-NOM delicious NO]-TOP true
'It is true that Kochi bonitos are delicious.'

Yoshimura (2010) cites just a single dialect in which the pronominal/sentential nominalizers are realized differently. In the Yatsushiro dialect, the pronominal nominalizer is realized as *tsu*, and the sentential nominalizer is as *to*, as shown in (21) and (22) respectively. The genitive is realized as *no*, as exemplified in (23), where *no* is shortened as *n* after a vowel.

(21) [*Son akaka tsu*]-*ba totte-yo*.
[that red NO]-ACC take-please
'Please get me that red one.'

(22) [*Kodomo-n piano-ba hiku to*]-*ba kiitotta.*
[child-NOM piano-ACC play NO]-ACC heard
'I heard the child play the piano.'

(23) [*Asoko-n uchi-n musuko*]-*n kinoo kekkonsashita.*
[that-GEN house-GEN son]-NOM yesterday got.married
'The son of that house got married yesterday.'

In this way, there is the strong tendency that pronominal/sentential nominalizing functions are encoded in the same form, and that the form is not associated with a genitive function.

The above dialectal data is consistent with a unitary analysis of the nominalizer *no* in (3, 4) excluding the genitive *no* in (5).

2.7 Summary

The considerations that have been provided in this section motivate, or at least are consistent with, a uniform approach to the nominalizer *no* in (3, 4), which excludes the genitive *no* in (5). Now that a unified analysis is justified, let's turn to the articulation of such an analysis.

3 Developing a uniform account

3.1 Dynamic Syntax

This section proposes a unified account of the two types of *no*-nominalization in light of semantic incrementality, as modelled within Dynamic Syntax (Cann et al. 2005, Kempson et al. 2001).

In this framework, a string is mapped onto semantic structure incrementally as a string is parsed word-by-word. The initial state is specified as a root node by the axiom, with the requirement that this node be decorated with a propositional content of the string. The initial state is updated by general, lexical, or pragmatic actions. Once a proposition appears at the root node, the requirement is satisfied, and the tree transition comes to an end. A string is grammatical if and only if there is a successful tree transition leading to a final state.

Though the transition is a gradual updating of semantic tree, this paper does not cite a whole tree, for reasons of brevity; rather, only relevant nodes are cited.

3.2 Proposal

No also appears in head-internal relatives in Japanese. Cann et al. (2005: 285) regard it as a nominalizer that copies a type-e term in a proposition and pastes it at another node. This paper extends this lexical entry of *no* to the cases in (3, 4). My proposal is formulated as (24), and will be illustrated in what follows.

(24) If a usual type-e term is copied, *no* serves as a pronominal nominalizer; if a type-e event term is copied, *no* serves as a sentential nominalizer. Thus, the two types of *no*-nominalization are reducible to a parser's choice of which type-e term s/he copies during the parse of *no*.

3.3 Pronominal nominalization

An example of pronominal nominalization is (25).

(25) [*Akai* *no*]-*o* *mui-ta*.
[red NO]-ACC peel-PST
'I peeled a/the red one (e.g. apple).'

In (25), two points need to be clarified. First, *akai* denotes a proposition with a subject gap, and the question is how to represent a gap. Kempson and Kurosawa (2009: 65) claim that a gap is notated as the type-e term (ε , x, P(x)) in Epsilon Calculus: ε is an existential operator, and P is an abstract restrictor. Second, all propositions contain a type-e event term (Gregoromichelaki 2011). Given these clarifications, the parse of *Akai* yields the proposition in (26).

(26) Parsing *Akai* → *akai*'(ε , x, P(x))(ι , x, E(x))

akai' is a type-(e→(e→t)) predicate, whose arguments are the type-e subject (ε , x, P(x)) and the type-e event term (ι , x, E(x)). ι is an iota operator, and E is an event predicate.

In Dynamic Syntax, a proposition is "evaluated" by enriching a term with a predicate in the proposition. So, the proposition (26) is evaluated as (27), where the evaluation of the event term is disregarded.

(27) Evaluating (26) → *akai*'(ε , x, P(x)&*akai*'(x))(ι , x, E(x))

This proposition may be simplified as (28). That is, the abstract restrictor P may be dropped, because there is an internal entailment relation between the two conjuncts within the term.

(28) Simplifying (27) → *akai*'(ε , x, *akai*'(x))(ι , x, E(x))

The parse of *no* then copies a type-e term in (28). There are two type-e terms, and technically both of them may be copied. In the case of (25), however, only the usual term (ε , x, *akai*'(x)) may be copied, because the main predicate *mui* cannot take an event term as an argument. In (29), only the copied term is cited.

(29) Parsing *Akai no* → (ε , x, *akai*'(x))

The Dynamic Syntax framework allows pragmatics to come in during structure building (cf. §3.1). So, this term may be enriched pragmatically as, say, (30).[4]

(30) Enriching (29) → (ε , x, *akai*'(x)&*ringo*'(x))

This term denotes an entity that is both *akai*' and *ringo*' (i.e. a red apple). This models the pronominal nominalization in (25). Since enrichment is pragmatic, it is context-dependent. In another context, the term may be (31), which denotes an entity that is *akai*' and *ichigo*' (i.e. a red strawberry).

(31) (ε , x, *akai*'(x)&*ichigo*'(x))

Finally, the term (30) becomes an object of the main predicate *mui* in (25), and the root node is decorated with the proposition in (32).

(32) Parsing [*Akai no*]-*o mui-ta* → *mui*'(ε , x, *akai*'(x)&*ringo*'(x))(*Tom*')

I assume that the speaker is Tom. In addition, (32) disregards the content of *ta* and the event term for the whole proposition. (Strictly speaking, (32) is not the final output, as it remains "evaluated"; see Cann et al. (2005).)

3.4 Sentential nominalization

An example of sentential nominalization is (33).

(33) [*Ringo-ga* *akai* *no*]-*o* *shit-teiru*.
[apple-NOM red NO]-ACC know-PRS
'I know that apples are red.'

The parse of *Ringo-ga akai* yields the proposition (34).

(34) Parsing *Ringo-ga akai* → *akai*'(ε , x, *ringo*'(x))(ι , x, E(x))

After the proposition is evaluated, the parse of *no* copies the evaluated type-e event term, as in (35). This term denotes the situation in which apples are red.

(35) Parsing *Ringo-ga akai no* → (ι , x, E(x)&*akai*'(ε , y, *ringo*'(y))(x))

This models the sentential nominalization in (33). Technically, the term (ε , x, *ringo*'(x)) in (34) may be also copied, but this leads to the characterization of head-internal relatives (Cann et al. 2005: Ch.6).

If the rest of the string in (33) is parsed, the term (35) becomes an object of the main predicate *shit*. The output is (36), where "a" stands for the term in (35).

(36) Parsing [*Ringo-ga akai no*]-*o shit-teiru* → *shit*'(a)(*Tom*')

Again, the speaker is assumed to be Tom. Furthermore, (36) omits the content of *teiru* and the event term for the whole proposition.

3.5 Summary

The nominalizer *no* forms a single item that copies a type-e term in a proposition. The two types of *no*-nominalization then emerge as an outcome of the parser's choice concerning what type-e item s/he copies in parsing *no*.

4 Conclusion

This paper has provided motivations for a uniform analysis of the two types of *no*-nominalization from diverse viewpoints, and has articulated such an analysis in light of semantic incrementality.

As has been pointed out in the literature, the nominalizer *no* has a number of interesting properties. For instance, in pronominal nominalization, *no* expresses a connotation when it refers to a human (Kuroda 1992). In Seraku (submitted), I draw several implications of the present article for the properties of *no*.

Notes

[1] I am grateful for the valuable suggestions made by David Cram, Bjarke Frellesvig, Stephen Horn, Ruth Kempson, Jieun Kiaer, Kerri Russell, and the audience of my presentation at WECOL 2011.
[2] Some speakers accept a complementizer usage of *no* in a certain type of relative clauses, where *no* appears between the adnominal predicate and the element that is modified (Frellesvig and Whitman 2011). This paper sets aside this data due to fluctuating judgments across speakers.
[3] Notations used in examples are slightly modified from the originals throughout the paper.
[4] In an articulated tree, an epsilon term has an internal structure: there are nodes for an operator, a variable, and a restrictor. Since structure building within Dynamic Syntax is monotonic, a node for a pragmatically added restrictor cannot be intercalated into the internal structure of the term. I assume that a node for a pragmatically added restrictor is associated with the internal structure of the term by LINK relation. The formalization of the suggested LINK relation is left for future work.

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Verb-adjective Distinctions in the Acquisition of the Apperceptive Ending *-(nun) kwuna* by L2 Learners of Korean*

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1 Introduction

The purpose of this study is to investigate L2 learners' attainment of word class distinctions in second language acquisition. Understanding and speaking a language proficiently requires a thorough knowledge of words in the language. Such word knowledge includes not only information about form and associated meaning but also its word class, namely categorical information such as nouns, verbs, adjectives, and so on. For example, when a word is known, such as *dog*, the pronunciation is determined (i.e., [dɔg]) along with what is being referred to (i.e., a particular kind of animal) and to which category the word belongs (i.e., 'noun'). Such information about the word class of each word enables speakers of the language to put each term in a grammatically appropriate position in a sentence. For example, a noun like the word *dog* can take the subject position of a sentence whereas an adjective like *pretty* cannot. Therefore, in order to understand and produce correct sentences in a second language, the L2 (second language) learners must also know about the word class in L2. Children's acquisition of categorical distinction has been studied by many researchers (e.g., Maratsos et al., 1979; Maratsos, 1981; Radford, 1990) whereas very little is known about how L2 learners develop their knowledge about word class in the second language (e.g., Zyzik & Azevedo, 2009).

The organization of word class in one language can be different from that in another language depending on the morphosyntactic properties of each word in the language. For example, categorical distinction between verbs and adjectives is relatively clear in some languages whereas it is not in others. Such differences between the two languages can pose a problem in second language acquisition. Comparing English and Korean, adjective-verb distinction in Korean is not as clear as it is in English. For instance, in English *pretty* is categorized as an adjective that does not allow the past-tense inflectional suffix, *-ed*. Therefore, **prettied*, where a past-tense inflectional suffix is attached to the adjective *pretty* is ungrammatical. However, in Korean *yeppu-ta* which has an attributive meaning of *pretty* syntactically behaves like a verb, so that a Korean past tense

morpheme, *-ess-* can be attached to it to make a past tense form, yeppu-ess-ta. This similarity between adjectives and verbs along with other types of evidence has driven many Korean linguists to argue against the existence of adjectives as a separate category in Korean (e.g., Maling & Kim, 1998; Kim, 2002). Therefore, it is plausible to assume that English-speaking learners of Korean will have difficulty in grasping the verb-like grammatical properties of words that have adjective-like (attributive) meanings. Subsequently, questions arise as to when English-speaking learners of Korean acquire such categorical distinction, and how they do so. Is it relatively easy or difficult to acquire the word class of each word and their morphological properties? At what point will these learners show native-like mastery of the word class?

Previous studies on first language acquisition proposed evidence for children's categorization of words around the age of 20 months (Radford, 1990). One piece of evidence comes from morphology. For example, it was observed that English-speaking children used the plural marker -s only with nouns when they began its application. Even when children make overgeneralization errors with the plural marker due to incomplete acquisition of the marker, still they do so only with the noun class (e.g. mans, sheeps), but not with the other word classes (e.g. verbs or adjectives). This indicates that children learn to easily categorize each word when learning new words.

How do they determine the category of a word? What kind of information or cues do they use when they learn new words? Two major types of information that show the categorical properties of a word are semantic information and distributional information (Zyzik & Azevedo, 2009). Semantic information relates to the meaning of a word. For example, adjectives relate to the meaning of attribution. Distributional information is morphological or syntactic. Thus, nouns usually appear in a pre-verbal position of a sentence and the plural marker *-s* appears with nouns.

Sometimes, the word class distinction is not clear. For example, the distinction between adjectives and verbs is very subtle in terms of their morphological behavior in Korean. Therefore, it can be very difficult for learners of Korean to categorize newly learned words based on the distributional information. On the other hand, if the learners use semantic information of the words and transfer their L1 categorical distinction based on semantics, it should be fairly easy for the English-speaking learners of Korean to acquire a categorical system of Korean words.

The purpose of this study is to ascertain how L2 learners acquire the categorization of L2 words. For instance, do they use L1 category information? Do they rely on semantic information or distributional information? One of the possible candidates of showing the subtle distinction between verbs and adjectives relates to the use of the apperceptive marker *-(nun) kuna*. Verbs require *-nunkwuna* (e.g., 아기가 잠을 잘 자-는구나 (sleep-*nunkwuna*)/*자-구나 (sleep-*kwuna*)!, The baby sleeps very well!) whereas adjectives use -kwuna (e.g.,

장미가 아주 예쁘-구나 (pretty-*kwuna*)/*예쁘-는구나 (pretty-*nunkwuna*)!). By investigating L2 learners' use of this particular apperceptive marker, their ability to distinguish one class of words (adjectives) from the other (verbs) can be indirectly measured. Subsequently, the L2 learners' strategy based on the experimental results can be discussed.

In this study, L2 learners' acquisition of the apperceptive marker, -(*nun)kwuna* was tested in order to investigate their acquisition of word class distinctions. The results showed that L2 learners' ability to distinguish adjectives from verbs in their use of the apperceptive maker *-(nun)kwuna* increased as their oral proficiency increased. More importantly, L2 learners revealed a word class distinction from an early stage of development. The results are also discussed in terms of L1 transfer, use of semantic cues, and input. This paper concludes by proposing that L2 learners use a semantic strategy in their categorization of words in SLA.

2 Background

2.1 Adjectives and verbs in Korean

The existence of a categorical distinction between verbs and adjectives in Korean grammar is still controversial. In other words, the existence of adjectives as a separate category has been argued for (e.g., Choy, 197; Sohn, 1999) as well as questioned (e.g., Maling & Kim, 1998; Kim, M-J, 2002) by different Korean linguists.

A group of Korean linguists have argued that there is no clear categorical distinction between verbs and adjectives in Korean (Maling & Kim, 1998; Kim, M-J, 2002). The proposal is based on various similarities between these two classes in Korean. The major shared characteristic of verbs and adjectives in the Korean language is that they are predicates that can be combined with various inflectional endings. Therefore, they share sentence enders such as *-yo?, -ni?* and non-sentence enders such as *-uni* and *–ko*. They also share pre-final endings such as the past tense marker *–-ass/ess-,* intention, the conjecture marker, *-keyss-* and subject honorific marker *-si-*. An example for non-sentence ender *–uni* is shown in (1) (Please refer to Lee (2011) for other examples):

(1) Final ending: non-sentence enders

	Verb	*Adjective*
a. –(u)ni	mek-uni	yeppu-ni
	eat-so	be.pretty-so
	'since (I) am eating'	'Since (I) am pretty'

However, different characteristics are also found between these two in the use of other inflectional morphemes. The differences are found in the sentence type endings like imperatives *-la*, propositives *-ca*, various declarative endings, such

as –*ta*, and apperceptive endings including, *-kwuna., -kwunyo,* and *-kwun*. For example, consider the following examples of the plain style apperceptive ending, *- (nun)kwuna*:

(2) Apperceptive ending (plain)

Verb	*Adjective*
mek-nunkwuna/*ca-kwuna	yeppu-kwuna/*yeppu-nunkwuna
eat-APPER/sleep-APPER	be.pretty-APPER/be.pretty-APPER
'(She) is eating!'	'(She) is pretty!'

Examples in (2) show that the apperceptive ending –*kwuna*, requires a non-past tense marker *-n(un),* when it is used with verbs such as 'eat' but not with adjectives such as 'pretty'. Such differences seem to indicate that there is a need for a categorical separation between verbs and adjectives in Korean. However, what makes it difficult to draw such a conclusion is that even among the apperceptive endings the distinction between verbs and adjectives may break down depending on which ending is applied. This is evident for example, with *-ney(yo)* and *-(n)un.tey*. This phenomenon is clearly shown in the examples found in (3):

(3) Apperceptive ending (counter-expectation)

	Verb	*Adjective*
a. –ney(yo)	mek-ney/*mek-nunney	yeppu-ney/*yeppu-nunney
b. –n(un)tey	mek-nuntey/*mek-tey	yeppu-untey/*yeppu-tey

The difference between the adjectives and verbs found in the examples shown in the apperceptive endings in (3) involves a particular inflectional morpheme *-nun*, as is the case for the examples in (2). Verbs in these examples take *-nun* whereas adjectives do not with *-(n)untey* as shown in the examples in (3b), which is similar to the cases in (2). However, neither verbs nor adjectives take *-nun* with *-ney(yo)* as shown in the examples in (3a).

In sum, categorical distinction between adjectives and verbs are very subtle and can be confusing for L2 learners to use the distributional cues to categorize words into the two classes: verbs and adjectives. This means that L2 learners of Korean will have difficulty in word class distinction if they depend on the distributional information of words as L1 children do. Thus it is assumed that L2 learners of Korean as a foreign/second language will have difficulty correctly using inflectional markings with regard to these two types of word classes.

2.2 L2 Acquisition of word class distinctions

A recent study by Zyzik and Azevedo (2009) reports the difficulty of word class distinctions in L2 acquisition. In their work, they tested English-speaking

learners of Spanish using a receptive task that asked the learners to select the right form (or word) between the two words that belong to the same word family (e.g. happy or happiness) based on the given context. The results showed that the L2 learners had difficulty in distinguishing nouns from adjectives. Based on their findings, they concluded that the learners were not sensitive enough to recognize the derivational morphology that clearly distinguishes the two forms from each other. They argue that the difficulties come from the learners' overall weakness in L2 morphology and syntax and incomplete knowledge of distributional regularities in L2.

However, the results of their study showing the L2 learners' incomplete knowledge of word class do not provide a convincing argument. As also pointed out by the authors, the study used the two types of words that belong to the same word family (e.g. happy and happiness). It seems that the low accuracy scores resulted from the learners' confusion between the two groups of words due to the surface morphology, rather than from their incomplete knowledge of syntax or categorical distinction. The test itself seems more related to the knowledge of vocabulary rather than to word class distinction. It is possible that the learners simply did not yet have a clear form-meaning association of the words, or that they had not yet acquired the derivational morphology. This does not mean that the L2 learners have little knowledge of or are not sensitive to word class distinction but rather that another method is needed to test L2 learners' sensitivity to word class.

A somewhat different finding comes from a study done by Sunderman and Kroll (2006), which tested more implicit knowledge of word class distinction of L2 learners. In their study, the test takers were presented with two types of English-Spanish pairs each time and were asked to decide if the words were the same or not. Among the distracters, there were two conditions: one was a matched condition where the two pairs belonged to the same category (e.g., cara (meaning face), noun and fact, noun). The other was an unmatched condition where the two pairs belonged to different categories (e.g., cara, noun and fast, adverb). Sunderman and Kroll (2006) found that less proficient learners as well as more proficient learners responded faster to the pairs from the same category than the pairs from different categories. This indicates that the L2 learners were sensitive to word class distinction from the early stage of L2 development which is different from the findings of Zyzik and Azevedo (2009).

Semantics as well as distributional information about a word are available and can be noticed by the L2 learners like L1 learners when they learn new words and their categorization. However, they might not be sensitive to those kinds of information because they can learn the word category by explicitly memorizing the categorical information along with the form-meaning association of a word.

Another possible way of learning word category in L2 is to transfer their L1 when they process L2 words, that is, direct translation of L2 to L1, along with categorical information. This will result in fast acquisition of word category in

L2 (i.e. sensitivity to word category from an early stage of L2 development). In this case, the learners will show high accuracy scores on their sensitivity to word class distinction in L2 even when the target categories are not very distinct from each other in the particular L2 as long as they are clearly distinguished in their L1. The present study tests this hypothesis with English learners of Korean regarding adjective-verb distinction in the use of the apperceptive marker *-(nun)kwuna*.

The subtle distinctions between verbs and adjectives, as explained above, enable us to predict that the English learners will have difficulty acquiring *-(nun)kwuna* and correctly applying the inflectional marker, *-nun*, depending on the category. However, the L1 transfer theory predicts that English learners will show sensitivity to adjective-verb distinction from the stage of low proficiency. The present research aims to answer the following research questions: *1. Are English learners of Korean sensitive to word class distinction between adjectives and verbs from an early stage of language development? 2. Does the sensitivity of English learners of Korean to word class distinction develop as their oral Korean proficiency increases?*

3 The Study

3.1 Participants

A total of 52 English-speaking learners of Korean participated in this study. 14 native speakers of Korean also participated as a control group. English-speaking learners were chosen due to the difference between their L1 (first language, English) and L2 (Korean) as mentioned above. The learners' proficiency of Korean was measured through an OPI (oral proficiency interview) by a certified OPI tester and determined according to the ILR (interagency language roundtable) speaking scales. The ILR scale is a language proficiency scale used by US government agencies with a range from 0 (no proficiency) to 5 (functionally native proficiency). The number of participants in each proficiency group is summarized in Table 1.

Table 1 Participants

P	*N*	*Mean Age*	*Gender*		*ILR Levels*					
			M	F	1+	2	2+	3	3+	4
NS	14	34	5	9						
L2	52	27	24	28	6	10	14	17	3	2
Total	66	28	29	37	6	10	14	17	3	2

P: Participants; N: Number of participants; NS: Native Speakers; L2: L2 learners

3.2 Materials

A listening version of a grammaticality judgment task was used in this study. A total of 10 pairs of grammatical and ungrammatical sentences with *-(nun)kwuna* were constructed. One half of the pairs included adjectives (i.e. adjective condition) with five grammatical and five corresponding ungrammatical sentences. The other half of the pairs included verbs (i.e. verb condition) with five grammatical and five corresponding ungrammatical sentences. Examples for each condition are shown in (4):

(4) Test items
 a. Adjective condition (adjective + *-kwuna*)
  i) cip-i acwu ku-*kwuna*! (grammatical) 'Your house is very big!'
  ii) *cip-i acwu ku-*nunkwuna*! (ungrammatical) 'Your house is very big!'

 b. Verb condition (verb + *-nunkwuna*)
  i) aki-ka cam-ul cal ca-*nunkwuna*! (grammatical) 'The baby is sleeping well!'
  ii) *aki-ka cam-ul cal ca-*kwuna*! (ungrammatical) 'The baby is sleeping well!'

The test items were included in a larger set of a grammaticality judgment task that included a total of 254 items and 10 warm-up items. All the test items were presented in random order so that the other test items played the role of distracters for each other. The task was done aurally as a computer-delivered test using the DMDX software package. It took approximately 30 minutes to finish the entire session of the grammaticality judgment task that included the target items of the present study.

3.3 Procedure

This study was included in a larger scale project that investigated linguistic knowledge of KFL (Korean as a foreign language) learners at each level of oral proficiency (see Lee et al., 2009 for details). Each participant took the test individually in a classroom or in a quiet office. About one week after the test, each participant's global oral proficiency in Korean was assessed by a certified OPI tester and their proficiency was labeled according to the ILR speaking scale.

3.4 Results

First, in order to determine if L2 learners are sensitive to word class distinction, the mean proportion scores and standard deviations were calculated for each condition by the ILR levels and the results are presented in Table 2.

Table 2 Grammaticality Judgment: Adjectives vs. Verbs

ILR level	*n*	Adjective + *-kwuna* *(k=10)*		Verbs + *-nunkwuna* (*k=10*)	
		Mean	SD	Mean	SD
1+	6	0.55	.50	0.52	.50
2	10	0.82	.38	0.72	.45
2+	14	0.81	.39	0.70	.46
3	17	0.91	.28	0.76	.43
3+	3	0.80	.40	0.73	.44
4	2	0.95	.22	0.85	.36
Native Speakers	14	0.99	.35	0.81	.44

Table 2 shows that the means for adjectives are always higher than those for verbs. A paired-sample *t*-test was conducted to compare the mean differences between the two conditions for the L2 group and it revealed that the mean differences between the two conditions were not statistically significant ($t(51) = .00026506$, $p > .05$). The mean difference between the two conditions for the native group was found to be not statistically significant, either ($t(13) = 0.003595$, $p > .05$) as predicted. This means that the native speakers as well as L2 learners were similar in terms of their adjective-verb distinction.

Notice that the accuracy rate is fairly high (82% for adjective condition and 72% for verb condition) when they reach ILR 2. Taken together, the results indicate that the learners are sensitive to categorical distinction between adjectives and verbs fairly correctly applying the apperceptive maker *-(nun)kwuna* to each category. Also noticeable is the change of mean proportion scores between ILR 1+ to ILR 2. The mean proportion scores increases from 55% to 82% for adjectives and from 52% to 72% for adverbs. This apperceptive ending is not a very productive and frequently used one compared to the other types of endings. Thus it can be said that the learners have little knowledge of the apperceptive marker *-kwuna* at the low proficiency level of ILR 1+ even without noticing the different forms (i.e., *-kwuna* vs. *-nunkwuna*). However, once they begin to attend to the different forms of the apperceptive marker, they correctly apply each form to its appropriate category (*-kwuna* to adjectives and *-nunkwuna* to verbs) with little confusion. This seems to indirectly indicate that the L2 learners are sensitive enough to category distinction at a very early stage of language development. In sum, it seems safe to conclude that English-speaking learners of Korean begin to acquire categorical distinction between adjectives and verbs from an early stage of development.

Secondly, in order to determine if the L2 learners' correct use of the apperceptive marker *-(nun)kwuna* increases as their oral proficiency improves,

the overall mean scores and standard deviations were calculated combining adjectives and verbs per each proficiency level and the results are shown in Table 3.

Table 3 Overall Grammaticality Judgment Mean Accuracy Scores

ILR level	Number of participants	Mean	SD
1+	6	0.60	0.19
2	10	0.87	0.15
2+	14	0.83	0.13
3	17	0.93	0.08
3+	3	0.87	0.00
4	2	0.97	0.05
Native Speakers	14	0.90	0.40

To determine the correlation between ILR level and the mean scores, Spearman correlation coefficients between ILR levels and mean scores were computed using the individual proportion correct scores as well as the mean proportion correct scores for the examinees at each ILR level. The Spearman correlation between the ILR scales and individual proportion scores were statistically significant ($r = .50$, $p <. 05$), and the Spearman correlation between the ILR scales and mean proportion scores was also statistically significant ($r = .89$, $p < .05$). This means that the L2 learners' knowledge of the use of the apperceptive marker *-(nun)kwuna* improves as their overall proficiency level increases. Nevertheless, it should be admitted that due to the small and unbalanced number of subjects, the findings still need to be confirmed with further studies with a higher and more balanced number of subjects in each proficiency level.

4 Discussion

The Korean apperceptive ending *-(nun)kwuna* was thought to be very difficult or confusing for English-speaking learners of Korean to learn due to the very subtle differences between adjectives and verbs in Korean. On the other hand, it was also expected that English-speaking learners of Korean may transfer their L1 categorical distinction between adjectives and verbs to their L2 categorical system. In such a case, it might not be as confusing as presumed when they learn different forms of apperceptive markers.

The research questions presented in Section 2 can now be addressed. The first research question was 'Are English learners of Korean sensitive to word class distinction between adjectives and verbs from an early stage of language development?' The results of this experiment indicate that English learners of

Korean seem to be sensitive to adjective-verb distinction from an early stage of language development. Even though the morphological behavior of the apperceptive marker was thought to be confusing, the learners acquired the forms and correctly applied each form to the appropriate word classes.

The second research question was 'Does the sensitivity of English learners of Korean to word class distinction develop as their oral proficiency increases?' The experimental results also showed a positive answer to this question. The L2 learners' performance on this particular type of marker the form of which differs depending on the word class correlates to the proficiency of their Korean measured with the ILR scale. In particular, their performance reaches almost native speaker range of accuracy of 87% at ILR 2, and continues increasing up to 97% at ILR 4.

Comparing the findings of this study with those of the previous studies, the present data provide supporting evidence to the findings of Sunderman and Kroll (2006). Their study about L2 learners' implicit knowledge of word class distinction also determined that L2 learners were sensitive to categorical distinction from a very early stage of L2 development. On the other hand, Zyzik and Azevedo's (2009) data showed rather opposite results: L2 learners' word class distinction was not stable due to their weak morphology and syntactic knowledge. As mentioned above, their experimental method tapped into more of the learners' knowledge of vocabulary and related derivational morphemes rather than their knowledge of implicit word class distinction. Therefore it seems rather unconvincing to state that the learners' performance in their study revealed the learners' knowledge about word class distinction. To overcome this problem, the present study used a different method to test the word class distinction knowledge more implicitly. By looking at the L2 learners' perception about the distribution of inflectional morphology that is affected by word classes, this study measured their implicit knowledge of word class distinction. The results of this study showed that the L2 learners were sensitive to word class distinction between adjectives and verbs even though the distinction was not very clear in Korean linguistics.

As proposed above, one promising explanation for the English-speaking learners' sensitivity to the adjective-verb distinction in the L2 acquisition of Korean seems to stem from L1 transfer. English distinguishes the two word classes very clearly and the learners can simply transfer the two separate categories to Korean through direct translation of each word. This also means that the learners seem to use a semantic strategy to categorize each word, rather than employ a distributional (syntactic) strategy. The reason is because the information of syntactic distribution of the two word classes is not very straightforward in Korean regarding inflectional morphology (e.g. past-tense inflection of adjectives). Therefore, the learners seem to depend on their semantic information of the word to categorize words. This hypothesis contradicts the previous theory about L1 acquisition of word categorization

proposed by Radford (1991) in which he argues that children use syntactic cues (distributional information) for categorization of each word. Semantic cues are not reliable enough to ascertain the categorical characteristics of each word. For example, the meaning of 'thank' and 'grateful' is very similar but 'thank' is a verb and 'grateful' is an adjective. Consequently, this seems to indicate that L2 learners use a different strategy from L1 learners in the process of word class distinction; L2 learners use semantic information whereas L1 children use syntactic information.

Also worthy of attention is that there was a slight tendency of both native speakers and the learners to be better at applying the correct apperceptive marker to adjectives than to verbs. This means that the learners and native speakers tend to accept the ungrammatical form verb + *-kwuna*. For example, they did not perceive the ungrammatical form verb + *-kwuna* (e.g., *공부하구나, study-*kwuna*) as negatively as the other type of ungrammatical form adjective + *-nunkwuna* (e.g., *착하는구나, be.good-*nunkwuna*). Even though the tendency has been proven to be statistically not significant, possible explanations for this phenomenon are considered. Several possible factors might include input and the role of the additional non-past tense marker, *-nun* and its acquisition. Regarding input, when the individual data of native speakers in the experiment are examined, six out of 14 showed a perfect score (1.0 for adjectives vs. 1.0 for verbs) but eight out of 14 showed adjective-verb asymmetry. The mean scores for adjectives were better than those for verbs. Moreover, two native speakers showed the mean scores, 1.0 vs. 0.5 and 1.0 vs. 0.4 for adjectives and verbs respectively. This indicates that there are Korean native speakers who accept the form verb + kwuna (e.g., *자구나, *sleep-kwuna; *먹구나, mek-kwuna, etc.) without non-past tense marker -nun). These types of errors are also found in children's speech. This might have affected the L2 learners performance through input, if not through instruction.

5 Conclusion

The present study investigated L2 learners' acquisition of word class distinction in second language acquisition, and determined that L2 learners' performance reached a high level of accuracy showing no difference between adjectives and verbs. This revealed L2 learners' sensitivity to word class. This study also found that the sensitivity continues improving as the learners' oral proficiency increases. The results were interpreted such that L2 learners are sensitive to the word class distinction from an early stage of L2 development, supporting the findings of Sunderman and Kroll (2006). Such an early development of the L2 learners' word distinction can be explained in terms of L1 transfer and semantic strategy: English-speaking learners of Korean depend on an L1 (English) word category system when learning L2 word class distinction through direct

translation of the form-meaning mapping of the word. Along with the fact that the distributional distinction between adjective and verb is confusing in Korean, the results indicate that L2 learners seem to depend more on semantic strategy than distributional (syntactic) strategy.

Notes

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Phase and Two Types of Negation*

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1 Introduction

Since Horn's (1985, 1989) seminal work, there has been an attested duality of negation in natural languages: *Descriptive Negation* (DN) and *Metalinguistic Negation* (MN).[1] DN is an unmarked ordinary negative with a simple logical import (¬), while MN is the marked one characterized as 'a device for objecting to a previous utterance on any grounds whatever' (Horn (1985: 121)).[2] From the standpoint of neo-Gricean pragmatics, Horn strongly argues that (i) this duality of negation comes from ''pragmatic ambiguity'' and (ii) negative operators interpreted as MN (i.e. MN operators) inherently cannot license NPIs. The relevant data is presented in (1), taken from Szabolcsi (2004) with slight modification.

(1) a. *Descriptive Negation*:
John did **not** see *anyone*.
b. *Metalinguistic Negation*:
*John did **NOT** see *anyone*.[3] (Szabolcsi (2004: 409))

As a result of Horn's influential work, these two types of negation (especially, MN) have intensively investigated in semantics and pragmatics (see Pitts (2011) for a recent comprehensive review).

However, under careful syntactic investigations, it turns out that Horn's account has some empirical flaws. First of all, the duality of negation has a distinction in syntactic structures from the typological perspective, despite the apparent ambiguity in English. In other words, there are overt 'syntactic' realizations behind the 'pragmatic' ambiguity proposed by Horn (1985). This situation is clearly demonstrated by Japanese examples like (2).

(2) a. *Descriptive Negation*:
John-wa *daremo* mi-**nakat**-ta.
John-Top *anyone* see-**Neg**-Past[4]
'John did not see anyone.'
b. *Metalinguistic Negation*:
*John-wa *daremo* mi-ta no-de(-wa)-**nai**.[5]
John-Top *anyone* see-Past C-Cop-Foc-**Neg**
'*John did NOT see anyone.'

In (2), two interpretations of negation (DN and MN) are reflected in different type of negative structure (internal/simplex and external/complex). The internal/DN negative (2a) can license the NPI *daremo* 'anyone' but the external/MN negative (2b) cannot, parallel to the English counterparts. This casts doubt on Horn's purely ''pragmatic ambiguity'' approach.

Secondly, MN can license NPIs in some environments. In this respect, Seuren (1990) presents an interesting observation in (3).

(3) *NPI licensing by MN*:
   a. We are **NOT** eating tomatoes *anymore*.
   b. That car is **NOT** old *at all*. (Seuren (1990: 451-452))

Importantly, the examples in (3) with the MN reading can license adjunct NPIs like *anymore* or *at all*. This data crucially argues against Horn's claim that MN operators inherently cannot license NPIs, which wrongly predicts that the examples (3) do not exist.

The alternative proposal to be developed in this paper is, contrary to the previous literature, that the two types of negation and their NPI licensing should be explained syntactically. Specifically, the following two claims will be presented.

(4) *Claims of this paper*:
   a. Two types of negation syntactically project in the clausal spine.
   b. The distribution of NPIs is constrained by a weak version of *Phase Impenetrability Condition* (PIC) advocated by Chomsky (2001).

This paper is organized as follows. Section 2 discusses the first claim that two types of negation are realized within different syntactic domains (IP for DN, CP for MN). In Section 3, based on the syntax of two types of negation, we will work out the second and central claim of this paper; that is, PIC is operative in NPI licensing, and then set out specific predictions to be testified. Section 4 shows that the predictions of the main proposal are actually borne out and offers an alternative syntactic explanation for various examples of NPI licensing, including counterexamples to Horn's analysis. Section 5 is the conclusion of this paper.

2 The Syntax of Two Types of Negation

The purpose of this section is to argue descriptively that two types of negation syntactically project in the clausal backbone. Specifically, it will be shown that DN is realized within the IP-domain, whereas MN is encoded within the CP-domain.

Let us start with the syntax of DN. As originally proposed by Pollock (1989), the ordinary negative projects its own functional projection (NegP). More precisely, NegP is immediately dominated by TP and selects *v*P in both English and Japanese, as shown in (5).[6]

(5) *DN in English and Japanese*:
a. [$_{TP}$ John [$_{T'}$ did [$_{NegP}$ **not** [$_{vP}$ hit Mary]]]].
b. [$_{TP}$ John-ga [$_{T'}$ [$_{NegP}$ [$_{vP}$ Mary-o tataka] -**nakat**] -ta]].
John-Nom Mary-Acc hit-**Neg**-Past
'John did not hit Mary.'

On the contrary, the syntactic status of MN is highly controversial in English due to the structural identity with DN as observed at the beginning of this paper. However, there are some pieces of evidence supporting the syntactic manifestation of MN. Drozd (2001) observes that MN markers are realized at the peripheral CP domain even in English. One type is the pre-sentential negation in child English and another type is the exclamative negation in adult English, as in (6).

(6) *MN in English*:
a. Pre-sentential Negation in Child English:
[$_{CP}$ **No** [$_{C'}$ [$_{TP}$ mammy doing]]].
b. Exclamative Negation in Adult English:
[$_{CP}$ **No way** [$_{C'}$ [$_{TP}$ she is wise]]].

Also in Japanese, MN can be analyzed as negation within the CP-domain. Hiraiwa and Ishihara (2002, 2012) proposes the mono-clausal approach to the Japanese focus in-situ construction *-no-da* 'it is that,' which is crucially regarded as the affirmative counterpart of the MN structure presented in Section 1. Their specific proposal is that the CP-periphery is exploited for *-no-da* structure.[7] Following this intriguing idea, we propose that the MN structure is mono-clausal and the MN marker is in the CP-domain as shown in (7).

(7) *MN in Japanese*:
[$_{NegP}$ [$_{CP}$ [$_{TP}$ John-ga Mary-o tatai-ta] no-de(-wa)] -**nai**].
John-Nom Mary-Acc hit-Past C-Cop-Foc-**Neg**
'John did NOT hit Mary.'

There are at least two pieces of evidence for the mono-clausal approach to the MN structure in Japanese. One is unavailability of Nominative-Genitive Conversion (NGC). NGC in Japanese has been assumed to be allowed only in embedded contexts (Maki and Uchibori 2008) as demonstrated in the examples (8).

(8) *Nominative-Genitive Conversion*:
a. John-**ga**/*-**no** kita.
John-Nom/-Gen came
'John came.'
b. Bill-wa [John-**ga**/-**no** kita-no]-o mita.
Bill-Top John-Nom/-Gen came-C-Acc saw
'Bill saw that John came.'

If the MN structure is bi-clausal, not mono-clausal, NGC is predicted to be fine with MN. However, this seems not to be the case.

(9) *Nominative-Genitive Conversion with MN*:
John-**ga**/*-**no** kita-no-de(-wa)-**nai**.
John-Nom/-Gen came-C-Cop(-Foc)-**Neg**
'John did NOT come.'

The other motivation for the mono-clausal analysis is the fact that the characteristic sequence of particles (i.e. *-no-de-wa-nai*) in the MN structure appears to be frozen/grammaticalized into one unanalyzable auxiliary *-nzyanai*. Given similar patterns found in Japanese modal auxiliaries such as *-kamosirenai* 'may' or *-nitigainai* 'must', this observation strongly suggests that the MN structure is not bi-clausal. Thus, it is safe to conclude that the mono-clausal approach is real.

Moreover, the hypothesis that MN is within the CP-domain is further supported by Italian, European-Portuguese, and Korean.

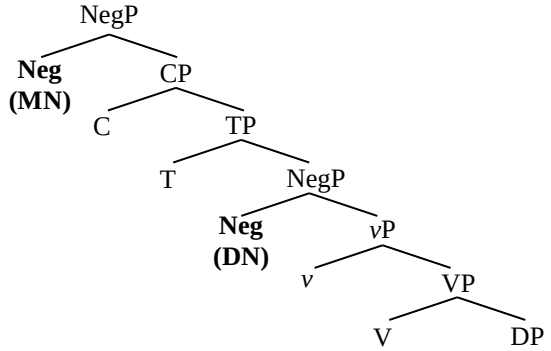
(10) a. *Italian*:
[$_{NegP}$ **No** [$_{CP}$ che non ghe vado]].
Neg there go there
'I will not go there.' (Poletto (2009))

b. *European-Portuguese*:
[$_{NegP}$ **Uma ova** [$_{CP}$ e que canta bem]].
Neg is that sing well
'She does NOT sing well.' (Martins (2010))

c. *Korean*:
[$_{NegP}$ [John-neun keikeu-reul meog-eun geos-eun] -**anida**].
John-Top cake-Acc eat-Past C-Foc-**Neg**
'John did NOT eat cake.'

To sum up this section, I have shown that DN is within the IP-domain and MN is within the CP-domain. The emerging picture is diagramed below.

(11) The *syntax of two types of negation* (simplified):



[$_{NegP}$ **Neg (MN)** [$_{CP}$ C [$_{TP}$ T [$_{NegP}$ **Neg (DN)** [$_{vP}$ *v* [$_{VP}$ V DP]]]]]]

3 The Mechanism of Phase

This section presents the main proposal of this paper; the distribution of NPIs is restricted by a weak version of *Phase Impenetrability Condition* (PIC) advocated by Chomsky (2001). Before making the empirical predictions, let us introduce some theoretical assumptions on the *derivation by phase* framework (Chomsky (2001)).

First of all, the notion *Phase Head* (H), whose complements are sent by Transfer/Spell-Out to both semantic and phonological components at certain designated points, is defined as 'propositional.' This is reminiscent of traditional *Subjacency*, *Barriers*, or *Strict Cycle*, giving rise to locality conditions and reducing the computational burden. According to Chomsky, phase heads are *v* and C, summarized below.

(12) *Phase Head (H) is* '*propositional*': *v*, C

Secondly, as for 'designated points' of Transfer, we will crucially adopt Chomsky's (2001) weak version of PIC, formulated as in (13).

(13) *Phase Impenetrability Condition* (PIC) - weak -:

> The domain of H is not accessible to operations <u>*at ZP*</u>; only H and its edge are accessible to such operations.
> (<u>*underlined italics*</u> mine, Chomsky (2001: 14))

> $[_{ZP}\ Z\ldots\ [_{HP}\ \alpha\ [H\ YP]]]$

Notice importantly here that we do not adopt the strong version of PIC originally put forth by Chomsky (2000) in (14).

(14) *Phase Impenetrability Condition* (PIC) - strong -:

> The domain of H is not accessible to operations <u>*outside HP*</u>; only H and its edge are accessible to such operations.
> (<u>*underlined italics*</u> mine, Chomsky (2001: 13))

This version of PIC is theoretically superior to Chomsky's (2001) weak version adopted in this paper in that the former is more restrictive than the latter. However, it has been convincingly argues that Chomsky's (2000) strong version makes wrong empirical predictions about NPI-licensing. Let us consider licensing of NPI *-sika* 'only' in Japanese mainly discussed by Yamashita (2003).

(15) *NPI -sika 'only' in Japanese*:
a. John-ga [$_{vP}$ Maty-to-*sika* awa]-**nakat**-ta.
John-Nom Mary-with-only meet-**Neg**-Past
'John met only Mary.'

b. Bill-ga [$_{vP}$ Pam-ni Mary-to-*shika*$_{i}$ John-ga t_{i} atta-to tutae]-**nakat**-ta.
B-Nom P-Dat M-with-only J-Nom met-that tell-**Neg**-Past
'Bill told Pam that John met only Mary.'

Yamashita (2003) argues that the strong version of PIC cannot explain even simple examples like (15a) where object NPIs are licensed by negation. This is because object NPIs are inaccessible to negation outside the *v*P phase. Even if the example (15a) is unproblematic thanks to scrambling of object NPIs to [Spec, *v*P], Chomsky's (2000) strong PIC fails to capture the more complex example (15b) since the NPI within the complement clause is too deeply embedded to be accessible to the matrix negation. Therefore, the strong PIC is not tenable at least for NPI-licensing.

Given these theoretical assumptions, in concert with the syntax of two types of negation established above, possible licensing domains of NPIs with DN and MN are schematically represented as in (16).

(16) *Descriptive Negation*:
[$_{NegP}$ DN $\boxed{[_{vP}\ \beta\ [v\ [\alpha\ [_{VP}]]]]}$] ($\boxed{\ \ }$ = 'visible' domain)
Metalinguistic Negation:
[$_{NegP}$ MN $\boxed{[_{CP}\ C\ [\gamma\ [_{TP}\ T\ [_{vP}\ \beta\ [v}$ [α [$_{VP}$]]]]]]]

Now we can make the following predictions on NPI licensing with DN and MN, as shown in (17).

(17) *Predictions on NPI licensing*:
a. DN licenses object NPIs within VP, while MN does not.
b. MN licenses *v*P-adjoined NPIs (β), but not VP-adjoined NPIs (α).
c. Both DN and MN license subject NPIs in-situ within *v*P (β).
d. MN licenses displaced/scrambled NPIs within TP (γ).

In the next section, we will show that these predictions are actually borne out and the proposed syntactic explanation for NPI licensing is superior to Horn (1985, 1989) both empirically and theoretically.

4 Verifying the Predictions

This section attempts to verify the empirical predictions on NPI licensing offered in preceding discussions. First, the main proposal of this paper correctly explains the asymmetry between DN and MN as in (18).

(18) *Object NPIs in English*:
a. Descriptive Negation:
John did [$_{NegP}$ **not** $\boxed{[_{vP}\ v\ [_{VP}$ see *anyone*]]}].
b. Metalinguistic Negation:
*[$_{CP}$ **Neg** $\boxed{[_{C'}\ C\ [_{TP}$ John did NOT [$_{vP}\ v$}] [$_{VP}$ see *anyone*]]]].

Let us crucially assume the *Uniformity Principle* proposed by Chomsky (2001:2) given below.

(19) *Uniformity Principle*:
In the absence of compelling evidence to the contrary, assume language to be uniform, with variety restricted to easily detectable properties of utterances.

Given this general principle, now we will hypothesize the phonologically null but semantically interpretable Neg within the CP-domain in English MN structures as in (18b).[8] Since Neg within the CP-domain is not local enough to license the NPI *anyone* within VP, NPI licensing fails in this particular case.

This is also true for the Japanese counterparts. As shown in the overt syntactic distinction between DN and MN, Japanese examples further support the main proposal of this paper. The relevant data is repeated in (20) with the licensing domain made explicit.

(20) *Object NPIs in Japanese*:
a. Descriptive Negation:
[$_{NegP}$ [$_{vP}$ John-ga [$_{VP}$ *daremo* mi]] **-nak**] -atta.
John-Nom *anyone* see-**Neg**-Past
'John did not see anyone.'
b. Metalinguistic Negation:
*[$_{NegP}$ [$_{CP}$[$_{TP}$[$_{vP}$ John-ga [$_{VP}$ *daremo* mi]]-ta] no-de (wa)] **-nai**].
John-Nom *anyone* see-Past NM-Cop-Foc-**Neg**
'*John did NOT see anyone.'

Second, more importantly for the goal of this paper, the proposed PIC-based explanation can straightforwardly account for the counterexample to Horn's (1985) proposal that MN inherently cannot license NPIs. The example is reproduced as (21).

(21) *Adjunct NPIs in English*:
a. [$_{CP}$ Neg [$_{C'}$ C [$_{TP}$ We are **NOT** [[$_{vP}$ *v* [$_{VP}$ eating tomatoes]] *anymore*]]]].
b. [$_{CP}$ Neg [$_{C'}$ C [$_{TP}$ That car is **NOT** [[$_{vP}$ *v* [$_{VP}$ <is> [$_{A/AP}$ old]]] *at all*]]]].

Since NPIs like *anymore* or *at all* are an adjunct and can freely adjoin to various clausal maximal projections and DN also licenses adjunct NPIs as in (22) below, it is reasonable to treat the NPIs in (21) as *v*P-adjuncts.[9,10]

(22) *Adjunct NPI Licensing by DN*:
John did **not** hit Mary *at all*.

Because edges of *v*P are accessible to the higher phase, these adjunct NPIs are visible to MN. Therefore, they can be perfectly licensed.

Furthermore, Pitts (2011) observes an interesting fact in favor of the syntactic approach. When the adjunct NPI *at all* is put onto the VP-internal position (i.e. VP-adjunct), MN becomes unable to license the NPI as in (23).

(23) a. *[$_{CP}$ **Neg** [$_{C'}$ C [$_{TP}$ The king of France is NOT [$_{vP}$ *v* [$_{VP}$ *at all* bold]].
b. The king of French is not at all bold.

This observation perfectly falls under the proposed analysis. That is, MN within the CP domain is inaccessible to the NPI within VP due to the PIC, as discussed in the previous section.

This line of reasoning is consistent with Japanese examples like (24).

(24) *Adjunct NPIs in Japanese*:
a. [$_{NegP}$[$_{CP}$ [$_{TP}$ [*kesshite* [$_{vP}$ John-ga [$_{VP}$ Mary-o mi]]-ta] no-de (wa)]] -**nai**].
at all John-Nom Mary-Acc see-Past C-Cop-Foc-**Neg**
'John did NOT see Mary at all.'
b. *[$_{NegP}$ [$_{CP}$ [$_{TP}$ [$_{vP}$ John-ga [$_{VP}$ Mary-o *kesshite* mi]]-ta] no-de (wa)]] -**nai**].
John-Nom Mary-Acc *at all* see-Past C-Cop-Foc-**Neg**
'*John did NOT at all see Mary.'

In (24a) where the NPI *kesshite* 'at all' is *v*P-adjoined, MN can license the NPI because it is within the accessible domain. In contrast, the example (24b), in which the NPI is deeply embedded into VP, is relatively degraded. This ungrammaticality results from the non-phase-mate status of Neg and NPI.

Thirdly, the proposed analysis is furthermore justified by Japanese examples with subject NPIs in-situ, as exemplified in (25).

(25) *Subject NPIs in Japanese*:
a. Descriptive Negation:
[$_{NegP}$ [$_{vP}$ *Daremo* [$_{VP}$ Mary-o tataka]]] -**nak**] -atta.
anyone Mary-Acc hit-**Neg**-Past
'*Anyone did not hit Mary.'
b. Metalinguistic Negation:[11]
?[$_{NegP}$ [$_{CP}$ [$_{TP}$ [$_{vP}$ *Daremo* [$_{VP}$ Mary-o tatai]]-ta] no-de (wa)]] -**nai**].
anyone Mary-Acc hit-Past NM-Cop-Foc-**Neg**
'??Anyone did NOT hit Mary.'[12]

As we discussed in Section 3, the prediction of our proposal is that both DN and MN license NPIs in [Spec, *v*P]. This prediction is borne out with examples (25). Assuming that Japanese subjects can remain in [Spec, *v*P] (Fukui (1986); Kuroda (1988); Lasnik and Saito (1992); Takahashi (1994)), both DN and MN license subject NPIs in-situ in clear contrast with object NPIs (cf. (20)).

Finally, when object NPIs, which are otherwise completely unacceptable with MN, are displaced/scrambled out of VP, the acceptability dramatically improves as correctly predicted by our analysis. Consider the example (26).

(26) *Displaced/Scrambled NPI in Japanese*:[13, 14]
?[$_{NegP}$ [$_{CP}$ [*Daremo*$_i$ [$_{TP}$ [$_{vP}$ John-ga [$_{VP}$ t_i tatai]]-ta]] no-de (wa)]] **-nai**].
anyone John-Nom hit-Past C-Cop-Foc-**Neg**
'*Anyone$_i$, John did NOT hit t_i.'[15]

Assuming that the clause-internal/local scrambling in Japanese is TP-adjunction (Saito (1992)) and NPI-licensing takes place at the traditional S-structure, this data also follows from the main proposal because MN can access to TP-adjoined positions (γ) exactly like *v*P-adjoined positions (β) discussed in this section.

5 Conclusion and Consequences

This paper has presented three-step arguments. First, we have pointed out empirical problems with Horn's (1985) proposal that the duality of negation comes from ''pragmatic ambiguity'' and MN inherently cannot license NPIs. Second, we have proposed the syntactic structures of two types of negation. Finally, it has been shown that the PIC-based approach to NPI licensing can fix Horn's empirical flaw and account for the broader range of empirical facts.

If the proposed analysis is on the right track, we can suggest some consequences for the syntax of negation. As we have claimed that MN is syntactically realized within the CP-domain, it follows that the dichotomy of negation is 'syntactic' in nature, casting doubt on Horn's purely 'pragmatic' approach. Furthermore, as for the debate on a negative operator, an ad hoc MN operator will become unnecessary both empirically and theoretically. As a consequence, only one neutral negative operator is necessary and sufficient in natural languages, and the difference in NPI licensing will deduce from syntactic structures and an independent principle like PIC.

As prospect of this paper, the distribution of Neg would be further derived with the theory of adjunction (Boeckx (2008)). If this idea is tenable, it might be that the 'core' clausal backbone (C-T-*v*-V) emerges (Richards (2007)), and a bare theory of locality of selection is retained. Also, if Constituent Negation (CN) selects DP, it follows that Neg is 'phase-head friendly' requiring a further unified explanation.

Notes

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[1] The meaning of the term 'MN' is twofold in this paper; (i) MN markers/operators (*NOT*) in particular and (ii) MN structures/sentences as a whole.

[2] Horn (1985) confines the definition of MN within non truth-functional negatives. In this paper, by contrast, I refer to all types of denial/objection negation as MN in a broader sense.
[3] Throughout this paper, I will indicate MN with capital letters *NOT* which phonologically reflect the obligatory marked stress property on the negative marker *not*.
[4] Abbreviations used in this paper are the following: Nom = nominative case marker, Acc = accusative case marker, Dat = dative case marker, Top = topic marker, Foc = focus marker, Neg = negative marker, Past = past tense marker, C = complementizer, Cop = copula.
[5] The contrastive focus marker *-wa* in Japanese is optional.
[6] In Pollock's (1989) original formulation, AgrP is assumed to project immediately below NegP. Under the current minimalist theorizing, however, it is eliminated on the theory-internal reason, and alternatively *v*P is adopted as 'core' functional category.
[7] Hiraiwa and Ishihara (2002, 2012) originally assumes the *Split-CP Hypothesis* of Rizzi's (1997) system, and treats *-no* as Fin^{o} and *-da* as Foc^{o}.
[8] While there are several possibilities to implement the null Neg (e.g. covert focus movement), the timing of focus movement and NPI licensing becomes highly important. That is, the NPI *anyone* cannot be licensed iff NPI-licensing occurs at the S-structure, contrary to the traditional D-structure licensing. This state of affairs poses a serious question why *NOT* cannot license the Object-NPI *anyone*. Alternatively, we can treat *NOT* itself in MN structures as vacuous (pleonastic) Neg, Negative Polarity Item, or Negative Concord Item. But I simply assume here that a covert Neg operator lies within the CP-domain in English MN structures.
[9] Interestingly, one of my informants points out that when argument and adjunct NPIs co-occur, MN becomes able to license object NPIs within VP as in (a), contrary to the previous conclusion.

(a) John did **NOT** hit *anyone at all*.

This phenomenon is reminiscent of free additional *wh*-/scrambling effect, i.e. additional NPI effect, given that movement and NPI-licensing dependencies are essentially the same. Richards' (1998) *Minimal Compliance* might be relevant here.
[10] To determine precise syntactic positions of adjunct NPIs, we should do syntactic tests like VP/*v*P-deletion/fronting, which will be left for future research.
[11] We will not restrict the definition of MN to an exact echo property as proposed by Carston (1996). Otherwise, independent of the question whether MN structures can license NPIs, previous utterances required for MN cannot exist from the beginning, as shown below.

a. *Daremo Mary-o tatai-ta-yo-ne? *Daremo Mary-o tatai-ta-no-de-wa-nai.
b. *Daremo Mary-o tataki-masi-ta-ka? *Daremo Mary-o tatai-ta-no-de-wa-arimasen.

[12] One of my informants reports that subject NPIs come to relatively improve with the MN interpretation even in English as in (a).

(a) ??*Anyone* did **NOT** hit Mary. (cf.) **Anyone* did **not** hit Mary.

Although the judgment is highly shaky, this data suggests the relevance of PIC in English MN structures. I leave this for further investigations.
[13] Hironobu Kasai (p.c.) has correctly pointed out to me that since Japanese NPIs lack Case-markers and thus their subject status is unclear, we should use as test case the following examples in which postpositions/inherent case-markers such as *-ni* 'to' or *-to* 'with' appear.

a. ??Dare-**ni**-mo Mary-ga tatak-e-ta no-de-wa-nai.
b. ??Dare-**ni**-mo monndai-ga tok-e-ta no-de-wa-nai.
c. ??Dare-**to**-mo John-ga au no-de-wa-nai.

[14] Scrambled NPIs can be licensed by DN more easily like (a).

(a) DN: nanimo$_i$ John-wa t_i tabe-nakat-ta.

To analyze this example, we may take NPI-licensing to be an ''anywhere'' condition like Binding Condition A. Interaction of timings of NPI-licensing and displacement/scrambling has to be carefully considered.
[15] The Japanese example corresponding to English NPI topicalization is similarly bad as shown in (a), probably because *wa*-marked phrases are located above Neg (e.g. TopP) or affixation of *-wa* to NPIs is banned for some semantic and/or morphological reasons.

(a) **Daremo*-wa$_i$ John-ga t_i tatai-ta no-de-wa-**nai**.
anyone-Top John-Nom hit-Past NM-Cop-Foc-**Neg**
'*Anyone$_i$, John did NOT hit t_i.'

Therefore, the reason why only Japanese has an amelioration effect via displacement can be attributed to availability of scrambling.

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