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Introduction

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We were extremely pleased to welcome the 2013 Western Conference on Linguistics (WECOL) and the Arizona Linguistics Symposium to Arizona State University in Tempe on November 8-10, 2013. This combined conference featured approximately 40 talks from scholars from 10 different countries, including representation from 19 universities in the United States alone. To highlight the linguistic diversity of our region, we had two intellectually challenging plenary talks by Elly van Gelderen (Arizona State University) and Mary Ann Willie (University of Arizona). Van Gelderen's talk, entitled "Historical Generative Linguistics: What diachronic cycles tell us", argued that historical linguistics can play a crucial role in understanding and advancing formal generative linguistics. By providing examples of systematic linguistic change, van Gelderen showed how such patterns provide insight into how we think about the Faculty of Language. In her talk entitled "*your nizhóní self:* The Spoken Varieties of Diné Bizaad (Navajo Language)", Mary Ann Willie demonstrated the increase of English vocabulary in the spoken varieties of Navajo. She highlighted the adaptability of various Navajo constructions to English words and phrases and discussed how to teach a language that is undergoing such rapid change. This theme of linguistic diversity in Arizona was further highlighted and showcased during the reception, where a Native American musician and two Native American dancers provided our guests with additional knowledge of the culture of our region and great entertainment.

The nineteen papers included in these Proceedings of the 2013 Western Conference on Linguistics / Arizona Linguistics Symposium reflect the diversity of linguistic research presented during the conference. The volume is organized into seven thematic sections. The first section presents articles that focus on language acquisition. In her article, Danton explores the corpus of two children to compare stages of acquisition of the determiner phrase (DP) in native language and in bilingual first-language acquisition. The results point to the less than clear-cut stages of DP acquisition (e.g., Hulk 2004) as well as provide support to the claim that children build two separate grammars (e.g., Paradis and

Genesee 1996). The second article, by Donahoo, focuses on the issue of age of acquisition in the development of nouns and verbs. His results favor various frameworks and also endorse a connectionist account of age of acquisition effects coupled with a semantic account. The third paper, by Brixey, tackles the issue of resumptive first language acquisition, which, she argues, includes a process of reacquisition, reactivation, or relearning. Brixey thus presents a model to describe the various factors at play during resumptive first language acquisition for both children and adults and aims at attracting attention to this very little studied phenomenon.

The second section comprises three articles that examine the Spanish language from various angles. First, Beas considers the analysis of periphrastic passive constructions with *ser* and *estar*. He argues that passivization is an operation on event structures, rather than argument structure, and that it represents the spell-out of an aspectual head. Second, Ganeshan adds to our knowledge of case marking of the object experiencer in reverse psychological (r-psych) predicates. Based on the correlation that exists between case marking and eventuality in r-psych verbs, she offers a principled-based classification of Spanish r-psych predicates that includes eventualities but excludes case marking. Finally, Garza Bazán scrutinizes the factors that influence the use of bidialectalism and loanwords in the speech of Mexican immigrants in Puerto Rico. Her findings support MacDonald and Thornton's (2009) Production-Distribution-Comprehension model stating that linguistic experience and a certain amount of exposure play a significant role in the choices and patterns of production.

The third section on morphosyntax includes three papers. By examining Japanese nominalizations, Imaoka proposes a new system for phrase structures—namely, multiple categorization—in Distributed Morphology (e.g., Halle & Marantz, 1993). Indeed, she highlights issues that current analyses have in explaining Japanese nominalizations and provides evidence for the need to expand the Distributed Morphology framework to include one-to-many categorizations. In their article, Obata and Sugimura study case valuation in Japanese, a language in which phi-agreement is missing. An analysis of the verb *give* is provided and supports Chomsky's (2000) case system. The authors therefore suggest that case-assignment occurs along with phi-agreement even in a language like Japanese. Sobin's article completes this section. His article further explores agreement, case, and articulated EPP in the task of finding subjects in English. Sobin proposes two types of agreement—subject-first and verb-first agreement—concluding that articulated EPP features allow finding surface subjects.

In the fourth section, the readers will find two articles on complex numerals. The first, by Anderson, provides insight into two expressions of approximation using *some* that exhibit separate semantic representations. However, these expressions can be treated similarly with a choice functional analysis of *some* allowing for alternatives to be available in the semantics. The second article, by

Ouwayda, examines additive complex numerals in Lebanese Arabic in comparison to Standard Arabic. She provides evidence for an additive operation that is different from coordination but allows the composition of complex numerals prior to merging with the rest of the DP.

The fifth section presents three papers on various syntactic matters. First, Kuo examines verb-copying in Mandarin Chinese and argues that the copied verb in this construction is an instantiation of differential object marking, closely related to the internal topicalization mechanism of the object NP. Second, Lee and Kang review the selectional properties of adjectives in English. The authors conclude that the difference in the structures of the complements of adjectival predicates stems from their specific selectional properties. Third, Sung examines intervention effects in Korean *wh*-phrases. In particular, Sung reviews a structure with multiple *wh*-phrases that cannot be accounted for with Beck's (2006) semantic approach to intervention effects. Sung proposes an explanation by relying on the *wh*-cluster hypothesis (Grewendorf, 2001).

The two articles in the sixth section focus on two aspects of pragmatics. Park studies the semantic and pragmatic properties of two types of so-called Biscuit conditionals (or relevance conditionals) in Korean. In the first type, the relevance of the consequent clause must be inferred by the addressee, resulting in acceptability judgments that are sensitive to context and intonation; in the second type, the antecedent contains a speech-act verb, and these are uniformly judged to be felicitous. In the second paper of this section, Tanno provides an overview of the various functions of the connective *sorede* and its variants in Japanese oral narratives. Tanno's study shows that, the majority of the time, the connective *sorede* and its variants appear immediately before the introduction of narrative clauses and thus concludes that these connectives dominantly emerge in narratives.

The last section bridges the gap from phonology to syntax to the interfaces. In her article, Baertsch examines the syllabification of diphthong plus liquid rhymes in English by comparing dictionary descriptions, predicted syllabification based on sonority, and the results of a perception experiment. She finds that, while dictionary descriptions are influenced by orthography, actual production and perception tend to favor disyllables, with differences between coda liquids falling generally in line with the predictions based on sonority. The focus of Berry's article is on the use of *hopefully* as a sentence-initial stance adverb in present-day English. Berry first examines the morphosyntax of *hopefully* as well as the lexical semantics of the word and then explores corpus data to propose that the change in the use of the word may result from analogy, from the affix *-ful*, or from a combination of the affixes *-ful* and *-ly*. Finally, Monich examines the distinction between the disjoint and the conjoint verbal forms in Sotho languages, Sesotho and Setswana in particular. Monich's account connects the difference found in tonal contours of the disjoint and conjoint forms to the syntactic operation of V-to-T movement.

The 2013 Western Conference on Linguistics / Arizona Linguistics Symposium would not have been possible without generous contributions of time and resources from many individuals and academic units. In particular, we would like to thank our sponsors: Dr. George Justice, Dean of Humanities, College of Liberal Arts and Sciences, Dr. Barbara Lafford, Professor in Charge of Humanities, School of Letters and Sciences, Dr. Sally Kitch, Director, Institute for Humanities Research, Dr. Mark Lussier, Chair, Department of English, Dr. Joe Cutter, Director, School of International Letters and Cultures, and Dr. John Tippeconnic, Chair, American Indian Studies. Additionally, many individuals have helped with the organization of this conference. In particular, we thank the steering committee members for all their help and advice along the way: Helene Ossipov (co-chair, SILC), Claire Renaud (co-chair, Dept. of English), Elly van Gelderen (Dept. of English), Carla Ghanem (SILC), Sara Lee (SILC), Mariana Bahtchevanova (SILC), Tomoko Shimomura (SILC), and Xia Zhang (SILC). In addition to the steering committee, other faculty members provided their expertise to review abstracts: Karen Adams (Dept. of English), Omar Beas (SILC), Alvaro Cerron-Palomino (SILC), Carrie Gillon (Dept. of English), Verónica González López (SILC), Mark James (Dept. of English), Ruby Macksoud (Dept. of English), Luke Plonsky (Northern Arizona University), Kathryn Pruitt (Dept. of English), Michael Shepherd (Fresno State University), Koji Tanno (SILC). For their help with the logistics, we thank the following staff members: Roxane Barwick (SILC), Jamie Coburn (SILC), Jo Faldtz (SILC), Gini Kramer (SILC), Kristen Burt LaRue (Dept. of English), Vesna Markovich (SILC), Maya Martin (SILC), and Cara Walters (SILC). Finally, we thank all the volunteer graduate students who ensured that the conference was running smoothly: Margaret Alvarado (SILC), Melissa Bailey (Dept. of English), Naomi Danton (Dept. of English), Tonya Eick (Dept. of English), Steven Flanagan (SILC/Dept. of English), Rebecca Foster (SILC), Ali Garib (Dept. of English), Daniela Kostadinovska (Dept. of English), Alexander Makiyama (Dept. of English), Jeston Morris (Dept. of English), Nooryyah Rochman (Northern Arizona University), Mattison Smith (Dept. of English), Cynthia Tsunoda (Dept. of English), Cameron Von Berg (SILC), Amanda Weaver (SILC), and Jacqueline Welsh (Dept. of English). In short, thanks to all who ensured that the conference became the success that it did.

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Development of the Determiner Phrase in Bilingual First Language Acquisition: A Comparative Corpus Analysis

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1. Introduction

In the past two decades, there has been increasing interest in the study of bilingual first language acquisition (BFLA) as a means to understand the cognitive processes underlying acquisition of linguistic structures—lexical and particularly grammatical elements. While it is certainly worthwhile to analyze a monolingual child's first language (L1) acquisition in order to better understand which areas of acquisition are most difficult or troublesome (e.g., tense, agreement, development of functional elements), the speech of bilingual children in particular often provides even greater insight, as cross-linguistic influence or interference highlight those troublesome areas. As Paradis and Genessee (1997) observe:

> Bilingual children can inform us about the ontological development of functional categories in all children because cross-linguistic data are important in determining…[how we account for] the nature of First Syntax" (p. 99; see also Hulk 2000, Meisel 2001).

In this study, I attempt to build on previous research conducted in BFLA. Based upon data from the Child Language Data Exchange System (CHILDES) corpus (MacWhinney 2000, MacWhinney and Snow 1985), I focus on the acquisition of functional elements in the nominal phrase (NP) and particularly the determiner phrase (DP)—comprised of nouns, adjectives, and determiners such as articles and demonstratives—in the bilingual development of a French-English speaking child, Olivier, for a period of one year. In the attempt to determine whether cross-linguistic influence is a factor in Olivier's production and to what degree it may play a role, I compare his speech with that of a monolingual French-speaking child, Théophile. I situate the subjects' speech

within the framework of proposed stages of determiner acquisition (see section 2.4). Lastly, I consider the acquisition of the definiteness feature by the subjects.

2. Research in BFLA Syntax

2.1. Cross-linguistic influence in the bilingual learner

Syntax-related studies in BFLA often center on the following research questions:

- Does the bilingual child work off of one overarching syntactic system that incorporates both languages, or does she simultaneously develop separate systems for each of her languages?
- Does *interlanguage contact* or *cross-linguistic influence* occur? If so, to what extent?

When analyzing cross-linguistic influence, it is important to understand how the two languages interact and influence each other. First, there is still strong debate over whether interlanguage contact—crossovers or interference between two languages—at the grammatical level contributes to bilingual children's development of two simultaneous syntactic systems (see, e.g., Paradis and Genesee 1997 who conclude that, although contact may occur, it is not a significant factor in bilingual development). Second, if we assume that at least some interplay of languages occurs and has an effect on the child's development, it is important to determine whether influence is bilateral, with both languages interacting, or unilateral, with one language dominating the other. This is the essential question behind the idea of language differentiation, a key issue in the study of BFLA.

While many researchers believe that bilingual children create two independent grammars for each of their languages (the independent structure hypothesis) (e.g., De Houwer 1990, 2009, Meisel 2001), others have claimed that bilingual language learners create one overarching grammatical system (e.g., Volterra and Taeschner 1978). Although this debate is still ongoing, many BFLA researchers now agree that the bilingual child seems to construct two separate syntactic systems (Döpke 2000, Genesee, Nicoladis, and Paradis 1995, Paradis and Genesee 1996, 1997). This is evidenced by the fact that while bilingual children do make errors that are rare or non-existent in monolingual learners of the same language (e.g., in word order, negation, inflection), their constructions are still very significantly target-like with respect to each language. Nevertheless, as they are unique to bilingual speech and acquisition, these errors suggest that bilingual children do experience some interaction between their target languages.

2.2. The DP in monolingual and simultaneous-bilingual French acquisition

The acquisition of determiners by children (whether monolingual or bilingual) is an important, though somewhat overlooked, area of study. One reason it is so rich in providing insight into monolingual (L1) or simultaneous-bilingual (2L1) acquisition of syntax is due to the highly functional nature of determiner elements—definite and indefinite articles, demonstratives, personal pronouns, possessive adjectives. In regards to determiners, Heinen and Kadow (1990) note that, while articles are present at a somewhat early stage of development, "no child uses all article forms at this stage" (p. 61). They also remark that children generally begin with the definite article (most often a default masculine article) "even in contexts where one would expect to find the indefinite article" (p. 61).
Hulk (2004) and Pannemann (2006) have specifically addressed the stages of determiner acquisition in monolingual French children. The description of the stages in (1) is taken from Hulk (2004:257):

(1) Stage 1: Bare noun
Stage 2: Det **or** Adj + N[1]
Stage 3: Det+Adj+N
Stage 4: Postnominal Adj. added to stage 3 structure
Stage 5: Adj. gender agreement occurs with noun

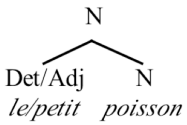
Hulk does not say exactly when gender agreement appears on definite and indefinite articles, though she does note that such agreement errors are quite rare in monolingual learners.

To clarify a couple points regarding (1), in stage 2, the child combines a noun with either a determiner or an adjective, but not both together. This suggests that she may only initially have access to two positions in the nominal structure (see (2)) and then later develop an extra position allowing for both a determiner and pronominal adjective (see (3)). Citing Granfeldt (2000a), Hulk observes:

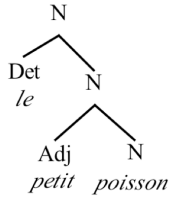
> The appearance of post-nominal adjectives in the child data [both monolingual and bilingual] indicates the next step in the structural development of the DP: the position of the adjective suggests [noun movement]" (p. 254).

Hulk suggests possible syntactic derivations for some of the stages she describes (all trees from Hulk 2004:254):

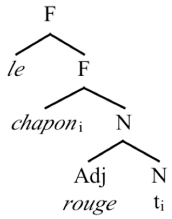
(2) Stage 2 structure



(3) Stage 3 structure



(4) Stage 4 structure (incorporating N-movement to account for postnominal adjective)



3. Methods

3.1. Research purposes

I analyze and compare the production of two children: monolingual French speaker Théophile and bilingual French-English speaker Olivier. My analysis focuses on the development of the DP structure and DP elements (e.g., bare nouns, articles, demonstratives) in their data samples. I also consider the development of DP-related features such as definiteness and gender marking. The main goal of this comparative analysis is to ascertain whether the production of the bilingual child shows evidence of cross-linguistic influence.

3.2. Subjects

For this study, I chose two subjects from the CHILDES corpus (MacWhinney 2000, MacWhinney and Snow 1985). The data for the bilingual subject, Olivier, are from the "Genesee" corpus, and the data for the monolingual subject, Théophile, come from the "French – Paris" corpus. The data for both subjects consist of conversations recorded in naturalistic play settings. 20 minutes of each session was then transcribed using the CHAT system by the researchers who gathered the data.

3.3. Data collection

Three transcripts of bilingual data are available for Olivier at ages 1;10.05 (the earliest recording of speech), 2;05, and 2;11.15. In an attempt to control for as many variables as possible, the monolingual speaker's data were tailored to fit Olivier's as close as possible. Since Olivier is from Montréal, I wanted to use a monolingual French-Canadian for this comparative study. However, no suitable data were available. I therefore chose Parisian French as it is often considered to be Standard French. I chose three transcripts of comparable age with Olivier's data: 1;10, 2;06.03, and 2;11.28.

During data collection and coding, I looked specifically for bare nouns, definite and indefinite articles, but also for demonstratives, possessive adjectives, partitives and quantifiers.

4. Analysis

4.1. Olivier's data

4.1.1. Olivier's data (1;10.05)

Olivier's first data set contains a variety of words and structures: tensed verbs (*attrape* [imperative] "catch"), adjectives (*broken*), adverbs (*encore* "again"*, là-bas* "over there"), negation (*no bonjour*), as well as a number of nominal phrases, both with and without determiners.

Approximately half of his nouns are bare, as shown in (5):

(5) *CHI: *baby*

However, a significant number of nouns have the requisite determiners, as illustrated by (6):

(6) *FAT: *il est où le chat?*
it is where DEF-M cat.M.SG
"where is the cat?"
*CHI: *un chat.*
INDF-M cat.M.SG
"a cat"

Example (6) shows evidence of a possible definiteness mismatch. While his father poses the question with a definite article, Olivier responds with the indefinite even though he is indicating a specific cat, suggesting that he may still be learning definiteness features.

Although he has begun to include determiners with many nouns, Olivier is still learning the rules regarding determiner usage, as illustrated by examples such as (7), where he initially (correctly) assigns an indefinite article to the noun, but drops it in the subsequent utterance, even after his father repeats it with the article.

(7) *FAT: *c'est quoi ça ici?*
CL is what that DEM
"what's this here?"
*CHI: *un cancan.*
INDF-M [cancan][2]
"a [cancan]"
*FAT: *un quoi?*
INDF-M what
"a what?"
*CHI: *canard.*
duck
*FAT: *un canard.*
INDF-M duck.M.SG
"a duck"
*CHI: *canard.*
duck

This may also be due to English allowing more bare nouns than French (which only permits bare nouns in rare, restrictive cases), which is a possible explanation for (8) where *poulet* requires the partitive (*du*) in French but is a bare noun, *chicken*, in English.

(8) *FAT: *qu'est ce t'as [: tu as] mangé comme souper?*
what is it CL have eaten as dinner.M.SG
"what did you eat for dinner?"
*CHI: *poulet.*
chicken

Based on this data, we see that Olivier is obviously still building his DP grammar. The majority of the nouns produced remain bare even though a determiner should accompany most of them. Furthermore, the data contain a few examples where the same noun is sometimes used with a determiner, sometimes determiner-less (e.g., *la balle* "the ball" is later *balle*), highlighting the "under construction" quality of the subject's DP. Nevertheless, the numerous instances of article production illustrate that Olivier is capable of combining a determiner with a noun, thus placing him within Hulk's (2004) stage 2.

4.1.2. Olivier's data (2;05)

By 2;05 years old, Olivier's data place him firmly in stage 3 of development of the DP, where he has access to a more complex syntactic structure that allows for both a determiner and an adjective before a noun.

(9) *MOT: *where do you sleep?*
*CHI: *dans un grand lit*.
in INDF-M big.M.SG bed.M.SG
"in a big bed"

In (9), we see Olivier using a (Prep+) D+A+N structure. Furthermore this is a creative, individual response to his mother's question, not simply a repetition of what his mother previously said. These data also show that he is able to produce utterances of at least 5 words.

At this stage in his development, Olivier includes nearly all necessary determiners, with only two instances of bare nouns, both of which are questionable as to what extent they may be affected by the surrounding discourse.

Besides these two possible errors, Olivier correctly uses determiners when required with nouns. He also correctly uses a bare noun when required in English, as illustrated in (10).

(10) *CHI: *had breakfast.*

Additionally, he consistently applies the correct gender to the determiners and seems to understand basic definiteness features, as his data include multiple examples of both definite and indefinite articles. His data only have a couple examples of a possible definiteness mismatch. One occurs in (11), where he gives the definite article *le* rather than the indefinite article *un* required for introducing a new item into the discourse.

(11) *MOT: *what's that, honey?*
*CHI: *le tracteur!*
DEF-M tractor.M.SG
"the tractor"

Olivier's data also include some instances of quantifiers/numbers (*four goals*, *deux minutes* "two minutes"), possessive adjectives (*ma pomme* "my apple"), partitives (*du lait* "some milk"), and even one demonstrative (*this one*).

Overall, it would seem that Olivier is well established in a stage 3 level of understanding of the DP. Although he has good control over his usage and is capable of rather long utterances, he does not show evidence of being in stage 4 yet as he does not have any postnominal adjectives in this data.

4.1.3. Olivier's data (2;11.15)

This data set of Olivier does not greatly expand the analysis, although there are a few interesting points of data. While his speech is obviously more developed over the six-month period between this data set and the previous one, there is not strong evidence to support him having reached a new stage of DP-related acquisition in French, as there are only two instances of D+N+A structures, and both are directly repeated after his father, as we see in (12).

(12) *FAT: *Olivier, sur ta joue gauche ou ta joue droite?*
Olivier on 2P.F.SG cheek left or 2P.F.SG cheek right
"Olivier, on your left cheek or right cheek?"
*CHI: *ma joue gauche.*
1P.F.SG cheek left.F.SG
"my left cheek"

Regarding the use of bare nouns and determiners, his usage is overwhelmingly "correct"; however, there are two instances where he uses a bare noun in French where he should include an article. In one of these cases, (13), this omission appears to be related to the surrounding discourse (i.e., pragmatically rather than syntactically related).

(13) *MOT: *what did you make?*
*CHI: *pâte à modeler.*
clay.F.SG for model-INF
"modeling clay"

In this utterance, Olivier is code-mixing—responding to his mother's question in French rather than English—and uses a French lexical item, but the correct English syntactic structure.

The utterance in (14), however, indicates some possible cross-linguistic influence, where Olivier uses the English form "play hockey" instead of including the pronominal Prep+article *jouer au hockey* ("play *at* [the] hockey") required in French.

(14) *CHI: *il a joué hockey?*
he has played hockey
"he played hockey"

There is also one interesting example (15) where Olivier over-applies the definite article in English, in a case where a bare noun should be used instead. This may also be indicative of cross-linguistic cue competition from French.

(15) *MOT: *what kind of popcorn?*
*CHI: *what (.) kind (.) (.) popcorn.*
*CHI: *the corn in the cob.*
*MOT: *corn on the cob [=! laughs]!*

It is perhaps surprising that there are more examples of Olivier having difficulties with determining article or bare noun structures in this data set than in the previous one. This may indicate that he is at a stage of development where he is beginning to better understand the semantic and pragmatic meanings behind the usage and is temporarily over-applying rules.

Regarding his acquisition of definiteness features, there is only one example of a possible definiteness mismatch in this data set, as provided in (16):

(16) *FAT: *Olivier, avec quoi on répare ta bicyclette?*
Olivier, with what we repare 2P.F.SG bicycle
"Olivier, what did we fix your bike with?"
*CHI: *avec le marteau.*
with DEF-M hammer
"with the hammer."

Since it has not previously been mentioned in the discourse, and does not necessarily require specification, we might expect Olivier to respond to his father's question with an indefinite article. However, it is perhaps equally as likely that the family has one household hammer that Olivier is identifying as the (definite) one that his father used to fix his bike.

4.2. Théophile's data

4.2.1. Théophile's data (1;10.00)

Théophile's first data set contains a very limited set of utterances. Most of his utterances consist of one word, placing him firmly within stage 1 of acquisition. The transcript includes multiple instances of words such as *papa* "daddy", *maman* "mommy", and *non* "no", and noises such as *vroum vroum* "vroom vroom". Théophile uses a couple of root infinitives at this stage and only one bare noun, *clef* "key", which he repeats directly after his mother (who uses it with an article, *la clef* "the key"). There are no instances of determiner elements or adjectives in this data set.

4.2.2. Théophile's data (2;06.03)

In Théophile's second data set, we see a limited amount of determiners emerging, as in (17).

(17) *MOT: *David [/] il faisait quoi David ?*
David he was doing what David
"David, what was he doing [being] (David)?"
*CHI: *euh le loup.*
uh, DEF-M wolf.M.SG
"uh, the wolf"

The majority of nouns are still determinerless. However, there are a few instances where Théophile correctly uses a determiner (in this case, the partitive), even in cases where it does not come from the immediate discourse.

Overall, Théophile seems to be in the early-to-mid stages of stage 2, where he still has many one-word utterances but has begun to add determiners and partitives in front of nouns, though it is not clear to what extent he understands their purpose.

4.2.3. Théophile's data (2;11.28)

Analysis of Théophile's third data set shows a rather convoluted picture of his development process. His inclusion and use of necessary determiners has developed as shown in (18) and (19):

(18) *CHI: *les ballons Lili euh oh là là là!*
DEF-PL balloons.PL Lili uh [exclaims]
"Lili's ballons oh wow!"
(19) *CHI: *veux faire un ballon attendez.*
want do INDF-M balloon.M.SG wait
"I want to make a balloon, wait."

And yet bare nouns are still rather prevalent in his data. Even regarding the same word, he may sometimes include an article, and sometimes not, as illustrated in (20) and (21):

(20) *CHI: *oh eh y a ballon dessus là!*
oh uh CL has balloon up DEM
"oh uh [there] is balloon up there!"
(21) *CHI: *gros ballon regardez [/] regardez!*
big.M.SG balloon.M.SG look look
"big balloon, look look!"

Looking at an utterance such as (21), we may hypothesize that he is perhaps in the stage of development where he only has a structure for either a determiner or a pronominal modifying adjective. However, that is not entirely supported by the data, as D+A+N structures, such as (22), occur three times within the data:

(22) *CHI: *hum un gros ballon!*
hmm INDF-M big.M.SG balloon.M.SG
"hmm a big balloon!"

Based upon these data, it is difficult to assess Théophile's stage of determiner acquisition. On one hand, his data still include many examples of bare nouns. On the other, he not only uses determiners about half of the time, he also uses D+A+N structures. He also uses possessive adjectives (which Heinen and Kadow 1990 place in stage 4 of acquisition) somewhat often and always correctly, as well as several correct instances of partitives.

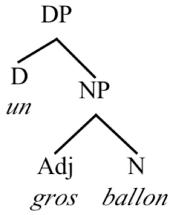
It is worth noting that, while Théophile still seems to have some difficulties knowing when and where to include articles, when he does use them, he always assigns the proper definiteness features (i.e., there are no instances of him using, for example, an definite where an indefinite is required).

5. Discussion

The data provide an interesting and somewhat unexpected view of acquisition. Although Théophile is a monolingual learner and therefore does not receive competing input from two languages, as Olivier does, he does not show evidence of learning determiner systems at a faster rate or more successfully than the bilingual child. To the contrary, he seems to have greater difficulty in many respects, using a much higher quantity of bare nouns than Olivier, even though he likely receives very little input including bare nouns due to restrictions in French syntax. Olivier, on the other hand, receives competing and contradictory input concerning use of determiner and bare nouns, but seems to set the parameters earlier and more clearly. As illustrated in the results section, his occasional errors indicate possible cross-linguistic influence but there are not enough instances recorded in the data to make a claim in that regard.

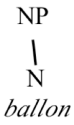
Théophile's data in particular provide an interesting view of DP development in child language. By the time he is 2;11, Théophile has access to a more expanded "stage 3" DP structure, which may include a determiner and prenominal adjective, as in (23) (repeated from (22)):

(23) *CHI: [*hum*] *un gros ballon !*

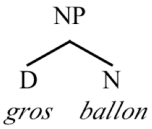


Yet he continues to regularly use stage 1 and stage 2 structures, as in (24) and (24) (repeated from (20) and (21)).

(24) *CHI: *oh eh y a ballon dessus là !*



(25) *CHI: *gros ballon regardez*



These data are significant for a number of reasons. First, they highlight the fact that the stages of DP development are not as clear-cut as they are often presented to be in studies of child language acquisition (Heinen and Kadow 1990, Hulk 2004). Although Théophile has access to stage 3 structures, he still makes use of less complex and syntactically incorrect structures. It is unclear why this should be, as it is not obviously related to utterance length, nor is it due to the surrounding discourse. He seems to be still in the process of understanding the syntactic function of determiners, although, when he includes them, he is always correct in his use of features that are semantic or discourse related (e.g., definiteness, partitive).

Secondly, these data provide support for a Continuity view of L1/2L1 acquisition (see, e.g., Clahsen 1990/1991, Demuth 1994, Hyams 1996, Lust 1999). If access to syntactic features and functional categories were simply a matter of neurological development, a step-by-step process as proposed by the Maturation theory (Borer and Wexler 1987, Radford 1990), there is little explanation as to why Théophile would omit functional categories once his syntactic system had matured enough to include them. Following the Continuity theory, Théophile would not initially have a fully developed adult-like DP, but

he would have always had access to the functional category of determiners through Universal Grammar. His variation in the use of determiner elements seems to come from some constraints on this access, such as underspecification of certain features (e.g., Clahsen 1996). Additional data would be needed in order to further clarify what these constraints are and how they affect Théophile's acquisition of the DP.

As for the definiteness feature, the data for both boys is simply too limited and not clear. When he uses an article, Théophile seems to have little to no issue assigning the correct definite or indefinite feature. Because he is a monolingual French speaker, there is no evidence that Théophile would consider bare nouns to have a "generic" or "mass" interpretation that an English speaker such as Olivier could potentially assign. Rather, he seems to still be acquiring the rules of article use in French. Olivier generally assigns the correct definite or indefinite article, but does make some errors. The fact that he makes more errors than the monolingual Théophile may indicate some cross-linguistic interference but the data are too limited to even make a general claim at this point.

6. Conclusion

This study contributes to the research in L1/2L1 determiner and definiteness acquisition in several ways. First, it adds to the discussion by comparing DP acquisition of French and English, which differ in the structure and features of the DP. Second, in providing evidence for the rarity and limited aspect of cross-linguistic influence, it supports the claim that children who simultaneously learn two L1s build two separate grammars. Lastly, and perhaps most significantly, it complicates the seemingly clear-cut "stages" of DP acquisition.

This study is limited in that it only analyzes a small subset of the data provided by the two corpora. Further research that considers not only the entire data set of both subjects but also those of additional monolingual and bilingual French-speaking children would help expand and clarify their development of determiner elements.

Notes

[1] Note that only prenominal adjectives are available to learners at this stage.
[2] non-word

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The Import of Youth: A Review and Experimental Study of Age of Acquisition in Nouns and Verbs

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1. Introduction

1.1. Overview

This paper attempts to thoroughly discuss age of acquisition (AoA) in both theoretical and empirical contexts. AoA will be related to grammatical class, and support will be given for specific neuroanatomical accounts as well. A study was conducted using a lexical decision task, (subjects indicate as quickly as possible whether a letter-string stimulus is a word or not) which found that AoA affects verbs and nouns differently. Endorsement of a connectionist framework, paired with a semantic account is used to explain the results. Additionally, a case for distinct neural representation in the brain is championed.

1.2. Background

There have been many studies designed to investigate what variables determine the rate and precision of word retrieval processes. All of these studies aim to find inferences of what factors intervene in the recognition of a word, and some attempt to corroborate with various general cognitive frameworks. From these studies, many variables have been documented to have an effect on the access of a retrieval processes of a given word—its concreteness, embeddedness, familiarity, frequency, imageability, length, neighborhood density, whether it has been lexically or semantically primed, and several others (Cortese and Khanna 2007).

In order to clarify these factors, a basic model of lexical retrieval should first be established. Generally, the perceptual process of lexical retrieval involves the activation of lexical representations that have been stored in long-term memory. Coupled with this activation is a selection process so that the 'correct' word is

selected for among the competing neighbors that are also activated: A disambiguation process is necessary as any given stimulus word can activate more than one representation in the mental lexicon.

Concreteness, one factor in the lexical retrieval process, expresses the extent to which a word depicts some object that is, to a certain extent, tangible, an object that can be experienced by the senses. Concrete words enjoy an advantage over abstract words in recognition, lexical decision (Paivio 1986), and even pronunciation (de Groot 1989).

Often, lexical configurations may feature embeddedness, or superimposition. This occurs when one word is embedded within another, when the sequence of letters that comprise the embedded word is a subunit of the sequence of letters of the larger, whole unit. For example *car* is embedded within *carrier*. This sort of configuration is very common and has been found to increase retrieval time due to greater processing effort (Lachaud and Kerzel 2007).

Familiarity, which varies from incredibly common function words to those that have never been seen, has also been demonstrated to contribute to the duration of the retrieval process. Eye tracking studies have demonstrated that readers will often reread an unfamiliar word in its entirety, not just dwell on it longer (Chaffin, Morris, and Seely 2001).

Another factor found to have an effect in the word retrieval process is frequency. Similar in nature to familiarity, readers spend more initial processing time on words of low frequency, those words that occur less often in the speaker's personal corpus (Williams and Morris 2004). It is also important to note that, although similar, familiarity and frequency are not necessarily interchangeable terms.

Imageability is a rating of how easily a word can be imagined. Words of high imageability prompt faster lexical access and are more memorable in episodic memory tasks (Coltheart, Laxon, and Keating 1988). Imageability is similar to concreteness; many concrete words are also highly imageable (like *cat*, for example), but the two are not the same. Color words for example (*purple*), are highly imageable, but not concrete.

Length has long been known to have an effect on recall. Lists of items with items consisting of fewer syllables are better recalled than lists with items of more syllables (e.g., Baddeley, Thomson, and Buchanan 1975). Recently, word length has been viewed as having a U-shaped effect on retrieval; New, Ferrand, Pallier, and Brysbaert (2006) found that words with three to five letters had a facilitory effect in lexical decision, words with five to eight letters had a null effect, and words with eight to thirteen letters had an inhibitory effect.

Neighborhood density has also been observed to have an effect on access. Neighbors are interpreted as words that differ from one another by the addition, deletion, or substitution of a single phoneme at any position. As such, a word like *lake* has many neighbors (*bake*, *cake*, *like*, *lace*, *flake*, etc.) and is said to

have a dense neighborhood. Luce and Pisoni (1998) demonstrated the words with sparse neighborhoods have an advantage in recognition.

In lexical decision tasks, semantic priming is observed in reaction time, where words preceded by semantically related words are more quickly recognized as words than if they are preceded by unrelated words or nonwords (e.g., Meyer and Schvaneveldt 1971, Becker 1979).

Focally among this list is age of acquisition, which refers to the age at which a word is acquired. Though initially not of major confound of interest, AoA has in recent years been viewed as especially important in the recognition of words, especially after Morrison and Ellis (1995) established that effects of word frequency were negligible if AoA effects were taken into account. They carried out six experiments, contrasting AoA with frequency. The first two experiments showed that AoA affected word-naming speed when they controlled for frequency, but the inverse did not hold true. They further demonstrated in the final two experiments that independent effects of frequency and AoA were observed in lexical decision tasks. The study was critical in holding connectionist networks (to be discussed below) accountable for AoA effects. In addition, the resurgence in interest has been triggered by the incorporation of both neuroimaging studies and especially computational modeling in research, which finally allowed experimenters the opportunity to contextualize their findings, and because AoA has such important implications for these theoretical models. The relationship is symbiotic, investigating AoA effects strengthens the viability of the models, and the modeling in turn provides further understanding of AoA itself. AoA in words that are learned at an early age are recognized faster than those learned later in life, which is a phenomenon that has been observed in a number of languages, including Chinese, Dutch, English, French, Icelandic, and Spanish (e.g., Cuetos, and Barbón 2006, Brysbaert 1996, Chen et al. 2007, Pind, Jónsdóttir, Tryggvadóttir, and Jónnson 2000). While it is possible to demonstrate support for this observation described in less localized terms as early as 1891 (Freud), it was not until the work of Carroll and White (1973a, 1973b) that established Freud's theories in the context of modern experimentation. Although AoA had now been investigated experimentally, it was not until Ghilhooly and Logie (1982) that AoA was paired with lexical decision tasks, a paradigm to be explored here, after a further review of the literature.

Now that AoA has been established, a discussion will follow which demonstrates that AoA enjoys a unique effect, separate from other lexical features. Then, a discussion of the various attempts to contextualize A0A theoretically will take place, followed by a description and analysis of the study carried out. The purpose of the study is to answer questions like (a) Does AoA affect grammatical class differently? And if it does, (b) is this evidence for neurological underpinnings? (c) Could transparency in orthography affect processing? And, (d) Do AoA effects in lexical decision tasks provide support

for any existing theoretical accounts? From the results of the study, an argument favoring specific theoretical models, as well as anatomical structure and orthography effects, will be made.

When trying to decipher exactly what variables have an influence on the retrieval of a word, it becomes a quite burdensome task, and this has indeed been a motivating force in AoA research, to tease out the relative roles of various, profoundly correlated psycholinguistic variables. Specifying what effects are exclusively the result of AoA is difficult; it is possible that many of the effects attributed to frequency, for example, correspond to some other variable, given that high frequency words are also amongst the most familiar and shortest, and it is imperative to establish AoA as an independent effect.

Indeed, investigations of just this sort have been carried out. Word reading times have been shown to be affected by AoA, rather than frequency (Morrison and Ellis 1995). Further, the faster and more accurate processing characteristic of AoA still exists, even after other factors like word frequency and word imageability are regulated (Barry, Morrison, and Ellis 1997, Bonin, Fayol, and Chalard 2001, Brown and Watson 1987, Brysbaert 1996, Morrison, Ellis, and Quinlan 1992, Stadthagen-Gonzalez, Bowers, and Damian 2004, Izura et al. 2011). Likewise, Izura and colleagues (2011) executed a controlled word training study where AoA could be mimicked in adults; they found AoA-effects for lexical decision and semantic categorization, among others.

Support for AoA in lexical cases can be garnered from other fields of enquiry as well. AoA effects have also been demonstrated in other arenas separate from the word level, including object picture naming (Barry et al. 1997, Barry, Hirsh, Johnston, and Williams 2001, Ellis and Morrison 1998), eye fixation durations (Juhasz and Rayner 2003), object decision (Moore, Smith-Spark, and Valentine 2004), facial categorization (Lewis 1999), and somewhat similarly, the naming of famous faces (Moore and Valentine 1998). It appears that the general nature of AoA bolsters support for the effects of AoA, especially in the domain investigated here; although, there is somewhat of a gradient concerning AoA and the specific task. In picture naming, all studies examining AoA effects have found such effects (Bonin, Boyer, et al. 2004), while word reading tasks are less universal. Lexical decision tasks also show AoA effects fairly consistently (Johnston and Barry 2006). Effects are not limited to one demographic either; they have been found in the young and old, in bilinguals, in Alzheimer's patients, and in a plethora of neuropsychological conditions (Johnston and Barry 2006). As Izura et al. (2011) point out, findings that extend AoA effects beyond words to other classes should lead to the investigation of a general principle. While there is thus robust support for the concept of AoA, it has not been extensively tested in relation to championing a model of neural representation, just one possibility to be explored in the present study.

2. AoA and Orthographic Transparency

Like the studies mentioned above, there have equally been a number of studies demonstrating that languages with transparent (sometimes referred to as predictable, shallow, or regular) orthographies demonstrate AoA effects, to go along with the numerous studies conducted in English, a language which has a relatively opaque (inconsistent, deep, irregular) orthography. AoA effects have been reported in several predictable languages, including Japanese (Havelka, and Tomita 2006), Italian (Bates, Burani, D'Amico, and Barca 2001), and Spanish, (Cuetos and Barbón 2006). Of particular interest for this experiment is the study on AoA in Japanese (Havelka and Tomita 2006). Japanese employs two different writing systems, Kanji, which is an arbitrary, logographic script, and Kana, a syllabic script which features regular mapping between orthography and phonology. Reading times were measured for the same words of both Kana and Kanji script, allowing for direct comparison between regular and irregular words within a shallow orthography. Despite the regular mapping of Kana, AoA effects were still found, though they were not as large as with Kanji. These findings indicate a challenge for models of AoA effects, in that regular mapping cannot be used to account for all of the observed effects of AoA.

3. Accounting for AoA Effects in Theoretical Models

While the support for AoA effects thus continues to expand, the way in which the effects of AoA are explained theoretically is still debated. These theoretical accounts should attempt to isolate the locus of the effect, in addition to determine the process by which the effect emerges (Barry et al. 1997). The approaches as to how early acquisition could be beneficial to cognitive representations and processing resemble two general types: Confining the AoA effects to their own strata of word processing, or, interpreting them as the product of brain structure, as the way information is sorted and maintained in the brain (Ghyselinck, Lewis, and Brysbaert 2004). From these general standpoints, a variety of frameworks have emerged: a bilateral representation account, the phonological completeness hypothesis, connectionist models (including the cumulative frequency hypothesis and the arbitrary mapping hypothesis), and the semantic hypothesis. Research executed here attempts to strengthen the case for endorsing a combination of the two latter models, as the results will indicate a preference to be discussed shortly. First, a brief account of these various models will be given.

3.1. Bilateral representation

While it has since been completely discarded, perhaps the first attempt to model AoA effects was associated with the idea that early acquired words were being represented bilaterally within the brain. Gazzaniga (1974) was the first to put forth an explanation for AoA in which words that are acquired early in life, before lateralization of verbal function is complete, are thence bilaterally represented. However, Ellis and Young (1977) showed that there was no reduced visual field asymmetry in early and late acquired words, meaning that there was no evidence that words learned early in life are bilaterally represented in the cerebral hemispheres. The proposal was subsequently snuffed.

3.2. Phonological completeness

The phonological completeness hypothesis proposes that AoA has its origins at the phonological level of representation, in which early-acquired words enjoy a complete storing of their phonology, while later-acquired words are represented in fragments, as it is more economical concerning the storage process for segmentation to occur, and possibly, because of limitations on storage itself. Yet, this savings in storage results in a greater processing effort in the assembly of later-acquired words (Brown and Watson 1987). Since its initial popularity, this account has recently received substantial criticism. On a conceptual level, the hypothesis challenges a dominant theory of lexical access in speech production, one involving discrete stages and the concept of the lemma (Levelt, Roelofs, and Meyer 1999, Roelofs 1997). And on an empirical level, Monaghan and Ellis (2002a) directly tested the proposition, whose segmentation task failed to support the phonological completeness hypothesis.

3.3. Connectionist frameworks

Two major computational accounts have also emerged, despite earlier claims that connectionist accounts which contrasted AoA and frequency would be difficult to produce (Gerhand and Barry 1998). Researchers could also have been leery to tackle any sort of computational modeling because AoA is actually a behavioral event—which must be understood as a theory addressing the preference of why some words are learned earlier than others—and not a variable like frequency (Zevin and Seidenberg 2002), though the label as variable has been retained here, for its convention and ease of use. While the literature often groups the two approaches together under a unified banner of connectionist approaches, the experimental results will demonstrate that it is critically necessary to analyze the Zevin and Seidenberg (2002) framework separately from the Ellis and Lambon Ralph (2000) proposal.

To begin, it is necessary to understand how both of these connectionist models tackle the problem generally. All models are an attempt at explaining intellectual skills via a system of neural networks. These neural networks are themselves simplified models of the brain, comprised of units, or 'neurons', and a system of weights which measure the strength of connections between the units (Garson 2010). The simple processing units are bundled together into larger and more complex networks. Knowledge is stored and represented by the strength of the connections between the units. Patterns that are presented early are better acquired because the model's learning gradients are sharpest at the onset of training, therefore causing a dramatic shift of the weights in their favor. So, AoA, and its influence, depends on the affiliation of the input mode and the output response. This is a persistent advantage in shift, one which has durative effects throughout the course of the model and cannot be overcome even in respect of increasing vocabulary size; the early patterns are "entrenched" (Zevin and Seidenberg 2002).

3.3.1. Cumulative frequency

Zevin and Seidenberg (2002) presented a parallel distributed processing network which implemented AoA effects via cumulative frequency, where apparent A0A effects are accounted for by differences in the cumulative frequencies of words classified as early or later, essentially trajectories that examine how experience with a word is distributed over time. However, frequency trajectory was measured according to frequencies of words in print. And as Johnston and Barry (2006) critically state, many words are learned well before even basic reading skills are in place. Their modeling has a general result in which AoA effects will appear most reliably in object and face naming tasks, where there are arbitrary or inconsistent mappings, but not in skilled reading tasks, as the irregularities in orthography and phonology, at least in alphabetic script, are too small. This concept of cumulative frequency has already been considered unfavorably (Carroll and White 1973b). Further, AoA effects have already been reported in face classification tasks which could not be accounted for by cumulative frequency (Lewis, Chadwick, and Ellis 2002).

3.3.2. Arbitrary mapping

A different connectionist model by Ellis and Lambon Ralph (2000) also showed that AoA effects could not be accounted for in terms of cumulative frequency. Their mapping model explored hidden levels of activation, which gave insight to how the network can distinguish early and late patterns. Early neural models for AoA were prone to the well-known 'catastrophic interference' phenomenon (Lewandowsky 1991, Sharkey and Sharkey 1995), where, if a neural network trained on one set of items is then exposed to another set, the network performance will deteriorate as the old patterns are replaced (the new essentially overwrites the old). But, as Ellis and Lambon Ralph (2000) argued, this does not

reflect what occurs in typical vocabulary acquisition, where development is cumulative, and old words continue to be used in addition to the newly acquired words. Therefore, to reflect this, different sets of items were entered into the Ellis and Lambon Ralph (2000) network at different points in time. Their model thus made the important distinction between interleaved and focused learning (see McClelland, McNaughton, and O'Reilly 1995), and programmed items to enter cumulatively. Zevin and Seidenberg (2002) failed to represent this pattern of normal reading development and had nearly all of their items trained at once. In support of their mapping model, another study examined response times to a lexical decision task in late acquired technical words (Stadthagen-Gonzalez, Bowers, and Damian 2004). Specific frequency effects were found within groups of participants: Those with Psychology PhDs responded faster to psychology related words (*cognition*, *participant*) and those with Chemistry PhDs responded faster to chemistry related words (*carbon*, *electron*). More interestingly, the response times to the late acquired and high frequency words were similar to early acquired and low frequency words, demonstrating that the loss of plasticity due to the learning of early acquired words, as the Ellis and Lambon Ralph (2000) model indicates, is extremely difficult to surmount.

The arbitrary mapping hypothesis predicts that AoA effects are a result of the arbitrary mapping between the input and the output representations created throughout the development of the lexical system, as the mapping between input and output is not a consistent, one-to-one event (Ellis and Lambon Ralph 2000, Zevin and Seidenberg 2002); inconsistent mappings between orthography and phonology should lead to larger AoA effects (Chen et al. 2007). This line of thinking will be discussed upon viewing the results of the study carried out below.

Both connectionist models do share similar observations in that AoA effects will occur where there is only slight overlap of input and output patterns for early and late learned items, as in picture naming. On the other hand, Ellis and Lambon Ralph (2000) hold that, although reduced, there will still be an AoA effect in word naming, while Zevin and Seidenberg (2002) argue that no residual effect, in other words, a null effect, of AoA will be seen.

3.4. Semantic hypothesis

It has also been suggested that AoA-effects are due to the involvement of a semantic processing component, where the meanings of concepts acquired later are built upon those acquired earlier (Van Loon-Vervoorn 1989 as reported in Brysbaert, Van Wijnendaele, and De Deyne 2000), an account which has been supported through the occurrence of AoA effects in semantic tasks (Burani, Arduino, and Barca 2007, Barca, Burani, and Arduino 2002). This idea considers the observation that AoA effects always occur in specific tasks, like picture naming, which rely on the mapping relation between semantics and the

phonological output. Additionally, evidence for this approach is taken from the word-associate generation task (Brysbaert, Van Wijnendaele, and De Deyne 2000), where subjects are asked to say the first word that comes to mind when a stimulus word is presented. A variant of the Van Loon-Vervoorn (1989) account has been given by Steyvers and Tenenbaum (2005), where AoA is localized in a continually developing semantic network. Their proposal involves semantic nodes where those established earlier build up more connections than those acquired later. Similarly, Burani, Arduino, and Barca (2007) propose that in the addition of later-acquired words to the lexicon, meaning is necessarily built on the early acquired words. AoA effects are greater for object naming than lexical decision, and larger for lexical decision than word naming (Izura et al. 2011, Barry, Johnston, and Wood 2006, Cortese, and Khanna 2007)

As a result of these attempts in accounting for AoA, the effects have been extended to theories of general human learning. Regardless of the precise framework, the AoA effects are said to demonstrate a loss of plasticity in the learning environment (Ellis and Lambon Ralph 2000, Ghyselinck, Lewis, and Brysbaert 2004, Zevin and Seidenberg 2002).

4. AoA in the Brain

In this present study, similar in certain respects to Boulenger et al. (2007), action verbs and concrete nouns with differing AoA values were investigated. The two categories employ different roles, both semantically and syntactically—nouns typically denote an entity, broadly signifying persons, places, things, and ideas; verbs signify actions, occurrences, and modes of being, and additionally have a morphological aspect which allows them to carry a range of inflections. These two open grammatical categories have been the joint subject of a large body of research throughout the past thirty years. Incorporating such varied research methods as behavioral, electrophysiological, neuropsychological, and imaging studies, researchers have probed the question of whether nouns and verbs (and other grammatical classes) engage different neural systems. The results of these studies have favored various conflicting accounts, but recently, a compilation of the literature was performed in which a definite trait emerged, one favoring separate neural substrates for object words, or nouns, and action words, usually verbs (Vigliocco et al. 2011). The general trend is that, within the left hemisphere the more frontal part of the brain is involved in processing verbs, while nouns are processed more temporally. This observation holds even in Spanish-English bilingual accounts (Willms et al. 2011), which is significant to the line of enquiry here. This plausibility of distinct neural representations is further supported by data from child language acquisition, where children are observed to acquire nouns faster than verbs (Gentner 1982), and also by adult studies, where they tend to perform better with nouns than verbs in a variety of

tasks (Lennon 1996). Likewise, early aphasia research noted that verbs are more affected by brain damage than nouns, given that verbs demonstrate more complexity in a grammatical sense (Saffran, Schwartz, and Marin 1980, Saffran 1982). In relation, several neuroimaging and neuropsychological studies have demonstrated this distinction of grammatical categorization in the brain, as in investigations where the processing of nouns and verbs has been separately disturbed. Several lesion-deficit studies show evidence for the two categories being represented by at least partly distinct neural regions, with verb deficits associated with left inferior frontal gyrus damage, and noun deficits with left temporal cortex damage (Longe, Randall, Stamatakis, and Lckc Tyler 2007).

Recently, several studies have looked at the matter in more general terms, choosing instead to investigate object-action relations, rather than strict noun-verb categories. Still, these studies also favor separate neural substrates. Words that signify action that can be performed with different parts of the body have been shown to activate both the premotor and motor cortex somatotopically, like what happens when a movement is executed (Hauk, Johnsrude, and Pulvermüller 2004). Further, it has been shown that these action words induce premotor/motor cortex activity within 200ms of word onset (Pulvermüller, Shtyrov, and Ilmoniemi 2005). Such a rapid response in the perisylvian language area was interpreted by researchers as favoring a Hebbian system (Hebb 1949). Therefore, action related words are assumed to be embedded in the premotor/motor cortex because a physical action is typically required upon hearing these words (Goldfield 2000). As for the object related words, these could have a temporal visual component, as they typically correlate with a visual percept (Pulvermüller, 1999). Hence, in order to posit the difference of neural representation, Boulenger et al. (2007) interpret these findings as evolution of correlation learning (Hauk, Johnsrude, and Pulvermüller 2004, Hauk and Pulvermüller 2004), which is essentially represented in connectionist modeling. This interpretation is also adhered to in this investigation.

5. Purpose

Based upon this interpretation, the double-dissociation of action verbs and concrete nouns could lead to unique AoA-effects for the two categories (Bogka et al. 2003, Bonin, Barry, et al. 2004, Morrison, Hirsh, and Duggan 2003). Therefore, the purpose of this investigation was to relate the reaction times of early and later-acquired action verbs and concrete nouns. This was to investigate the hypothesis that, if there are distinct neural representations of the two grammatical categories, they will cause a difference in subject performance towards these two classes. The reasoning behind the experiment being executed in Spanish was two-fold: one, that, as mentioned, the inspiration for this study was Boulenger et al. (2007), which carried out their research in French. No

justification was given for this, so it was presumably an issue of convenience. Therefore, while the design of their study was modified in other ways, this added another aspect of novelty. In addition, and more importantly, Spanish offers some rather interesting traits, not necessarily unique to the language, but qualities which do set it apart from English and French in certain respects. With English, it can be difficult to carry out even a more generalized object-action task, as many words do not operate as purely verbs or nouns (Bogka et al. 2003). For example, "kiss" can function dually as a verb or noun, depending on context. In Spanish, grammatical class is unambiguous among noun and verbs (Rodríguez-Ferreiro et al. 2009). Therefore, the verb-noun confound is greatly reduced in the Spanish language. Additionally, Spanish offers that quality of predictable orthography as mentioned earlier. That is, Spanish is completely transparent in respect to the grapheme-phoneme relationship. This allows a fluent reader to correctly read virtually any word, even those totally unknown or new to the reader. Spanish employs a one-to-one correspondence; each letter in the language consistently represents one distinct sound. The only two exceptions are with the letters c and g, which can have two different sounds—θ/k, and j/g, respectively; but these are regulated by their use, with the first before the vowels e and i, and the second before the vowels a, o, and u, and before a consonant (Alija, and Cuetos 2006). Also, Spanish reduces the load on the lexical-semantic system (Cuetos, and Barbón 2006), so by using this language, if any effect which favors a semantic interpretation arises, it would be rather noteworthy.

Based upon other studies in the realm of AoA, a lexical decision task was selected as the tool to examine the possible effects. In support of this design, AoA effects have already been noted in other lexical decision studies (Lyons, Teer, and Rubenstein 1978, Rubin 1980). In addition, the task also incorporates a semantic component (Chumbley and Balota 1984). Further, it has been noted that, at least in English, AoA effects are stronger for lexical decision tasks than for reading aloud (Morrison and Ellis 1995), and a lexical decision task also demonstrates greater AoA effects than a naming task (see also Cortese and Khanna 2007). Also significant to this design, effects of both AoA and frequency on lexical decision times for Italian nouns and verbs have been found (Columbo and Burani 2002), so it is probable that AoA effects will be seen in Spanish, as the two languages share much in common.

As such, investigating the effects of AoA is meritorious in several ways. It could provide insight into the neuroanatomical organization of the brain, and therefore provide additional indications for theories of cognition.

6. Design

The design of the experiment is fully factorial, in which AoA and lexical category have been manipulated orthogonally, so that there are four groups of items within the two-by-two design.

6.1. Participants

Twenty volunteers (12 female and 8 male) between the ages of 18 and 47 (average age: 26), from the greater University College London community, performed the task. All participants were native Spanish speakers with normal or corrected vision, and no history of dyslexia.

6.2. Materials

In order to implement such a study as outlined above, it was necessary to have three hundred and sixty items comprising the experiment, 180 real words and 180 pseudo-real words. The nouns, and objective AoA values for them, were obtained from Álvarez and Cuetos (2007), who used items from Snodgrass and Vanderwart (1980), in addition to new items of their own. Data from Cuetos and Alija (2003), who used the action drawings of Druks and Masterson (2000), provided AoA information for verbs. All of the nouns were in the singular form and they referenced imageable, concrete entities. The verbs were all in the infinitive form and they referenced actions that could be performed with the upper or lower extremities, or a combination thereof. While it could be seen as problematic to use AoA ratings from two different studies, AoA has repeatedly been shown to have very high reliability both in intergroup and comparative studies (e.g., Cirrin 1984, Gilhooly and Logie 1980, Jorm 1991, Snodgrass and Yuditsky 1996). Additionally, AoA ratings are consistently valid, as well (de Moor, Ghyselinck, and Brysbaert 2000). Further, objective measures of AoA have been shown to have a high correlation (.747) with adult ratings of the same object names (Morrison, Chappell, and Ellis 1997). The words from these lists were then analyzed through BuscaPalabras, a program used to derive various orthographic and phonological statistics for Spanish (Davis and Perea 2005), in order that the noun and verb categories could be normed for frequency, syllable length, phoneme length, word length. Bigram frequency and neighborhood density were also taken into account, as well as other relevant lexical variables, in order that the data would demonstrate as clearly as possible effects only from AoA or grammatical category.

Of the 180 real words, 120 were experimental items—60 verbs (30 with low AoA, 30 with high AoA), and 60 nouns (30 with low AoA, 30 with high AoA). These were comprised of two or three syllable items. As the data for AoA used a seven-point scale initially put forth by Gilhooly and Logie (1980), early AoA

was defined as 1-2.5, and late AoA as 2.6-3.9. This was mostly to ensure even distribution. A wider variance among the two categories would have been more ideal, but it was necessary to have this more constrictive set to allow full crossing of AoA and lexical category, when relevant factors such as frequency and length were taken into consideration. This challenge of list construction in crossed design has already been noted for AoA and frequency (Morrison and Ellis 1995).

Of the remaining 60 real words, 20 were adjectives, 20 were nouns, and 20 were verbs. These 60 items were very dissimilar from the actual test items, and used to help mask the test items. These words, as well as the filler items, were obtained primarily via applying restrictive searches to the LEXESP corpus (Sebastián-Gallés, Martí, Carreiras, and Cuetos 2000).

To create the 180 fillers items, a list of 60 each of nouns, verbs, and adjectives was established, ensuring that there was no duplication of test items. These were then modified to create pseudo-words; the modification was induced by changing the coda, the onset, or by vowel-exchange or consonant insertion. Therefore, pseudo-words could be classified as pseudo-nouns, pseudo-verbs, or pseudo-adjectives. These were then checked that they were both pronounceable and phonotactically legal within Spanish. The importance of the construction of legal pseudo-words is especially important, even if they are not directly of intrigue themselves. The effects of the filler items used has been shown to greatly affect the test items; Gerhand and Barry (1999) noted average response times of 681ms to test items with the use of pseudo-homophones, and 508ms with the use of orthographically illegal items.

These 360 items were then pseudo-randomized, ensuring that no more than three conditions ever occurred, that there were no more than three positive or negative responses in a row, or that there was no phonological similarity in adjacent items. Table 1 provides a summary of the materials.

Table 1. Frequency and AoA Ratings for Experimental Items

Variables	All nouns	All verbs
AoA	2.65	2.61
Word frequency	33.63	32.38

6.3. Procedure

The experiment was run using the DMDX software developed at Monash University and at the University of Arizona by K.I. Forster and J.C. Forster (Forster and Forster 2003). Stimuli were displayed at the center of a Windows monitor. A central fixation cross was initially presented for 500ms. The stimulus then appeared immediately following the offset of the fixation cross and remained on the screen for 500ms. All items were presented in lower case, using Courier New font type, a fixed width font. This allowed that all of the letters had

a visual appearance of taking up the same amount of space on screen. Thirty six point font was selected for the display size. This particular size was chosen through a trial-and-error process; subjects reported that they could easily read the word, and that they did not have to stray far from the fixation point. The time out for response was 2500ms, so the subjects had an additional 2000ms after presentation of the test item if needed in order to indicate a word/non-word response. This was more than sufficient to garner a response. Participants were prompted to respond as quickly and accurately as possible, and the stimulus presentation was randomized as outlined above. A short break occurred halfway through the experiment. Accuracy and response latencies were recorded.

7. Results

Like Boulenger et al. (2007), trials with reaction times above or below 2.5 standard deviations from individual means (over the entire set of 360 words) were excluded from the analysis. Accuracy and response latencies for the nouns, verbs, pseudo-nouns, and pseudo-verbs were calculated individually and then averaged out over all the participants. The mean reaction time for the pseudo-words was significantly longer than for the real words (711.62ms compared to 526.85ms); an analysis of variance (ANOVA) by subject of the full set of real words and pseudo-words demonstrated longer reaction times for the pseudo-words. In addition, subjects also responded with greater accuracy to the real verbs and real nouns than to the pseudo-nouns/verbs (percent error for the test items was 1.67%, and for the pseudo-words, 8.40%). There was no variance in the percent error for the real nouns and the real verbs (1.67%). And although both the noun and verb lists endured rigorous matching for frequency and other potential confounds, the mean reaction times for nouns (523.66ms) were significantly shorter than for verbs (574.19ms). This was the case even in the pseudo-item construction, where reaction times for pseudo-nouns (692ms) were significantly shorter than for pseudo-verbs (731.16ms).

When comparing the early to the late acquired items, the data displays faster reaction times for early acquired items in both categories. Mean reaction times for early AoA nouns (513.46ms) was significantly faster than late AoA nouns (533.86ms). Similarly, early AoA verbs had faster mean reaction times (533.23ms) than late AoA verbs (615.15ms). The same case was found even in the pseudo-word category, where pseudo-nouns had a faster reaction time (692ms) than the pseudo-verbs (731.26ms). Table 2 presents a summary of the collective findings, while Table 3 presents the results according to early and late AoA.

Table 2. Reaction Times (in ms) for Collective Items in Study

Items	Mean Reaction Times
All real nouns	523.66
All real verbs	574.19
All pseudo-nouns	692
All pseudo-verbs	731
All real nouns and verbs	526.85
All pseudo-nouns and verbs	711.63

Table 3. Reaction Times (in ms) of Early and Late AoA for Verbs and Nouns

Variables	Mean Reaction Times
Nouns	
Early AoA	513.46
Late AoA	533.86
Verbs	
Early AoA	533.23
Late AoA	615.15

8. Discussion

It should come as no surprise that, while the effects were diminished compared to a similar study (Boulenger et al. 2007), AoA effects were still found in a language with a transparent orthography. If the arbitrary mapping framework of Ellis and Lambon Ralph (2000) is taken into account, this should not come as a surprise, given that the Spanish language lends itself to more consistent, transparent mappings compared to the deep orthography of French, though it is a bit puzzling as to why the pseudo-words appeared to be more difficult than in French. When dealing with filler items, there are many factors that can contribute to performance, and it could possibly be that the filler items for this study were simply more difficult. And, while it is useful to compare the results found in this study to Boulenger et al. (2007), there were several differences in the two, all of which could contribute to a different outcome. Other factors in the respective languages could also contribute to the different results. In addition, Monaghan and Ellis (2002b) had previously explored the effects of AoA and spelling-sound consistency on reading times within a fully factorial design. Their study found significant main effects of both AoA and consistency, and also a significant interaction between them. And while the AoA effect was larger for the inconsistent word set, a simple main effects analysis demonstrated that AoA also affected the consistent population as well. These sorts of finding are also supported by Seidenberg, Waters, Barnes, and Tanenhaus (1984), in addition to the study on the multiple script of Japanese (Havelka and Tomita 2006).

The present study shows that, concerning lexical decision time, AoA does not have the same effect on concrete nouns and action verbs. In addition, reaction times to early acquired nouns are generally faster than for later acquired nouns. The same holds for action verbs, though the difference was larger. This reflects the AoA effects for verbs as in other studies in English and Greek (Bogka et al. 2003), French (Bonin, Barry, et al. 2004), and Italian (Colombo and Burani 2002). Interestingly, the difference in High/Low Verbs was larger than the difference among high and low nouns.

These findings were congruent with the Boulenger et al. (2007) study though the AoA effects in this experiment were smaller. This is in accordance with the endorsing of the mapping hypothesis of Ellis and Lambon Ralph (2000) as the orthographic features of French are more opaque than for Spanish. Thus, it is to be expected that AoA effects, although definitely present, are smaller.

To bolster the favoring of the Ellis and Lambon Ralph (2000) model over that of Zevin and Seidenberg (2002), the results of this study here are congruent with that of Cuetos and Barbón (2006), who reported that AoA cannot be reduced to cumulative frequency or frequency trajectory.

As mentioned and highlighted by Boulenger et al. (2007), cortical motor regions are activated during the processing of action-related language (Shtyrov, Hauk, and Pullvermüller 2004). In a follow-up study, it was demonstrated that language-related motor activity could even interfere with simultaneous execution of motor behavior, which was interpreted as a supportive of the stance that neural representation of action words involves cortical motor regions (Boulenger et al. 2006).

9. Conclusion

The results favor a number of frameworks which were outlined in the Introduction. The data endorses further a connectionist account of AoA-effects, coupled with a semantic account. In order to fully grasp the causes of AoA, the evidence best supports a hybrid account, similar to that taken by Wilson, Ellis and Burani (2012), where the neural network model advanced by Ellis and Lambon Ralph (2000) is paired with the semantic account. In favor of incorporating a semantic hypothesis as well, Alija and Cuetos (2006) also demonstrated semantic effects, even in the transparency of Spanish, a substantial finding.

Support has thus been demonstrated for AoA effects in three separate domains. The results indicate that the mapping hypothesis of Ellis and Lambon Ralph (2000), if coupled with a semantic component, is well on its way in its attempt to account for general modeling of the language acquisition process. Also, the results also support the endorsing of distinct neural of at least broadly object and action in the brain, and perhaps also nouns and verbs. Finally, the results, if

compared to other studies in different languages, which feature varying degrees of orthographic transparency, demonstrate that shallow orthography can facilitate lexical processing. As Strain, Patterson, and Seidenberg (2002) state, "a genuine consistency or regularity effect is indisputable".

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Resumptive L1 Bilinguals: A Conceptual Model

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1. Introduction

While attrition and acquisition are being studied in detail, little has been done to understand the processes and implications of waxing and waning bilingualism. Are languages simply lost, written over by later acquired languages, or will they be maintained even though unused?

2. Research Goals

It is clear that this behavior has similarities and differences from bilinguals and non-native language speakers and learners, and is in fact its own phenomena apart. While attrition will have an effect upon the nature of resumption, the focus is upon what occurs once the first language (L1) language interruption ceases. This phenomenon of language resumption has neither been given an official term nor an official definition. Case studies were the primary source of information for generalizations and commonalities, as it is a unique situation and typically involves a longitudinal investigation of the same speaker. Articles citing the case study by Berman (1979), the first known case study about a resumptive bilingual, were included in the review.

Since the term "resumptive bilingual" is being created now, a variety of other terms were used to search for this phenomena. There has been several terms used in the literature for this, although no standard term has been defined or applied. The terms of reference have been "re-emergence" (Faingold 1999), "reactivation" (Dahl, Rice, Steffensen, and Amundsen 2010; de Bot and Stoessel 2000), "recovery" (Hubbel-Weinhold 2005), "relearning" (Hansen, Umeda, and McKinney 2002), "language regaining" and "reviving" and "renewal" (Colville-Hall 1995), "successive acquisition" (Hansen 1980), "regaining" (Yukawa

1998), and "re-exposure" (Ventureyra 2005). It is a semantic issue as to what to call this linguistic act.

> "Indeed it seems that 'recover' would suggest that skills are not really lost, but that they have become dormant in some way. 'Reacquisition' on the other hand, seems to imply that the skills in question were lost, and must be completely relearned" (Hubbell-Weinhold 2005: 1050).

3. Attrition

Because the L1 is not being used fully, attrition is expected. The main conclusions drawn from attrition research are that L1 attrition is less in adults than in children when exposed to a prolonged L2immersion. Children typically show evidence of extensive attrition (Montrul 2008). The traditional psychological view of forgetting is that higher-proficiency subjects lose more, because they have more to lose, or "the more you know, the more you forget" (Weltens, Van Els, and Schils 1989: 206).

4. L1 Resumed

4.1. Resumed as a child

When resuming as a child, "we see that, for children at least, learning a language a second time can be a dramatically faster experience than the first time" (Hansen et al. 2002: 656). The pattern of language resumption is observed to be more like a non-native language learner than like a bilingual language learner (Dahl et al. 2010).

Social-affective factors like motivation, language identity, education, and peer pressure play a significant role in language maintenance and loss in children (Montrul 2008). Across the case studies, the child typically spent the first part of his/her resumption period with adults. It is suggested that this is done as a "socially adaptive strategy for the language reacquisition process" (Dahl et al. 2010: 505) since adults are considered the experts in the language, and the child often interacts only with adults that are known to be bilingual.

As resumption continues, the child will seek out members of their peer group, who tend to be monolingual, and will use less code-switching with those peers. Code-switching is carried out primarily with bilinguals and less with monolinguals, and code-mixing with both as the resumption period progresses before finally ceasing (Dahl et al. 2010). Young children's language is modeled on the language of their peers, rather than those of adults in the environment,

and will show linguistic patterns, even at the dialectal level, of children of about the same age (Weinreich, Labov, and Herzog 1968).

An example of modeling language after peers is seen in the case study of a Norwegian boy, Per, by Dahl et al. (2010), who resumed his L1 of Norwegian at 4;3 after 15 months in the US. During the 28 weeks of observation, it was noted that overall Per did not speak more in total during the time period, it was only a matter of what the ratio was of Norwegian and English that changed. Week nine of the observation marked the shift to dominance in Norwegian for language preference in exchanges, and also marked when Per began to interact with his monolingual peers. By the end of the observation period, Per spoke only Norwegian, even with adults known to be bilingual. Unlike bilingual language learners and users, Per did not increase his use of code-switching with other bilinguals as his proficiency in Norwegian increased.

Fluctuations in code switching were a topic discussed in many of the case studies concerning children resuming an L1. Structures and stages of bilingual development were seen to occur at the same time as code-switching was present. One example is a case study involving a boy named Shem, an L1 English speaker, who acquired Turkish as a L2, then returned to the US. Shem went to Turkey at 2;6, leaving at 2;11. He ceased to speak English after six weeks in Turkey. During this cessation, he still understood English but would not respond in English. What was observed upon return to the US was that Shem spoke only Turkish for the first two weeks, and was not until week three that Shem resumed the L1. From weeks three to eight, overall utterances decreased, as though Shem was undergoing intensive reorganization. Also during this time, Shem treated new vocabulary items phonologically and morphologically as Turkish words. There was rapid expansion of the L1 in week eight, and by week eleven, normal L1 development was observed, and Shem ceased to speak the L2 (Slobin, Dasinger, Kuntay, and Toupin 1993).

Ruth Berman's (1979) study follows Shelli, an English-Hebrew bilingual, who resumes Hebrew at the age of 4;3. Much like Per in Norway, Shelli shows a 9 week lag before fully buckling into Hebrew. During the first 2 weeks, Shelli used almost no Hebrew and avoided her Hebrew monolingual peers. Berman remarked that Shelli's pronunciation at this point had an American English accent in her Hebrew speech. By weeks 3-4, Shelli used unanalyzed set phrases in Hebrew as a strategy to be understood. She also shows more language mixing at the intraword level at this point. By weeks 7-8, Shelli made learning errors consistent with errors of her monolingual peers, and showed less code-switching for reasons of linguistic inadequacy, and more interlocutor-sensitivity. In months 3-4, English became the heritage language for Shelli as it was restricted to her parents and a few other adults that she knows to be English speaking. Berman qualifies Shelli as being a "bilingual" at the 3-4 month point, as neither Hebrew nor English were dominant. By months 5-6, Shelli used both languages

fluently and easily at age appropriate levels, she is interlocutor-specific consistently.

A study by Yukawa (1998) on three children resuming Japanese L1 after being in an English L2 environment also gives insight. The pilot study is of H1, who lived in Hawaii from 5;5-5;10 then returned to Japan. H1 was raised as a simultaneous bilingual. By counting MLU produced in both a storytelling task and recorded natural conversation sessions, H1 showed that he regained the syntactic complexity of the four-month interruption in five weeks. Unlike the other cases, H1 used L1 on the first day back in the L1 environment, showing no discomfort with immediately resuming. Also unlike the other cases, H1 did not use the L2 for code-switching, preferring to converse either entirely in L1 or L2 even if the interlocutor was using the opposite language.

Yukawa follows H1 through a second resumption when H1 is 8;4, after 17 months in Stockholm speaking English and Swedish. Yukawa classifies this second resumptive experience as H2. For H2, he received no Japanese input during his time in Stockholm. Yukawa's third subject is Shoko, who was 3;10 when she left Japan and returned at 5;5. Pre-interruption, Shoko was a simultaneous bilingual, although she was Japanese dominant. Unlike H1, Shoko did receive Japanese input two afternoons a week at daycare. It was concluded from the three samples that Shoko's and H1's repertories of lexicon and syntax showed decline, while H2 showed "vague" (p. 258) shrinkage in his vocabulary and no syntactic attrition. Shoko reached pre-interruption level L1 after four months in the L1 environment.

4.2. Resuming as an adult

There are two approaches for how resuming as an adult will be viewed. The first is an adult who undergoes an interruption in their L1. In this scenario it is noted that most adults typically interact with immigrant communities in the new environment (Schmid 2002). It was found that first-language attrition does not typically occur in immigrant environments because there is opportunity to maintain the L1 language during the first years in the new location, and those who maintain the language were likely to remain fluent speakers in their L1 (de Bot and Clyne 1994). How much contact with the L1 is needed to continue fluency is difficult to quantify as case studies depended on self-reported data (Schmid 2002).

A study of L1 attrition in a group of German-Jewish emigrants found that although most emigrants made little or no use of German for more than 50 years, they maintained the full repertoire of linguistic knowledge. Mistakes made in speech production were argued to merely reflect perceived insecurities and problems with accessibility. The findings of this study suggest that suppression of a fully acquired L1 by proficient adult speakers will not result in competence issues when they resume the L1 later in adult life (Schmid 2002).

Similarly, De Bot and Clyne (1994) studied a group of Australian Dutch-English bilinguals in a longitudinal study. Rather than indicating an increase in Dutch attrition, the group reflected a preferred use of L1, better recall of the L1, a decrease in English fluency, and an increased L1 accent in English.

The second approach for resuming an L1 as an adult is if the L1 was interrupted during childhood. The interruption could be manifested as a complete cessation of the L1, or continuing the L1 as a heritage language. Children undergo incomplete L1 acquisition in childhood when specific properties of the language do not have a chance to reach age appropriate levels of proficiency after intense exposure to the L2 begins. Attrition and incomplete acquisition in childhood are not mutually exclusive since both processes can occur simultaneously or even sequentially for different grammatical properties (Montrul 2008).

The crystallization hypothesis predicts that early exposure to the L1 between the ages of 3 and 8 should have long-lasting remnants in the neural circuits of language processing (Montrul 2008). In a recognition test, adult adoptees, Koreans who had been adopted by French speaking families, were tested for Korean to French translations. The results indicated that the Korean adoptees did not differ significantly from the French native speakers, and did not reveal any differences in brain activation in the fMRI data. The study concluded that the L1 can be completely lost (Pallier, Dehaene, Poline, Le Bihan, Dupoux, and Mehler 2003). However, a case study of an adoptee tested for L1 memory under hypnosis suggested that the L1 may not be completely lost, but rather is hidden or temporarily inaccessible. A notable case study of this was Footnick's (2007) research concerning a 21 year old Togolese speaker raised in France. From 2;6 to 6;0, the subject learned the Mina language in Togo, and then ceased to speak this L1. In self-reports, the subject stated that he did not remember the L1, but while under hypnosis, the subject regressed to ages 4-5 and was able to both speak and understand Mina. This suggests that it is possible for traces of a ceased L1 to remain fossilized in the brain even when consciously inaccessible to the speaker (Montrul 2008).

5. Different Skills

Studies suggest that a reduction in competence or performance in the L1 is a direct a consequence of time.

5.1. Lexicon

The first model for semantic retention was shown in the famous experiment by Ebbinghaus (1885), who established the "forgetting curve" for forgetting vocabulary knowledge. This curve showed that the decline of retention is

asymptotic, which suggests that even after prolonged periods of time, there is still a certain amount of knowledge left and that the residual knowledge can be reactivated (de Bot, Martens, and Stoessel 2004).

The classic Bahrick (1984) study showed that a portion of L2 Spanish was retained for more than 50 years, and that recognition of vocabulary levels off earlier than recall of vocabulary, with smaller portions affected by attrition. Further, the data indicated that vocabulary knowledge declines exponentially for an initial period of three to six years, and then remains plateaued for twenty years, followed by an additional decline in middle age (Hansen et al. 2002, Colville-Hall 1995). Similarly, a study by de Bot and Stoessel (2000) found that German adults, who had spoken Dutch as children for four years, showed residual knowledge of Dutch 30 years later. A strong-linguistic effect was reported, however non-cognate words also showed retention.

"Relearning" vocabulary is defined as the reintroduction of previously known vocabulary so that old items will become reactivated to a level that makes them retrievable (de Bot et al. 2004). The savings paradigm shows the idea, that through relearning, the reintroduction of previously known lexical items will become reactivated to a level that makes them retrievable, while new lexical items will not reach the same level of activation after the same time period for learning. Thus, semantics for resumptive bilinguals is relearning, and will be a trace-strengthening operation.

A common behavior in surface structure semantics is code-switching. In code-switching, there are developmental patterns related to the pragmatics of what kind of content is code-switched and in which circumstance. However, unlike normal code-switching patterns in bilinguals, code-switching ceased to be used over time with resumptive bilinguals who became monolingual (Dahl et al. 2010).

5.2. Phonology

There has been some research concerning the phonology of resumptive bilinguals. In a study involving English speakers returning from Brazil, one participant reported that her American accent in English returned after moving back to the U.S. This suggests that the L1 phonology was never permanently unavailable and was resumed once cued by the environment (Major 1993).

In Werker and Tee's (1984) study, they tested English-speaking adults on their ability to perceive the contrast between dental and retroflex stops in Hindi. The participants who were able to hear the distinction had no conscious memory of Hindi but had been exposed to it early in life.

As was noted earlier in the case studies, the children Shem (Slobin et al. 1993) and Shelli (Berman 1979), showed interfering phonology of the L2 (Turkish and English, respectively) when resuming the latent L1.

5.3. Socially

In nearly all of the case studies with self-reporting of perceived language loss, there is a remarkable discrepancy between actual language data and the speaker's perceptions of language attrition. In fact, speakers tended to think their performance was worse than the actual results indicated on tests (de Bot et al. 2004). It has been suggested that the reason that self-perceptions are so pessimistic is because speech is one of the more readily obvious ways of seeing language attrition (Harley 1994).

5.4. Syntax

From the case studies, we can state a few generalities. In a study by Weltens et al. (1989) they found that there was significant attrition in syntax skills during the first 2 years of nonuse, regardless of the amount of knowledge or time previously spoken. Idiomatic expressions and formulaic patterns are less easily forgotten than more complex and complicated features of language among average language learners (Berman and Olshtain 1983).

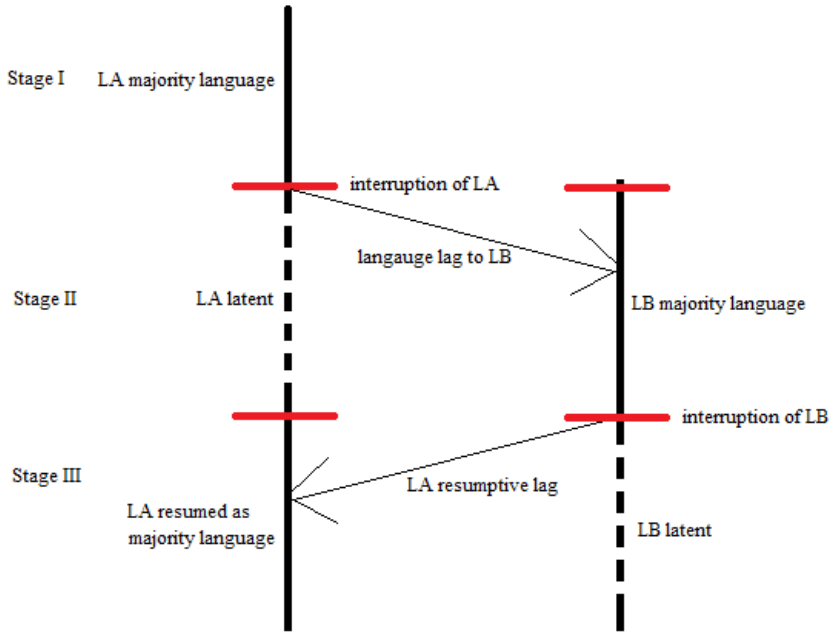
Yukawa's (1998) work on children resuming a L1 showed through storytelling tasks and through recorded natural conversation sessions that her subjects resumed syntactic complexity to pre-interruption within 5 weeks.

6. The conceptual framework

The literature has inconsistently called this a reacquisition, reactivation, or relearning process. I propose that this phenomenon involves all of these, and thus should be called a term that is over-arching to describe a macro language environment change. I propose calling this phenomenon "resumptive bilingualism.

The Resumptive Bilingualism Model (Figure 1) describes the process that defines resumptive bilingualism. The first language will be referred to as the LA, and is not necessarily the L1. The second, or interrupting language, will be referred to as the LB, which is not necessarily the L2. Strength of the latency of the LA will depend on the age when the interruption occurs, as will the strength of the resumptive lag of the LA. The LA is considered latent in Stage II, but not necessarily completely disused, since the speaker may have continued to speak the LB as a heritage or minority language. The LA will receive less input than the LB in Stage II. In Stage III, the LB language may continue to be used once the LA is resumed, with much less input than in the Stage II phase. In addition, LB usage may occur in Stage I.

Figure 1. Resumptive Bilingualism Model



The independent variable is the increased input of the latent language that reactivates dormant neurological connections. The dependent variables are an accelerated rate of learning new lexical items and syntactic principles, relearning previously mastered linguistic knowledge, and a phonological and code-switching lag before producing native-like forms in the LA. For children, this lag has shown to be around nine weeks, with the use of peer-level competence and performance after six months of sustained input. There was no time table provided for adults. Intervening variables are whether the language was ceased in childhood before the critical period, the level of input of the latent LA during Stage II, and the attained proficiency in the LA before becoming latent. In addition, the LB may have an interfering effect, as cognate lexical tokens tended to be more resistant to loss than noncognates, and the latent LA will show signs of simplification, restructuring, and probable L2 influence at the phonological level.

7. Future Research

In conclusion, early exposure to a language shows selective advantages for resumptive bilinguals, marking the difference between first time exposure and second time, and also marking the difference between learning and the act of relearning and resuming.

As is always the problem with qualitative case studies, it is difficult to say whether these cases are representative of all resumptive bilinguals. This qualitative study was intended to lay the groundwork for identifying some common behaviors observed in L1 resumptive bilingual studies. Further research will assist in refining the conceptual model and definition of this linguistic phenomenon.

In the field of applied linguistics, greater study in the linguistic needs for reactivating grammar and relearning vocabulary, as well as what are the needed practices for phonology are other areas for further research. This will depend in part on the study of attrition, as greater knowledge about what specifically deteriorates per language will give an enhanced view of what would need to be reactivated and relearned by the resumptive bilingual. Insight into whether exposure as a child to foreign languages would provide a foundation for greater gains in the language at a later time in life would be informative for foreign language instruction, even if not much actually gets learned or produced at an early age. Further, we would have greater knowledge about the results from breaks in foreign language contact, both positive and negative.

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Voice and *v** in Spanish: The Case of *Ser*-passives and *Estar* + Passive Participle Constructions

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1. Introduction

Within the Principles and Parameters approach, a crucial shift in the way to conceive passives was made in the mid and late 1980s. Jaeggli (1986), and later Baker, Johnson, and Roberts (1989), argued that passives are not the outcome of specific intransitivization or passivization rules. Thus, the characteristic promotion of the object to subject position and the availability of a *by*-phrase are not derived by specific or disconnected rules, but rather these properties are derived from more general properties and from their independently needed morphological requirements. As an illustration consider Jaeggli's analysis of (1):

(1) a. This door was broken by the police.
b. [$_{IP}$ *e* was [$_{VP}$ break –en [$_{NP}$ the door] [$_{PP}$ by the police]]
c. [$_{IP}$ The door was [$_{VP}$ break –en [t_{NP}] [$_{PP}$ by the police]]

Example (1a) is derived as follows. The object *this door* is promoted to "subject position" as an effect of the participial morphology *–en,* which "absorbs" the thematic role of the external argument and the Accusative Case of the main predicate in (1b). As a result, the internal argument *this door* must raise to the specifier position of IP to obtain Nominative Case in (1c). Given that the external argument *by the police* is an adjunct, an exceptional thematic interpretation is assigned by "thematic transmission" or percolation from the VP.[1]

Despite the attractiveness of this analysis, several of its aspects have been questioned (Baker, Johnson, and Roberts 1989, Goodall 1997, Mahajan 1995, among others). More recently, in an influential paper by Collins (2005), the issue of how the external argument in the *by*-phrase obtains a thematic interpretation is addressed. His main idea is that the arguments in active and

passive sentences are generated in the same structural configurations as defined by the Uniformity of Theta Assignment Hypothesis (UTAH). Furthermore, the preposition *by* is a dummy preposition with no role in interpretation, generated in the head of a VoiceP as in (2b), directly above the *v*P. If anything, the role of the preposition *by* is to check the Accusative Case of the external argument generated in [Spec, *v*P]. Passives are derived in this analysis by phrasal movement of PartP "smuggling" the internal argument DP through the specifier of VoiceP, (2c). After Merge of the auxiliary, (2d), the smuggled NP moves to the specifier of TP, (2e):

(2) a. This door was broken by the police.
b. **by**$_{\text{Voice}}$ [$_{v\text{P}}$ the police v^{o} [$_{\text{PartP}}$ broken the door]]
c. [$_{\text{VoiceP}}$ **[$_{\text{PartP}}$ broken the door**] by$_{\text{Voice}}$ [$_{v\text{P}}$ the police v^{o} **t$_{\text{PartP}}$**]]
d. **was** [$_{\text{VoiceP}}$ [$_{\text{PartP}}$ broken the door] by$_{\text{Voice}}$ [$_{v\text{P}}$ the police v^{o} t$_{\text{PartP}}$]]
e. [$_{\text{TP}}$ **the door** was [$_{\text{VoiceP}}$ [$_{\text{PartP}}$ broken **t$_{\text{NP}}$**] by$_{\text{Voice}}$ [$_{v\text{P}}$ the police v^{o} t$_{\text{PartP}}$]]]

In this paper, we will refine two aspects of the smuggling analysis of passives by examining two types of periphrastic passives in Spanish: *ser*-passives and *estar*-passives (Gili Gaya 1943, Fernández Ramírez 1951). First, we will extensively argue that passivization is an operation on event structures (Gehrke and Grillo 2009) and not an operation on argument structure. Second, we will argue that passivization is the spell-out of an aspectual head, not necessarily a Voice head. This aspectual head is manifested as *ser* or *estar* in Spanish and displays sensitivity to the eventive structure of the predicate.

The structure of this paper is as follows. In section 2, we describe the main properties of *ser*-passives and *estar*-passives and point out some problems with the smuggling analysis of passives in Collins (2005). Section 3 provides an analysis based on the idea that passivization affects eventive structures. Finally, we conclude the paper in section 4 discussing possible implications pertaining to the representation of the external argument and the role of Voice.

2. Problems with the Smuggling Analysis

Passive constructions are not a universal construction among languages. However, in languages which do express these constructions, Keenan and Dryer (2007) observe that the core form adopted by passives is what they call "basic passives." Basic passives represent the most wide-spread form of passives across languages in which (i) no *by*-phrase is present, (ii) the main verb in the active counterpart is transitive, and (iii) the main verb in the active counterpart expresses an action between its arguments. We will adopt this conceptual distinction and will restrict our discussion to basic passives.

One possibility in Spanish to express basic passives is periphrastically[2] through

the use of the auxiliaries *ser* or *estar*. A basic sentence such as (3) can be expressed as in (4a) or as in (4b):

(3) La compañía vende las casas.
the company sell:PRS the houses
"The company sells the houses."

(4) a. Las casas fueron vendi-das.
the houses SER:PST sell-PCTP
b. Las casas están vendi-das.
the houses ESTAR:PRS sell-PTCP
"The houses are sold."

A potential problem with a smuggling analysis of passives has to do with the motivation of the phrasal movement of PartP to the specifier of VoiceP. Collins argues that PartP movement might have a double motivation. On the one hand, PartP moves because some uninterpretable feature in the participial morphology needs to be checked. On the other hand, movement of PartP avoids a potential minimality violation because the internal argument inside PartP is now closer to the probe T than the external argument in the *v*P. Although some researchers such as Bošković (2007) have obtained a similar effect, crucially without assuming feature checking, this does not solve the problem. More importantly, the smuggling analysis leads to a potential look ahead problem, as the proposed phrasal movement of PartP must precede the insertion of the Probe T. Finally, Gehrke and Grillo (2009) claim that the status of smuggling seems challenged by the empirical data in English. They observe that in examples similar to (5) the movement of PartP applies independently of the movement of the internal argument to subject position where the expletive *there* is inserted:

(5) There was $_{VoiceP}$ [$_{PartP}$ a Swabian killed $\mathbf{t_{NP}}$] [$_{vP}$ t_{PartP}]
(Gehrke and Grillo 2009: 235)

Examples in (6a)-(6b) make a similar point in Spanish passives with *ser* and *estar*, where the promoted object can precede or follow the verbal complex or can appear between the auxiliary and the participial:

(6) a. Son (las casas) destruí-das (las casas).
SER:PRS the houses destroy-PCTP the houses
b. Están (las casas) destruí-das (las casas).
ESTAR:PRS the houses destroy-PCTP the houses
"The houses are destroyed."

Assuming that smuggling is present in English and Spanish, the data in (5) and

(6) suggest that this operation is not necessarily driven by Case checking.

2.1. Transitivity

As described by Keenan and Dryer (2007) transitivity is a defining property of basic passives but it does not apply to non-basic passives. This distinction finds a correlate in *ser*-passives and *estar*-passives in Spanish. *Ser*-passives have a strict requirement of transitivity for passive formation:[3]

(7) a. El vigilante fue golpea-do.
the guard SER:PST hit-PTCP
"The guard was hit."
b. *El vigilante fue llega-do.
the guard SER:PST arrive-PTCP
"The guard was arrived."

Estar-passives can also be constructed with transitive verbs. Importantly, *estar*-passives create a difference in the interpretation. Example (7a) refers to the process denoted by an event without necessarily specifying the result but *estar*-passives as in example (8) only refer to the result of the event:

(8) El vigilante está golpea-do.
the guard ESTAR:PRS hit-PTCP
"The guard is hit."

Interestingly, *estar*-passives are also allowed with some unaccusative verbs, in particular, those depicting an internal cause of change such as *florecer* "to flourish", *envejecer* "to age", and *crecer* "to grow" in which an impersonal flavor is obtained. As illustrated in (9) *estar*-passives do not admit an overt realization of the argument associated with participials derived from unaccusative verbs:

(9) a. *El maestro está envejeci-do.
The teacher ESTAR:PRS age-PTCP
"The teacher is aged."
b. Está envejeci-do.
ESTAR:PRS age-PTCP
"It is aged."

Similarly, example (10) shows that *estar*-passivization is impossible with other types of unaccusatives.

(10) *Está llega-do.
ESTAR:PRS arrive-PTCP
"It is arrived"

Collins argues that the passive participle in English is specified only for uninterpretable features. For this reason, they must be checked by movement of the PartP to the specifier of VoiceP in passives. In contrast, VoiceP is not projected in active sentences, which triggers the insertion of the auxiliary *have* to check the uninterpretable features of PartP. The Spanish data discussed above present problems to these assumptions, suggesting that VoiceP might not be needed.

First, if *ser* and *estar* are generated above Voice as in the smuggling analysis, it is not easy to understand how the Voice head relates to the differences in interpretation of the event between (7a) and (8), probably related to the aspectual differences between *ser* and *estar*. Second, it appears that *ser* and *estar* are closely related with the type of complement they select, something that cannot be expressed by its association with VoiceP or PartP. Whereas *ser* selects complements including an external argument, *estar* seems not to require them. Finally, the ungrammaticality of (7b) and (9a) indicates that the postulated uninterpretability of features in the participle cannot be the trigger of phrasal movement of PartP because ungrammaticality persists after checking.

The preceding discussion reinforces the idea that transitivity is a necessary condition but not a sufficient condition in passivization. Even languages which do not allow passivization of intransitives impose restrictions on the type of transitive predicate involved, displaying sensitivity to its inherent aspectual value or Aktionsart (Jurado Salinas 2000, González Calvo 1992, Díaz Blanca 2007). This also occurs in Spanish as will be demonstrated in the next section.

2.2. Perfectivity restriction and Aktionsart

A crucial property involved in the characterization of periphrastic passives with *ser* in Spanish is the restriction on perfectivity or telicity. *Ser*-passivization affects verbal predicates that denote a change of state or an event with a natural endpoint or with a potential (arbitrary) endpoint such as accomplishments and activities.[4] As illustrated by (11), s*er*-passives are compatible with participials based on these types of predicates:

(11) a. El garaje fue vigila-do *por muchas semanas*.
the garage SER:PST watch-PTCP during many weeks
"The garage was watched during many weeks."
b. La maratón fue corri-da *en una hora*.
the marathon SER:PST run-PTCP in one hour
"The marathon was run in one hour."

The sentences in (11a) and (11b) can be modified by *por muchas semanas* and *en una hora* showing that they denote activities and accomplishments, respectively.

Telicity is a key factor in passivization, but it is not determinant. As shown by the distribution of achievement predicates in *ser*-passives, the distinction between stages and punctuality is relevant:

(12) a. *Esta bomba fue estalla-da.
this bomb ESTAR:PST explode-PTCP
"This bomb was exploded."
b. El agua fue hervi-da.
the water SER:PST boil-PTCP
"The water was boiled."

In (12a) *ser*-passives are not possible with achievement predicates with a punctual interpretation (i.e., semelfactives). Nevertheless, if the achievement denotes a minimal duration identifiable in more than one stage or a non-punctual reading as in (12b), *ser*-passivization is possible.

Finally, *ser*-passives are not allowed when combined with states because they do not express change:

(13) a. *Muchos votos fueron teni-dos.
many votes SER:PST:PLU have-PTCP
"Many votes were had."
b. *Los políticos fueron odia-dos.
the politicians SER:PST:PLU hate-PTCP
"The politicians were hated."

The perfectivity restriction also applies for *estar*-passives but their distribution is more complex than with *ser*-passives. Superficially, *estar*-passives are allowed with telic predicates such as non-punctual achievements (*encender* "to turn on" in 14a) and accomplishments (*escribir* "to write" in 14b) where a resultative interpretation is obtained:

(14) a. Esta luz está encendi-da.
this light ESTAR:PRS turn.on-PTCP
"This light is turned on."
b. Esta historia está escrita.
this story ESTAR:PRS write:PTCP
"This story is written."

As mentioned in the previous section, *estar*-passives are only available with

unaccusatives expressing an internal cause. If the cause is external, *estar*-passivization is only possible with the transitive version of unaccusatives that participate in the causative alternation (Mendikoetxea 1999). This explains the ungrammaticality of examples in (15) and the availability of the resultative interpretations in (16):

(15) a. *La maratón está corri-da.
the marathon ESTAR:PRS run-PTCP
"The marathon was run."
b. *La pared está golpea-da.
the wall ESTAR:PRS hit-PTCP
"The wall was hit."
c. *El carro está empuja-do.
the car ESTAR:PRS push-PTCP
"The car was pushed."

(16) a. La puerta está abierta.
thedoor ESTAR:PRS open:PTCP
"The door is open."
b. La ventana está rota.
the window ESTAR:PRS break:PTCP
"The window is broken."
c. La ciudad está destrui-da.
the city ESTAR:PRS destroy-PTCP
"The city is destroyed."

Finally, *estar*-passives are not compatible with states of the type shown in (17):

(17) a. *La casa está teni-da.
the house ESTAR:PRS have-PTCP
"The house is had."
b. *Los candidatos están odia-dos.
the candidates ESTAR:PST:PLU hate-PTCP
"The candidates are hated."

The perfectivity restriction is expressed typologically as a contrast in terms of aspect. For example, Keenan and Dryer (2007) observe that any language with passives must express the range of perfective meanings but crucially, no language can display passives with only the range of imperfective meanings in exclusion of perfectivity. Given the paradigms discussed in this section, it seems inaccurate to adopt a smuggling analysis where PartP only moves for formal or syntactic reasons. Instead, the contrasts between passivization with *ser* and *estar* reveal that these constructions are sensitive to the semantic content of

Aktionsart. Therefore, passivization should not be expressed only as an operation on argument structure excluding the event structure and the aspectual interpretation of the predicate.

2.3. Viewpoint in periphrastic passives

If the Aktionsart of a predicate is only visible by its association with a particular aspectual viewpoint as proposed by Smith (1997), we expect to find more restrictions with *estar* than with *ser* because *estar*-passives express the result of a change of state whereas *ser*-passives express the complete process. This prediction is borne out. As reported in the recent literature (Mendikoetxea 1999, Conti Jiménez 2004, Jurado Salinas 2000), *ser*-passives are allowed with perfective viewpoints, see (18):

(18) a. El banco fue roba-do esta semana.
the bank SER:PST steal:PTCP this week
"The bank was stolen this week."
b. El partido ha sido arregla-do.
the game have:3SG SER:PCTP fix:PTCP
"The game has been fixed."

They are also allowed with imperfective viewpoints but with an iterative or habitual reading (De Miguel 1999) as indicated by the presence of the modifiers *todos los días* and *cada cinco años* in (19):

(19) a. La puerta es abierta *todos los días.*
the door SER:PRS open:PTCP all the days
"The door is opened every day."
b. Los hoteles eran vendi-dos *cada cinco años.*
the hotels SER:IPFV sell:PTCP every five years
"The hotels used to be sold every five years."

In contrast, *estar*-passives favor the use of the present indicative or the imperfect, (20a), and do not tolerate perfective viewpoints, (20b):

(20) a. Las velas están/estaban encendi-das.
the candles ESTAR:PRS/ESTAR:IPFV light:PTCP
"The candles were lit."
b. *La ventana estuvo/ha estado abierta.
the window ESTAR:PST/HAVE:PRF ESTAR:PTCP open:PTCP
"The window has been opened."

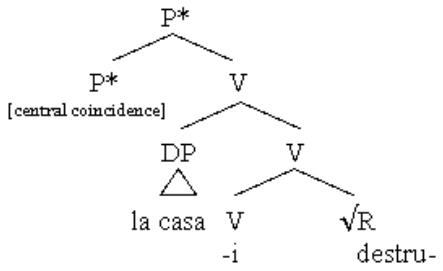
Importantly, the use of imperfective viewpoints in *estar*-passives is only

possible with a special meaning in which the viewpoint is focused on a situation external to the result itself (Smith 1997). This situation expresses the continuation of the state denoted in *estar*-passives and not a "passive" meaning *per se*.

3. Passivization and Eventive Structure

In this section, we explain the contrasts between *ser*-passives and *estar*-passives assuming that the head Asp (not Voice as in Collins) is directly generated above the verbal complex. The semantic composition of this Asp head is viewpoint expressed as [±perfectivity]. Following Camacho (2012) among others, I argue that the copulas *ser* and *estar* reflect aspectual distinctions, and I represent them as two different spell outs of the Asp head. Furthermore, if statives are preposition-based as in Hale and Keyser (2005), I would like to propose the representation for the PartP in (21) in which the external argument of V is the result of the subevent denoted by the composition of V and the root R. In this structure, the participial morphology selects V and the phonological matrix of the complex V+Root is materialized in P*, assigning Case to the external argument of V. Using Hale and Keyser's terminology, the P* head in (21) is a [central coincidence] preposition, expressing the result of the subevent denoted by V+Root as a concurrent property of *la casa* "the house":

(21)



Following Hale and Keyser, if non-stativity is a verb-based structure, then a *v** head is built as introducing a process subevent with an agentive external argument which becomes the initiator. This also means that the perfectivity restriction is derived if P* is selected by *v**.

In this scenario, we would like to suggest that *v** comes in two flavors: an unmarked *v** head and a marked *v** head. Unmarked *v** can be lexicalized by selecting the phonological features of P*+V+√R. Marked *v** expresses a relation similar to a path (Zagona 2012), which can lexicalize as *por*. Thus, the spell-out conditions shown in (22) derive passives in Spanish without making reference to

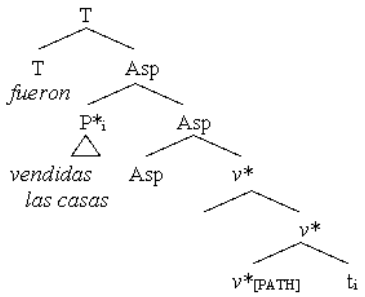
a VoiceP:[5]

(22) a. If the $Asp_{[\pm perfectivity]}$ head selects v^*_{PATH}, Asp spells out as *ser*
b. If the $Asp_{[-perfectivity]}$ head selects $P^*_{[central\ coincidence]}$, Asp spells out as *estar*

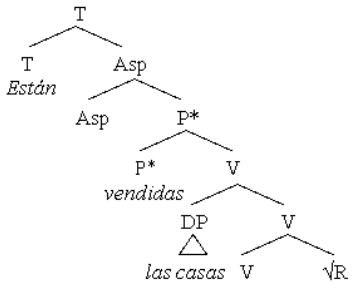
An $Asp_{[+perfectivity]}$ head selecting $P^*_{[central\ coincidence]}$ is excluded for semantic reasons due to incompatibility of the viewpoint aspect, which by definition cannot focus on either the initial or the endpoint of a homogeneous eventuality without identifiable stages.

Given the representation in (21) and the spell-out conditions in (22), the contrast between *ser*-passives and *estar*-passives is derived by phrasal movement of the P* structure to the specifier of AspP in the case of *ser*-passives, and by no movement in the case of *estar*-passives. The auxiliaries *ser* and *estar* are generated in the Asp head and move to the T head to obtain their temporal interpretation as illustrated in (23):

(23) a.



b.



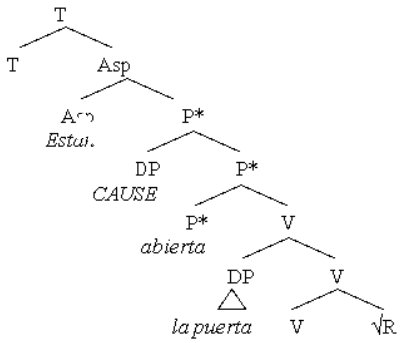
As argued by Gehrke and Grillo (2009), we also believe that passivization applies as an operation relating viewpoint aspect and Aktionsart. To the extent that languages with more than one type of passive always elaborate aspectual distinctions (Keenan and Dryer 2007), I also claim that these distinctions are expressed as passive-raising, (23a), or P* selection, (23b).[6]

Although the focus of this paper is not the distribution of the *by*-phrase, our analysis also finds support from the contrasts between *ser*-passives and *estar*-passives. *Estar*-passives do not tolerate agentive *by*-phrases because $v^*_{[PATH]}$ is not merged. However, a very important exception occurs if *estar*-passives are constructed with verbs participating in the causative alternation, in which case *by*-phrases are allowed. Crucially, this *by*-phrase must be interpreted as a cause and not as an agent as shown in (24c)-(24d) where the *by*-phrase overrules a volitive interpretation and in (24a)-(24b) where the *by*-phrase is only possible with a causal meaning:

(24) La puerta está abierta…
the door ESTAR:PRS open:PTCP
"The door is open…"
a. ?por Juan.
"by Juan"
b. a causa de Juan.
"because of Juan"
c. por el viento.
"because of the wind"
d. *intencionalmente.
"intentionally"

Furthermore, *estar*-passives require the *by*-phrase obligatorily with lexical causatives such as *provocar* "to provoke" and *ocasionar* "to cause" indicating that P* is linked to a causative external argument. We represent this fact as (25):

(25)



A final remark disconfirms Collins' suggestion that the head of the by-phrase only contains uninterpretable features. It is well known that some activities require the presence of the *by*-phrase with *ser*-passives in Spanish (Jiménez and Marín 2000, Jurado Salinas 2000), a phenomenon also reported in English by Grimshaw and Vikner (1993).[7] If this effect is taken into account, it shows that the *by*-phrase has an impact on the interpretation of the event structure. Presumably, this is because activities are inherently atelic and as such they only constitute processes not involving a $v^*_{[PATH]}$.

4. Conclusions

In this paper we have argued for an analysis of passives in terms of

aspectual/eventive licensing where no reference to a VoiceP as in Collins is needed. On the one hand, Spanish *ser*-passives select a *v** and display raising of their P*-structure to [Spec, Asp], which denotes the result of a process. In contrast, *estar*-passives show stative properties due to its lack of agentive $v^*_{[PATH]}$, and their Asp simply licenses P* by local selection.

This paper is consistent with previous research suggesting the decomposition of the verbal domain. For example, Pylkkänen (2008) and Folli and Harley (2005) have suggested that different flavors of *v* should be identified. The analysis of periphrastic passives in Spanish provides evidence for the expression of the external argument in different positions, as shown in (26):

(26)

Point of focus of viewpoint	External argument of Asp
Cause of change involving volition	External argument of *v**
Cause of resulting state	External argument of P*
Affected theme	External argument of V

This is also consistent with the different roles attributed to *v* in the literature. For example, *v* is a Voice head which introduces external arguments in Heim and Kratzer (1998); *v* is a verbalizer head in Harley (1995); and *v* is also the head which expresses Aktionsart in Ramchand (2008).

We would like to mention an additional instantiation in the typology of (26) coming from the *estar*-family. Note that although *estar*-passives are not possible with states as observed in Section 2.2, there is an interesting deviation when using spatial predicates:

(27) a. La ciudad está rodea-da.
the city ESTAR:PRS surround-PTCP
"The city is surrounded."
b. El cultivo está cerca-do.
the crops ESTAR:PRS fence-PTCP
"The crop is fenced."
c. La montaña está cubiertas de/por mucha nieve.
the mountain ESTAR:PRS cover:PTCP of/by many snow
"The mountain is covered by snow."

The predicates in (27) describe the resulting state as a relation of contiguity between a location and a localizer. Thus, the corresponding subjects are interpreted as non-affected themes or locatives. When the *by*-phrase is expressed as in (27c), it is interpreted as the localized point of reference. A possible analysis along the assumptions of this paper would generate non-affected themes or location as the external argument of a P*-related projection, say P, which is in turn locally selected by Asp.

Finally, one of the pending questions in this paper has to do with the role of

Voice in the structure. In the present contribution there is no specific Voice projection because the *v** head is marked for Voice through the preposition *por*. Future research should pursue the plausibility of this idea to cover other "voice-related phenomena" such as active verbs, ergativity, and middle verbs.

Notes

[1] Baker, Johnson, and Roberts deny the existence of a "transmission mechanism" or "percolation", but they face comparable issues when they claim that the relationship between *-en* and the *by*-phrase (which can be phonetically null) is akin to the one found in clitic doubling constructions.
[2] Spanish can also express passivization by morphological means using the reflexive *se* as in *Las casas se vendieron* "The houses were sold". We will leave this topic aside for future research.
[3] Interestingly, *ser* had a wider distribution in Old Spanish, allowing combinations with unaccusative verbs and a perfective meaning.
[4] Activity predicates are mostly intransitive verbs. As Mendikoetxea (1999) points out, *ser*-passives based on activity predicates require a reiterative interpretation.
[5] Another spell-out possibility we do not discuss involves the selection of an unmarked *v** by an $Asp_{[\pm perfectivity]}$ head. In this context the aspectual head would spells out an active sentence with the auxiliary *haber* "to have" in a very similar way as in Kayne (1993). We will leave this aspect for future research.
[6] Passive-raising would create a semantic relation of the following type: "the result R of the state is such that there is an initiator of a process event whose effect is the result R of this state." See Gehrke and Grillo's paper for details on how this idea is implemented in semantic terms.
[7] As observed by Grimshaw and Vikner (1993) for English, unacceptable structures can be saved by modifying the structure with relevant adverbials (cf. example 11 above) or by adjusting viewpoint aspect.

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Revisiting Spanish ObjExp Psych Predicates

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1. Introduction

This paper deals with case marking of the experiencer argument in Spanish psychological verbs[1] such as *molestar* "to bother", *sorprender* "to surprise", *asustar* "to frighten", etc. The argument experiencing the emotion or mental state is referred to as the *experiencer* and the argument causing or evoking the mental state is referred to as the *stimulus*.[2] Traditionally, psychological verbs have been classified into two main groups based on whether the experiencer is selected as the subject or the object: the Subj(ect)Exp(eriencer) and the Obj(ect)Exp group respectively (Belleti and Rizzi 1988, Grimshaw 1990, Croft 1993, Pesetsky 1996, Levin and Rappaport 2005).[3]

In the SubjExp group the experiencer is selected as the subject and the stimulus as the object as in (1) where the experiencer *my children* is the subject and the stimulus *thunderstorms* is the object.

(1) My children fear thunderstorms. (Levin and Rappaport 2005: 14)

In the ObjExp group it is reversed; the stimulus is selected as the subject and the experiencer as the object, as in (2) where the stimulus *thunderstorms* is selected as the subject and the experiencer *my children* is the object. Thus, this ObjExp group of verbs is often referred to as reverse-psychological verbs.

(2) Thunderstorms frighten my children. (Levin and Rappaport 2005: 14)

Based on this grouping, and additionally based on case marking, in Spanish there are three classes of psychological verbs: Class I- verbs like *temer* "to fear", Class II- verbs like *gustar* "to like/please", Class III- verbs like *molestar* "to bother" (Parodi and Luján 2000, Ackerman and Moore 2001). Class I verbs are SubjExp, as in (3), where the experiencer *Juan* is the subject and the stimulus *las arañas* "the spiders" is the object. Class II verbs are ObjExp, as in (4), where the stimulus *las arañas* "the spiders" is the subject and the experiencer, expressed here as the dative clitic *le*,[4] is the object.

(3) Juan odia las arañas.
Juan.NOM hate.3SG the spiders.ACC
"Juan hates spiders."

(4) Le gustan las arañas.
CL.DAT please.3PL the spiders.NOM
"The spiders please him/He likes spiders."

Spanish Class III verbs, illustrated in (5), form a unique group within Romance languages because they allow for both the dative and the accusative case for their experiencers.[5] The Class III verbs are ObjExp, as seen in (5), where the stimulus *las arañas* "the spiders" is the subject and the experiencer can be either a dative clitic *le* or an accusative clitic *lo*.[6]

(5) Le/Lo molestan las arañas.
CL.DAT/ACC bother.3PL the spiders.NOM
"The spiders bother him."

In this paper, I only deal with Class II and Class III psych verbs. As mentioned before, Class II and Class III psych verbs are ObjExp verbs and are often referred to as reverse psychological verbs. Henceforth I will refer to them as r-psych verbs.

There are two issues pertinent to r-psych verbs: (a) case marking, and (b) lexical entry. First, as far as case marking is concerned, the question arises as to how and why the dative or accusative case is assigned to the experiencer argument. Second, there is the problem of how these verbs are represented in the lexicon given that they can select accusative or dative case.

2. Previous Analyses

Starting with case marking, research on Spanish r-psych verbs (Parodi and Luján 2000, Ackerman and Moore 2001) argue that case marking depends on the eventuality denoted by the sentence; that is, if the eventuality of the sentence is stative then the experiencer argument is realized as dative and the accusative is ungrammatical, as shown in (6); and when the eventuality is eventive then the experiencer argument is realized as accusative and the dative is ungrammatical, as shown in (7).

(6) El ruido le /(*la) molestó/preocupó/afectó.
the noise.NOM CL.DAT/ACC bother/worry/affect.3SG
"The noise bothered/worried/affected him/her (all his/her life)."

(7) El ruido la /(*le) molestó/preocupó/afectó.
the noise.NOM CL.ACC/DAT bother/worry/affect.3SG
"The noise bothered/worried/affected him/her (yesterday)."
(Parodi and Luján 2000: 3)

According to Parodi and Luján (2000; henceforth P&L), the meaning in (6) would be that "the noise bothered/worried/affected her always, while she was alive" (cf. P&L 2000: 4), a stative reading. In (7), on the other hand, the meaning of the sentence is that "Mary is usually not bothered/worried/affected by noise, but on one occasion, yesterday, the noise bothered/worried/affected her" (cf. P&L 2000: 4), an eventive reading. Additionally P&L claim that a non-affected experiencer is realized as dative. Thus the experiencer in (6) is not affected. They also claim that an affected experiencer is realized as accusative. Thus the experiencer in (7) is affected. P&L use the notion of affectedness as defined by Anderson (1979), "an object is affected if it is changed, moved, created or exposed by the verb." (cf. P&L 2000: 4). Ackerman and Moore (2001; henceforth A&M) also argue along the same lines as P&L; and in order to resolve the second issue of how these verbs are represented in the lexicon, A&M posit the Paradigmatic Selection Principle, illustrated in (8), to account for case assignment.

(8) PARADIGMATIC ARGUMENT SELECTION PRINCIPLE
If P(arg1 and arg2) is a predicate of class X, where arg1 is associated with the indirect object function, then the lexicon also contains P'(arg1, arg2') where arg2 and arg2' have identical entailment sets, except that arg2' has an additional entailment of UNDERGOES CHANGE OF STATE; arg2' is associated with the direct object grammatical function.
(A&M 2001: 68)

The principle states that if there is a verb that selects a dative experiencer, that verb can also select an accusative experiencer. With the accusative experiencer a change of state is encoded. The verb is expressed in the lexicon as having two related lexical entries- $molestar_a$ and $molestar_b$, the first selecting the dative and the second, the accusative.

There are various problems with the previous proposals. First, both P&L and A&M identify eventuality and affectedness as factors that determine the case of the experiencer in r-psych verbs and their analysis presents case marking as a clear binary contrast. However, there are instances where an eventive sentence contains a dative experiencer. As shown in (9), an example from the *Corpus de Referencia del Español Actual* (CREA), the r-psych verb used is *sorprender* "to surprise"; the sentence is eventive since it is reporting the moment of the experiencer's death.

(9) Reparó la nave, y al año siguiente repitió el intento. Subió
fixed the ship and to-the year following repeated the attempt climbed
hasta un punto cercano a la isla de Midway y **allí le**
up-to a point close to the island of Midway and **there CL.DAT**
sorprendió la muerte. Tuvo el océano por tumba.
surprise.3SG the death had the ocean for tomb
"He fixed the ship and the following year tried again. He sailed up to a point close to Midway island and there death surprised him. He had the ocean for his tomb."

According to previous proposals the verb should have an accusative experiencer; however, the dative clitic *le* is used instead. Previous proposals do not account for such examples. Additionally, A&M's Paradigmatic Selection Principle does not make the right predictions. It predicts that all r-psych verbs that select dative experiencers can select an accusative experiencer. While that may be the case with r-psych verbs like *molestar* "to bother" and *sorprender* "to surprise", it does not work with r-psych verbs such as *gustar* "to like/please" and *encantar* "to really like", since these verbs only allow for a dative experiencer and never an accusative experiencer. Thus, the previous binary analyses are inadequate, since they do not account for all of the data.

3. Methodology

3.1. Data

The data used for this paper comes from native Mexican Spanish speakers as well as from the *Corpus de Referencia del Español Actual* (CREA). Due to the many varieties of Spanish spoken all over the world, a study to encompass all the varieties is beyond the scope of this paper. I restrict this paper to modern Mexican Spanish, which is a recognized standard variety of Spanish (Cotton and Sharp 1988, Anzaldúa 1999, *inter alia*). Furthermore the *leísmo* phenomenon in which native speakers use the dative 3rd person clitics *le/les* (SG/PL) in lieu of the 3rd person masculine accusative clitics *lo/los* (SG/PL) is predominant in various parts of Spain and occurs also in parts of Argentina, Bolivia, Ecuador, Paraguay and Peru. The possibility of biased and unclear judgments prevents me from considering these regions in my study. Moreover, case marking in Spanish can only be discussed with explicit clitics in the sentences.[7] As shown in Torres-Cacoullos (2002), the *leísmo* phenomenon does not occur in modern Mexican Spanish. The *laísmo* and *loísmo* phenomena, the use of the 3rd person feminine accusative clitic *la* and the 3rd person masculine accusative clitic *lo* respectively in place of the 3rd person dative clitic le, also only occurs in Spain (Roldán 1975, Bello 1898) but is not attested in Mexican Spanish. In order to discuss case

marking in r-psych verbs I need clear judgments and explicit clitics in the data, hence the use of modern Mexican Spanish data in this paper.

The data collected for this paper is from written texts (specifically from books, not from magazines and newspapers) in order to limit any variation due to genre.[8] Finally, only tokens with an explicit 3rd person dative clitic *le* or *les* or accusative clitic *lo* or *los* or *la* or *las* are analyzed since the other clitic forms, 1st and 2nd person singular (*me/te*) and plural (*nos/os*) do not differentiate case in Spanish,[9] and in the absence of a clitic it is speculative to determine case.

3.2. States and events

The notions of state and event are crucial to discussing case marking in r-psych verbs, and for this paper I use Smith's (1991/1997) definitions. States do not involve any change and are characterized as non-dynamic. Smith defines states as "static, with no dynamics and no internal structure; they have a duration of at least a moment" (Smith 1991/1997: 28). The examples she gives are *know the answer, be in Athens.* The temporal schema she proposes for states is shown in (10).

(10) Temporal schema for states
(I) ———————— (F) (Smith 1991/1997: 37)

In (10), the line represents the duration for which a state holds and the initial and final points are in parenthesis because they are not part of the state. Thus, states have no endpoints and do not entail results. As far as events are concerned, Smith claims that non-states are basically events. She defines events as "dynamic, involving agency, activity and change" (Smith 1991/1997: 29). Thus, all non-states are basically events. This definition includes accomplishments, achievements, activities and semelfactives.[10]

Moving on to the diagnostics for states and events, the tests I use are subject oriented manner adverbials and the *acabar de* "to have just finished doing something" (from Salaberry 2000). States in Spanish do not allow for a subject oriented manner adverbial whereas events do, as shown in (11)–(12). In (11) the verb *saber "*to know" is a stative verb and in (12) the verb *tirar* "to throw" is an eventive verb.

(11) *Juan sabe la lección a propósito.
Juan know.3SG the lesson to purpose
"Juan deliberately knows the lesson."

(12) Juan tira el libro a propósito.
Juan throw.3SG the book to purpose
"Juan deliberately throws the book."

Similarly, a stative sentence is not grammatical when embedded under *acabar de*, while an eventive sentence is grammatical, as shown in (13)-(14). In (13), the verb *saber "*to know" is a stative verb, and in (14), the verb *tirar* "to throw" is an eventive verb.[11]

(13) *Juan acaba de saber la lección.
John have-just.3SG of to-know the lesson
"John has just finished knowing the lesson."

(14) Juan acaba de estudiar la lección.
John have-just.3SG of to-study the lesson
"John has just finished studying the lesson." (Salaberry 2000: 30)

Based on these definitions and diagnostics for state and event, let us look at the correlation between case marking and eventuality in r-psych verbs in the next section.

4. Observations and Discussion

The two issues studied in this paper are (i) case marking in r-psych verbs, and (ii) their representation as a lexical entry. With regard to the first issue, case marking, the data from the corpus and from native speakers shows that while there is a strong correlation between case marking and eventuality, it is not a strict binary system as proposed by previous researchers. It is true that stative r-psych verbs choose dative experiencers, and eventive r-psych verbs choose accusative experiencers.

As seen in (15)-(16), we know that these sentences are stative because they are ungrammatical with the subject oriented manner adverbial and in both the sentences the dative clitic *le* is used.[12]

(15) *A la autora le sorprenden las narraciones de personas
to the author CL.DAT surprise.3PL the narration.PL.NOM of people
a propósito
to purpose
"The people's narrations are deliberately surprising to the author."

(16) *Ya no le importaba el dolor de su mano herida ni
already no CL.DAT matter.3SG the pain.NOM of his hand hurt nor
le asustaba la presencia del oso **a propósito**.
CL.DAT scare.3SG the presence of-the bear to purpose
"The pain in his wounded hand did not matter anymore, neither was he deliberately scared of the bear's presence."

Similarly in (17)-(18), the sentences are eventive because they are grammatical with the subject-oriented manner adverbial and the accusative clitic *lo* is used.

(17) Pero entra Max, con un gran rollo de cable, y lo
but enter.3SG Max with a big roll of cable and CL.ACC
sorprende **a propósito.**
surprise.3SG to purpose
"But Max enters with a big roll of cable and deliberately surprises him."

(18) Si alguien se le acercaba Pan gritaba tan fuerte
if someone REFL CL.DAT approach.3SG Pan.NOM shout.3SG so loud
que lo asustaba **a propósito**.
that CL.ACC scare.3SG to purpose
"If someone approached him, Pan shouted so loudly that he deliberately scared him."

However, an interesting finding is that there are instances where eventive r-psych verbs also choose dative experiencers, as shown in (19), where we know the sentence is eventive because it is grammatical with the subject oriented manner adverbial.

(19) Mejor para mí; le sorprenderé **a propósito** actuando como hombre.
better for me CL.DAT surprise.1SG to purpose acting like man.
"Better for me; I will deliberately surprise him by acting like a man."

Thus the dative can be used irrespective of the eventuality of the sentence. This suggests that the dative is unmarked for eventuality. The accusative case is the marked case; it only occurs in a more limited set of cases. The question arises why eventive r-psych verbs can take both accusative and dative case and what factors determine case in these sentences. The hypothesis I would like to entertain is that the accusative case requires certain specific features in order to be realized in an eventive sentence. Looking at the sentences that have accusative case, as shown in (20)-(21), the features that are relevant perhaps have to do with the nature of the subject and object.

(20) Pero entra Max, con un gran rollo de cable, y lo sorprende
but enter.3SG Max with a big roll of cable and CL.ACC surprise.3SG
"But Max enters with a big roll of cable and surprises him."

(21) Si alguien se le acercaba Pan gritaba tan fuerte
if someone REFL CL.DAT approach.3SG Pan.NOM shout.3SG so loud
que lo asustaba.
that CL.ACC scare.3SG
"If someone approached him, Pan shouted so loudly that he scared him."

In both (20)-(21) the subjects are agentive and act volitionally and the objects are affected. Now let us compare the properties of the subject and object in the eventive sentence with the dative, as shown in (22).

(22) Mejor para mí; le sorprenderé actuando como hombre.
better for me CL.DAT surprise.1SG acting like man.
"Better for me; I will surprise him by acting like a man."

While in (22) the subject is agentive and acts volitionally, the object is not yet affected given that the action has not taken place yet. Another eventive sentence with the dative clitic is shown in (23). Here the subject is not agentive and cannot do the action volitionally, although the object in (23) is most certainly affected given the experiencer's death. Thus, in both (22)-(23) the dative case is selected due to the lack of all the three features.

(23) Reparó la nave, y al año siguiente repitió el intento. Subió
fixed the ship and to-the year following repeated the attempt climbed
hasta un punto cercano a la isla de Midway y **allí le**
up-to a point close to the island of Midway and **there CL.DAT**
sorprendió la muerte. Tuvo el océano por tumba.
surprise.3SG the death had the ocean for tomb
"He fixed the ship and the following year attempted again. He sailed up to a point close to the Midway island and there death surprised him. He had the ocean for his tomb."

Thus, the accusative case seems to be feature-rich, specifically possessing the features of agency, volition, and affectedness; whereas the dative case is devoid of these. High degrees of agency, volition, and affectedness directly correlate to high transitivity (Hopper and Thompson 1980). Given this, I propose that r-psych verbs with high transitivity select accusative case and r-psych verbs with low transitivity select dative case.

Turning to the issue of the lexical entry for r-psych verbs, Ackerman and Moore's Paradigmatic Selection Principle predicts that all r-psych verbs that

select dative experiencers can select an accusative experiencer which is not true since there are r-psych verbs that can only select dative case like *gustar* "to like", or *encantar* "to really like". Moreover, since the dative is the unmarked default case, all r-psych verbs can select dative case and only a few can select accusative case for their experiencers. Given these findings, I propose the lexical entries for r-psych verbs illustrated in (24). The lexical entries only need to make clear the possible eventualities that can be expressed by the r-psych verb. There is no need to include case marking in the entries since case marking follows from independent principles of transitivity.

(24) Class II: *e.g. gustar* "to like/please"*, encantar* "to really like", *apetecer* "to fancy" are STATIVE.

Class III: *e.g. molestar* "to bother"*, sorprender* "to surprise"*, asustar* "to frighten" can be STATIVE or EVENTIVE.

5. Conclusion

In this paper, I have revised the classification of r-psych verbs to include eventualities but to exclude case marking. I have shown that, in line with previous research, there is a correlation between case marking and eventuality in r-psych verbs. However, the dative case seems to be the unmarked case; it is unmarked for eventuality type, and in fact seems unmarked for any features whatsoever. The dative stands out for its lack of features. The accusative case in r-psych verbs is marked and feature rich, that is, it requires specific features in order to be assigned to the experiencer argument. The features it requires are agency, volition, and affectedness, which correlate with transitivity. Thus, High transitivity in r-psych verbs requires an accusative experiencer and low transitivity results in a dative experiencer.

Notes

[1] Psych verbs are verbs like *love, hate, fear*, *frighten*, *please*, *bother, surprise* etc. that describe emotions and mental states.
[2] The term *theme* is also commonly used instead of *stimulus*.
[3] For English, there have been further sub-classifications based on agency and nature of event. See Desidero (1993), Arad (1998).
[4] Note that clitics are glossed as CL in the examples. Also, for convenience and consistency, all clitics, unless otherwise indicated in the gloss, are 3rd person. The singular dative clitic is *le*, while the plural one is *les.* The dative clitics do not mark gender. The singular accusative clitic is *lo* (masculine) and *la* (feminine), while the plural ones are *los* and *las.*

[5] This is unusual since in Romance languages ObjExp psych verbs are divided into two classes: (a) verbs that express the experiencer as a dative, as seen in (i); and (b) verbs that express them as an accusative, as seen in (ii); but not both.

(i) A Gianni piace questo.
to Gianni.DAT please.3SG this.NOM
"This pleases Gianni."

(ii) Esto preoccupa Gianni.
This.NOM worry.3SG Gianni.ACC
"This worries Gianni." (Belleti and Rizzi 1988: 291)

For French see Legendre (1989), Herschensohn (1992). For English see Desidero (1993), Arad (1998).

[6] It is only when the experiencer argument is substantiated overtly as a 3rd person singular or plural clitic that case can be ascertained. See Bleam (1999), Cuervo (2003), Demonte (1995), Franco (1991), Jaeggli (1982, 1986), Nishida (In preparation), Strozer (1976), and Suñer (1988).

[7] For more on clitics in Spanish see Bleam (1999), Cuervo (2003), Demonte (1995), Franco (1991), Jaeggli (1982, 1986), Nishida (In preparation), Strozer (1976), and Suñer (1988).

[8] For literature on genre differences, differences between written and spoken texts see Biber (1991), Dijk (1975), and Hyland (2002, 2011).

[9] Here is a tabular comparison of accusative and dative clitics in Spanish in which it can be seen that the 1st and 2nd person dative and accusative clitics are syncretic:

Table 1. Dative and Accusative Clitics in Spanish

		Dative clitics	Accusative clitics
Singular	1st pers.	me	me
	2nd pers.	te	te
	3rd pers.	le	lo (masc)/la (fem)
Plural	1st pers.	nos	nos
	2nd pers.	os	os
	3rd pers.	les	los(masc)/las (fem)

[10] For further reading see Smith (1991/1997) and Verkuyl (1972).

[11] Some states result in grammatical sentences when embedded under *acabar de*, however in those cases there is a coerced reading (inchoative in many cases) of the sentences that allows the judgment to be grammatical. For more on coercion see Ganeshan (In preparation).

[12] All examples in this section are from the *Corpus de Referencia del Español Actual* (CREA).

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Bidialectalism and Loanwords in the Speech of Mexican Immigrants in Puerto Rico

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1 Introduction

1.1. Dialect contact and lexical change: Mexicans in Puerto Rico

According to the last census administered by the Mexican Consulate-General in Puerto Rico, there are 2,500 Mexicans (of whom only 1,600 are registered with the Consulate) residing on the Island. The 2,500 represent only those who were born in Mexico and immigrated as the first generation to the Island.

These numbers reflect how Mexicans do not represent a significant percentage of the foreign Hispanic population in Puerto Rico, unlike Dominicans, for example, who are quite numerous. However, Mexican informants have been selected for this study due to the evident lexical differences that exist between their dialect and Puerto Rican Spanish. One of the objectives of this study was to determine if there has been linguistic change in the speech of Mexicans in Puerto Rico, despite the linguistic prestige of the Mexican dialect on the Island. Linguistic prestige is understood as the belief that certain linguistic features are more valuable or more cultured and, therefore, less stigmatized than others. In contrast with the Dominican community, whose dialect tends to be stigmatized by Puerto Ricans on the Island (Martinez-San Miguel 2003), the Mexican dialect appears to have greater prestige and value for Puerto Ricans due to its association with televised programs and popular music. One would assume, from the Mexicans' perspective, that they also consider their own dialect as more linguistically prestigious than the Puerto Rican one. Nonetheless, in this research, it is hypothesized that the Mexican community in Puerto Rico has undergone lexical change under the influence of the Puerto Rican dialect.

Lexical change or assimilation is a process only relevant for those words that give reference to the same object, action, or feeling, but differ in form for each dialect in contact. For example, (1) presents the lexical variation that exists for a given noun in the Puerto Rican dialect, the Mexican dialect, and the general Spanish language, despite the fact that it denotes the same entity.

(1) a. Juan es mi *pana* de toda la vida. (Puerto Rican)
b. Juan es mi *cuate* de toda la vida. (Mexican)
c. Juan es mi *amigo* de toda la vida. (General Spanish)
"Juan is my lifetime *friend.*"

The elements of the general Spanish variant are understood here as those words semantically equivalent to the particular variants of the other two communities involved, but that are shared between both dialects. In other words, in the Puerto Rican dialect (1a), the word *pana* is used to indicate a "friend" while in the Mexican dialect (1b), *cuate* is used. Both words (*pana* and *cuate*) give reference to the same meaning that can also be represented by the non-culture-specific word *amigo* (1c) "friend" in both dialects. Therefore, *pana* is an element of Puerto Rican Spanish, while *cuate* pertains to Mexican Spanish and *amigo* to general Spanish.

1.2. Purpose

The pilot study described here utilizes lexical comparison between the Spanish of Mexico and that of Puerto Rico as a distinguishable criterion in order to investigate (1) whether the Mexican immigrant population in Puerto Rico (specifically, in the San Juan metropolitan area) has maintained its country's original lexicon (dialect of origin), has adopted some elements of the Puerto Rican lexicon (new dialect), or has opted for the general Spanish dialect, and (2) how the extent of contact with the Puerto Rican speech community affects the Mexicans' knowledge of and willingness to produce items from the Puerto Rican lexicon.

1.3. Research questions

Specifically, this study has four research questions:

1. Do participants from the Mexican community produce and understand lexical elements from Puerto Rican Spanish?
2. Is there a correlation between the time of residence in Puerto Rico and the extent of assimilation of the Mexican community to Puerto Rican Spanish? If so, is the correlation negative or positive?
3. Do participants recognize and accept their degree of assimilation to Puerto Rican Spanish? Do participants give the Puerto Rican lexical items higher judgment scores?
4. Are participants able to identify linguistic differences between the Mexican and Puerto Rican dialects? If so, do they reflect a preference for one dialect over the other?

2. Theoretical Framework

2.1. Production-Distribution-Comprehension (PDC) model

MacDonald and Thornton's (2009) Production-Distribution-Comprehension (PDC) model, which is most frequently discussed in psycholinguistic and language processing studies, argues that

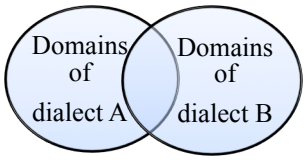
> "distributional patterns [in this case, dialect particularities] in a language user's input are constraints on the language production system, which promotes certain structures and lexical/structural pairings over others" (MacDonald and Thornton 2009: 1178).

This model has been tested in several studies of monolingual and bilingual syntactic and lexical choices, but none that account for bidialectal lexical choices. Notwithstanding, the "accessibility-based production" (MacDonald and Thornton 2009:1178) model is relevant to this study since it states that the frequency of exposure to linguistic structures affects production. Thus, this paper addresses and supports the notion that the more exposure a speaker has to new dialect B while being less exposed to their dialect of origin A, the more likely it is for that speaker to produce particularities from dialect B in discourse.

2.2. Complementary domains principle

Subsequently, the speakers' motivations and the functions of their dialect preferences and lexical choices are also a matter of interest. It is known that for bilinguals, language choice depends on factors, such as situation, interlocutor, and topic, and the distribution of each language varies across these and other different domains. Grosjean's (2010: 29) complementary principle claims "bilinguals [including bidialectals] usually acquire and use their languages [dialects] for different purposes, in different domains of life, with different people". Thus, for a bidialectal speaker, one dialect will not cover all domains. Instead, one dialect will cover some domains, the other dialect will cover other domains, and some domains will be covered by both dialects (Grosjean 2010: 29-30). (See Figure 1)

Figure 1. The overlapping domains of two dialects



> "In general, if a [dialect] is spoken in a reduced number of domains and with a limited

> number of people, then it will not be developed as much as [the dialect] used in more domains and with more people" (Grosjean 2010: 31)

This means that the number of domains covered by one dialect depends on the situation, the interlocutor, the communication purposes, and the speakers' cultural identity and dialect preferences.

2.3. Cultural identity and dialect preference

Culture identity has often been linked to language preference and use since language (verbal and nonverbal) is the most common vehicle of expression and cultural identification. Language is used by speakers to identify themselves as members of certain speech communities and non-members of other speech communities. Dialect preferences and lexical choices could also be signs of association with and disassociation from different speech communities. The processes of dialect preferences and lexical choices can be explained by the adaptation[1] of two terms proposed by Weinreich (1974) (as cited by Silva-Corvalán 1994: 168): *language shift* and *language loyalty*.

Dialect shift refers to the change from the everyday, traditional use of one dialect to that of another, and *dialect loyalty* refers to the conscious and explicit resistance of changes in the functions, the structures, and/or vocabulary (or even pronunciation) of one dialect when in contact with another dialect. These two principles, dialect shift and dialect loyalty, may correlate with negative and positive attitudes in such a way that negative attitudes towards the native dialect may stimulate dialect shift, while positive attitudes toward the native dialect may encourage dialect loyalty.

Zentella (1990: 1095), in a study on the effects of inter-dialect contact, states that a "[linguistic] change is the result of the interrelationship between ... experience with a new item and factors which promote or inhibit its acceptance"[2]. However,

> "the process of incorporation, loss, or maintenance is not predictable by a simple mathematical formula, which calculates the number of people who know a term versus those who ignore it, because of a number of social and economic realities that impinge upon communication and linguistic change, leveling, and/or diffusion" (Zentella 1990: 1098)

Thus, several possibilities still remain: Mexicans may choose to incorporate Puerto Rican lexical items along with the Mexican lexical items; they may stop using some or all of their Mexican lexical items; or they may choose to maintain their Mexican variety.

2.4 Predictions

The exposure approach (see Fishman 2000, Grosjean 2010, MacDonald and Thornton 2009, Silva-Corvalán 1994, Zentella 1990) leads to the prediction that when dialects come in contact and there is a dichotomy in production frequency of certain lexical items, the lexical choices employed by the largest Spanish dialect-speaking group in the area (in this case, Puerto Ricans) will be adopted. That being said, this study has four hypotheses:

H1: The participants of the Mexican community produce and comprehend, at different levels, the lexical elements of Puerto Rican Spanish.
H2: There is a positive correlation between the number of years that the participants have spent living in Puerto Rico and the number of Puerto Rican words they have adopted.
H3: Participants who have lived longer in Puerto Rico will accept and recognize their use of Puerto Rican lexical items (that is, give them higher judgment scores) more than participants who have lived fewer years in Puerto Rico.
H4: Participants are able to identify linguistic differences between the Mexican and the Puerto Rican dialects and, even though they may assimilate, they will also show tendencies to prefer the Mexican dialect to the Puerto Rican.

3. Empirical Study

3.1. Participants

Participants were selected for the study based on three requirements: (a) they must have been born and raised in Mexico; (b) they must have been living in Puerto Rico for at least a year; and (c) they must have been at least eighteen years old. Thirteen participants took part in this study, but four of them were excluded from the analysis because they did not complete the second experimental task. The remaining nine participants were divided into three groups based on the number of years spent living in Puerto Rico: Four participants had lived in Puerto Rico between one and ten years; one participant had lived in Puerto Rico between eleven and twenty years; and four participants had lived in Puerto Rico between twenty-one and thirty years.

3.2. Materials and design

The study consisted of two questionnaires and two tasks that collected quantitative and qualitative data regarding lexical change, factors that favor or

disfavor linguistic change in dialect contact situations, and the attitudes and beliefs of the participants toward both variants under study.

3.2.1. Questionnaires

The first questionnaire collected demographic data; participants provided personal information such as their place of birth, their gender and age, the number of years spent living in Mexico and Puerto Rico, and their travelling tendencies. The second questionnaire gathered information on the perceptions, attitudes, and experiences of the participants with regard to their cultural identity, their inter-dialectal status, their linguistic performance, the way they perceive themselves and others, and how they believe others perceive them.

As for the tasks, the first one examined the participants' production while the second one examined their comprehension.

3.2.2 Production task

The experimental stimuli for this first task comprised 10 experimental sentences, in addition to four practice sentences and 15 fillers. The purpose of the practice sentences was simply to familiarize the participants with the stimuli format. Each of the experimental sentences was contextually constrained with the intention of triggering certain lexical items without imposing one of the dialects upon the other. Example (2) displays one of the experimental sentences used in the first task.

(2) Para que Marta no camine por la calle de noche, Juan le da _____ a su casa.
"In order for Marta not to walk out on the street at night, Juan gives her _____ to her house."

Just as in this example, in each experimental sentence, the critical region (fill-in-the-blank section) appeared towards the end of the sentence to provide the participants with the information necessary prior to the critical region under examination, in order for them to fulfill the task adequately. The fill-in-the-blank section was considered the critical region because the design of this task was, as mentioned above, intended to trigger accessibility and production of certain Puerto Rican lexical items to find if they constituted part of the participants' lexicon. In example (2), the lexical item intended to be triggered was either *pon* (as the Puerto Rican variety), its equivalent in the Mexican dialect (possibly *aventón),* or any other option in the general Spanish dialect. The Puerto Rican lexical items under examination were selected strategically based on usage frequency within the Puerto Rican community. The ten lexical items were: *pon* "ride", *zafacón* "trash can", *bizcocho* "cake", *chequee "*check/verify", *panas* "friends", *guagua* "bus", *bregar* "handle/work with", *coger* "take/grab", *tapón* "traffic" and *revolú* "chaos". In addition to the experimental sentences, 15 filler sentences were used to distract the participant

from predicting a pattern in the design of the experimental sentences. Participants were never exposed to the same sentences, and all three types of sentences (practice, experimental, and fillers) were controlled for length. That is, all sentences appeared in the same size and font on two lines in each slide when presented to the participant in a PowerPoint (Microsoft) presentation.

3.2.3. Comprehension and production frequency-rating task

The experimental stimuli for the second task consisted of sentences similar to those of the first task, but they differed in the way the critical region was examined. In this task, lexical items were provided in the sentences presented. The same ten Puerto Rican lexical items were used along with their semantically equivalent lexical items from either the Mexican or the general Spanish dialect. Example (3) displays a set of three sentences presented in the second task, each presenting a lexical item associated with a dialect.

(3) a. Juan me dio *pon* a la escuela. (Puerto Rican lexical item)
"Juan gave me a *ride* to school."
b. Eliza me dio un *aventón* al trabajo. (Mexican lexical item)
"Eliza gave me a *ride* to work."
c. Fernando me *llevó* a mi casa. (General Spanish lexical item)
"Fernando *took* me home."

This set of sentences was not presented together in the second task; on the contrary, the sentences in example (2) were separated and spread randomly throughout the handout given to the participants. Again, all sentences were controlled for length. The experimental stimuli of the second task comprised 27 sentences, of which 10 included a Puerto Rican lexical item, eight included a Mexican lexical item, and the remaining nine included a lexical item from standard Spanish.

Participants completed the two questionnaires and the two tasks in two separate blocks. Block presentation was the same for all participants.

3.3. Procedure

In the first block, the participants received the demographic questionnaire followed by the first experimental task. For the first task, participants were instructed to read out loud and fill in the blanks of several sentences with the first word that came to mind according to the context of each sentence. They were notified that they were going to be recorded for the duration of the task and that each slide in the PowerPoint presentation was timed, except for the two slides that indicated a break (one after the practice sentences and the other half way through the experiment). Participants were also aware that once a slide had passed and changed to a new one, they could not go back. This task was

completed in approximately five minutes.

The second block was scheduled to take place at least a week after the date of the first session. This measure was adopted in order to avoid the possibility of participants remembering the target lexical items or deciphering the purpose of the study. The second session began with the facilitation of the Comprehension and Production Frequency-rating Task, which was neither recorded nor timed. Participants were instructed to read the sentences silently and to rank them according to the frequency with which they used each type of sentence. In other words, using a Likert Scale that ranged from 1 to 7 (1 being "very rare" and 7 being "very frequent"), the participants were instructed to identify how often they would produce sentences with similar structure and vocabulary to those used in the sentences provided. For example, when participants looked at sentence (4) here below, ideally, they paid attention (without being directly told) to the lexical items used and identified whether they produced them and how often.

(4) Hubo un revolú en la oficina de desempleo.
Rara ---- 1--- 2 --- 3 --- 4 --- 5 --- 6 --- 7 ---- Común
"There was a chaos at the unemployment office"
"Rare ---- 1--- 2 --- 3 --- 4 --- 5 --- 6 --- 7 ---- Frequent"

After the completion of this task, the participants were asked to complete the second questionnaire in which they shared their linguistic perceptions, attitudes, and experiences.

3.4. Results

For the data analysis of all tasks, participant 007 from the second group (11-20 years in Puerto Rico) was put aside because this participant was the only member of the second group and, thus, not fully represented the group. However, the comparison between the other two groups (G1 & G3) revealed significant variation.

3.4.1. Production task

However, from a general perspective, most of the Puerto Rican lexical items were not produced by the participants of the other two groups. The following percentages were taken from the eight participants that constituted group 1 (1-10 years in PR) and group 3 (21-30 years in PR). Out of the ten target words, *pon* was produced 62.5%, *zafacón* was produced 37.5%, *bizcocho*, *tapón* and *revolú* were tied with 25%, while *coger* was produced only once with a percentage of 12.5. The remaining words, *chequee*, *panas*, *guagua,* and *bregar* were not produced (apparently not adopted) by any of the participants (see Appendix, Table 1).

3.4.2. Comprehension and production frequency-rating task

In the attempt to collect the participants' self-assessment of their use of Puerto Rican Spanish, Mexican Spanish, and general Spanish lexical items, the scores given by each participant for each Puerto Rican lexical item were tallied to identify a group score. That is, the sum of the ranking scores given to the use of the word *pon* by the participants in group 1 totaled 13 points. This same group accumulated 13 points for *guagua*, 12 points for *zafacón*, *bizcocho* and *tapón*, 11 points for *panas*, 10 for *coger*, 9 for *bregar*, 8 for *revolú* and 7 for *chequee* For group 3, the highest score of 26 points was given to *zafacón*, followed by *coger* with 24 points, then *chequee* with 21, *bregar* with 16, *bizcocho*, *panas*, and *guagua* with 15, *tapón* with 14 and finally, *pon* and *revolú* with 12 points (see Appendix, Table 2).

3.4.3. Linguistic and cultural awareness questionnaire

The questionnaire included 39 items that regarded several aspects of contact and its possible consequences; however, for the purpose of this study, I will only present and discuss four questions that were found to be the most relevant and influential in the lexical choices that the participants made in the aforementioned tasks. For the first question, participants were instructed to indicate the extent to which they identified with the Mexican culture, the Puerto Rican, and others using a scale from 1 to 10, in which 1 indicated no identification and 10 indicated complete identification. When ranking the degree to which they identified with Mexican culture, all participants in group 1 identified completely, giving it a mean score of 10. When this same group ranked their Puerto Rican culture identification, the mean score was 5, with a range between 2 and 8 points. Group 3, on the other hand, identified with the Mexican culture with a mean score of 9.5 (range 8-10) and with the Puerto Rican culture with a mean score of 8.5 (range 7-10) (see Appendix, Table 3).

The second question examined whether the participants believed that it was inevitable for their Spanish dialect to assimilate to that of Puerto Ricans while living in Puerto Rico. Seventy-five percent of the participants in group 1 believed that such assimilation could actually be avoided, while 25% understood that it could not. In contrast, 75% of the participants in group 3 agreed that while living in Puerto Rico, assimilation to Puerto Rican Spanish was unavoidable, while 25% argued that it could be prevented (see Appendix, Table 4).

The last two questions considered in this paper will be discussed in relation to one another, as they took into account whether the participants were aware of adapting their lexical choices to the dialect of the interlocutor. One of these two questions referred to the Mexican interlocutors and the other referred to the Puerto Rican interlocutors. Results showed that most participants did modify their vocabulary in order to assimilate to the interlocutor's dialect. One hundred percent of both groups claimed to use the Mexican dialect when speaking to

Mexicans. In addition, 100% of group 3 claimed to use the Puerto Rican dialect when speaking to Puerto Ricans, and only 75% of group 1 appeared to use the Puerto Rican dialect instead of the Mexican dialect when speaking to Puerto Ricans (see Appendix, Table 5).

3.5. Discussion

The results will be interpreted with respect to each of the research questions stated previously. To answer the first research question, data from Task 1 were analyzed by percentage of assimilated words per individual and per group. Setting aside group 2 for reasons already noted, group 1 had the lower percentages of words assimilated by each of its members, ranging from 0 – 20% of the ten target words, scoring only 7% of assimilation as a group. In group 3, on the other hand, three-fourths of the group assimilated more than 20% of the target words with a range of 10-50%. The group score indicated 30% of assimilation. As for comprehension, both groups demonstrated their comprehension and were able to indicate their usage frequency of the target words. Group 1 judged their usage frequency with a minimum of seven points and a maximum of 13. Group 2 judged their usage frequency with a minimum of 12 points and a maximum of 26.

The differences in percentages and judgment scores between the two comparable groups reveal that as the amount of time spent in Puerto Rico increased, so did the accessibility and the use of the Puerto Rican lexical items (see Appendix, Table 6). In regards to the second research question, these results suggest a positive correlation between the time of residence in Puerto Rico and the extent of assimilation of the Mexican community to Puerto Rican Spanish answers.

The third research question was addressed by examining the sums of the judgment scores given by groups 1 and 3 during Task 2 (see Appendix, Table 2). After the scores were tallied, the sum for each word was compared for the two groups. The difference between the sum of group 1 and that of group 3 for the word *pon* was negative 1, meaning that the sum for group 1 was higher than the sum for group 3 by one point. This result was not expected, considering that the members of group 3 had been in Puerto Rico the longest and, therefore, were expected to use the Puerto Rican lexical item *pon* more frequently than those in group 1. However, despite this case, the differences between the sums of the other lexical items corroborated the prediction that group 3 would have higher scores than group 1 due to their longer period of time in Puerto Rico and, thus, longer time exposed to the Puerto Rican vocabulary. From the ten target words, *zafacón*, *chequee* and *coger* had the largest difference (14 points) between the scores from group 1 and group 3 (see Appendix, Table 7). These may represent words that are more difficult or less likely for Mexicans to adopt during the first years of arrival. To better answer the third research question, it was found that

participants admitted and embraced their degree of assimilation to the Puerto Rican Spanish when they ranked their use of the target words with any score higher than 2. In addition to this analysis, the individual and group mean scores were taken. When comparing both groups, group 1 has a lower score than group 3 yet, no significant difference was found (see Appendix, Table 8).

The fourth research question was addressed based on the responses to the linguistic questionnaire. Participants in group 1 identified with Mexican culture twice as much as they identified with Puerto Rican culture. Half of the members admitted to having used Puerto Rican lexical items in their everyday speech, and they recognized their own ability to assimilate to the Puerto Rican Spanish dialect when required by the interlocutor. However, regardless of their ability to assimilate, 75% still displayed a high preference and loyalty to the Mexican dialect since they believed that as speakers, they had the power to resist change or assimilation. As for the participants in group 3, they appeared to feel almost equally identified with the Mexican and the Puerto Rican cultures, and 75% of the members admitted to having used Puerto Rican lexical items in their everyday speech. All of them recognized their own ability to assimilate to the Puerto Rican Spanish dialect when required by the interlocutor, but 25% believed that such assimilation could be avoided. This group did not display a clear preference of one dialect over another, but they did continue to value their native Mexican dialect by avoiding complete assimilation or shift to the Puerto Rican dialect.

4. Conclusions

This pilot study analyzed certain factors that influence dialect preferences and lexical choices. Specifically, it examined whether more frequently produced lexical items were adopted more easily and quickly than less frequent lexical items. The findings support the PDC model (MacDonald and Thornton 2009), which states that linguistic experience and extent of exposure play a crucial role in the choices and patterns of production.

The combination of factors, such as the frequency of exposure, cultural identity, and the situation of interaction, resulted from the dialect contact and led to varied patterns of lexical choices that functioned as strategies to resolve communication conflicts. The majority of the participants in this study displayed incorporation of Puerto Rican lexical items since they were able to comprehend and produce the words. This ability to know and use two dialects on a daily basis identifies them as bidialectal speakers who have not corrupted or replaced one dialect with another but, instead, have increased their lexical repertoire.

5. Future directions

This pilot study has set out to examine the effects of dialect contact, specifically the degree of bidialectalism that is present in the Mexican community that lives in Puerto Rico. In order to further investigate this topic, future studies can use less controlled tasks, such as free narration, in order to heighten the degree of spontaneity and naturalistic production. Moreover, it would be interesting to examine the effect of the interlocutor in the participants' use of lexical items from each Spanish variety. Although the present study only included a speaker of Mexican Spanish as the interlocutor, by adding an additional set of tasks with a speaker of Puerto Rican Spanish as the interlocutor, it would be possible to see if participants' use of the lexical items varies based on this factor.

Notes

[1] Since the focus of this study is on the varieties of languages (dialects), from now on the word "language" in the terms *language shift* and *language loyalty* will be replaced by the word "dialect", so that there is *dialect shift* and *dialect loyalty*.

[2] In addition, Trudgill (1984) and Labov (1966) consider that personal contact is essential in order for linguistic accommodation to occur; hence, the total number of people who are familiar with and use a term in their daily speech is a critical factor for the extinction or the preservation of such term (cited by Zentella 1990: 1098).

Appendix: Tables

Table 1
Puerto Rican assimilated lexicon (production task)

	Target Words				
Groups	pon	zafacón	bizcocho	chequee	panas
1-10 years in PR	50%	0%	0%	0%	0%
21-30 years in PR	75%	75%	50%	0%	0%
% of production	62.5%	37.5%	25%	0%	0%
Groups	guagua	bregar	coger	tapón	revolú
1-10 years in PR	0%	0%	25%	0%	0%
21-30 years in PR	0%	0%	0%	50%	50%
% of production	0%	0%	12.5%	25%	25%

Table 2
Puerto Rican assimilated lexicon (comprehension and production frequency-rating task)

	Target Words				
Groups	*pon*	*zafacón*	*bizcocho*	*chequee*	*panas*
1-10 years in PR	**13**	12	12	7	11
21-30 years in PR	12	**26**	15	21	15
Groups	*guagua*	*bregar*	*coger*	*tapón*	*revolú*
1-10 years in PR	**13**	9	10	12	8
21-30 years in PR	15	16	**24**	14	12

Table 3
Cultural Identity

Groups	Mex Culture Mean Score	PR Culture Mean Score	Statistical Significance ($p \leq .05$)
1-10 years in PR	10	5	**0.030**
21-30 years in PR	9.5	8.5	**0.092**

Table 4
Is it inevitable to speak like a Puerto Rican?

Groups	Yes	No
1-10 years in PR	25%	**75%**
21-30 years in PR	75%	**25%**

Table 5
Dialect accommodation

Groups	Yes	No
1-10 years in PR	100%	**75%**
21-30 years in PR	100%	100%

Table 6
Puerto Rican assimilated lexicon (production task)

	Group Scores		
Groups	No.	%	Statistical Significance ($p \leq .05$)
1-10 years in PR	3/40	**7%**	**0.018**
21-30 years in PR	12/40	**30%**	

Table 7
Puerto Rican assimilated lexicon (comprehension and production frequency-rating Task)

	Target Words				
Groups	*pon*	*zafacón*	*bizcocho*	*chequee*	*panas*
1-10 years in PR	13	12	12	7	11
21-30 years in PR	12	26	15	21	15
Judgment difference	N1	**14**	3	**14**	4
Groups	*guagua*	*bregar*	*coger*	*tapón*	*revolú*
1-10 years in PR	13	9	10	12	8
21-30 years in PR	15	16	24	14	12
Judgment difference	2	7	**14**	2	4

Table 8
Acceptability judgment of Puerto Rican lexicon

Groups	Group Scores	Statistical Significance ($p \leq .05$)
1-10 years in PR	2.65	**0.277**
21-30 years in PR	4.25	

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Multiple Categorization in Distributed Morphology*

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1. Introduction

The main aim of this paper is to propose that a derivation can proceed without an originally non-categorized root element being categorized, and that one-to-many categorizing system between one categorizer and many root elements should be introduced within the framework of Distributed Morphology (henceforth, DM) (see, for instance, Embick and Noyer 2007, Halle and Marantz 1993, Harley and Noyer 2000, Marantz 1997, 2000). This system is not discussed in the current DM system. Then I provide pieces of evidence from Japanese nominalizations, and claim that this proposal should be introduced into the DM framework. This proposal introduces a new mechanism of phrase structures; that is, multiple categorization. Additionally, my claim supports DM, since pieces of evidence in this paper are dependent on characteristics of category-neutral root elements. Lastly, I propose that whether this system is available or not in a language is parameterized.

The paper is structured as follows: Section 2 introduces Japanese nominalizations and considers previous studies and problems of such studies. Section 3 shows the framework of DM. Section 4 establishes an alternative DM-based analysis for these nominalizations. Section 5 concludes the paper.

2. Japanese Nominalizations

In this section, I provide data from Japanese *-kata* "way" nominalizations that have peculiar characteristics, and introduce their two previous analyses. Then I reveal problems of these previous analyses. The study of these nominalizations will lead to the new system "multiple categorization."

2.1. Data

Let us start with displaying behaviors of *-kata* nominalizations briefly. On the

surface, they are formed by adding a nominalizing suffix *-kata* to a verbal stem of a clause, with changing Cases, as shown in (1).

(1) a. John-ga tyuuibukaku hon-o yomu.
John-NOM carefully book-ACC read
"John carefully reads a book."
b. John-no tyuuibukai hon-no yomi-kata
John-GEN careful book-GEN read-way
"The way of John's carefully reading a book"

In (1b), which represents a nominalized counterpart of (1a), *-kata* is attached to *yomu* "read," forming *yomi-kata* "read-way." (*Yomu* is changed to *yomi* because of a morphological reason, when *-kata* is attached to it.) And importantly, the nominative (NOM) Case, the accusative (ACC) Case and the adverb are not used and instead, the genitive (GEN) Cases and the adjective are assigned and used, respectively.

I need to clearly state that *-kata* nominals involve contradictory internal characteristics[1]: both verbal and nominal characteristics. Namely, I claim that the *-kata* nominals are a different type of nominalizations from both English gerunds and derived nominal.[2] Firstly, regarding verbal characteristics, *-kata* nominals can involve control or causative constructions as shown in (2). (See, for instance, Kishimoto 2006).

(2) a. John-no hon-no yom-oe-kata.
John-GEN book-GEN read-finish-way
"The way of John's finishing reading a book"
b. John-no hon-no yom-ase-kata.
John-GEN book-GEN read-cause-way
"The way of John's causing to read a book"

Since these constructions are well-known to involve a vP, *-kata* nominals are said to have verbal properties. Secondly, let me introduce gerundive characteristics of these nominals. I observe that all clauses can be *-kata* nominalized. This is the same character as that in English gerunds. Since English gerunds are said to involve a vP (see, for instance, Baker 1985), *-kata* nominals seem to have verbal characteristics as well. Lastly, as to nominal characteristics, GEN Cases *no* are assigned to all arguments, and not adverbs but adjectives are used for modifiers as shown in (1b) which is repeated here. In sum, *-kata* nominals have both verbal and nominal characteristics internally.

(1) b. John-no tyuibukai hon-no yomi-kata
John-GEN careful book-GEN read-way

"The way of John's carefully reading a book"

In contrast, English gerunds and derived nominals have only one characteristic internally. Firstly, gerunds only involve the verbal characteristic internally—that is, they do not show the nominal characteristic internally. Observe the examples in (3). The ACC Case is assigned to the internal argument from *construct*, and the adverb *frequently* is used as shown in (3a). Additionally, these nominalizations can involve control constructions as shown in (3b).

(3) a. Dan's frequently constructing sailing boats impressed us.
b. Dan's continuing constructing sailing boats impressed us.

Secondly, English derived nominals only involve the nominal characteristic internally—that is, they do not show the verbal characteristic as shown in (3). *Construction* cannot assign the ACC Case to the internal argument in (4) and instead, *of* is inserted to assign it. Furthermore, causative or control constructions cannot be involved in derived nominals.

(4) Dan's frequent construction of sailing boats impressed us. (Siloni 1997: 4)

Summarizing, Japanese *-kata* nominals have peculiar characteristics internally, which are different from English gerunds or derived nominals.

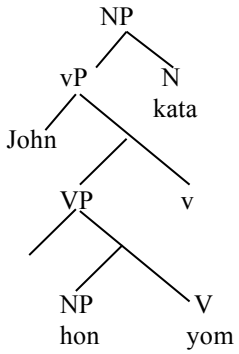
2.2. Previous analyses for *-kata* nominalizations and their problems

The first previous analysis is that these nominals are formed in syntax and involve a vP (see, for instance, Kageyama 1993, Kishimoto 2006, Sugioka 1992). That is to say, they are derived by adding the nominalizing suffix to a clause. (5) is a clausal example and (6) represents its nominalized counterpart. ((6b) is the corresponding a tree diagram.)

(5) [$_{vP}$ John-ga hon-o yomu]
John-NOM book-ACC read
"John reads a book."

(6) a. [$_{NP}$ [$_{vP}$ John-no hon-no yomi]-kata]
John-GEN book-GEN read-way
"the way of John's reading a book"

b.



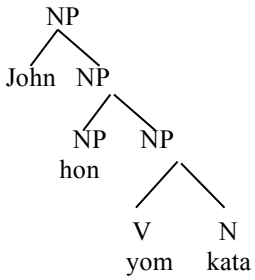
The first analysis is on the right track in that the internal verbal properties that are involved in *-kata* nominals can be explained, since under this approach, these nominals involve a vP. In addition, the gerundive properties—that is, all clauses can be *-kata* nominalized—are captured by the derivation in (6) where the suffix *-kata* can always be attached to a vP. That is, *-kata* nominals are productive. However, I point out the important problem of this approach: This analysis cannot capture the nominal behaviors of these nominals (i.e., GEN Case assignments and adjective modifiers). To solve this problem, Kishimoto (2006) explains GEN Case assignments by claiming that the nominal head *-kata* Case-checks all arguments. Also, he excludes NOM Cases and ACC Cases by providing assumptions that Japanese ACC Cases can appear only when NOM Cases are available and furthermore that NOM Cases are licensed by T, which is not included in *-kata* nominalizations. Hence, both NOM and ACC Cases cannot be assigned, according to Kishimoto (2006).

However, I argue against Kishimoto's claim in two respects: The first is that his argument to exclude NOM and ACC Cases depends on some extra and unusual assumptions, and more importantly, the unavailability of adverbs cannot be explained even with these assumptions. The second is that his argument cannot capture why verbal characteristics are suppressed in only Case assignments and modifiers. Therefore, under Kishimoto's approach, the unavailability of NOM Cases, ACC Cases and adverbs, and in addition, the reason why nominal characteristics prevail only in Case assignments and modifiers cannot be accounted for straightforwardly.

The second previous analysis is that these nominals involve only NPs[3] (see Hoshi 2001, Saiki 1987). The proposed structure of this analysis is shown in (7). In this analysis, *yomu* and *kata* are first merged and as a result a NP *yomi-kata* is formed. Then *hon* "book" and *John* are merged to it.

(7) a. [$_{NP}$ John-no [$_{NP}$ hon-no [$_{NP}$ yomi-kata]]]
John-GEN book-GEN read-way
"the way of John's reading a book"

b.



The second analysis can capture nominal characteristics because this nominal is a NP through the whole derivation as indicated in (7). I claim that this is the same derivation as is the one proposed in the Lexicalist Hypothesis. That is, these nominals are derived in the lexicon. The problem of this analysis, I claim, is that verbal behaviors cannot be explained under this approach, because there are no verbal elements in these nominalizations.

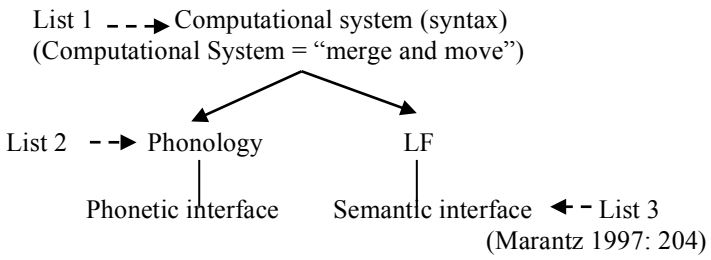
To sum up, the two previous approaches cannot capture the characteristics of *-kata* nominals entirely. Namely, the behaviors of these nominals cannot be captured under the current dichotomy of the syntactic and lexical approaches. In section 4, I provide an alternative analysis for *-kata* nominals under the framework of DM to which I now turn.

3. Distributed Morphology (DM)

In this section, I introduce the framework of DM (see, for instance, Embick and Noyer 2007, Halle and Marantz 1993, Harley and Noyer 2000, Marantz 1997, 2000).[4] In the following section, I will establish an alternative DM-based analysis for *-kata* nominalizations. First of all, let me explain the DM framework briefly.

There is no Lexicon in DM and instead distributed, non-computational lists as Lexicon-replacements are included. The structure of grammar might be represented as in (8).

(8)



(Marantz 1997: 204)

DM pursues "the single engine hypothesis" (see Embick and Noyer 2007). According to Embick and Noyer (2007: 291),

> The Lexicalist position, which posits two distinct generative systems in the grammar, can be supported only to the extent that there is clear evidence that Lexical derivations and syntactic derivations must be distinct. (…) Thus specific arguments that are intended to support the Lexicalist position must show that a particular phenomenon *must not* be treated syntactically.

That is, I claim that to adopt DM is more economical and simpler than the Lexicalist position. Although the detailed mechanism is still controversial, Marantz (1997) claims that List 1 in (8) contains the atomic roots of the language and the atomic bundles of grammatical features, and then the generative system, which is assumed in the Lexicalist position, is not assumed in this list. List 2 is called "Vocabulary" and provides the phonological forms for the terminal nodes from the syntax, although this mechanism is still controversial, and List 3 is called "Encyclopedia" and is the list of special meanings of particular roots within local domains.

Here I focus only on List 1, which is important in my analysis, although much discussion is needed on List 2 and 3 in order to clarify the framework of DM. Under DM, primitives of the syntax are limited narrowly: abstract morphemes such as [Past] or [Pl] and originally non-categorized roots such as √*sit* or √*ox*. Roots do not contain or possess grammatical (syntactic-semantic) features and therefore are not categorized. They are syntactically derived by merging category-neutral roots with category-defining functional heads *v*, *n* or *a*, and roots cannot appear without being categorized (see, for instance, Embick and Noyer 2007, Harley and Noyer 2000, Marantz 2000). For example, when √*destroy* merges with a verbalizer *v*, a verbal category is defined and then a verb *destroy* is derived as shown in (9a). In contrast, a noun *destruction* is derived when √*destroy* merges with a nominalizer *n*, as shown in (9b).

(9) a. vP

b. nP

Based on the arguments above, I claim that under the current system of DM, one-to-one relations between one categorizer and one root element are implicitly supposed.

4. An Alternative DM-based Analysis for *-Kata* Nominalizations

In the preceding section, I illustrated problems of the two previous analyses for *-kata* nominalizations. In this section, I propose that these nominalizations can be captured within the framework of DM—that is, the non-categorized root system. However, we have to make sure that the current DM system, that is, one-to-one relations between one categorizer and one root element, is not enough to capture these nominalizations.

Let us first consider derivations under current one-to-one relations. (10) shows a derivation in which *hon √yom* is merged with and categorized by a *v*, while (11) describes a derivation in which this phrase is categorized by a *n*.

(10) $[_{nP}$ [[John $[_{vP}$ [hon √yom] v]] √kata] n] [5,6]
John book √read √way
"The way of John's reading a book"

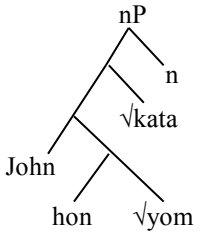
(11) $[_{nP}$[[John $[_{nP}$ [hon √yom] n]] √kata] n]
John book √read √way

In the current one-to-one system, one root element has to be categorized by one categorizer. Even if either *v* or *n* is merged with *hon √yom*, as shown in (10) and (11), respectively, the characteristics of *-kata* nominals, which have both nominal and verbal behaviors, cannot be captured. That is, only verbal characters in (10) and only nominal ones in (11) are considered.

Based on the particularity of *-kata* nominals, I propose that not only one-to-one relations but also one-to-many relations are available for phrase structures. The derivation and the tree diagram of *John-no hon-no yomi-kata* "the way of John's reading a book" are shown in (12):

(12) a. [hon √yom]→b. [John [hon √yom]]→ c. [[John [hon √yom]]√kata]
book √read John book √read John book √read √way
→d. [[[John [hon √yom]] √kata] n]
John book √read √way
→ e. $[_{nP}$ [[[John hon √yom] √kata] n]]
John book √read √way
→ f. John-no hon-no yomi kata
John-GEN book-GEN read way
"the way of John's reading a book"

g.



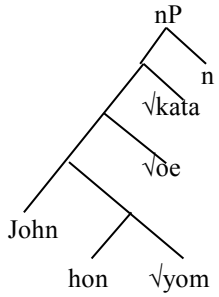
Let me explain the derivation in (12). The first step is that √*yom* merges with *hon* and as a result *hon* √*yom* is derived as shown in (12a). Secondly, *[hon* √*yom]* is predicted to be categorized. However, the external argument *John* is merged and then *[John [hon* √*yom]]* is derived as shown in (12b). [7] The third step, as in (12c), is not a categorization, again. I alternatively propose that √*kata* merges with this phrase, and then *[[John [hon* √*yom]]* √*kata]* is derived. Fourthly, a nominalizer *n* is merged, and then *[[[John [hon* √*yom]]* √*kata] n]* is derived as in (12d). Both √*yom* and √*kata* will be categorized by one categorizer *n*. (12e) shows that the resultant phrase is a nP, and as shown in (12f), *John-no hon-no yomi kata* is formed. ((12g) is a tree diagram of this derivation.)

The important steps are (12b), (12c), and (12d). The first notable steps are (12b) and (12c). They indicate that a derivation can proceed without a root element being categorized, and more importantly, the next root element can be merged to the uncategorized phrase in (12c). The next remarkable step is (12d). It illustrates that one nominalizer can define the category of two root items. I call the mechanism in (12d) "multiple categorization." Although this mechanism has not been argued in DM before, I argue that -*kata* nominalizations cannot be captured without this system.

This new system can describe the behaviors of -*kata* nominals entirely. Firstly, GEN Cases are assigned because only the nominalizer is involved, and NOM Cases, ACC Cases and adverbs are not assigned because no vPs are involved. Thus, nominal characteristics can be explained. Secondly, verbal characteristics such as those involving control constructions can be interpreted in the proposed one-to-many categorization as seen in (13). (13b) indicates the tree diagram of (13a).

(13) a. [[[[John hon √yom] √oe] √kata] n]
John book √read √finish √way
"The way of John's finishing reading a book."

b.



In (13), I propose that √*oe* "√finish" can be merged with *[John hon √yom]*, and after this operation, √*kata* is merged. Namely, three root items can be merged, and after that, they are categorized by one categorizer *n*. Therefore, properties involving control constructions, can be captured straightforwardly.[8] Lastly, the gerundive properties (i.e., all types of clauses can be -*kata* nominalized) can be captured within this theory, since √*kata* can always be attached as shown in (12) or (13).

In sum, my proposal can account for all characteristics of -*kata* nominals, and then is superior to the previous analyses. This evidence strongly shows that the proposed one-to-many categorizing mechanisms should be introduced into DM.

I propose that whether the one-to-many categorizing system is available or not in a language is parameterized. Let us introduce here "the uniqueness parameter" in Fukui (1999). "The uniqueness parameter" determines whether languages have one-to-one relations or one-to-many relations between a head and the phrase that agrees with the head. If the value of [unique] is +, one-to-one relations are sustained. In contrast, the value of [unique] is －, one-to-many relations are allowed. Japanese belongs to the latter, whereas English does to the former. The fact that multiple subject constructions or scrambling are allowed in Japanese can follow from this parameter.[9] The proposed "multiple categorization" is consistent with "the uniqueness parameter."[10]

In this section, I proposed one-to-many categorizing system. In addition, I would like to propose many-to-one categorizing system between many categorizers and one root element, and this system should also be introduced in DM. The representatives for this system are verbal nouns or adjectival nouns. I need to leave the consideration of this system to further research. To sum up, I propose that "multiple categorization" has the following two new systems: one-to-many categorization between one categorizer and many root elements, and many-to-one categorization between many categorizers and one root element which I have not discussed in this paper.

5. Conclusion

In this paper, I provided a new system for categorization—that is, "multiple categorization"—by examining Japanese nominalizations. This is a new system for phrase structures within DM. I proposed that whether this system is available or not in a language is parameterized. In addition, my claim supports DM, since pieces of evidence in this paper are dependent on the characteristics of category-neutral root items.

Notes

* This paper was supposed to be presented at the Western Conference on Linguistics/Arizona Linguistics Symposium 2013 (WECOL/AZLS 2013). However, I could not visit Tempe to present this paper because of a sudden personal matter. I am grateful to the organizing committee for allowing me to submit the paper for the proceedings.

[1] I use the term "internal" or "internally" with the following meaning: Nominalizations are necessarily DP (NP) phrases externally in any languages. However, whether the DP phrases have verbal or nominal properties in their internal elements, depends on the types of nominalizations. I focus on the internal properties of the DP phrases, by using the term 'internal' or 'internally.'

[2] It is well-known that English has two types of nominalizations: gerunds and derived nominals. In addition, these nominals are often divided into two types as shown in (ii)-(v). ((i) is a clausal example and (ii)-(v) are its nominalized counterparts.) Terms that I use for these nominals here are still controversial.

(i) clause: Dan frequently constructs sailing boats.
(ii) gerund (verbal gerund): Dan's frequently constructing sailing boats impressed us.
(iii) gerund (nominal gerund): Dan's frequently constructing of sailing boats impressed us.
(iv) derived nominal (event nominal): Dan's frequent construction of sailing boats impressed us. (Siloni 1997: 4)
(v) derived nominal (result nominal): Dan's constructions impressed us.

[3] I do not discuss here whether "DP" or "NP" is adopted.

[4] Let us list briefly other analyses of nominalizations. The first one is the non-lexicalist Hypothesis (see, for instance, Lees 1960). This approach insists that all nominalizations are derived in syntax through a transformation operation. The second one is the Lexicalist Hypothesis (see, for instance, Chomsky 1970, Siegel 1974, Aronoff 1976). This approach claims that derived nominals are formed in the lexicon. And the new and important one here is DM (see, for instance, Embick and Noyer 2007, Halle and Marantz 1993, Harley and Noyer 2000, Marantz 1997, 2000).

[5] Although a verbalizer is introduced before an external argument is merged in (10), there may be a derivation in which a verbalizer is introduced after an external argument is merged as shown in (vi). Whether an external argument is merged before or after a categorizer is introduced, is little discussed in previous studies. However, this discussion does not affect my proposal here, and thus I leave this issue for further research.

(vi) $[_{nP}$ $[[_{vP}$ [John [hon √yom]] v] √kata] n]
John book √read √way

[6] *Hon* "book" is already categorized as a noun in this example. Obviously, *hon* is originally a root element and is categorized by merging with a categorizer *n* as seen in (vii). However, I skip this stage for convenience.

(vii) $[_{nP}$ √hon n] → $[_{nP}$ hon]

[7] Whether the external argument is merged before or after the categorizer is introduced, is still controversial in the literature. See the note 5.

[8] Readers may notice a problem that constructions such as those involving causative or control constructions do not involve a vP projection in this analysis, although these constructions are often claimed to involve a vP. However, based on the assumption that these constructions cannot be involved in a nominal projection, no problems would arise. That is to say, I claim that when √*oe* "finish" is merged as shown in (viii), the phrase is non-nominal because it is uncategorized. Thus this derivation causes no problems. (I thank Naoki Fukui for calling my attention to this point.)

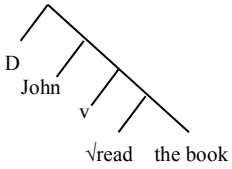
(viii) [[John hon √yom] √oe]
John book √read √finish

[9] Naoki Fukui (personal communication) pointed out to me that this parameter can be reduced to other more general principles.

[10] English gerunds do not need this new system since they require only one root element as shown in (ix)-(x); that is, one-to-one system is enough in English gerunds.

(ix) John's reading the book

(x)



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Phi-Agreement in Japanese: On the Person Restriction of Case-valuation

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1. Introduction

Since Chomsky's (2001) phase-based derivational approach, it has been a widely held view that Case is assigned/valued as a reflex of phi-feature agreement. One of the questions that immediately arises from this system is how Case is valued in languages like Japanese where phi-agreement is apparently missing; in other words, phi-agreement morphemes do not emerge overtly.

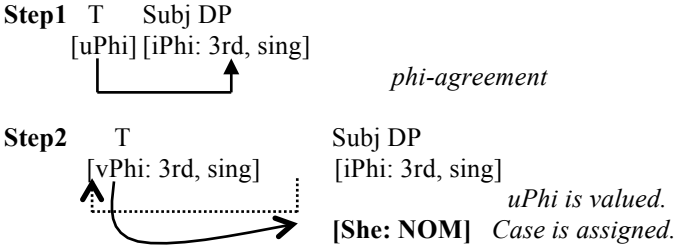
The goal of this paper is to give a closer examination of the Case system in Japanese and see if Case-valuation is in any relation to phi-agreement. Taking up the verb *give* in Japanese and the person restriction peculiar to this verb, we address the issue of how the V-*te* V compound in Japanese is formed. On the basis of Nakatani's (2001) analysis, which suggests that the V-*te* V compound is generated through head movement in syntax, we especially pay attention to person restriction on argument DP. Cases to be discussed involve some specific instances of the V-*te* V compounds where the second V is filled with the verb *ageru/kureru* in Japanese, which means *give* in English. We propose that person restriction is applied to Case valuation in the case of the verb *give* in Japanese, which implies that Case-valuation can be in tandem with phi-agreement in accordance with Chomsky's (2000) analysis. Also, we provide additional support to Nakatani's (2001) view that the V-*te* V compound is formed by head-movement in syntax.

The paper is organized as follows: Section 2 overviews two main approaches to Case-assignment and clarifies the issue we tackle. Section 3 outlines some Japanese cases to consider whether Case is related to phi-agreement or not. Section 4 discusses person restriction observed in the verb *give* in Japanese, which consequently demonstrates that phi-agreement is in tandem with Case-assignment. The section also clarifies some empirical and theoretical consequences obtained from the proposed analysis. Section 5 concludes our study.

2. Framing the Issues

In the generative tradition, how Case-marking is executed has been one of the central issues. In Government and Binding Theory explored in Chomsky (1981), Case is assigned directly by Case-assigning heads such as T for nominative Case or V for accusative Case. This type of "direct" Case-assignment has now been taken over by Chomsky's (2000) "indirect" Case-assignment approach, in which Case is valued/assigned as a consequence of phi-agreement. In the indirect assignment approach, Case-valuation is completely dependent on phi-agreement as illustrated in (1):

(1) English: *eg. She loves chocolates.*



One obvious question arises here: How does Case-valuation take place in languages where phi-agreement is apparently missing? Japanese is one of those languages and Case is overtly realized on phrases. In the next section, we take up this question and examine how Case is valued in Japanese.

3. Japanese: Case and Phi-Agreement

This section overviews some approaches to the Case system in Japanese. One of the analyses is that Case is not dependent on phi-agreement in Japanese. Saito (2012) takes this position and suggests that Case is not a precondition for a phrase to participate in Agree but is required of a phrase to participate in Merge. More precisely, Case is required to be merged by phase heads. His analysis is based on the fact that Case-marked PPs are extensively observed in Japanese, where the PPs themselves do not carry phi-features:

(2) a. Koko-kara-ga huzi-san-ni nobori-yasu-i
here-from-NOM Mt.Fuji-DAT climb-easy-PRES
"It is easy to climb Mt. Fuji from here."
b. Taroo-no oya-e-no izon
Taro-GEN parents-to-GEN dependence
"Taro's dependence on his parents."

As in (2), the PPs *koko-kara* (here-from) and *oya-e* (parents-to) are marked with nominative Case and genitive Case, respectively. The DPs contained within the PPs have phi-features but the entire PPs do not. If Chomsky's Case-assignment system based on phi-agreement is also true of Japanese, the cases in (2) cannot be explained. This is why Saito (2012) presents the Case-assignment system independent of phi-agreement, although we do not discuss his analysis in detail here.

Interestingly, however, there are some cases where Case-assignment takes place in tandem with phi-agreement. Miyagawa (2010) presents some phi-agreement examples in Japanese, which exhibit person restriction on the subject (i.e., nominative) imposed by a modality morpheme attached to the verb:

(3) a. Watasi-ga Taro-ni tegami-o okuri-mashoo.
I-NOM Taro-Dat letter-Acc send-let's
"Let's (have) me send Taro a letter."
b. {*Anata/*Yamada-sensei}-ga Taro-ni tegami-o okuri-mashoo.
You Prof. Yamada-Nom Taro-Dat letter-Acc send-let's
"Let's (have) *you/*Prof. Yamada send Taro a letter."

In (3), the exhortative morpheme *mashoo* imposes person restriction on the subject. Since this restriction is limited to the subject, Miyagawa argues that it is imposed through nominative Case assigned by T. In other words, phi-agreement is in tandem with Case-assignment, although the context is limited to the case where modality morphemes are attached to verbs.

In sum, some of the syntactic environments show that Japanese Case-valuation is in tandem with phi-agreement. But in some other environments, Japanese Case-valuation is independent of phi-agreement. Although proposing a new Case system in Japanese is beyond the scope of this paper, we present additional evidence in favor of the approach that Case is constrained by phi-features in Japanese and clarify obtained theoretical consequences.

4. Person Restriction on Case Assignment: *Ageru* and *Kureru*

In the last section, we presented Miyagawa's (2010) data showing that by attaching modality morphemes, the host verbs impose person restriction on the subject. One might think that modality morphemes play some special roles in Case-assignment. However, person restriction is not limited to the cases involving modality morphemes. Section 4.1 and 4.2 discuss sentences containing the verb *give* in Japanese, where person restriction is observed on argument DP. Section 4.3 demonstrates how the V-*te* V compounds involving the verb *give* are derived, especially focusing on the V-*te* V formation and

person restriction.

4.1. The verb *give* in Japanese: *ageru* and *kureru*

The verb *give* in Japanese, which happens to appear in two different forms *ageru* and *kureru*, forces its argument to be realized in a certain person. Unlike in English, Japanese has two kinds of verbs equivalent of the English verb *give*. That is, the English sentence in (4) can be expressed in two ways as illustrated in (5a) and (5b):

(4) Hanako gave Taro a book.

(5) a. Hanako-ga Taro-ni hon-o age-ta.
Hanako-Nom Taro-Dat book-Acc give-Past
"Hanako gave Taro a book."
b. Hanako-ga Taro-ni hon-o kure-ta.
Hanako-Nom Taro-Dat book-Acc give-Past
"Hanako gave Taro a book."

(5a) and (5b) have almost the same meaning but only the speaker's point of view is different. (5a) captures the event from Hanako's point of view, while (5b) expresses the same event from Taro's point of view. That is, both (5a) and (5b) describe the fact that the owner of a book changes from Hanako to Taro.
In English, the verb *give* does not impose phi-restriction (person restriction) on DPs, so that both the subject and object positions can be filled with any person type of DP. In Japanese, on the other hand, person restriction is imposed both on the subject and indirect object when the verb *ageru* or *kureru* appears in a sentence. Compare (6) and (7):

(6) English
a. Hanako gave me/you/Taro a book.
b. I/you/Hanako gave Taro a book.

(7) Japanese
a. Hanako-ga {*watasi/anata/Taro}-ni hon-o age-ta
Hanako-Nom me you Taro-Dat book-Acc give-Past
b. {*Watasi/Anata/Hanako}-ga Taro-ni hon-o kure-ta
I you Hanako-Nom Taro-Dat book-Acc give-Past

Note that unlike (6), person restriction is applied to the dative object in (7a): the first person DP is not allowed with respect to *ageru*. As for *kureru* in (7b), on the other hand, the same restriction is imposed on the subject. Bearing this in mind, let us consider slightly more complicated cases: the V-*te* V compounds

employing these verbs.

4.2. V-*te* V compounds

Japanese is a language that frequently makes use of two verbs to make up a single predicate. The V-*te* V compound is one of those examples in which two verbs are mediated by a non-finite T head *te* according to Nakatani (2001). The verbs *ageru* and *kureru* often appear in this environment: V-*te ageru* and V-*te kureru*. In (4)-(7), the verb *give* is used in giving things (=DP). On the other hand, V-*te ageru* / V-*te kureru* is used in giving 'action' (=TP). Consider the examples in (8), where the verb is *hanasu* (=tell), which does not impose person restriction either on the subject or the dative DPs:

(8) V = tell/*hanasu*
 a. Hanako-ga {watasi/anata/Taro}-ni kyo-no yote-o hanasi-ta.
 Hanako-Nom me/ you/ Taro-Dat today-Gen plan-Acc tell-Past
 "Hanako told me/you/Taro about today's plan."
 b. {watasi/anata/Hanako}-ga Taro-ni kyo-no yote-o hanasi-ta.
 I / you/ Hanako-Nom Taro-Dat today-Gen plan-Acc tell-Past
 "I/you/Hanako told Taro about today's plan."

Once *hanasu* and *ageru/kureru* are concatenated as in (9), however, person restriction immediately shows up:

(9) V-*te* V Construction (tell+give)
 a. Hanako-ga {*watasi/anata/Taro}-ni kyo-no yote-o hanasi-te age-ta.
 Hanako-Nom I/ you/ Taro-Dat today-Gen plan-Acc tell-te give-Past
 'Lit. Hanako gave me/you/Taro the action of telling about today's plan.'
 "Hanako (kindly) told me/you/Taro about today's plan."
 b. {*watasi/anata/Hanako}-ga Taro-ni kyo-no yote-o hanasi-te kure-ta.
 I/ you/ Hanako-Nom Taro-Dat today-Gen plan-Acc tell-te give-Past
 'Lit. I/you/Hanako gave Taro the action of telling about today's plan.'
 "I/you/Hanako (kindly) told Taro about today's plan."

The person restriction as in (7) is also observed in (9) when *ageru/kureru* and *hanasu* are combined. What (9) implies is that person restriction is applied (i.e., phi-agreement between V and the dative object in (9a)/the subject in (9b) takes place) **after** the two verbs are combined. Based on the observation we made here, we demonstrate in the next section how the sentences in (9) are derived.

4.3. How to derive the V-*te* V compounds

According to Nakatani (2001), in the V_1-te V_2 construction, V_1 is combined with V_2 by head movement, as shown in (10):

(10) [[[[OBJ V_1 $_{VP}$] T(-te) $_{TP}$] V_2 $_{VP}$] T(-ta) $_{TP}$]
→ [[[[OBJ t $_{VP}$] t $_{TP}$] **V_1+*te*+V_2** $_{VP}$] T(-ta) $_{TP}$]

Given the head movement approach in (10), it follows that the lower verb (V_1) *hanasu* in (9) in the previous subsection undergoes head movement to *ageru/kureru*. Recall that person restriction is applied only after head movement takes place. Otherwise, V_2 itself does not have access to the elements included in the lowest VP because of locality. By combining V_1, *te*, and V_2, the derived compound now becomes the closest head to the lowest VP.
Let us next see how (9a) is derived by assuming Nakatani's (2001) head movement analysis. Consider the derivation of the sentence in (9a) shown in (11):

(11) The derivation of (9a)
Step1: *No person restriction is applied.*
[[Subj [[ec **IO** DO hanasi(V_1) $_{VP}$] T(-te) $_{TP}$] age(V_2) $_{VP}$] T(-ta) $_{TP}$]
Step2: *Head movement is applied. The V-te V compound is formed.*
[[Subj [[ec **IO** DO t $_{VP}$] t $_{TP}$] **hanasi-te-age**(V_2) $_{VP}$] T(-ta) $_{TP}$]
Step3: *Person restriction is applied.*
[[Subj [[ec **IO** DP t $_{VP}$] t $_{TP}$] **hanasi-te-age**(V_2) $_{VP}$] T(-ta) $_{TP}$]

At Step 1, no person restriction is observed because V_1 *hanasu* itself does not impose person restriction and head movement of V_2 has not taken place. At Step 2, the compound is formed by head movement. At Step 3, the concatenated V agrees with the DP-Dat and assigns dative Case, at which point the person restriction is applied.
One might wonder why V_1 does not assign Case but V_2 does. We in fact assume that both V_1 and the V_1-*te* V_2 compound agree with the dative object and assign their Case individually. The Case realization in accordance with V_2 is due to the fact that only the V_1-*te* V_2 compound imposes person restriction on the dative object, and therefore this form is ultimately realized. A similar phenomenon can be seen in *tough*-constructions in English. In (12), the subject gets Case twice (Accusative from *please* and Nominative from the matrix T) according to Obata and Epstein's (2012) analysis, but the second Case, not the first one, is always realized:

(12) a. He is tough to please.
b. *Him is tough to please.

It is thus reasonable to assume that both verbs (V_1 and V_2) in (11) take part in phi-agreement and Case-assignment as in the *tough*-construction case.
Now consider the derivation of (9b) given in (13):

(13) The derivation of (9b)
Step1: *No person restriction is applied.*
[[**Subj** [[ec IO DO hanasi(V_1) $_{VP}$] T(-te) $_{TP}$] kure(V_2) $_{VP}$] T(-ta) $_{TP}$]

Step2: *Head movement is applied.*
[[**Subj** [[ec IO DO t $_{VP}$] t $_{TP}$] **hanasi-te-kure**(V_2) $_{VP}$] T(-ta) $_{TP}$]
Step3: *Person restriction is applied.*
[[**Subj** [[ec IO DO t $_{VP}$] t $_{TP}$] t $_{VP}$] **hanasi-te-kure-ta**(T) $_{TP}$]

Again in (13), person restriction shows up after head movement is applied. At Step 3, the combined verb subsequently moves to T and receives the past tense morpheme *-ta*. T agrees with the subject and assigns nominative Case, at which point person restriction is applied.

4.4. Empirical and theoretical consequences

We have shown that the verb *give* in Japanese forces its argument to bear certain person, which supports Chomsky's (2000) Case system utilizing phi-agreement. This Case-phi-agreement correlation is observed even when modality morphemes are absent and is also seen in the dative object as well as in the nominative subject. Although Miyagawa's (2010) data all involve modality morphemes and are limited to the nominative subject, our work presents additional data supporting Case-assignment as a reflex of phi-agreement.

Another consequence concerns the timing of head movement. In order to derive the sentences in (9) in section 4.2, head movement needs to take place before person restriction is applied and Case is assigned. Since phi-agreement takes place in narrow syntax, the proposed analysis implies that head movement also takes place in narrow syntax, which goes against Boeckx and Stjepanović (2001) and Fukui and Sakai (2003). At the same time, our analysis provides additional support to Nakatani's (2001) view that the V-*te* V construction is formed by head-movement in syntax. The fact that head movement extends a domain for Case and phi-agreement is somehow reminiscent of Baker's (1988) Government Transparency Corollary, which in turn suggests that our view on the Case-phi-agreement correlation brings out further insight into domain extension in the context of complex predicates. How complex predicates behave

as if they were single verbs has still been the center of the discussion in the literature (Bobaljik and Wurmbrand 2005, Wurmbrand 2001, among others). If complex predicates in Japanese employ head movement, our present work will ultimately support the view that head movement plays a role in the extending syntactic domain, along the lines of Baker (1988) and den Dikken (2007).

5. Summary and Conclusion

We have shown some possibilities that Case-assignment is in tandem with phi-agreement even in Japanese, where phi-agreement is apparently missing. The data presented here regarding the verb *give* in Japanese provide us with some insights into phi-agreement in Japanese. Although the phenomena we reported here are observed only with the specific verbs, our analysis presents additional support for Chomsky's (2000) Case system.

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Finding Subjects: Agreement, Case, & Articulated EPP

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1. Problems

In what might be termed the standard Minimalist view (e.g. Chomsky 2008, Richards 2012), the search for the subject of a sentence is driven by ϕ agreement and Case from the tense head T. All ϕ agreement is effectively 'verb-first' agreement. T probes its c-command domain to acquire ϕ features from, and assign nominative (NOM) Case to, a DP, which then merges into the surface subject position specifier of T (SPEC-T), as in (1b). Alternatively, an expletive (EXPL) (*there*) may fill SPEC-T, leaving the subject low, as in (1c). In either case, T has undergone ϕ agreement with the DP and has assigned it NOM. The supporting evidence cited for this idea is the coincidence of plural agreement in (1b) and (1c).

(1) a. [$_{TP}$ T [$_{ProgP}$ be ... [$_{vP}$ people *v* [$_{VP}$ singing ...
[*u*ϕ:] [*u*Case:]
[*u*NOM] [ϕ: *3/pl*]

b. People (NOM) are singing (= 'Subject-first agreement')
[$_{TP}$ people T+be [$_{ProgP}$ <be> ... [$_{vP}$ <people> *v* [$_{VP}$ singing ...
[~~*u*ϕ~~: *3/pl*] [~~*u*Case~~:NOM]
[~~*u*NOM~~] [ϕ: *3/pl*]
'*ARE'*

c. There are people (NOM) singing (= 'Verb-first agreement')
[$_{TP}$ there T+be [$_{ProgP}$ <be> ... [$_{vP}$ people *v* [$_{VP}$ singing ...
[~~*u*ϕ~~: *3/pl*] [~~*u*Case~~:NOM]
[~~*u*NOM~~] [ϕ: *3/pl*]
'*ARE'*

A serious problem for this view is that there are significant disparities in ϕ agreement and Case marking possibilities between 'verb-first' agreement

involving T and a c-commanded DP on the one hand (as in English expletive sentences (ES)), and subject-first agreement involving T and a subject-positioned DP on the other. Some of these disparities are seen in (2-5).

(2) a. There is/?*are a boy and a girl singing.
b. A boy and a girl are/*is singing.

(3) a. There's books on the desk.
b. Books are/*is on the desk.

(4) a. There has to be hundreds of photos... [1]
b. Hundreds of photos have/*has to be...

(5) a. There is only me in that picture
b. Only I am in that picture

(6) a. There arrived a train//A train arrived
b. There is a train arriving (*a train)
c. There was someone arrested (*someone)
d. There was someone being (*someone) arrested (*someone)

Chomsky (2001) claims that these movements are 'phonological', but others (e.g., Atkinson 2001, Rezac 2006) argue that such movements must be a part of the syntactic derivation.

The view that I will present here is that these problems are intertwined. Φ agreement and NOM Case assignment are not the central drivers of the 'subject search'. Rather, the EPP features of functional heads do the bulk of the work. Case and ϕ agreement play a secondary role. Further, ϕ agreement and NOM Case assignment do not always coincide.

2. Background Assumptions

This analysis builds on earlier work concerning where EXPL insertion takes place and concerning the structure of verbs compatible with EXPL insertion.

2.1. 'Low' v 'high' *there* insertion

Chomsky (2000, 2001) has argued that, in expletive sentences, *there* is freely inserted 'high', directly into Spec-T. However, Richards and Biberauer (2005) claim that *There*/EXPL Insertion is universally limited to the Spec of a phase head C or *v*. They argue that the insertion of EXPL into Spec-T is not plausible because it raises problems for the probe-goal system. However, if *There*/EXPL

Insertion is 'low', in Spec-*v*, with raising to Spec-T, then all the probe-goal-related problems are resolved. Their conclusion is that *There* Insertion in English is low, in Spec-*v*, and is universally limited to the Spec position of phase heads (C and *v*).

2.2. Verbs that allow *there* insertion

Regarding the question of which verbs allow *There* Insertion, Deal (2009) argues that low *There* Insertion is related in part to the nature of the functional *v* heads accompanying the various verb types. Following work by Marantz (1984, 1997), Burzio (1986), Haegeman (1991), Parsons (1990), Levin (1993), Piñón (2001), Pylkkänen (2002), Kratzer (1996, 2005), and in particular, Alexiadou, Anagnostopoulou, and Schäfer (2006), Deal analyzes verbs into four basic types, each with a unique functional structure, as in (7) .

(7) a. Unergative: $[_{vP}$ DP $[_{v}$ Voice$_{v}$ √laugh]]
b. Transitive: $[_{vP}$ DP $[_{v}$ Voice$_{v}$ $[_{\sqrt{P}}$ √watch DP]]]
c. Inchoative: $[_{vP}$ event$_{c}$ [CAUSE$_{v}$ $[_{\sqrt{P}}$ √fall DP]]]
d. Non-inchoative unaccusative: $[_{vP}$ [*v*˜ $[_{\sqrt{P}}$ √arrive DP]]]
(Deal 2009: 298-302)

Here, the first two verb types, unergative and transitive, have a functional structure built on an 'active voice' type of *v*, labeled Voice$_{v}$, which fills it's Spec with the subject argument. Inchoative verbs, the third type, have a verbalizing functional head CAUSE$_{v}$. This head lacks a subject argument, but requires a causal event element to appear in its Spec position. Thus, the first three verb types have a base-filled Spec position, and hence they cannot allow *There* Insertion into Spec, as evidenced in the sentences (8a-c).

(8) a. *There laughed someone.
b. *There watched someone a flying saucer.
c. *There fell a book on the floor.
d. There arrived a train.

However, as (8d) indicates, the fourth verb type, 'non-inchoative unaccusative', allows *There* Insertion. This is because these verbs are associated with what Deal terms the 'default' verbalizing head, written as '*v*~'. As seen in (7d), this head has nothing base-generated in its Spec, and hence is open to *There* Insertion, as in (8d). Deal's analysis of the *v*P level of derivation for (8d) is (9), with *there* inserted into Spec-*v*~.

(9) [$_{vP}$ there [$_{v}$ *v*~ [$_{\sqrt{P}}$ √arrive a train]]]

The derivation proceeds from (9) by *there* raising to Spec-T, resulting in (8d). In the sentence (10), with no *There* Insertion, *a train* is raised to the surface subject position Spec-T.

(10) A train arrived.

Deal argues further that the auxiliary verb *be*, like *arrive*, is also non-inchoative unaccusative, since *be* facilitates *There* Insertion in sentences with verbs of any type, as in (11).

(11) a. There is someone laughing.
b. There is someone watching a flying saucer!
c. There is a book falling.
d. There is a train arriving.

Her *v*P analysis of sentence (11a) is (12), with *There* Insertion taking place in Spec-*v*~ of *be*.

(12) [$_{vP}$ there [$_{v}$ *v*~ [$_{Asp}$ Asp$_{prog}$ [$_{vP}$ someone [$_{v}$ Voice$_{v}$ √laugh]]]]]
"BE"

In sum, only verbs with the verbalizing head *v*~ (non-inchoative unaccusative) allow *There* Insertion. However, there is no account of the short movement phenomenon.

3. The Analysis of Short Movement[2]

The account of short movement that I propose follows in part from observing the Quantifier Floating possibilities in sentences like (13).

(13) a. (All) the girls (all) could (all) have (all) been (all) smoking cigars.
b. (All) the cigars (all) have (all) been (all) given out.

Assuming that QF reveals the movement path of a raised subject, it appears that each verb in a complex English verb sequence is associated with an EPP feature. Second, this analysis employs Deal's functional analysis of verbs as in (7), since it seems to successfully delimit the verbs which allow *There* Insertion.

Finally, this account employs a claim of Chomsky (2000) that movement consists of two major sub-components: Agree and Merge. In Chomsky's analysis of *There* Insertion, the separation of these is critical to allowing T to

merge *there*, but at the same time to agree with the associate DP. However, it is possible that such a split is not simply 'free'/'general'. I propose that different functional heads have differing 'split' EPP properties. That is, it is the division of the EPP features of various verbalizing functional heads into their Agree and Merge components which allows an explanation of low *There* Insertion and short movements. The EPP features of different functional heads may vary in terms of whether or not they allow such a split. We turn to these details next.

The first three verbalizing heads in (7) (unergative, transitive, and inchoative) do not bear an EPP feature. They only merge and do not raise an element into their Spec position. The default *v*~ head which allows *There* Insertion has the split EPP feature in (14).

(14) EPP for *v*~: [*u*Theta$_{AGR}$, *u*D$_{MRG}$]

This EPP feature contains an Agree component with an uninterpretable feature *u*Theta, meaning that default *v*~ must agree a theta-role-bearing DP (a true argument). (NB: This sort of agreement is not ϕ agreement.) The Merge component of (14) is an uninterpretable feature *u*D, meaning that default *v*~ may merge any DP (either *there* or a true argument) into Spec-*v*~. Thus, the sentences '*There arrived a train*' and '*A train arrived*' will have the *v*P derivations in (15a-b), respectively. In (15), '⇓'s demark phase boundaries. These will be significant.

(15) a. [$_{vP}$ there ⇓ [$_{v}$ *v*~ [$_{√P}$ √arrive a train]]]
[~~*u*Theta~~]$_{AGR}$
[~~*u*D~~]$_{MRG}$

b. [$_{vP}$ [$_{DP}$ a train] ⇓ [$_{v}$ *v*~ [$_{√P}$ √arrive <a train>]]]
[~~*u*Theta~~]$_{AGR}$
[~~*u*D~~]$_{MRG}$

Default *v*~ must agree a theta-bearing DP, here *a train*, but it may merge either *a train* or *there*.

A sentence with progressive *be* allowing the possibility of *There* Insertion such as (11a) *There is someone laughing* has the *v*P derivation in (16).

(16) [$_{vP}$ there ⇓ [$_{v}$ *v*~ [$_{Asp}$ Asp$_{prog}$ [$_{vP}$ someone ⇓ [$_{v}$ Voice$_{v}$ √laugh]]]]]]
[~~*u*Theta~~]$_{AGR}$
[~~*u*D~~]$_{MRG}$
"BE"

The unergative verb *laugh* with its Voice$_{v}$ selects a subject *someone* into its Spec. The default *v*~ of *be* can agree *someone*, and may merge *there*, as in (16). Alternatively, it could also merge *someone*, leading to the sentence '*Someone is*

laughing'.

The ability of this proposal to deal with short movement phenomena emerges when we consider its treatment of sentences like (6b)/(11d) '*There is a train arriving*'. Under this proposal, the *v*P derivation of this sentence is (17).

(17) [$_{vP}$ there ⇓ [$_{v}$ *v*~ [$_{Asp}$ Asp$_{prog}$ [$_{vP}$ a train ⇓ [$_{v}$ *v*~ [$_{\sqrt{P}}$ √arrive <a train>]...
[~~*u*Theta~~]$_{AGR}$ [~~*u*Theta~~]$_{AGR}$
[~~*u*D~~]$_{MRG}$ [~~*u*D~~]$_{MRG}$
"BE"

Here there are two default *v*~s. The lower one must agree *a train*, but is free in principle to merge either *a train* or *there*. But if it merges *there*, then the higher default v~ cannot locally satisfy its Agree requirement for a theta-marked DP. This is because Agree cannot look past a phase boundary. So the only course of derivation which succeeds is for the lower default *v*~ to agree and merge *a train*, as in (17), allowing the higher default *v*~ to locally satisfy its Agree requirement. Here, multiple *there*s are disallowed, and short movement is accounted for.

As Milsark (1974) and later Rezac (2006) observe, the progressive *be* and the passive *be* each allow *There* Insertion, but when both are present, there is only a single higher short movement (TH/EX) position available. These results are captured here directly. I will assume that passive verbs involve a *v* head Voice$_{pass}$ with the EPP feature in (18) (= the passive/unaccusative *v* of Chomsky 2001). This head must both agree and merge a theta-marked DP, and it must merge what it has agreed.

(18) EPP for Voice$_{pass}$: [*u*Theta]$_{AGR/MRG}$

Given this, a simple passive expletive sentence such as '*There was someone arrested*' has the *v*P derivation in (19).

(19) [$_{vP}$ there ⇓ [$_{v}$ *v*~ [$_{Pass}$ Pass [$_{vP}$ someone ⇓ [$_{v}$ Voice$_{pass}$ [$_{\sqrt{P}}$ √arrest <someone>...
[~~*u*Theta~~]$_{AGR}$ [~~*u*Theta~~]$_{AGR/MRG}$
[~~*u*D~~]$_{MRG}$
"BE"

In (19), Voice$_{pass}$ must Agree and Merge *someone*, the object DP of *arrest*. This provides the Theta-marked DP which default *v*~ requires for Agree. If default *v*~ also merges this argument, then we get '*Someone was arrested*'. But if it merges *there*, we get the passive expletive sentence (19).

Now, for a sentence such as '*There was someone being arrested*', which contains both the passive and the progressive, the *v*P derivation is (20).

(20) [$_{vP}$ there ⇓ [$_{v}$ *v*~ [$_{Asp}$ Asp$_{prog}$ [$_{vP}$ someone ⇓ [$_{v}$ *v*~ [$_{Pass}$ Pass [$_{vP}$ <someone>

[*u*~~Theta~~]$_{AGR}$ [*u*~~Theta~~]$_{AGR}$
[*u*~~D~~]$_{MRG}$ [*u*~~D~~]$_{MRG}$
"BE" *"BE"*

⇓ [$_{v}$ Voice$_{pass}$ [$_{√P}$ √arrest <someone> ...
[*u*~~Theta~~]$_{AGR/MRG}$

Just as with '*is arriving*' (in (17)), there are two verbs in (20) with a default *v*~, the two instances of *be*. As was true earlier, the lower default *v*~ must agree a theta-marked DP, and in principle may merge either that DP or *there*. However, if *there* is merged low, then the higher default *v*~ will not have the requisite theta marked DP to satisfy its Agree feature phase-internally. So again the only successful derivation will be one in which the lower default *v*~ has agreed and merged the theta-marked DP *someone*, so that the higher default *v*~ can meet its Agree requirement.

What of other verbs that may be involved in such derivations? The auxiliary verb *have* and the verb *seem* (taking an infinitival complement) are not capable of introducing *there*, as illustrated in (21a) and (b), so the EPP feature involved here is (22), which I'll refer to as 'simple' *v* .

(21) a. *There has a train arrived.
b. *There seemed a train to arrive.

(22) EPP for simple *v* (*have*, *seem*): [*u*D]$_{AGR/MRG}$

Such a feature allows Agree and Merge to apply to any D(P), an argument or *there*, but it must merge what it has agreed, so, using *have* for illustration here, we get either (23a) or (23b), with their respective *v*P derivations in (24)--the sentences in (21) are not derivable.

(23) a. There has arrived a train.
b. A train has arrived.

(24) a. [$_{v}$P there ⇓ [$_{v}$ *v* [$_{Asp}$ Asp$_{perf}$ [$_{v}$P <there> ⇓ [$_{v}$ *v*~ [$_{√P}$ √arrive a train]..
[*u*~~D~~]$_{AGR/MRG}$ [*u*~~Theta~~]$_{AGR}$
[*u*~~D~~]$_{MRG}$
"HAVE

b. [$_{v}$P a train ⇓ [$_{v}$ *v* [$_{Asp}$ Asp$_{perf}$ [$_{v}$P < a train > ⇓ [$_{v}$ *v*~ [$_{√P}$ √arrive <a train>]..
[*u*~~D~~]$_{AGR/MRG}$ [*u*~~Theta~~]$_{AGR}$
[*u*~~D~~]$_{MRG}$
"HAVE"

In sum, this system answers the questions about short movement (TH/EX) concerning (i) where and why short movement (TH/EX) positions appear, and (ii) what motivates short movement (TH/EX). The short movement positions are the Spec positions of default *v*~ accompanying non-inchoative unaccusative verbs. The theta-open Spec of default *v*~ allows *There* Insertion to take place. 'Longer' short movements arises when a higher default *v*~ requires an argument to locally (phase-internally) satisfy its Agree feature, effectively forcing a lower default *v*~ to both agree and merge an argument. Given this, the ban on multiple *there*s is automatic, since once *there* is introduced, nothing higher can agree with it unless it also merges it.

4. Φ Agreement and Case

Turning now to the top end of derivations, T must also have an EPP feature, since it raises a subject to Spec-T. T has the simple EPP feature in (25).

(25) EPP and ϕ agreement features for T: $[u\text{D}]_{\text{AGR/MRG}}$, *u*ϕ,..

As (25) shows, T also bears a Φ agreement feature (encoded here as '*u*ϕ') that is separate, not a part of this EPP feature proper. Here I will follow somewhat the view of Chomsky (2008) that C and T are heads of a single phase, and that features such as NOM Case are features of C. In the analysis here, it is C and not T that assigns NOM (or ACC with infinitival C-T) to whatever occupies SPEC-T. Thus, the EPP feature of T agrees any D-type expression, *there* or an argument, that appears in the immediately lower SPEC position and merges it into SPEC-T for NOM Case assignment from C.

Regarding ϕ agreement, let's assume here (roughly following George and Kornfilt 1981, Chomsky 2000, 2001, Cardinaletti 1997) that ϕ agreement will coincide with NOM if such agreement is possible. T probes for a DP and raises it to SPEC-T. Argument DPs always bear ϕ features, and T will undergo ϕ agreement with these features, as in (2b), (3b), (4b), and (5b). This sort of derivation is illustrated in (26).

The vacillation in ϕ agreement seen in ES (the 'a' examples of (2-5)) points toward the possibility that EXPL/*there* may (but need not) bear the gratuitous ϕ features *3/sg*. If *there* does bear these ϕ features, then ϕ agreement is *3/sg* and coincides with NOM Case marking as in (3a), (4a), and (5a). (3a) is common not because it is a 'frozen' form, but because it follows the normal system, the common path of derivation. This is also true of (4a) and (5a). This type of derivation is illustrated in (27).

If *there* does not bear ϕ features, then ϕ agreement cannot coincide with NOM Case assignment, and to satisfy ϕ agreement, T must probe its c-command

domain for the most local **lexically concrete** DP, a DP that has a lexical head. (Coordinations don't count.) This possibility is illustrated in (28). As seen in (2a) and (29), the result may be left-conjunct agreement, a common agreement pattern in verb-first languages. The plural agreement in (1a) is also a result of this 'verb-first' agreement strategy.

As a final note here, the associate DPs in ES bear default Case. That is why we see the ACC pronominal form in (5a). NOM is absolutely impossible here. There is much more to say about this, but time does not permit a more extended analysis here.

(26) '*Trains are arriving*'

$[_{CP}$ C $[_{TP}$ trains T_{fin} $[_{vP}$ <trains> ⇓ $[_{v}$ *v*~ $[_{Asp}$ Asp_{prog} ....
[~~*u*nom~~] [3/pl] [~~*u*D~~]$_{AGR/MRG}$ [3/pl] [~~*u*Theta~~]$_{AGR}$
[NOM] [~~*u*ϕ~~: 3/pl] [*u*Case:]
[~~*u*D~~]$_{MRG}$

(27) '*There 's/is/was trains arriving*'

$[_{CP}$ C $[_{TP}$ there T_{fin} $[_{vP}$ <there> ⇓ $[_{v}$ *v*~ $[_{Asp}$ Asp_{prog} ...
[~~*u*nom~~] [3/sg] [~~*u*D~~]$_{AGR/MRG}$ [3/sg] [~~*u*Theta~~]$_{AGR}$
[NOM] [~~*u*ϕ~~: 3/sg]
[*u*Case:] [~~*u*D~~]$_{MRG}$

(28) '*There are trains arriving*'

$[_{CP}$ C $[_{TP}$ there T_{fin} $[_{vP}$ <there> ⇓ $[_{v}$ *v*~ $[_{Asp}$ Asp_{prog} $[_{vP}$ trains ...
[~~*u*nom~~] [--] [~~*u*D~~]$_{AGR/MRG}$ [--] [~~*u*Theta~~]$_{AGR}$ [3/pl]
[NOM] [~~*u*ϕ~~: 3/pl] [*u*Case:] [~~*u*D~~]$_{MRG}$

(29) '*There is a train and a bus arriving*'

$[_{CP}$ C $[_{TP}$ there T_{fin} $[_{vP}$ <there> ⇓ $[_{v}$ *v*~ $[_{Asp}$ Asp_{prog} $[_{vP}$ a train and ...
[~~*u*nom~~] [--] [~~*u*D~~]$_{AGR/MRG}$ [--] [~~*u*Theta~~]$_{AGR}$ [3/sg]
[NOM] [~~*u*ϕ~~: 3/sg] [*u*Case:] [~~*u*D~~]$_{MRG}$

5. Final Remarks

In sum, there are two different systems of agreement at work: subject-first agreement, where T undergoes ϕ agreement with the NOM DP in SPEC-T, and verb-first agreement, where the element in SPEC-T lacks ϕ features, forcing T to look elsewhere for a lexically concrete DP to satisfy agreement, possibly resulting in left-conjunct agreement. As a consequence, we see the disparities between the two systems in (2-5). Contrary to the popular assumption, the coincidence of plural agreement forms in (1) is accidental rather than systematic. Verb-first agreement is not a viable source for subject-first agreement. Thus, Case and ϕ agreement are not the basis for finding surface subjects. Most of this work is actually done by articulated EPP features.

Notes

[1] Here is an excellent example of the natural use of a singular verb form in the presence of a plural associate DP: "'There has to be hundreds, if not thousands, of photographs or observations down at the finish line,' said State Police Superintendent Col. Timothy Alben." (Boston Herald 4/16/13). Also, "One witness, who would not be named, told Kent Online:

> There was debris on our side of the road from the accident, then we saw the first part of the crash - there was cars, lorries, vans, ploughed into each other like a concertina...I've never [seen] anything like this before in my life. " (Kent Online 9/5/13)

[2] The analysis of TH/EX offered here is an abbreviated version of the one in Sobin (forthcoming).

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Approximation of Complex Numerals Using *Some*

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1. *Some* Can Play a Role in Approximation

English *some* normally plays the role of a determiner, appearing before a noun phrase, as in (1). This use of *some* has most often caught the attention of linguists and philosophers. However, *some* can be used in a non-canonical way with numerals, as in (2) and (3).

(1) a. There were some dogs in the yard.
b. Some man is crossing the street.
c. I put some apple in the salad.
(2) a. Some twenty people attended the party.
b. Some 5 million people are without health insurance.
(3) a. Twenty-some people were at the party.
b. 5 million-some people are without health insurance.

The salient observation about the examples in (2) and (3) is that not only is *some* allowed to modify the cardinal number in a position before the number, but there exist cases where *some* can be in a modifier relationship with the number while appearing after it as well. Throughout the rest of the paper, I will call the former construction the pre-numeral *some* and the latter the post-numeral *some*.

The pre-numeral *some* is able to modify a variety of numerals, demonstrated in (4). However, quite mysteriously, the post-numeral *some* cannot modify some of these same numerals, as shown in (5).

(4) a. Some ten people attended the lecture.
b. Some five years after an economic crisis
c. The original text was written some twenty-five years ago.
(5) a. *Ten-some people attended the lecture.
b. *Five-some students were arrested after the riot.
c. *The original text was written twenty-five some years ago.

Finally, there are interpretational differences between these two non-canonical uses of *some* as well. In the pre-numeral *some*, the natural interpretation is one of approximation—values close to the number being modified by *some* are implicated in the meaning of the pre-numeral *some*. In contrast, with the post-numeral *some*, there is an "at least" interpretation—the values for the number implied in this construction start at the number being modified and continue up the scale.

A couple of questions naturally arise here. The first is how these two uses of *some* are related to each other, and whether they are the same *some*. Second, how does the semantic system build an approximative meaning for the pre-numeral *some* and an "at least" interpretation for the post-numeral *some*? Finally, what is the nature of the syntactic restrictions between the two *somes*? I explore and answer each of these questions, analyzing *some* as being sensitive to Hamblin alternatives (Hamblin, 1973). These alternatives are constructed in separate ways for the two some constructions at issue in this paper, with the pre-numeral *some* invoking imprecision alternatives, alternatives that model Lasersohnian pragmatic halos (Lasersohn, 1999; Morzycki, 2011), while the post-numeral *some* implies a covert *wh*-word that abstracts over positions in the syntax of cardinal numbers, providing numerical alternatives to *some*. Evidence for this covert *wh*-word comes from a similar construct to the post-numeral *some* in Japanese.

2. Post-numeral *Some* Is Sensitive to Numeral Syntax

To account for the post-numeral *some*, it's useful to return to its interpretation and to its restrictions. What I will show here is that there is a common source for both of these, namely that syntactic structure in complex numbers explains both the syntactic restrictions of post-numeral *some* and its interpretation. The core idea will be that numbers are derived compositionally, and that the post-numeral *some* is sensitive to the structure of numerals.

The nature of the restrictions on post-numeral *some* strongly suggests that numbers have a complex syntactic structure. That numbers are built compositionally is not a new idea, having appeared at least as early as Hurford (1975), and more recently in Ionin and Matushansky (2006), Zweig (2005), and others. To start, we notice that not combinations of numerals are licit –- not all numbers can appear in all syntactic positions. This is demonstrated in (6). In fact, in the absence of a word such as *eleven*, we might have otherwise predicted that **ten one* could have the same meaning as *eleven*, but in English it is simply ungrammatical.

(6) a. *Three five (intended: thirty five)
b. *Ten one (intended: eleven)
c. *Fifteen eight (intended: one hundred fifty eight)

However, numbers do combine with other numbers more generally. *Twenty-five* is composed of the two numbers *twenty* and *five*, for instance, while *one hundred twenty five* is composed of *one hundred* and *twenty five*. And this is of course recursive: *twenty-five* in *one hundred twenty five* is also built from *twenty* and *five*. The conclusion should be that complex numerals are built from smaller, less complex numerals.

What we notice about the post-numeral *some* is that it is sensitive to these same restrictions: the numbers in (6) cannot combine with the post-numeral *some* as well, shown in (7). The conclusion I draw is that the post-numeral *some* construction is sensitive to restrictions inherent in how complex numerals are constructed.

(7) a. *Three-some
b. *Ten-some
c. *Fifteen-some

Some additional evidence that the post-numeral *some* is sensitive to the syntactic structure of the numeral comes from decimal numbers. Decimal numbers in English, at least in casual speech, have a list-like structure to them, where they are simply a sequence of numbers (for instance, 1.634 is commonly uttered as *one point six three four*). The post-numeral *some* can abstract over parts of decimal numbers, provided there is a suitable context, as shown in (8).

(8) *A student in a chemistry class need to fill a test tube with a quantity of fluid. The exact amount of fluid is 1.635 milliliters, but the student cannot remember this number. This student can say:*
I need to fill this with 1.63-some milliliters of fluid.

3. Approximation of Numerals in Japanese

Like English, Japanese builds larger, more complex numbers by putting together smaller numbers. As shown in (9a), Japanese *juu-ichi* “eleven” is built by putting together the morphemes *juu* “ten” and *ichi* “one.” Relatedly, in (9b), *ni* “two” and *juu* “ten” are put together to form the numeral *ni-juu* “twenty.”

(9) a. juu-ichi	b. ni-juu
ten-one	two-ten
“eleven”	“twenty”

Like in the English post-numeral *some* construction, Japanese has a way of being imprecise about the precise value of some number. The example in (10) has an interpretation similar to the English post-numeral *some;* a syntactic position in the numeral has been abstracted over with *nan* "what" in order to build an "at least" interpretation. Unlike English, Japanese is more flexible in what may be abstracted over. This is demonstrated in (11), where, due to the Japanese equivalent of English "twenty" being composed of "two" and "ten," the speaker can make assertions about some multiple of ten by using *nan* in the position that would otherwise be occupied by the numeral *ni* "two," as in (9b).

(10) Juu-nan-nin-ka-ga kita
ten-what-cl(people)-ka-nom came
"10 plus *x* people came."
(11) Nan-juu-nin-ka-ga kita
what-ten-cl(people)-ka-nom came
"x multiple 10 people came."

What is interesting about (10) and (11) is how these approximative constructions are composed. In each, there is a morpheme that appears in the position of the number that is abstracted over, *nan*. *Nan* is an indeterminate pronoun, roughly equivalent to "what" in English. But, Japanese looks like English in these constructions in at least one other way, with the particle *ka* in (10) and (11); *ka* is sometimes analyzed as carrying existential force, similar to *some* (Slade, 2011; Cable, 2010; Kratzer & Shimoyama, 2002).

To tackle the English pre-numeral and post-numeral *some*s which are the focus of this paper, I suggest we should understand the Japanese constructions above first. Looking at the Japanese will help us construct an analysis of the English facts. Two theoretical pieces will be introduced here: the Hamblin semantics analysis of Japanese indeterminate pronouns of Shimoyama (2001) and Kratzer and Shimoyama (2002), and *ka* as denoting a choice-functional variable.

Kratzer and Shimoyama (2002) and Kratzer (2005) provide an analysis of Japanese indeterminate pronouns using a Hamblin alternative semantics (Hamblin, 1973). The idea behind an alternative semantics is that related sentential meanings can be represented in parallel to each other as sets of meanings. This is widely used for the semantics of questions, where questions denote alternatives representing answers to the question (Hamblin, 1973; Karttunen, 1977). Shimoyama (2001) suggests that indeterminate pronouns in Japanese, which resemble *wh*-words (question words, such as "who" and "what" in English), can be given an alternative semantics, where they directly denote sets of alternatives.

In an alternative semantics, a new notion of composition is needed, since sets themselves cannot be combined. The basic method of composition, Function

Application (Heim and Kratzer, 1998), is reformulated as Pointwise Function Application (see Kratzer and Shimoyama (2002) for details). The intuition is to apply each function in the first set of alternatives to each object in the second set of alternatives, yielding a new set. Throughout the course of the derivation, a set of alternatives will continue to expand, due to each successive application of Pointwise Function Application creating a larger set of alternatives from the alternatives for some function and some object.

Sets of alternatives must be captured and mapped to a single alternative, if a coherent declarative meaning is to be constructed. The intuition is that the particle *ka* associates with alternatives, stops alternatives from expanding, and maps the alternatives to a single alternative. Analyses such as Slade (2011) and Cable (2010) argue that *ka* denotes a choice functional variable, a variable for a function from sets to a member of a set. In effect, this is a way of providing existential quantification. At the level of the DP, as in examples (10) and (11), the role of *ka* would be to close off the set of alternatives and select a single alternative to project. This conception of *ka* has connections to the meaning of English *some* which, as an indefinite determiner, also seems to have existential force associated with it.

In Japanese, *ka* can also serve as a question particle. The question particle *ka* associates with these alternatives if there is no other intervening *ka* to capture the alternatives. If there is an intervening *ka* in the question, however, what we expect is for the question word to only be able to associate with the singleton alternative—that is, for there to be only a yes/no question interpretation. As shown in (12) and (13), this is what we find, where an intervening *ka*, as in (12), forces a yes/no question interpretation, but no intervening *ka* in (13) allows all the numerical alternatives to project. When the operator *ka* is present low in the structure, at the level of the DP, it stop the alternatives from the *wh*-word from expanding, forcing the yes/no question interpretation. When *ka* is not present at the DP level, the alternatives from the *wh*-word—the numerical alternatives associated with abstracting over part of the complex numeral—can continue to expand upward, until they are caught by the question particle *ka*. At that point, they are used in forming the question, a question that's seeking information about which number of people came.

(12) Nan -juu -nin **-ka** -ga -kita ndesu ka?
what -ten -cl(people) -ka -nom came be Q
"Is it the case that x multiple 10 people came?" (yes/no question)

(13) Nan -juu -nin -ga kita ndesu ka?
what -ten -cl(people) -nom -came be Q
"What is the number x such that x multiple 10 people came?" (wh-question)

The Japanese data is important in a few key respects. First, it quite transparently

shows that numerals are constructed syntactically. Second, it suggests that there may be overt or covert morphemes that can be used to hook into the syntax of the numeral in order to build an approximate interpretation. Third, a connection between *ka* and *some* is made, as both contribute existential force. Finally, it suggests that there is a role to be played by alternatives in the computation of approximate numerical meanings.

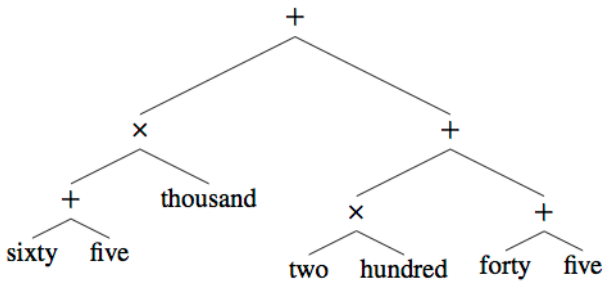
4. Semantics for Approximation with *Some*

4.1. Post-numeral *some*

The analysis of the post-numeral *some* will consist of three components motivated in part by the Japanese data in the previous section. First, English numerals will also be syntactically complex. That English numerals are syntactically complex is argued for by Hurford (1975), Ionin and Matushansky (2006), and others. Second, like Japanese, I will assume that there exists a covert *wh*-word present in the post-numeral *some* that abstracts over a position in the numeral. Finally, I use an alternative semantics to model approximation. The *wh*-word will be interpreted in situ as a set of numerical alternatives, which will combine pointwise with the other alternatives composing the numeral.

As has been argued, large numerals have structure to them. A complex numeral such as s*ixty-five thousand two hundred forty five* is constructed out of smaller numerals such as *forty five*, *sixty-five thousand*, and *two hundred*, each of which is also built of smaller numerals. Certain configurations of numerals are additive, while others are multiplicative. For instance, *forty five* is additive, as it is the number 45, which is simply the addition of 40 and 5, while *sixty-five thousand* is multiplicative, as it 65 multiplied by 1000. A complex number intuitively has a constituency like in (14), where configurations of numerals are combined via an additive or multiplicative process, as illustrated via a + or × dominating the numerals being combined.

(14)



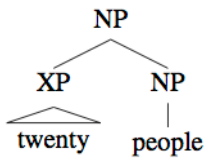
As argued previously, the post-numeral *some* is sensitive to the structure of the numeral. More specifically, it is only numerals that are composed additively that the post-numeral *some* can pick out for approximation. This is illustrated in (15) and (16), where *some* can be used in (15) since the meanings of the numbers are built from adding the two numbers together, while *some* cannot be used with the intended meaning in (16) since that meaning comes about from multiplying the numbers.

(15) a. Twenty-some people
b. Sixty-some thousand dollars
(16) a. *Two-some people
Intended: twenty thousand people
b. *Sixty-some dollars
Intended: sixty-thousand dollars

More generally, the meanings available when the post-numeral *some* can be used depend on what numbers can be licitly used additively with the modified number. In *twenty-some*, for instance, only numbers *one* through *nine* can be composed additively with *twenty*, and hence *twenty-some* has the interpretation of denoting a number between 21 and 29.

I set aside the precise internal structure of numerals for further work, as all that is crucial in this paper is that numerals have structure associated to them. I will represent numerals as simply XPs adjoined to NP, as in (17).

(17)



To model the semantics of the numeral, I assume a domain of numbers D_n. Addition + and multiplication × are defined over pairs of numbers in D_n, with the result being another number in D_n. As I will be using an alternative semantics to model approximation, numerals themselves will denote sets of numbers rather than directly denoting numbers. Simple number words denote singleton sets whose member is a number in D_n. For instance, ⟦*twenty*⟧ is just the set containing only the numeric value of *twenty*, {20}.

(18) ⟦ *twenty*⟧ = {20}
(19) ⟦ *five*⟧ = {5}

I assume a typeshift CARD to convert numerals to properties, type ‹*e,t*›. This is defined in (20).

(20) $[\![\text{CARD } \alpha]\!] = \lambda x\ [\ |x| = [\![\alpha]\!]\ ]$
where α is a numeral

In the post-numeral *some* examples, based on the Japanese data, I suppose the existence of a covert *wh*-word. This covert *wh*-word essentially acts as a placeholder for any of the numerals that could have been composed with another numeral additively. In *twenty-some*, the syntactic structure at LF (the level of representation responsible for semantic interpretation) would be *twenty-WH-some*, where *WH* is the covert word and stands in for the numerals *one* through *nine*. Hence, WH has the meaning of the set {1,. . . ,9} in *twenty-WH-some*. However, the meaning of the WH depends on the syntactic structure; *WH* could take on different values in other examples, such as denoting {1, . . . , 99} in *two hundred-WH-some*.

(21) twenty-WH-some
$[\![WH]\!] = \{1, \ldots, 9\}$
(22) two hundred-WH-some
$[\![WH]\!] = \{1, \ldots, 99\}$

How do numbers get composed in this system? As we're working with sets of numbers and not functions, the typical mode of semantic composition, Function Application (Heim & Kratzer, 1998), will not work. I propose Pointwise Addition and Pointwise Multiplication, derived from Kratzer and Shimoyama's Pointwise Function Application. These are defined in (23a) and (23b), respectively.

(23) a. **Pointwise Addition**
Where $[\![A]\!]$ and $[\![B]\!]$ are sets of numbers,
$[\![C]\!] = \{c: \exists a \in [\![A]\!] \wedge \exists b \in [\![B]\!] \wedge c = a + b\}$
b. **Pointwise Multiplication**
Where $[\![A]\!]$ and $[\![B]\!]$ are sets of numbers,
$[\![C]\!] = \{c: \exists a \in [\![A]\!] \wedge \exists b \in [\![B]\!] \wedge c = a \times b\}$

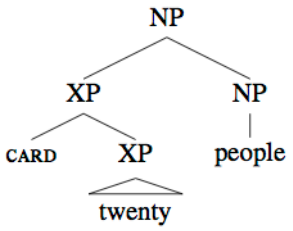
The idea behind these rules is simple: everything from the first set is added or multiplied in turn with each item from the second set. With two singletons, this process is trivial; all that is to be done is to add (or multiply) the only item from the first with the only item from the second. With non-singleton sets, Pointwise Addition and Multiplication is much more interesting. In a case with non-singleton sets, each item from the first set will be added or multiplied with each item from the second set, generating a third set. This is what happens when a

number such as {20} is added pointwise to the set of numbers denoted by WH. This process is illustrated in (24).

(24) a. ⟦*twenty WH*⟧
= ⟦*twenty*⟧ + ⟦*WH*⟧
= {20} + {1, … , 9}
= {20+1, 20+2, … , 20+9}
= {21, 22, … , 29}

How does the numeral combine with the noun phrase in the cases without WH and *some*? For this, the CARD typeshift is involved to convert the number to a property. The property can then be combined intersectively with the denotation of the noun phrase.

(25)



(26) ⟦CARD *twenty people*⟧
= { λx. ⟦CARD *twenty*⟧$(x) \wedge$ ⟦*people*⟧(x) }
= { λx. $|x| = 20 \wedge$ **people**(x) }

The set-based representation pays off when we consider numerals with WH. The purpose of WH was to introduce a set of alternatives into the representation. When WH is in the numeral, the numeral will denote a non-singleton set of numbers, as shown above in (24). The role of *some* in the post-numeral *some* construction is to map this set of alternatives to a single alternative.

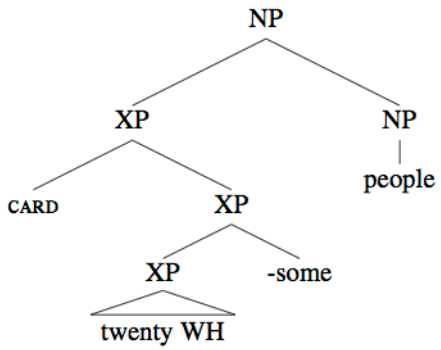
The method of doing this will be a choice function (Reinhart, 1997; Winter, 1997; Kratzer, 1998), a function from a set to a member of that set. The choice functional analysis for *some* can be developed as in (27), where the alternatives of the expression α, a placeholder for the numeral, are mapped to a singleton. The value of the choice functional variable *f* is supplied by the context.

(27) **Choice Functional *Some* (First Version)**
⟦*some* α⟧ = { *f*(⟦α⟧) }
where *f* is a choice functional variable

The derivation of *twenty WH some people* would proceed as follows. *WH* combines with *twenty*, forming a set of numerical alternatives. *Some* selects

from among these alternatives, and the typeshift CARD maps the number to a property. This property combines intersectively with the denotation of the NP, in the same fashion as in (26).

(28)



(29) a. $[\![\textit{twenty WH}]\!] = \{21, 22, \ldots, 29\}$
b. $[\![\,[\textit{twenty WH}]\ \textit{some}]\!] = \{f([\![\textit{twenty WH}]\!])\}$
c. $[\![\text{CARD}\ [[\textit{twenty WH}]\ \textit{some}]\,]\!] = \{\ \lambda x.\ |x| = f([\![\textit{twenty WH}]\!])\ \}$
d. $[\![\,[\text{CARD}\ [[\textit{twenty WH}]\ \textit{some}]]\ \textit{people}]\!]$
$= \{\ \lambda x.\ |x| = f([\![\textit{twenty WH}]\!]) \wedge \textbf{people}(x)\ \}$

To summarize, *some* is sensitive to alternatives, picking from among alternatives by way of a choice function. A covert *wh*-word WH helps to build the set of alternatives in this system, by supplying alternatives that could fill a position in a complex numeral.

4.2. Pre-numeral *some* and pragmatic halos

The pre-numeral *some* has a different interpretation from the post-numeral interpretation, namely in having an approximative rather than "at least" interpretation. Whereas *twenty-some* has an interpretation where any number from the range 21 to 29 would satisfy the phrase, *some twenty* requires numbers close to 20, such as 18, 19, or 21. The numbers implied in *some twenty* do not have to have 20 as their lower bound; they can start below 20 as well. Since pre-numeral *some* doesn't depend on the syntactic form of the numeral, I will assume that there is a different mode of approximation at work in the pre-numeral construction, and that the covert *wh*-word implicated in the post-numeral construction is not used in the pre-numeral construction.

The interpretation in the pre-numeral *some* cases seems most closely related to imprecision (Lasersohn, 1999; Kennedy, 2007). The way I will model this is by appealing to Lasersohn's pragmatic halos. Lasersohn offers halos as an

explanation for imprecision, where natural language expressions have some amount of fuzziness surrounding them about what counts for an expression in a context. For example, *three o'clock* can be used imprecisely to mean 2:58pm in many contexts, due to *three o'clock* having 2:58pm within its pragmatic halo. As suggested by Morzycki (2011), halos might play a role in the compositional semantics, where he formalizes them using an alternative semantics. For my purposes here, the issue is how to get a halo around the number in the first place. I propose that the halo is coerced via presupposition accommodation, namely to satisfy the felicity requirements of *some*.

Well-known is that the determiner *some* enforces epistemic requirements on the speaker, namely that the referent of the *some* indefinite be unidentified. Strawson (1974) observes that this contrasts with *a(n)* indefinites, which do not have the same requirement.

(30) a. I've been stung by a wasp.
b. #I've been stung by some wasp.

Strawson argues that (30b) is odd because of the felicity requirements of *some*. Wasps are normally not individually identifiable to the average person. Uttering the sentence generates the implication that the speaker could have in principle identified the wasp, but our own knowledge tells us that wasps cannot be identified. The tension between our knowledge of wasps and the implicature generated by the sentence causes us to judge the sentence as being odd.

To generate the unidentifiability requirement of *some*, Weir (2012) proposes that *some* incorporates an anti-singleton presupposition on its domain. This follows Alonso-Ovalle and Menéndez-Benito (2010), who originally propose a similar requirement on Spanish *algún*. (31) demonstrates this (*f* is a subset selection function).

(31) $[\![\textit{algún}]\!] = \lambda f_{\langle et,et\rangle}\, \lambda P_{\langle e,t\rangle}\, \lambda Q_{\langle e,t\rangle}$: **anti-singleton**(f) . $\exists x\, [\, f(P)(x) \wedge Q(x)\,]$
(Alonso-Ovalle and Menéndez-Benito 2010 : 19)

The anti-singleton presupposition is intended to generate an implication that the speaker cannot or will not identify the referent of the indefinite noun phrase.

(32) **Choice Functional *Some* (Final Version)**
$[\![\textit{some}\ \alpha]\!] = \underline{[\![\alpha]\!] \text{ is not a singleton}}\ .\{\, f([\![\alpha]\!])\, \}$
where f is a choice functional variable

The presupposition is satisfied in the post-numeral *some* case, due to fact that the covert *wh*-word supplies a set of alternatives for *some* to choose from. In the pre-numeral case, however, there is no non-singleton set of alternatives, since numerals denote singletons. The anti-singleton presupposition fixes this

problem; the presupposition is accommodated by assuming that the number that *some* combines with does in fact denote a non-singleton. The mechanism to do this is to union the denotation of *twenty* with its pragmatic halo (schematically as in (34), where *halo* is a contextually sensitive function returning the pragmatic halo of some linguistic object).

(33) $[\![some\ twenty]\!] = [\![\underline{twenty}]\!]\ \underline{\text{is not a singleton}}\ .\{\ f([\![twenty]\!])\ \}$
Presupposition failure!
(34) $[\![twenty]\!]^{c} = [\![twenty]\!] \cup halo_{c}([\![twenty]\!])$

The lesson is that the pragmatic halo can be present just when we need it; it's accommodated due to the pragmatic requirements of *some*.

5. Conclusion

In this paper I show that there are two approximative constructions using *some* with separate semantic representations, but that they can be treated in similar ways by making use of a choice functional analysis of *some*, and by making alternatives available in the semantics. Theoretically interesting in this analysis is the source of the alternatives. In the post-numeral *some* construction, the alternatives are generated through merger of a covert *wh*-word. The *wh*-word is interpreted in situ, where it directly denotes a set of numerical alternatives that are possible in the syntactic position on the *wh*-word. These alternatives are determined by the syntactic environment of the *wh*-word, making the post-numeral *some* sensitive to the syntactic properties of the numeral it combines with. The alternatives in the pre-numeral *some*, instead, are coerced to match the anti-singleton requirement of *some*; the pragmatic halo of the numeral is used for the set of alternatives in this case.

Notes

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Composing Additive Complex Numerals in the DP

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1. Introduction

Based on novel empirical evidence from Lebanese Arabic and Standard Arabic, this paper argues that complex numerals are formed prior to merging with a DP, and that they are formed through numeral-specific operations not involving general linguistic means like coordination and modification.

I specifically argue that additive complex numerals, like (1b) do not involve coordination of any usual kind. Specifically, they do not involve DP coordination, NP coordination, or coordination of the numerals as modifiers. I argue that numerals are not modifiers of type <<e,t>,<e,t>> (Ionin and Matushansky 2004, 2006). Rather, I argue for the proposal that they are arguments of their own type, *n*, which require mediating functions in order to compose with the rest of the DP (Zabbal 2005, Scha 1981, Ouwayda 2010, 2012, 2014).

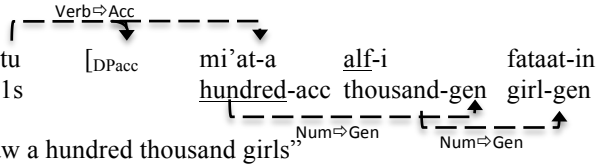
(1) a. Three hundred children
b. Fifty-four apples
c. Four hundred and nine stories

The following section briefly describes the two opposing views. Section 3 presents the core evidence presented in favor of the dedicated function view supported in this paper. Section 4 discusses evidence in favor of the coordination view. Section 5 concludes.

2. Two Views

As Ionin and Matushansky (2006) point out, complex numerals cannot be formed entirely outside of the linguistic system: This possibility is

straightforwardly ruled out by the fact that numerals interact very directly with case assignment, which is a purely linguistic phenomenon: We already know that in a lot of languages, complex numerals as well as their sub-parts are case marked according to what precedes them, and they assign case marking on the words that follow them. This is illustrated in (2) in Standard Arabic. As the example shows, not only do parts of speech other than numerals assign case to numerals and vice versa, but different parts of a complex numeral receive case assignment based on the structure of the complex numeral. Specifically, the first part of the numeral multiplicative, *mi'at-a* "hundred" in (2), is accusative marked, which is the case marking expected for the DP containing it because it is the object of the verb *ra'aytu* "I saw". Moreover, the noun *fataat-in* is genitive marked due to the presence of the numeral. But like the noun following the numeral, the second half the multiplicative numeral, *alf-i* "thousand", is genitive marked, as it follows *mi'at-a* "hundred".



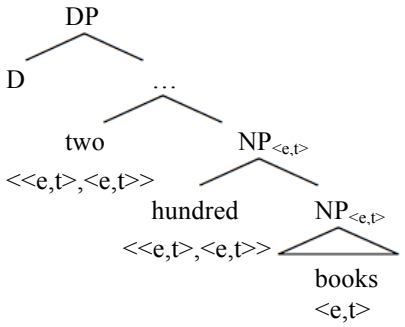
(2) ra'aytu [$_{DPacc}$ mi'at-a alf-i fataat-in
saw.1s hundred-acc thousand-gen girl-gen
"I saw a hundred thousand girls"

Taking as established the fact that the language faculty (specifically syntax) plays at least a partial role in the formation of complex numerals as they occur in language, we are left with two views, one in which the formation of complex numerals is purely linguistic, and one in which it is only partially linguistic. So the question becomes: To what extent is the formation of complex numerals linguistic? And if complex numeral formation is partly or wholly linguistic, when in the formation of a numeral containing DP does it take place?

One way to look at complex numerals is to assume that they are a combination of addition and multiplication of simple numerals, resulting in multiplicative complex numerals (1a), additive complex numerals (1b), and combinations of the two (1c).

Arguing that all numerals are modifiers of type <<e,t>,<e,t>>, Ionin and Matushansky (2004, 2006) propose that multiplicative complex numerals are the result of iterative modification (3), and additive complex numerals are the result of DP coordination (4). Thus, the formation of complex numerals takes place alongside the formation of the DPs that contains them. In this sense, Ionin and Matushansky place the formation of complex numerals completely in the linguistic system, with general linguistic functions (modification and coordination) at play.

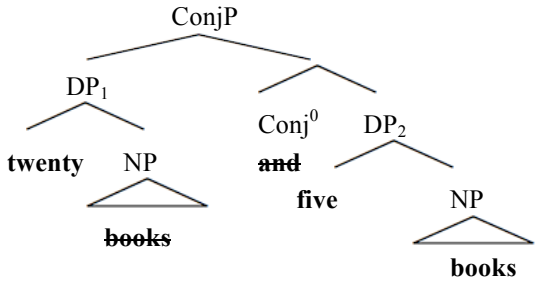
(3) a.



b. $[\![\text{two}]\!] = \lambda P_{et} . \lambda x_e . \exists S_{et} [\pi(S)(x) \& |S| = 2 \& \forall s \in S\ P(s)]$ $[\![\text{hundred}]\!]$ $= \lambda P_{et} . \lambda x_e . \exists S_{et} [\pi(S)(x) \& |S| = 100 \& \forall s \in S\ P(s)]$

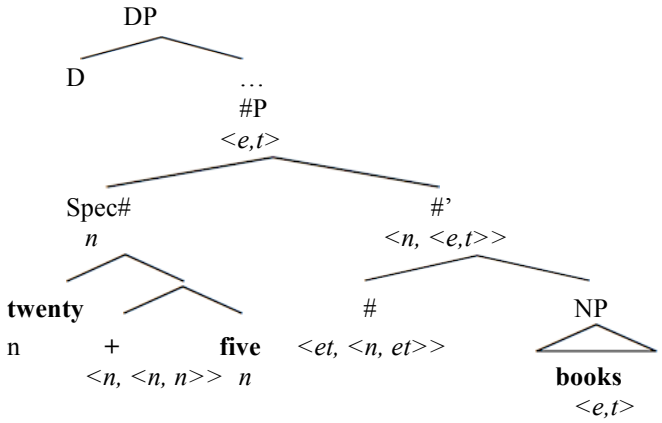
c. $[\![\text{two hundred books}]\!] = [\![\text{two}]\!]([\![\text{hundred books}]\!]) = \lambda x . \exists S [\pi(S)(x) \& |S| = 2 \& \forall s \in S\ \exists S_2 [\pi(S_2)(s) \& |S_2| = 100 \& \forall z \in S_2\ z \text{ is a book}]$

(4)

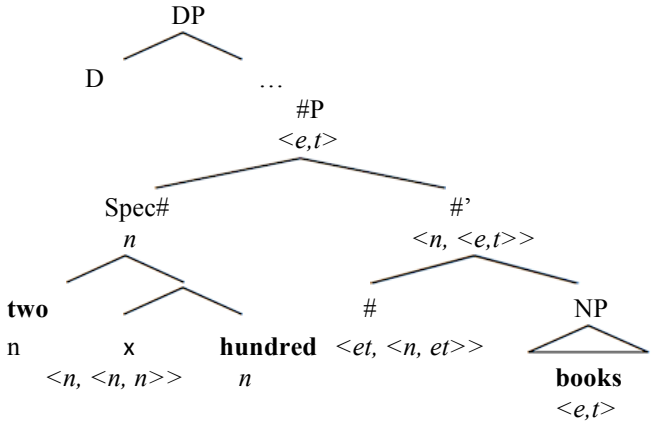


A competing view treats numerals as their own type, *n*, needing a mediating function to merge into a DP (Scha 1981, Zabbal 2005, Ouwayda 2012, 2014). In this view, complex numerals are formed through dedicated additive and multiplicative functions, separate from coordination and modification, and which operates on numerals independently of any other parts of speech. This view is consistent with both a purely linguistic view and a partly linguistic view, as these functions can be semantic functions '+' and 'x' with *n*-type arguments, and whose denotation is exactly that of addition and substraction, as illustrated in (5), (6), and (7). Or they can be purely mathematical, non-linguistic functions, occurring before the numeral's merger into syntax. In either case, importantly, the composition of a complex numeral occurs prior to its merger into the DP, and does not involve any other parts of the DP.

(5)



(6)



(7) a. $[[+]] = \lambda u_n. \lambda v_n. u+v$
b. $[[x]] = \lambda u_n. \lambda v_n. u*v$

3. Decisive Evidence

In this section, I provide new evidence that additive complex numerals occurring in DPs are formed in two different ways, one that indeed involves DP coordination, and another in which components of the complex numeral compose with each other prior to merging with the rest of the DP. I do this by showing that additive complex numerals cannot always be reduced to multiple coordinated DPs with PF-deletion deletion of the noun. Crucially, I show that

additive complex numerals do not trigger agreement the same way that coordinated DPs do.

3.1. Agreement and numerals in Lebanese Arabic

First, I briefly review how agreement works, specifically in Lebanese Arabic. In SVO word order, in Lebanese Arabic, verbs must always agree in number with the subject, so if the subject is plural, as in (8a), the verb has to also be plural. If the subject is singular, as in (8b), "the boy arrived", the verb has to also be singular. So in Lebanese Arabic, plural DPs trigger plural agreement on the verb, and singular DPs trigger singular agreement on the verb. Unsurprisingly, when the subject consists of two coordinated DPs, the verb has to always be plural marked, even if each conjunct is singular, as illustrated in (9a). This is also true for English, as shown in (9b).

(8) a. l-wleed weSl-uu/*ø
the-boy-pl arrived-pl/*sg
"The boys arrived."
b. l-walad weSel/*-uu
the-boy-sg arrived-sg/*pl
"The boy arrived."

(9) a. [rejjeel w walad] weSl-uu/*weSel
man-sgand boy-sg arrived-pl/*arrived-sg
"A man and a boy arrived."
b. A man and a woman come/*comes here every day

As (10) illustrates, nouns that follow numerals larger than 10 in Lebanese Arabic are not plural marked. Verbs following such DPsDPs containing numerals larger than 10 can be either plural or non-plural (Ouwayda 2012, 2014). This is illustrated in (11).

(10) a. xamsiin walad
fifty boy-sg
"Fifty boys"
b. *xamsiin wleed
fifty boy-pl

(11) a. xamsiin walad weSel
fifty boy-sg arrived-sg
"Fifty boys arrived."
b. xamsiin walad weSl-uu
fifty boy-sg arrived-pl
"Fifty boys arrived." Ouwayda (2012, 2014)

Based on this data, and associated semantic effects, Ouwayda (2012, 2014) argues that the verb can be singular because the presence of a numeral in a DP is not sufficient for the DP to be plural. Rather, there are two possible mediating functions that allow the merger of a numeral into the DP: # and $\exists_n$, and only one of them, #, is a syntactic and semantic pluralizer, and $\exists_n$ is not.

3.2. The evidence: Agreement unlike coordination

Like other numerals larger than ten, additive complex numerals larger than ten also do not necessarily trigger plural agreement. So unlike coordinated DPs in (9a) which do not allow a singular marked verb, additive complex numerals larger than ten in Lebanese Arabic allow both singular agreement and plural agreement (12). Therefore, additive complex numerals behave syntactically differently from coordinated DPs with the first noun deleted, and thus cannot always be reduced to DP coordination as Ionin and Matushansky (2006) argue.

(12) a. miyyeh w xamsiin walad weSel
hundred and fifty boy-sg arrived-sg
"A hundred and fifty boys arrived."
b. miyyeh w xamsiin walad weSl-uu
hundred and fifty boy-sg arrived-pl
"A hundred and fifty boys arrived."

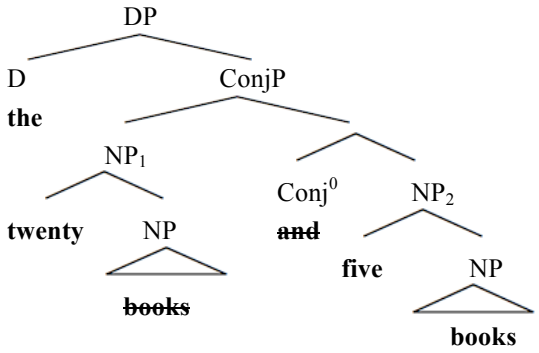
3.3. Not any other kind of coordination, either

Also, as Ionin and Matushansky (2006) point out, additive complex numerals do not behave like noun coordinations or smaller NP coordinations (14), thus treating (13) like the example in (15) discussed in Heycock and Zamparelli (2005). In these coordinated NPs, two smaller chunks, "friend" alone, and "colleague" alone, are coordinated before the merger of the determiner, and these DPs allow singular agreement. But (15) has to mean that one person is simultaneously a friend and at the same time is a colleague and he or she visits me in August (Heycock and Zamparelli 2005). (13), however, does not mean that my friends, who are at the same time fifty people and they are also three people, arrived. With the same logic, the additive numerals cannot be reduced to

regular modifier coordination (16), as this option would also predict an overlap in reference, as is the case in (17).

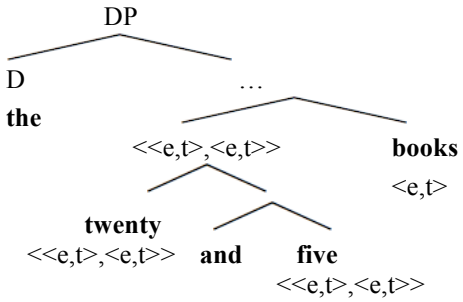
(13) My twenty five books arrived ≠ My books which are simultaneously twenty and at the same time they are five, arrived

(14)



(15) My friend and colleague visits me in August. = One person who is simultaneously a friend and a colleague visits me.

(16)



(17) My nice and handsome friend visits me in August = One friend who is simultaneously nice and handsome visits me

(18) a. $[[\text{twenty and five}]] = \lambda P_{et}.\lambda x.[[\text{twenty}]](P(x)) \& [[\text{five}]](P(x))$ (PM)

b. $[[\text{twenty and five books}]] = \lambda y.\ [\lambda x_e\ .\ \exists S_{et}\ [\pi(S)(x)\ \&\ |S| = 20\ \&\ \forall s \in S\ \text{books}(s)]]\ (y)\ \text{and}\ [\lambda z_e\ .\ \exists S_{et}\ [\pi(S)(x)\ \&\ |S| = 5\ \&\ \forall s \in S\ \text{books}(s)]]\ (y)$
$= \lambda y\ .\ \exists S_{et}\ [\pi(S)(y)\ \&\ |S| = 20\ \&\ \forall s \in S\ \text{books}(s)]\ \text{and}\ .\ \exists S_{et}\ [\pi(S)(y)\ \&\ |S| = 5\ \&\ \forall s \in S\ \text{books}(s)]$

c. Prediction: [[the twenty and five books arrived]] = 1 iff there is a unique

individual x, and x can be partitioned into 20 parts each of which is a book, and x can be partitioned into 5 parts each of which is a book, and that individual arrived → wrong predictions

So we can also rule out any variations on the DP coordination theory, such as modifier coordination or NP coordination.

We also know that the internal composition of the two components of the additive complex numerals must, at least in some cases, take place prior to merging with the noun. One possible such structure is the one in (5), argued for by Zabbal (2005) and Ouwayda (2012, 2014), where there is a dedicated addition function that sums the two numerals first, and then the whole complex numeral merges into the DP as one unit.

4. Some Additive Complex Numerals are Coordinated DPs, and That's Not Surprising

As Ionin and Matushansky (2004, 2006) point out, many languages have at least some additive complex numerals that visibly involve DP coordination. They list Luvale, Welsh, and Biblical Hebrew. This, in fact, is also true in Arabic, for numerals 101 and 102, as illustrated in (19)-(20) for Lebanese Arabic. In fact, they can only have this form—as illustrated by the ungrammaticality of the [[numeral and numeral] noun] form in (21). This is arguably because weeHed "one" and tnein "two" in Arabic are adjectives rather than numerals, as argued by (Shlonsky 2004). Since they are adjectives, they cannot precede the nouns, and they cannot compose with other numerals.

(19) a. miit kteib w kteib
hundred book-ø and book-ø
"A hundred and one book"
b. miit kteib w kteib-ein
hundred book-ø and book-dl
"A hundred and two books"

(20) a. miiyeh w kteib
hundred and book-ø
"A hundred and one/two books"
b. miiyeh w kteib-ein
hundred and book-dl
"A hundred and one/two books"

(21) a. *miyyeh w weeHed kteeb/ketob
hundred and one book-ø/book-pl
"A hundred and one books"
b. *miyyeh w tneen kteeb/ketob
hundred and two book-ø/book-pl
"A hundred and two books"

The difference between (19) and (20), which appear to be DP coordination, and (12), which the previous section showed cannot be DP coordination is structural and not just a superficial effect. This is shown in two ways: First, unlike (12), agreement on verbs following the DPs in (19) or (20) must be plural, despite the fact that the noun is also non-plural in some of these cases. This is shown in (22)-(23).

(22) [[miit kteib] w [kteib]] weSl-uu/*weSel
hundred book-ø and book arrived-pl/*sg
"A hundred and one books arrived."

(23) [[miyyeh w xamsiin] kteib] weSel/weSl-uu
hundred and fifty book-sg arrived-sg/-pl
"A hundred and fifty books arrived."

Second, while nouns following numerals in standard Arabic are obligatorily marked accusative or genitive, depending on the numeral as (24) shows, the case marking on the second noun in the visibly conjoined forms is always the DP's case. Here it is nominative, because the DP is a subject. This strongly suggests that "book" in this sentence is structurally at the same level as "hundred".

(24) mi'at-u kitaab-in wa kitaab-on waSal-uu
hundred-nom book-gen and book-nom arrived-pl
"A hundred and one books"

So numerals like 101 and 102 in Arabic must have a structure like that proposed by Ionin and Matushansky (2006), where there are two separate DPs "a hundred book" and "one book", which are coordinated. While this is the case, I believe that this is not surprising. The coordinated DP form for complex additive numerals is simply a periphrastic way of expressing additive numerals in languages or syntactic environments that lack the direct way of doing so, either because of the way the simple numerals are, as in the Arabic numerals "one" and "two", or because there is a parameter in that language that is not set.

This is not the only place where this happens. Similar to this, a lot of languages have classifier systems, which are entirely built into their DP systems, like in Mandarin Chinese (25). In some other languages like English, however, there

are no classifiers in the same sense. Instead, measure phrases like in (26) are used to express the meaning of classifiers in languages that lack them. While they express the same meanings, partitives/measure phrases have different syntactic properties (e.g. can be modified by adjectives and separated from the noun in ways classifiers cannot), and are analyzed as different syntactic objects from classifiers (Borer 2005, Cheng and Sybessma 2005, Doetjes 1997, among others)

(25) Mandarin: [$_{DP}$ zhe [$_{ClP}$ li [$_{NP}$ mi]]]
this Cl rice

(26) English: [$_{DP1}$ This [$_{NP}$ grain [$_{PP}$ of [$_{DP2}$ rice]]]

5. Conclusion

While conjoining multiple DPs is one possible way to express additive cardinality, and that option is attested in some languages and some syntactic contexts, there is a dedicated function that allows for complex numerals to compose internally prior to merging with the rest of the DP. The semantics of the additive operation is different from that of coordination, as it behaves differently from coordinations of nouns, adjectives, and DPs.

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The Copied Verb as a Case of Differential Object Marking in Mandarin Chinese*

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1. Introduction

In this paper, I clarify the syntactic status of the copied verb in the verb copying construction as shown in bold in 0.

(1) Zhangsan **kan** zhe-ben shu kan [$_{deP}$ de hen zixi].
Zhangsan read this-CL book read DE very carefully
"Zhangsan read this book very carefully."

In example 0, the verb *kan* "read" appears twice, which is the main reason why this construction is called the verb copying construction. Following Cheng (2007), I assume that the original verb is the one preceding the *de*-clause, while the verb preceding the object is the copied verb (i.e., the one in bold in example 0). Although the copied verb looks like a "verb", I argue that its real syntactic status is a kind of differential object marking [DOM] (see Bossong 1985, Aissen 2003, Rodríguez-Mondoñedo 2007, Dalrymple and Nikolaeva 2011, and so on). In the following discussion, I first discuss some unique properties of the copied verb. I will show that the copied verb does not behave like a real verb. I then propose the relevant derivation for example 0. I argue that the object *shu* "book" has undergone internal topicalization in example 0, which echoes the proposals by García García (2005), Guntsetseg (2009), and Dalrymple and Nikolaeva (2011) for the correlation between DOM and internal topicalization. The current proposal for the copied verb as a case of DOM is also supported by the phenomena observed in the BA construction in Mandarin Chinese. Last but not least, I compare the current analysis to an alternative analysis by Hsu (2008), whose proposal for the verb copying construction is also related to internal topicalization. I conclude the paper in the last section.

2. The Syntactic Properties of the Copied Verb

In this section I present some unique syntactic properties of the copied verb in the verb copying construction. These properties show that the copied verb does not behave like a real verb at all.

First of all, the proposal that the copied verb is not a real verb has been made by Tsao (1987b). Tsao observes that while a real verb can take aspectual markers or form an A-not-A question, it is not possible for a copied verb to do so. This contrast is shown in 0 (a typical verb) and 0 (a copied verb).

(2) a. Zhangsan kan-le/zhe/guo zhe-ben shu.
Zhangsan read-ASP this-CL book
"Zhangsan read/is reading this book."
b. Zhangsan kan-bu-kan zhe-ben shu?
Zhangsan read-not-read this-CL book
"Does Zhangsan read this book?"

(3) a. *Zhangsan kan-le/zhe/guo zhe-ben shu kan [$_{de\text{P}}$ de hen zixi].
Zhangsan read-ASP this-CL book read DE very carefully
"Zhangsan read/is reading this book very carefully."
b. *Zhangsan kan-bu-kan zhe-ben shu kan [$_{de\text{P}}$ de hen zixi]?
Zhangsan read-not-read this-CL book read DE very carefully
"Does Zhangsan read this book very carefully?"

Secondly, a normal verb is syntactically lower than the dynamic modal *dei* "must", as shown in 0. However, as observed in Hsu (2008), the copied verb is higher than the dynamic modal, as shown in 0.

(4) Zhangsan dei kan zhe-ben shu.
Zhangsan must read this-CL book
"Zhangsan must read this book."

(5) Zhangsan **kan** zhe-ben shu dei kan [$_{de\text{P}}$ de hen zixi].
Zhangsan read this-CL book must read DE very carefully
"Zhangsan must read this book very carefully."

Thirdly, it is absolutely not possible for the main verb in 0 to be omitted. But the copied verb can be optionally omitted as shown in 0. The omission of the copied verb does not change the meaning of the sentence.

(6) Zhangsan *(kan) zhe-ben shu.
Zhangsan read this-CL book
"Zhangsan read this book."

(7) Zhangsan **(kan)** zhe-ben shu kan [$_{deP}$ de hen zixi].
Zhangsan read this-CL book read DE very carefully
"Zhangsan read this book very carefully."

There is a restriction on the optionality of the copied verb in the verb copying construction though (see also Huang, Li, and Li 2009). As shown in 0, if the object following the copied verb is a [+person] NP, the copied verb becomes obligatory if the same interpretation needs to be maintained.

(8) Zhangsan ***(da)** Lisi da [$_{deP}$ de hen yongli].
Zhangsan beat Lisi beat DE very hard
"Zhangsan beat Lisi very hard."

Note that the omission of the copied verb in example 0 does not cause ungrammaticality. It is just the case that a different interpretation will be triggered. As shown in 0, if the copied verb is omitted, *Lisi* will be interpreted as the subject, and *Zhangsan* the object. This is exactly the opposite interpretation of example 0.

(9) Zhangsan Lisi da [$_{deP}$ de hen yongli].
Zhangsan Lisi beat DE very hard
"Zhangsan, Lisi beat him very hard."

To summarize: in this section we have seen three syntactic properties of the copied verb. Via the comparison with a real verb, we conclude that the copied verb does not behave like a normal verb. The copied verb cannot take any aspectual markers or form an A-not-A question. Syntactically the copied verb is higher than modals. And, importantly, the copied verb can be optionally omitted when the following object is a [-person] NP.

3. The Derivation of the Verb Copying Construction

In the previous section, we have seen that the copied verb does not behave like a normal verb. The question of its real syntactic status then arises. In this section, I will first propose the derivation for example 0, repeated here as example 0. I then argue that the copied verb in example 0 is a kind of differential object marking.

(10) Zhangsan **kan** zhe-ben shu kan [$_{deP}$ de hen zixi].
Zhangsan read this-CL book read DE very carefully
"Zhangsan read this book very carefully."

The derivation, shown in 0, goes as follows: Following Huang (1988), I assume that the manner *de*-clause is an adverbial. In addition, following Huang, Li, and Li (2009), the *de* heading the *de*P is a kind of verbal affix. The *de*P therefore has to be merged to a verb as in (11a). However, as one can see in (11a), there is an object intervening in between the verb and the *de*-clause. To solve this problem, I propose that the object NP may undergo movement to the Spec, *v*P position (the escape hatch) as in (11b) (see Bošković 2007). Moreover, since the object is at the edge of a phase (Chomsky 2000, 2001 and 2004), it may undergo further movement to the IP domain as shown in (11c). Next, following the sideward movement analysis (i.e., Nunes 2001, 2004) by Cheng (2007), the main verb in (11c) is copied, and the copied verb merges with the object NP separately and forms a VP as in (11d).

(11) a. [$_{IP}$ Zhangsan kan zhe-ben shu] - [$_{deP}$ de hen zixi].
b. [$_{IP}$ Zhangsan [$_{vP}$ zhe-ben shu [$_{vP}$ kan [$_{deP}$ de hen zixi]]]].
c. [$_{IP}$ Zhangsan zhe-ben shu [$_{vP}$ kan [$_{deP}$ de hen zixi]]].
d. [$_{IP}$ Zhangsan [$_{VP}$ **kan** zhe-ben shu] [$_{vP}$ kan [$_{deP}$ de hen zixi]]].

Although there are two copies of the verb realized in (11d), this is allowed since the original verb has merged with the *de*-clause. Hence these two copies are distinct from each other and can be realized simultaneously in the same clause (see Kayne 1994). The VP constituent in (11d) is attested in the following example, 0, in which the VP constituent *kan zhe-gen shu* can be externally topicalized.

(12) Kan zhe-ben shu, Zhangsan kan de hen zixi.
read this-CL book Zhangsan read DE very carefully
"Zhangsan read this book very carefully."

As one can see, the copied verb in (11d) is in the IP domain. This then explains the first two facts/puzzles presented in the previous section. Recall that the copied verb cannot take any aspectual marker or form an A-not-A question, repeated here as 0, and the copied verb is higher than the dynamic modal, repeated here as 0.

(13) a. *Zhangsan kan-le/zhe/guo zhe-ben shu kan [$_{deP}$ de hen zixi].
Zhangsan read-ASP this-CL book read DE very carefully
"Zhangsan read/is reading this book very carefully."
b. *Zhangsan kan-bu-kan zhe-ben shu kan [$_{deP}$ de hen zixi]?
Zhangsan read-not-read this-CL book read DE very carefully
"Does Zhangsan read this book very carefully?"

(14) Zhangsan **kan** zhe-ben shu dei kan [$_{deP}$ de hen zixi].
Zhangsan read this-CL book must read DE very carefully
"Zhangsan must read this book very carefully."

From the current proposal, the copied verb is in the IP domain. Hence it is predicted that it cannot take any aspectual marker or form an A-not-A question, as these are syntactic properties of the *v*P domain. In addition, the copied verb being higher than the dynamic modal is also a natural consequence of the proposal in (11d). According to Tsai (2009, 2010), the dynamic modal marks the *v*P periphery. Since the copied verb is in the IP domain, it therefore can be higher than the dynamic modal.[1]

4. Differential Object Marking

There remains the last puzzle of the copied verb in the verb copying construction. That is, the copied verb seems to be optional under certain conditions and obligatory under other conditions. This is repeated here as 0 and 0.

(15) Zhangsan (**kan**) zhe-ben shu kan [$_{deP}$ de hen zixi].
Zhangsan read this-CL book read DE very carefully
"Zhangsan read carefully."

(16) Zhangsan ***(da)** Lisi da [$_{deP}$ de hen yongli].
Zhangsan beat Lisi beat DE very hard
"Zhangsan beat Lisi very hard."

Recall that the major difference between 0 and 0 is the [±person] distinction of the following object NP. The [±person] distinction of the object NP is reminiscent of differential object marking observed in other natural languages. According to the literature, differential object marking is sensitive to the [±animacy] and [±specificity] of the object (see Bossong 1985 and Aissen 2003). Take Spanish in 0 for example; the [-animate] object is not preceded by the preposition *a* in (17a), but this preposition is obligatory when the object is [+animate], as in (17b) (Rodríguez-Mondoñedo 2007).

(17) a. John ama le libros.
John likes the books
"John likes the books."
b. John ama *(a) Mary
John likes Mary
"John likes Mary."

There is a salient difference between Spanish and Mandarin Chinese. In both languages, DOM is required when the object is a [+animate] NP. But for [-animate] objects, DOM is prohibited in Spanish and optional in Mandarin Chinese. However, the difference is not surprising, since DOM varies across languages. For example, DOM in Malayalam is only sensitive to [+animate] object NPs, while DOM in Hebrew is only sensitive to [+specific] object NPs. Furthermore, according to Rodríguez-Mondoñedo (2007), the DOM that we have observed in Mandarin Chinese seems to behave like the one in Kannada. In Kannada, [+person] object NPs have to be marked by DOMs. Other [-person] (i.e., inanimate) objects can be all unmarked, but they can optionally be marked by DOM if they are specific. This is exactly the pattern that shown in 0 and 0.

In addition, recall that in the previous section I have proposed that the object NP is preposed by movement to the IP domain (i.e., (11c)). This kind of movement, to be more specific, is termed internal topicalization in the literature (see Paul 2002, 2005 and Hsu 2008) and is quite common in Mandarin Chinese. As shown in 0, an SVO order sentence can be transformed into an SOV one easily.

(18) a. Zhangsan kan-wan-le zhe-ben shu.
Zhangsan read-finish-ASP this-CL book
"Zhangsan finished reading this book."
b. Zhangsan zhe-ben shu kan-wan-le.
Zhangsan this-CL book read-finish-ASP
"Zhangsan finished reading this book."

Interestingly, in the discussion of differential object marking, one of the conditions for DOM to emerge in the structure is topicalization (see García García 2005 for Spanish, Guntsetseg 2008 for Mongolian, Dalrymple and Nikolaeva 2011 for Tigre, and so on). Take the following Tigre example 0 as an instance. In this example, the object "dog" is construed as a secondary topic, and this secondary topic object exhibits DOM (marked by a preposition).

(19) da$^{?}$am dəmmu … $^{?}$əgəl kaləb wə$^{?}$ul talmat $^{?}$ətu
but cat Prep dog deliberately she.deceived him
"But the cat … deliberately deceived the dog." (Raz 1983: 104)

The current proposal categorizing the copied verb as a case of differential object marking is also supported by the BA construction in Mandarin Chinese. Yang and van Bergen (2007) have proposed that BA in the BA construction is a kind of DOM. If the current proposal regarding the copied verb is on the right track, we should expect that the pattern observed in the verb copying construction is available in the BA construction. This prediction is borne out as

follows:

(20) Zhangsan (**ba)** zhe-ben shu kan [$_{de}$P de hen zixi].
Zhangsan BA this-CL book read DE very carefully
"Zhangsan read this book carefully."

(21) Zhangsan ***(ba)** Lisi da [$_{de}$P de hen yongli].
Zhangsan BA Lisi beat DE very hard
"Zhangsan beat Lisi very hard."

As shown in 0, when the BA NP is a [-person] NP, BA can be optional. On the other hand, the BA NP in 0 is a [+person] one, and BA is obligatory. In addition, the BA NP has been argued by Tsao (1987a) to be a case of internal topic. This proposal also echoes the observation that we have made above for the verb copying construction.

Finally, note that under the current analysis, example 0 can be derived from the same initial structure as example 0. The initial structure is repeated here as (22a). Recall that the manner *de*-phrase needs to merge with a verb as in (22a). Hence the object is forced to undergo movement to Spec, *v*P as in (22b). At this point, the derivation for the BA construction is the same as the verb copying construction. But different from the verb copying construction, the object does not undergo further movement to the IP domain. It stays at Spec, *v*P. Next, following Li (2006), a *Ba*P is merged right above the *v*P, and the head of this *Ba*P is overtly realized as BA. The final derivation (22c) is exactly the structure for example 0.

(22) a. [$_{IP}$ Zhangsan kan zhe-ben shu] - [$_{de}$P de hen zixi]. = (11a)
b. [$_{IP}$ Zhangsan [$_{v}$P zhe-ben shu [$_{v}$P kan [$_{de}$P de hen zixi]]]]. = (11b)
c. [$_{IP}$ Zhangsan [$_{Ba}$P BA [$_{v}$P zhe-ben shu [$_{v}$P kan [$_{de}$P de hen zixi]]]]].

By comparing the verb copying construction to the BA construction, in this section we have seen that these two constructions share the same syntactic properties: differential object marking and the internally topicalized object. This similarity further strengthens the current analysis for the copied verb in the verb copying construction.

5. VP or NP Topicalization?

In Hsu (2008), a topicalization-related proposal is proposed for the verb copying construction as well. However, what Hsu has proposed is a VP topicalization analysis. That is, in an example like 0, the VP *kan zhe-gen shu* "read this book" is base-generated as an internal topic in the IP domain. Compared to the current

analysis, what I have proposed is an NP topicalization analysis for the verb copying construction.

(23) Zhangsan [$_{VP}$ kan zhe-ben shu] kan-de hen zixi.
Zhangsan read this-CL book read-DE very carefully
"Zhangsan read very carefully."

Although both proposals are topicalization-related, there is a simple way to differentiate these two analyses from each other. This is illustrated as follows: As shown in 0, if the object NP is an indefinite NP, the example in the verb copying construal is ungrammatical.

(24) *Zhangsan [$_{VP}$ kan yi-ben shu] kan-de hen zixi.
Zhangsan read one-CL book read-DE very carefully
"Zhangsan read a book very carefully."

Under Hsu's VP topicalization analysis, it is hard to explain why the definiteness/indefiniteness of the object NP is in charge of the grammaticality/ ungrammaticality of the sentence. However, under the current NP topicalization analysis, the ungrammaticality of 0 is in fact expected. As shown in 0, it has been observed in the literature that external topics cannot be indefinite NPs (see Li and Thompson 1981, Liu 1997, Bender 2000, and so on).

(25) a. Zhen-ben shu, Zhangsan kan-de hen zixi.
this-CL book Zhangsan read-DE very carefully
"Zhangsan read this book very carefully."
b. *Yi-ben shu, Zhangsan kan-de hen zixi.
one-CL book Zhangsan read-DE very carefully
"Zhangsan read a book very carefully."

The same pattern in 0 can be observed in the case of internal topics, as shown in 0. The only difference between 0 and 0 is the location of the object NP.

(26) a. Zhangsan zhe-ben shu kan-de hen zixi.
Zhangsan this-CL book read-DE very carefully
"Zhangsan read this book very carefully."
b. *Zhangsan yi-ben shu kan-de hen zixi.
Zhangsan one-CL book read-DE very carefully
"Zhangsan read a book very carefully."

In example 0, the object NP is an indefinite one. Therefore it is not allowed to be an internal topic. Hence the ungrammaticality can be explained under the current NP internal topicalization analysis, rather than the VP internal topicalization

analysis.

6. Conclusion

a. In this paper I have discussed the syntactic status of the copied verb in the verb copying construction. I first showed that the copied verb does not behave like a typical verb syntactically. Secondly, the derivation of the verb copying construction was proposed. I proposed that the copied verb is a case of differential object marking, which is closely related to the internal topicalization mechanism of the object NP. This proposal for the verb copying construction is further supported by the BA construction in Mandarin. In addition, I also showed that an NP internal topicalization proposal is empirically better than a VP internal topicalization proposal. Importantly, the current proposal regarding the verb copying construction shows that the verb copying construction is not an idiosyncratic construction, but a construction that shares common syntactic mechanisms observed in other constructions in Mandarin Chinese.

Notes

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[1] Another similar test to show that the copied verb is in the IP domain is to examine the verb copying construction in the form of a *lian…dou* construction. This is shown in (i).

(i) Zhangsan lian **kan** zhe-ben shu dou kan [$_{deP}$ de hen zixi].
Zhangsan even read this-CL book all read DE very carefully
"Zhangsan even read this book very carefully."

According to Shyu (1995), *dou* in the *lian…dou* construction marks the *v*P periphery. Since the copied verb is higher than *dou* in example (i), this indicates that the copied verb should be in the IP domain.

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Selectional Properties of Adjectives and Their Clausal Complements

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1. Introduction

It is well-known that in English subject raising constructions the subject of the non-finite embedded clause appears in the subject position of the matrix clause as shown in (1b).

(1) a. It seems that she is smart.
b. She seems to be smart.

The subject of the non-finite embedded clause appears in the subject position of the matrix clause not only when the matrix predicate is a verb such as *seem* but also when the matrix predicate is an adjective such as *likely* or *certain*.

(2) a. It is likely that he will come to the party.
b. He is likely to come to the party.

(3) a. It is certain that the weather will change.
b. The weather is certain to change.

In *tough*-constructions the argument equivalent to the semantic object of the embedded clause appears in the subject position of the matrix clause as exemplified in (4b) and (5b).

(4) a. It is tough to read this book.
b. This book is tough to read.

(5) a. It is hard to please Mary.
b. Mary is hard to please.

However, in cases where the matrix predicate is a *probable*-type adjective, the semantic subject of the embedded clause is not allowed to appear in the subject position of the matrix clause even when the embedded clause is non-finite as shown in (6b).

(6) a. It is probable that he will come to the party.
b.*He is probable to come to the party.

Also, a *wh*-phrase cannot be extracted from the clausal complement of *probable*, while it can from that of *likely*.

(7) a. Who is it likely that Susan will marry?
b.*Who is it probable that Susan will marry?

In cases where the matrix predicate is an *essential*-type adjective, the argument equivalent to the semantic object of the embedded clause is not allowed to appear in the subject position of the matrix clause as shown in (8b).

(8) a. It is essential to read this book.
b.*This book is essential to read.

In this paper, we argue that the selectional properties of adjectives determine whether subject and object raising can occur in non-finite embedded clauses. We discuss the selectional properties of adjectival predicates and the empirical evidence that supports the postulation of the different selectional properties of these adjectives.

2. *Likely*-Constructions and *Probable*-Constructions

2.1. Complement structures of *likely*-type and *probable*-type adjectives

Haegeman (1994:320) was unable to explain why the semantic subject of a non-finite embedded clause is not allowed to appear in the subject position of the matrix clause when the matrix predicate is a *probable*-type adjective as in (10b), unlike when the matrix predicate is a *likely*-type adjective as in (9b).

(9) a. It is likely that he will come to the party.
b. He is likely to come to the party.

(10) a. It is probable that he will come to the party.
b.*He is probable to come to the party.

Closer examination is needed to explain the difference in embedded subject raising between the two different types of constructions. We propose that *likely*-type adjectives select only a TP in cases where they select a non-finite complement clause, whereas *probable*-type adjectives in the same position select a CP instead of a TP, as illustrated in (11) and (12) (cf. Kang 2011a).

(11) [T be likely [$_{TP}$ he to come to the party]]

(12) [T be probable [$_{CP}$ [$_{TP}$ he to come to the party]]]

With this suggestion it becomes possible to explain the difference in terms of the Government and Binding (GB) Theory (Chomsky 1981, 1986a, 1986b; Chomsky and Lasnik 1993) and the Minimalist Program (Chomsky 2000, 2001, 2004, 2008). The embedded subject in (11) can raise to the matrix subject position across the TP without a problem because the TP is not a barrier. However, the embedded subject in (12) is not allowed to raise to the matrix subject position because the CP is a barrier and so the embedded subject trace will violate the Empty Category Principle (ECP). If the embedded subject stops in the Spec of the embedded CP in the course of raising to the matrix subject position, then Condition (C) of the Binding Theory will be violated. In this way, it is possible to explain in terms of the ECP and the Binding Theory why the embedded subject in the complement clause of the *probable*-type adjective cannot raise to the matrix subject position.

We can account for this in terms of the Phase Impenetrability Condition (PIC) as well (Chomsky 2000, 2001, 2004, 2008). In the case of (11) the probe T in the matrix clause can agree with the goal in the embedded subject position since the *likely*-type adjective selects a TP for its non-finite complement. Hence there is no problem in raising the embedded subject to the matrix subject position in order to satisfy the EPP. However, in (12), where the matrix predicate is a *probable*-type adjective, which selects only a CP for its non-finite complement, the embedded subject is not allowed to raise to the matrix subject position because of the PIC. Since the embedded CP is a strong phase, the probe T of the matrix clause cannot probe into the embedded TP, which is the domain of the phase head C. As a result, the matrix probe T cannot undergo Agree with the goal in the embedded subject position and so the embedded subject cannot raise to the matrix subject position.

Next, let us consider how we can explain the difference between (7a) and (7b), repeated below as (13a) and (13b).

(13) a. Who is it likely that Susan will marry?
b.*Who is it probable that Susan will marry?

To account for the ungrammaticality of (13b) we suggest that not every C has an edge-feature. We suggest that the C selected by such adjectives as *probable* has no edge-feature unlike the C selected by such adjectives as *likely*. If *probable* selects a CP headed by C with no edge-feature, then the *wh*-phrase is not allowed to move from the embedded object position to the Spec of the intermediate CP as seen in (13b). Because of the PIC, the *wh*-phrase is not accessible to the probe of the C in the matrix clause. In this way, we can explain why (13b) is ungrammatical.

2.2. Evidence

The postulation of the selectional properties of these adjectives is not merely an ad hoc stipulation. Rather it is supported by empirical evidence. Examples (14) and (15) show that *likely*-type adjectives must select a finite CP rather than a non-finite CP for a clausal complement.

(14) a. It is likely that he will come to the party.
b.*It is likely for him to come to the party.

(15) a. What is likely is that he will come to the party.
b.*What is likely is for him to come to the party.

Conversely, examples (16) and (17) show that *probable*-type adjectives can select either a finite or non-finite CP for a clausal complement, unlike *likely*-type adjectives.

(16) a. It is possible that he will come to the party.
b. It is possible for him to come to the party.

(17) a. What is possible is that he will come to the party.
b. What is possible is for him to come to the party. (Lee 2011: 525)

The empirical evidence above shows that *likely*-type and *probable*-type adjectives have different selectional properties.

3. *Tough*-Constructions and *Essential*-Constructions

3.1. Problems with *tough*-movement

Next, we will discuss the complement structures of *tough*-type and *essential*-type adjectives. In early transformational grammar, it was assumed that the embedded object in the *tough*-construction moves to the matrix subject position.

However, this analysis of the *tough*-construction has theoretical problems since the *tough*-construction remains grammatical even though the movement of the embedded object to the matrix subject position violates the Chain Condition, the Last Resort Principle, the Binding Theory, and the Minimal Link Condition. To explain this anomaly, Chomsky (1981) suggested that the subject of the *tough*-construction be introduced into the matrix subject position. In doing so, Chomsky assumed that θ-roles are assigned at LF and that the subject can be introduced into a sentence not only at D-S but also in the course of syntactic derivation after D-S since the subject position of the *tough*-construction is not a θ-position. Chomsky (1981) also suggested that a null-operator moves from the embedded object position to the Spec of the embedded CP, forming a complex predicate with the matrix adjectival predicate and assigning a θ-role to the subject of the *tough*-construction.

(18) a. This book$_i$ T be tough [$_{CP}$ [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read OP$_i$]]]]
b. This book$_i$ T be tough [$_{CP}$ OP$_i$ [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read t$_i$]]]]

The GB theory, however, faces a problem in accounting for how a phrase or a clause that includes a predicate can be introduced into the subject position of a *tough*-construction after D-S as in (19).

(19) a. The books that Mary enjoyed are hard for Bill to read.
b. *Moby Dick* being hard to read is tough for Bill to understand.
(Hornstein, Nunes, and Grohmann 2005: 67)

Hornstein, Nunes, and Grohmann (2005) argued that if D-S is discarded, this problem disappears. Thus the Minimalist approach, which dispenses with D-S, is supported by such constructions as (19) (cf. Chomsky 1995). Under the Minimalist approach, *tough*-constructions like (20) can be derived by the Merge and Move operations through the process shown in (21).

(20) This book is tough PRO to read.

(21) a. [$_{C}$ · PRO to read OP] ← Applications of Merge
b. [$_{CP}$ OP$_i$ [PRO to read t$_i$]] ← Move OP
c. [$_{AP}$ tough [$_{CP}$ OP$_i$ [PRO to read t$_i$]]] ←CP + $_{Merge}$ *tough*
d. [$_{T}$ · is [$_{AP}$ tough [$_{CP}$ OP$_i$ [PRO to read t$_i$]]]] ←AP+ $_{Merge}$ *is*
e. [$_{TP}$ This book is [$_{AP}$ tough [$_{CP}$ OP$_i$ [PRO to read t$_i$]]]] ← T ' + $_{Merge}$ *this book*

Unlike Chomsky (1981) and Hornstein, Nunes, and Grohmann (2005) Hicks (2009) argued that *tough*-movement can be explained by the smuggling approach under which the matrix subject is smuggled by the null operator from

the embedded object position to the Spec of the intermediate CP and then raises to the Spec of the matrix TP. However, these accounts of *tough*-movement constructions provide no answer to the question of why *tough*-movement of the semantic object in the embedded clause is not allowed in the *essential*-construction.

3.2. Complement structures of *tough*-type and *essential*-type adjectives

Although *tough*-constructions can be explained in terms of Chomsky's (2000, 2001, 2004, 2008) Minimalist approach or Hicks' smuggling approach, it remains unexplained why the argument equivalent to the semantic object of the embedded clause in *essential*-constructions is not allowed to appear in the subject position of the matrix clause as in (22b).

(22) a. It is essential to read this book.
b.*This book is essential to read.

In order to account for this, we propose that *essential*-type adjectives select a CP headed by C with no operator-feature for their complement, whereas *tough*-type adjectives select a CP headed by C with an operator-feature, as shown in (23) and (24) (cf. Kang 2011b).

(23) This book is tough [$_{CP}$ C$_{[+OP]}$ [$_{TP}$ to read]]

(24) *This book is essential [$_{CP}$ C [$_{TP}$ to read]]

This proposal makes it possible to explain the difference in grammaticality between (23) and (24). Consider (25), which is a more detailed representation of (23), where the adjective *tough* selects a CP headed by a null C with an operator-feature.

(25) This book$_i$ T be tough [$_{CP}$ C$_{[+OP]}$ [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read OP$_{i]}$]]]]

Since the null operator with an uninterpretable [+OP] feature can move to the Spec position of the embedded CP, the adjective *tough* and the CP can form a complex predicate. In this way, the subject of the *tough*-construction can be assigned a θ-role by the complex predicate.

We can explain when the complex predicate can be formed and when it cannot in terms of Chomsky's (2000, 2001, 2004, 2008) theory of phases if we assume that a complex predicate can be formed when the matrix probe T and the embedded goal null operator are at a distance close enough to undergo Agree.

(26) This book$_i$ T be tough [$_{CP}$ OP$_i$ [C$_{[+OP]}$ [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read t$_i$]]]]]
Phase 2 Phase 1

The null operator in the *tough*-construction (25) is in the domain of phase 1 at the beginning of the derivation, but due to the operator-feature of the C it moves to the Spec of the embedded CP, which is the edge position of phase 2, as shown in (26). The matrix T can probe into the edge position of phase 2. Thus, Agree can occur between the matrix T and the null operator without being hindered by the PIC. Consequently, the matrix predicate and the null operator can form a complex predicate. This explains how the argument equivalent to the semantic object of the embedded clause appears in the subject position of the matrix clause in the *tough*-construction.

Next, let us consider the *essential*-construction. We can see the *essential*-construction is different from the *tough*-construction since the possibility of the embedded semantic object appearing in the matrix subject position differs in each as shown in (27a) and (27b).

(27) a. This book is tough to read.
b.*This book is essential to read.

The two sentences are both grammatical when the semantic objects stay in their original positions. Yet they display quite a contrast in grammaticality when their semantic objects appear in the matrix subject positions. These inconsistencies can be explained by showing how the complement structures of the two sentences differ. As mentioned briefly earlier, *essential*-type adjectives select a CP headed by C with no operator-feature as shown in (28).

(28) This book$_i$ T be essential [$_{CP}$ C [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read OP$_i$]]]]

Therefore, in *essential*-constructions the null operator cannot move to the Spec of the embedded CP.

This phenomenon can be explained in terms of the phase theory.

(29) This book$_i$ T be essential [$_{CP}$ C [$_{TP}$ PRO to [$_{vP}$ [$_{VP}$ read OP$_i$]]]]
Phase 2 Phase1

In (29) the probe T in the matrix clause is not close enough to undergo Agree with the null operator, which is the goal in phase 1 in the embedded clause. According to the PIC, the probe T can only agree with the element at the edge of phase 2, which is the embedded CP. Therefore, the matrix predicate *essential* cannot form a complex predicate with the embedded clause. As a result, the matrix subject of the *essential*-construction cannot be assigned a θ-role, violating the θ-criterion.

Due to the fact that C in the *essential*-construction lacks an operator-feature, neither forming a complex predicate nor smuggling the embedded object is possible. This is why *essential*-constructions like (27b) are ungrammatical. The derivation crashes even if the null operator of the *essential*-construction moves to the Spec of the embedded CP, as it does in the *tough*-construction. This is because the uninterpretable [+OP] feature of the null operator cannot be checked off due to the absence of an operator-feature in C.

3.3. Evidence

The postulation concerning these selectional properties of adjectives is supported by the fact that *tough*-type adjectives can select a non-finite CP but not a finite CP headed by the complementizer *that*, whereas *essential*-type adjectives can select either a finite or non-finite CP for their complement.

(30) a. It is tough for him to read this book.
b. *It is tough that he reads this book.

(31) a. What is tough is for him to read this book.
b. *What is tough is that he reads this book.

(32) a. It is essential for him to read this book.
b. It is essential that he should read this book.

(33) a. What is essential is for him to read this book.
b. What is essential is that he should read this book. (Lee 2011: 526)

The evidence provided in this paper strengthens the validity of the proposal that different selectional properties of adjectives account for the differences between *likely*-constructions and *probable*-constructions as well as *tough*-constructions and *essential*-constructions. The significance of this proposal is that it is applicable to other cases where *wh*-movement or null operator movement is not allowed. For example, our proposal extends to the selectional properties of manner-of-speaking verbs such as *quip*. Consequently, our argument explains why sentences like (34) are ungrammatical.

(34) *Who do you quip that Mary saw in New York?

4. Conclusion

The difference in the structures of the complements of adjectival predicates is due to their distinct selectional properties. This argument is supported by

empirical evidence, which strengthens the validity of the proposal that different selectional properties exist for different adjectives. Overall, this paper sheds new light on the nature of the clausal complements of adjectival and verbal predicates.

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Korean Multiple *Wh*-Phrases and Intervention Effects

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1. Introduction

This paper focuses on a linguistic phenomenon called intervention effects. Below are well-known Korean examples of typical intervention effects.

(1) a. *amuto mues-ul sa-ci an-ass-ni?
anyone what-ACC buy-ci not-PST-Q[1]
"What did no one buy?"
b. mues-ul$_i$ amuto t_i sa -ci an-ass-ni?
what-ACC anyone buy-ci not-PST-Q
"What did no one buy?" (Beck and Kim 1997: 339)

Korean is a SOV language with relatively free word order due to scrambling. It is also a *wh*-in-situ language, which means that *wh*-phrases in interrogative sentences do not undergo overt movement with the exception of scrambling. With these properties in mind, we can assume that the ungrammaticality of (1a) is caused by the syntactic structure of the first two lexical items, namely, the negative polarity item (NPI) *amuto* and the *wh*-phrase *mues-ul,* as the sentence becomes grammatical when the *wh*-phrase scrambles over to the NPI, as shown in (1b). The term *Intervention Effects* originates from an early account of this phenomenon (Beck 1996, Beck and Kim 1997, Hagstrom 1998, Pesetsky 2000). According to previous research, the problem with sentences like (1a) comes from the fact that there is an *intervener* placed between a *wh*-phrase and the interrogative complementizer C. This *intervener*, then, blocks the LF movement of the *wh*-phrase to the [Spec, CP] position where the *wh*-phrase is assumed to take scope. In the case of (1a), the NPI *amuto* acts as an intervener that blocks the covert movement of the *wh*-phrase *mues-ul* to the [Spec, CP]. On the other hand, in (1b), and as a result of scrambling of the *wh*-phrase, the NPI is no longer in the way regarding the covert movement of the *wh*-phrase, and therefore, the sentence is grammatical.

Nevertheless, recent research has suggested that it may be the semantic property of the interveners in general and that of the *wh*-phrases that are at issue in the relevant structure, and not necessarily the syntactic movement (Beck 2006, Cable 2010).

In this paper, a set of new data will be presented, which concerns multiple *wh*-questions in Korean. The set of sentences that will be at the center of the investigation is as follows:

(2) a. *Minsu-man nuku-eykey mues-ul cu-ess-ni?
Minsu-only who -DAT what-ACC give-PST-Q
b. ?mues-ul$_i$ Minsu-man nuku-eykey t_i cu-ess-ni?
what-ACC Minsu-only who -DAT give-PST-Q
c. mues-ul$_j$ nuku-eykey$_i$ Minsu-man t_i t_j cu-ess-ni?
what -ACC who -DAT Minsu-only give-PST-Q
"What did only Minsu give to whom?"

The sentence in (2a) is expected to be ungrammatical as the LF movement of *wh*-phrases is blocked by the intervener *man* "only". Nevertheless, the sentence becomes grammatical if the *wh*-phrases scramble over the intervener, as in (2c). However, sentences that involve a syntactic structure like (2b) are predicted to be subject to intervention effects under both of the syntactic and semantic accounts of intervention effects as there is a *wh*-phrase—*nuku* "who"—that follows the intervener *man* "only". However, Korean speakers accept (2b) and report that it is better than (2a), although not as good as (2c).

This paper will focus mainly on the structure (2b) and investigate a possible way to account for the improved grammaticality of the structure. I claim that the grammaticality of (2b) provides evidence for covert *wh*-clustering (Grewendorf 2001) of multiple *wh*-phrases in Korean.

The outline of the paper is as follows. In Section 2, the semantic account on intervention effects is reviewed. In Section 3, I propose an analysis to account for the grammaticality of the structure in (2b). Section 4 is the conclusion of the paper.

2. Intervention Effects

2.1. Intervention effects as focus effects

In their semantic approach to intervention effects, Beck (2006) argues that the structures exhibiting intervention effects are uninterpretable due to the fact that the semantics of the structure fail to converge successfully.

Beck (2006), following Kim (2002, 2005), starts with the generalization illustrated below:

(3) *[Q_i [… [FocP [… *wh*-phrase$_i$ …]]]]
A focused phrase (e.g., "only" + NP) may not intervene between a *wh*-phrase and its licensing complementizer.

Both Beck and Kim postulate that the true nature of interveners is that they are focus-sensitive items which introduce non-singleton sets of alternatives (in the sense of Rooth's (1985, 1992) alternative semantics for focus). Beck notices that the semantics of *wh*-phrases are parallel to that of focus, as *wh*-phrases are also analyzed as introducing a set of alternatives in previous research (Hamblin 1973). This parallelism led her to assume that *wh*-questions and focus items share the same interpretative mechanism, which is what causes intervention effects.

By adopting Rooth's (1992) semantics of focus, Beck (2006) assumes that a focused phrase possesses two semantic values, namely, an ordinary semantic value and a focus semantic value. An ordinary semantic value refers to a proposition expressed by a sentence, while a focused semantic value refers to a set of alternative propositions to the ordinary proposition. As to the *wh*-questions, adopting Hamblin (1973) and Karttunen (1977), Beck assumes that *wh*-questions denote the set of answers to the questions and, therefore, they introduce a set of alternatives just as focus phrases do. However, as opposed to the focus phrases that have two semantic values (ordinary and focus), the focus semantic value is the only semantic value that the *wh*-questions have. The ordinary semantic value of *wh*-questions, Beck (2006) argues, is undefined. Following these assumptions, Beck posits that intervention effects arise in structures like the following:

(4) *[$_{CP}$Q … [*Op* [$_{YP}$ … XP_F … *wh* …]]]
Where Q is a question operator and *Op* is a focus operator.

According to Beck (2006), Q, the question operator, is the one responsible for saving a constituent containing a *wh*-phrase. That is because a constituent with a *wh*-phrase, such as YP in (4), does not have an ordinary semantic value until it meets Q in its derivation. Q elevates the focus semantic value of the *wh*-phrase to the ordinary semantic value, hence helping the constituent to have well-formed ordinary as well as focus semantic values. What makes a structure like (4) ungrammatical (or uninterpretable) is that there is another operator (*Op*) that makes use of both the focus semantic value and the ordinary semantic value when evaluating the focus phrase. That is, as the semantic system works its way up, it encounters the focus operator *Op*, at which stage the operator utilizes both of the ordinary and focus semantic values of the phrase YP and, more importantly, resets all foci to their ordinary semantic values. Note that Beck already established that the ordinary semantic value of the *wh*-phrase is undefined. This means that the ordinary as well as the focus semantic values of

the YP are left undefined. Therefore, by the time the system gets to the question operator Q, it fails to interpret the sentence because neither the focus semantics nor the ordinary semantics of the sentence are properly defined.

Let us look more closely at how the semantics of the structures like (4) would fail to converge under Beck's framework. The Korean example in (5) illustrates intervention effects.

(5) a. *Minsu-man nuku-lul po -ass -ni?
Minsu-only who-ACC see-PST-Q
"Who did only Minsu see?"
b. [$_{CP}$ Q_2 [$_{IP2}$ ~ C [$_{IP1}$ $Minsu_{F1}$-man_C $nuku_2$-lul po-ass-ni]]]]
Minsu -only who saw

The example in (5b), the LF of (5a), represents that $Minsu_{F1}$ is associated with the ~ operator while the *wh*-phrase *nuku* is associated with the Q operator. In addition, the Q operator takes scope over the ~ operator. First of all, the ordinary semantic value of [IP1] is undefined since that of the *wh*-phrase *nuku* is undefined. This leads to the undefined ordinary semantics of [IP2]. Then, the system meets the ~ operator, which evaluates the focus semantic value of [IP1] and resets all the foci to their ordinary semantics. However, this results in the undefined focus semantic value of [IP2] because, as mentioned before, the ordinary semantics of [IP1] are undefined. Lastly, it follows that the ordinary semantics of [CP] are also left undefined since the Q operator needs the focus semantic value of its sister constituent, IP2, to evaluate its ordinary semantics. As it fails to have a well-defined ordinary semantics, (5b) becomes uninterpretable.

On the other hand, in (6), the *wh*-phrase is scrambled over to the subject saving the sentence from intervention effects. The example in (6b) is the LF of (6a), and we will go through how the semantic values of (6b) can be successfully defined as opposed to the ones in (6b).

(6) a. nuku-lul$_i$ Minsu-man t_i po -ass -ni?
who-ACC Minsu-only see-PST-Q
"Who did only Minsu see?"
b. [$_{CP}$ Q_2 [$_{IP3}$ $nuku_3$-lul$_i$ [$_{IP2}$ ~C [$_{IP1}$ $Minsu_{F1}$-man_C t_i po-ass-ni]]]]]
who Minsu-only saw

First, the ordinary semantics of [IP1] can be defined since there is no *wh*-phrase. Then, the ~ operator interprets the focus semantic value of [IP1]. In terms of [IP3], the ordinary semantic is not yet defined until it meets the Q operator but, as mentioned before, the Q operator ignores the undefined ordinary semantics of [IP3] while evaluating the focus semantics of the phrase. In addition, the Q operator elevates the focus semantics to the ordinary semantics

of [IP3]. This leads to well-defined ordinary and focus semantics of [CP], and thus, (6a) is grammatical.[2]

In short, Beck's (2006) framework predicts that whenever *wh*-phrases are c-commanded by an operator other than the question operator Q, the sentence should be uninterpretable. In other words, a *wh*-phrase is required to have the Q operator as its first c-commanding operator. Otherwise, the phrase that contains the *wh*-phrase would have an undefined ordinary semantic value. The uninterpretability would be transferred to the higher constituents and consequently leads to the uninterpretable and thus, ungrammatical sentence. As a result, Beck (2006) excludes a structure below based on this reasoning (from Beck 2006 [54]).

(7) *[Q_i [...[~C [...*wh*-phrase$_i$ ...]]]]
A *wh*-phrase may not have a ~ operator as its closest c-commanding potential binder.

Let us go back to the Korean data shown in the introduction, which is repeated below:

(8) a. *Minsu-man nuku-eykey mues-ul cu-ess-ni?
Minsu-only who -DAT what-ACC give-PST-Q
b. ?mues-ul$_i$ Minsu-man nuku-eykey t_i cu-ess-ni?
what-ACC Minsu-only who -DAT give-PST-Q
c. mues-ul$_j$ nuku-eykey$_i$ Minsu-man t_i t_j cu-ess-ni?
what -ACC who -DAT Minsu-only give-PST-Q
"What did only Minsu give to whom?"

The pattern shown in (8a) and (8c) is explained under Beck's analysis. However, the grammaticality of (8b) is unexpected. In the case of (8b), the sentence should be straightforwardly ungrammatical if we assume Beck's analysis. Importantly, the *wh*-phrase *nuku* does not have a Q operator as its first c-commanding operator. In other words, there is an intervening expression between the *wh*-phrase and the Q operator, *Minsu-man*.

In Section 3, I propose that Korean multiple *wh*-phrases undergo covert *wh*-clustering, which explains the grammaticality of the structure in (8b).

3. Korean Multiple *Wh*-questions and Intervention Effects

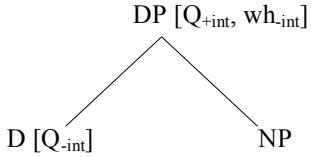
3.1 *Wh*-clustering in multiple *wh*-questions

In multiple *wh*-fronting languages like Bulgarian, all of the *wh*-phrases in a multiple wh-question move to the front of the sentence. Grewendorf (2001)

proposed that in multiple *wh*-fronting languages the *wh*-phrases form a cluster before moving to the Spec CP position. He also argued that multiple *wh*-questions in Japanese undergo the same procedure but only in a covert manner.

Grewendorf (2001), following Cheng (1991, 1997), assumes that *wh*-words in languages like Bulgarian and Japanese have a structure like the one illustrated below (Grewendorf 2001: 8):

(9)



Support for a structure like (9), where a *wh*-word is essentially like an NP, comes initially from Cheng (1997)'s observation that the *wh*-words in *wh*-fronting languages and Japanese are also found in indefinite NPs with some affixes. Based on this observation, she concluded that the *wh*-words in these languages lack inherent quantificational force, unlike languages like English, where *wh*-phrases are assumed to be quantificational. This is also true in Korean, as shown in (10).

(10) a. Bulgarian

kój	"who"	njákoj	"someone"
kudé	"where"	njákude	"somewhere"
kogá	"when"	njákoga	"sometime"

b. Japanese

dare	"who"	dare	"someone"
nani	"what"	nani	"something"
doko	"where"	doko	"somewhere"

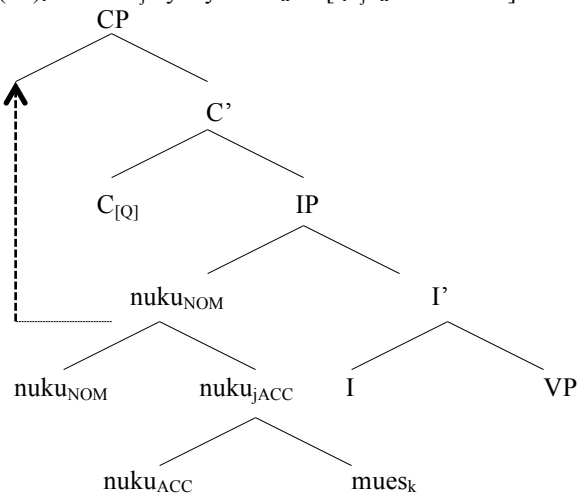
c. Korean

nuku	"who"	nuku-(i)nka	"someone"
mues	"what"	mues-(i)nka	"something"
enchey	"when"	enchey-(i)nka	"sometime"

As shown in (9), Grewendorf (2001) claimed that *wh*-phrases in languages like Bulgarian and Japanese are endowed with an uninterpretable Q feature as a "parametric property" of a language. Consequently, not only are the *wh*-elements attracted to the interrogative C, but they also can act as a *probe* and thus attract a *wh*-element themselves. He claims that these *wh*-elements form a cluster by adjunction. Below is an example of a Korean multiple *wh*-question

that illustrated how the derivation of the covert *wh*-cluster formation would work.

(11) a. Nu(ku)-ka nuku-eykey mues-ul mul-ess-ni?
who-TOP whom-DAT what-$_{ACC}$ ask -PST-Q
"Who asked whom what?"
LF: Nu(ku)$_i$-ka nuku$_j$-eykey mues$_k$-ul [t_i t_j t_k mul-ess-ni]?
b.



Let us take a look at how the *wh*-clustering in (11b) is derived. First of all, the uninterpretable [Q] feature in the D-head of *nuku$_{ACC}$* attracts the direct object *mues*, which adjoins to its attractor and forms a *wh*-cluster. As a result of this step, the uinterpretable [Q] feature on the head *nuku$_{ACC}$* and the uninterpretable [wh] feature on the DP *mues* will be deleted.[3] Next, the *wh*-cluster formed in step 1 is attracted to the *wh*-subject *nuku* by the uninterpretable [Q] feature on the D-head of the *wh*-subject. This uninterpretable [Q] feature matches the interpretable [Q] feature on the DP that dominates *nuku$_{ACC}$* and now also *mues*. This leads to the deletion of the uninterpretable [Q] on *nuku$_{NOM}$* and of the uninterpretable [wh] feature on the DP. The last step is the movement of the *wh*-cluster to the [Spec, CP], triggered by the uninterpretable [Q] feature on C, which matches the interpretable [Q] on the subject *wh*-phrase. This results in the deletion of the uninterpretable [Q] on C and of the uninterpretable [wh] feature on the wh-subject *nuku$_{NOM}$*.

Now let us come back to the set of Korean sentences that shows various levels of grammaticality and intervention effects. The relevant sentences, in (8) earlier, are repeated below for convenience:

(12) a. *Minsu-man nuku-eykey mues-ul cu -ess -ni?
Minsu-only who -DAT what-ACC give-PAST-Q
b. ?mues-ul$_i$ Minsu-man nuku-eykey t_i cu -ess -ni?
what-ACC Minsu-only who-DAT give-PAST-Q
c. mues-ul$_j$ nuku-eykey$_i$ Minsu-man t_i t_j cu -ess -ni?
what -ACC who -DAT Minsu-only give-PAST-Q
"What did only Minsu give to whom?"

If we assume that the *wh*-clustering hypothesis applies to Korean, the well-formedness of (12b) can be explained. In (12b), the lower *wh*-phrase moves covertly and adjoins to the higher *wh*-phrase to form a *wh*-cluster. As a result of this, the LF of (12b-c) will no longer be in violation of Beck's generalization in (7), repeated here as (13):

(13) *[Q_i [...[~C [...*wh*-phrase$_i$ ...]]]]
A *wh*-phrase may not have a ~ operator as its closest c-commanding potential binder.

After the covert *wh*-clustering is applied, as in (12b), none of the *wh*-phrases are c-commanded by a ~ operator. It follows that the ordinary and focus semantic values of (12b) will be well-defined, and the semantic derivations will successfully converge. The ungrammaticality of (12a) persists despite the *wh*-cluster formed between the two *wh*-phrases as they are still c-commanded by the ~ operator that evaluates the focus-sensitive phrase, *Minsu-man*. However, recall that in Grewendorf's (2001) analysis, the *wh*-cluster formed moves to the [Spec, CP] covertly at the final stage. This will essentially make all three sentences in (12) end up with the same LF structure and leave the contrast in grammaticality unexplained. Fortunately, we can prevent this from happening by adopting a proposal like the one developed in Hagstrom (1998) and, more recently, in Cable (2010),[4] that it is not the *wh*-element itself that undergoes LF movement to the [Spec, CP] in *wh*-interrogatives, but the Q operator.[5] In other words, if we follow this *Q-Grammar*, the *wh*-cluster formed in (12) stays in-situ while Q moves to the [Spec, CP] in order to get an interrogative interpretation. As a result, the predictions about the grammaticality of (12) are borne out.

Interestingly, the same structure as (12b) in German is subject to intervention effects as shown below.

(14) a. * Wen hat niemand wo gesehen?
whom has nobody where seen
"Where did nobody see whom?"
b. Wen hat Luise wo gesehen?
whom has Luise where seen
"Where did Luise see whom?"

German *wh*-interrogatives behave like English *wh*-interrogatives in that only one *wh*-phrase moves to the [Spec, CP], and others, if there were any, stay in-situ. Grewendorf (2001) proposes a rather complicated analysis for the German *wh*-cluster formation, in which he claims that German *wh*-clusters consist of one visible *wh*-word and one, or several, invisible *wh*-words. Notice that if it were the case of (14a), at LF, both the *wh*-word *wen* and *wo* would be in the position where they could be evaluated by the Q operator, and, therefore, the sentence would have a well-defined semantic interpretation. In other words, if it were the case the *wh*-cluster hypothesis is in action in German, the uninterpretability of (18a) would only be explained if the lower *wh*-word would be interpreted in its original position, below the intervener. But why would it move on the first place if it would have to be back in its position for the interpretation? For this reason, I move away from Grewendorf's (2001) proposal for German by assuming that German is not a *wh*-cluster language, and that all *wh*-phrases in German are interpreted in their overt position, as proposed in Beck (2006). After all, what differentiates Korean from German is that Korean multiple *wh*-interrogatives involve *wh*-clustering. This allows Korean to have a structure like (16b) since, if there is at least one *wh*-phrase higher than an intervener, any lower *wh*-phrases can move away from the illegal position by adjoining to the higher *wh*-phrase, thereby saving the structure from having an undefined interpretation.

4. Conclusion

In this paper, Korean multiple *wh*-phrases that show intervention effects were investigated. A particular structure where there are two *wh*-phrases and an intervener sitting in-between was called into question due to its unexpected grammaticality. Beck's (2006) semantic approach to intervention effects predicts that a sentence in that construction should be ungrammatical, as the sentence cannot have properly defined semantics.

To account for the grammaticality of the structure in question, I adopted the *wh*-cluster hypothesis proposed by Grewendorf (2001), in which he argued that the Japanese multiple *wh*-questions involve *wh*-cluster formation as multiple-fronting languages like Bulgarian, but in a covert way. Following Grewendorf's (2001) proposal along with the Q-grammar proposed in Hagstrom (1998) and Cable (2001), I claimed that Korean multiple *wh*-interrogatives also involve

covert *wh*-cluster formation. These assumptions led to the correct predictions for the Korean intervention data that we were interested in, successfully explaining the grammaticality of sentences that involve an intervener between two *wh*-phrases. Nevertheless, one questions still remains; (12b) is not judged to be as grammatical as (12c). The *wh*-clustering hypothesis may explain why a Korean speaker can interpret a sentence like (12b), but it does not answer the question about gradient grammaticality found in the set of data. Further research may be needed to investigate the nature of this gradient grammaticality.

Notes

[1] The following abbreviations are used: ACC=accusative, PST=past, Q=interrogative marker, DAT=dative, TOP=topic.
[2] Beck (1996) assumes that *wh*-phrases are interpreted in their moved position. Also, for more complete and detailed semantic derivations of the relevant sentences, please see Beck (2006).
[3] The uninterpretable [Q] feature on the DP *mues* also gets deleted at this stage as the uninterpretable [Q] feature on the "probe" and that on the "goal" get deleted at the same time. If there was only one *wh*-word, the uninterpretable [Q] feature on this *wh*-word would get deleted when it associates with C as well as the uninterpretable [Q] feature on C. Grewendorf also mentions this in his paper (Grewendorf 2001: 98).
[4] Cable (2010) also suggests the possibility that Q could be base-generated at the matrix-final position, instead of being merged lower in the tree and moving upwards.
[5] Note that this is also in line with Beck's (2006) proposal since she argues that in-situ *wh*-phrases are interpreted in their in-situ position. In her analysis, Q is base-generated in C.

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Why are Korean Speakers So Particular about Biscuit Conditionals?*

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1. Introduction

Conditionals like (1a) are often distinguished from ordinary conditionals like (1b) (e.g., Bhatt and Pancheva 2006, Siegel 2006, Scheffler 2008a, 2008b, and many others). In such conditionals, the antecedent clauses do not seem to specify the conditions in which the proposition described by the consequent clause is true. Rather, they express possible worlds or situations in which the utterance of the consequent clause is relevant. In (1a), for example, the existence of pizza is not determined by whether the addressee is hungry or not. Rather, it expresses that the utterance of *there's pizza in the fridge* is relevant in the situation in which the addressee is hungry.

(1) a. If you're hungry, there's pizza in the fridge. (Siegel 2006:168)
b. If it rains tomorrow, the match will be canceled.

This type of conditional has been called many different names: Biscuit Conditionals, following Austin's (1961) famous example (DeRose and Grandy 1999, Siegel 2006, etc.), Relevance Conditionals (Iatridou 1991, Bhatt and Pancheva 2006, Scheffler 2008a, 2008b, Kaufmann and Schwager 2011, etc.), Speech-act Conditionals (Sweetser 1990, etc.), and others. In this paper, I will use Biscuit Conditionals (BC).

BCs are also found in Korean. Like the case with English BCs, an antecedent in Korean BCs provides a situation in which the utterance of the consequent is relevant. Examples are illustrated in (2).

(2) a. (?)paykophu-myen, thakca-wi-ey ppang(-i) iss-e.
hungry-if table-above-at bread-NOM exist-END
"If you are hungry, there's bread on the table."

b. cohun sosik hana allyucwu-ca-myen, nayil pi an on-tay!
good news one inform-EXH-if tomorrow rain not come-EVID
"If I may tell you good news, it will not rain tomorrow."

In (2a), the existence of bread is not determined by whether the addressee is hungry. Instead, the antecedent provides the situation where the utterance of the consequent *there's bread on the table* is relevant. Similarly, in (2b), tomorrow's weather is not determined by whether the speaker gives good news or not.

The use of BCs in Korean, however, is more limited than that of English. While some BCs like (2b) are widely accepted as felicitous, BCs like (2a) or (3a) are degraded under the intended interpretation. The acceptability of (3b) varies from speaker to speaker, and BCs like (3c) are uniformly judged unacceptable. As seen in English translations, the corresponding English sentences are all grammatical.

(3) a. (?)nacwungey pi o-myen, wusan mwun yep-ey iss-e.
later rain come-if umbrella door beside-at exist-END
"If it rains later, the umbrella is beside the door."
b. %cwumal-ey an pappu-myen, caymissnun yenghwa sanyenghay.
weekend-at not busy-if, interesting movie on.show
"If you are not busy this weekend, there's an interesting movie on."
c. #alko siph-umyen, hankukcencayng-un 1950-nyen-ey ilenass-e.
know want-if, the.Korean.war-TOP 1950-year-in break.out-END
"If you want to know, the Korean war began in 1950."

This paper attempts to investigate the semantic and pragmatic properties of Korean BCs and develop an analysis that explains the peculiar judgment discrepancy of Korean BCs.

2. Two Types of BCs

It has been widely pointed out that Japanese BCs are classified into two types: Type 1 and Type 2 (Nakau 1994, Uchida 2001, Shizawa 2011, and many others). According to Shizawa (2011), in Type 1 BCs like (4a), speech-act verbs such as *iu* "say" or *osieru* "inform" do not have to occur, whereas speech-act verbs obligatorily occur in Type 2 BCs like (4b).

(4) a. nanika tabe-tai nara, reezooko-ni tabemono-ga aru-wa-yo.
something eat-want if fridge-at food-NOM exist-PAST-*yo*
"If you want to eat something, there is food in the fridge."
(Shizawa 2011: 20)

b. hontoo-no koto-o **ie**-ba, boku-wa nattoo-ga kirai-da.
truth-gen thing-ACC **say**-if I-TOP natto-NOM dislike-COP
"Honestly speaking, I don't like natto."

Such a distinction is also found in Korean. In BCs like (5a), the antecedent clause does not require a speech-act verb such as *malha-* "say" or *yaksokha-* "promise". In contrast, in BCs like (5b), the antecedent clause must include a speech-act verb followed by the exhortative mood marker *-ca*.

(5) a. (?)nacwungey paykophu-myen, nayngcangko-ey phica iss-e.
later hungry-if fridge-at pizza exist-END
"If you are hungry later, there's pizza in the fridge."
b. hana **yaksokha**-ca-myen, celtay ne-l sokici an-ul ke-ya.
one **promise**-EXH-if never you-ACC deceive not-AD NML-END
"If I may make a promise, I will never deceive you."

As we have seen in (3) and (5a), the acceptability judgment of Type 1 BCs varies and seems unpredictable, whereas Type 2 BCs are uniformly judged acceptable.

3. Judgment Discrepancies in Type 1 BCs

3.1. Relevance relation

Intuitively, the acceptability of Type 1 BCs depends on whether the utterance of the consequent is relevant with respect to the antecedent. Then, the question arises: What does it mean to be relevant? The concept of 'relevance' is found in Grice's (1975) Maxims. According to Grice (1975), the dialogue in (6) satisfies the Maxim of Relation—that is, *be relevant* (from Davis 2009: 344 (16)).[1]

(6) (A is standing by an obviously immobilized car and is approached by B)
A: I am out of petrol.
B: There is a garage around the corner.

Although the connection is not direct, B's utterance is relevant in the sense that B helps A to find the solution of her problem (i.e., a lack of fuel). Davis (2009) claims that A's problem in (6) can be understood as van Rooy's (2003) contextually salient decision problem. In van Rooy's (2003) analysis, a context C has a set of possible actions, $A(C) = \{\alpha_1, \alpha_2, \ldots \alpha_n\}$, and the agent in that context should select the best action out of those possible actions based on the desirability or utilities of the actions. Van Rooy (2003) claims that the agent's dilemma of which action to choose is her *decision problem* (van Rooy 2003:

733). Davis (2009) further claims that this can be understood as an expanded concept of Roberts' (1996) Question Under Discussion (QUD) which is driven by the solution-seeking question, 'What should we do?'—that is, a question as to which one is the optimal action for the agent to perform (Davis 2009: 347).

Given the meaning of the relevance relation, the antecedent in a Type 1 BC is now understood to provide the context in which the addressee has some sort of decision problem, which is formulated as a partially ordered set of contextually salient possible actions, and the utterance of the consequent is now seen as an 'indirect' relevant response to the addressee's decision problem. For example, the addressee's decision problem in (7a) can be illustrated as in (7b).[2] The context C has a set of contextually salient actions that the addressee can perform, and the addressee should select the best action out of those possible actions. The utterance of the consequent is relevant in the sense that it gives a hint to the solution of the problem. In other words, it helps the addressee to select the best action.

(7) a. If you are hungry, there's pizza in the fridge.
b. $A(C) = \{PZ_{STARVE(ad)}, PZ_{OUT(ad)}, NPZ_{STARVE(ad)}\} <_c \{PZ_{EAT(ad)}, NPZ_{OUT(ad)}\}$

In (7b), 'eating pizza in the worlds with pizza (PZ)' and 'going to a restaurant in the worlds without pizza (NPZ)' are ranked higher than starving based on desirability and practicality. The addressee needs to choose between 'eating pizza' and 'going to a restaurant.' In this context, the consequent clause leads the addressee to eat pizza in the fridge rather than to starve or to go out for food.

3.2. The judgment discrepancy is explained

The acceptability of Type 1 BCs correlates with the relevance relation between the consequent clause and the addressee's decision problem. In this section, I will show that whether or not a Type 1 BC is acceptable is determined by how easy it is to infer what kind of solution the addressee follows (i.e., how much effort is needed to make the connection between the addressee's decision problem and the content of the consequent). This will explain the judgment discrepancies in Type 1 BCs. Since the ease of making the connection greatly depends on the context, the acceptability judgment of Type 1 BCs is gradable.

If the proposition of the consequent can easily be connected to the optimal action, Type 1 BC sentences are judged to be natural.[3] In (8a), for example, it seems very easy for the addressee to figure out that the speaker is suggesting the action of eating pizza as an optimal solution.

(8) a. (?)nacwungey paykopeu-myen, naygcangko-ey phica iss-e.
later hungry-if fridge-at pizza exist-END
"If you are hungry later, there's pizza in the fridge."
(The optimal action: eating pizza in the fridge)
b. (?)nwuka na chac-umyen, na-nun 3.chung-ey iss-e.
somebody me look.for-if, I-TOP 3.floor-at exist-END
"If somebody is looking for me, I'm on the 3rd floor."
(The optimal action: informing the questioner that the speaker is on the 3rd floor)

If it is unclear what is actually being suggested, the sentence is judged to be infelicitous, as in (9). To get the waitress's attention, Koreans do not call the waitress/waiter's name. Therefore, giving her name to the customer as in (9) does not lead to any action.[4]

(9) (In the restaurant, the waitress is talking to her customer.)
??nacwungey mwe philyoha-n key iss-usi-myen, cey ilum-un
later something need-AD NML exist-HON-if my name-TOP
yuri-ipni-ta.
Yuri-COP-DEC
"If you need something later, my name is Yuri."

According to the relevance relation in 3.1, the solution of the decision problem is seen as the selection of the optimal action out of the contextually salient possible actions. For this reason, the solution suggested in the consequent clause must involve an action. If the consequent does not include any action, as in (10a), the sentence is judged infelicitous. In (10a), it is hard for the addressee to infer what she should do. Compared to (10a), the consequent of (10b) clearly involves an action, and so the addressee can easily figure out that she will have to inform someone when the Korean War began.

(10) a. #alko siph-umyen, hankukcencayng-un 1950-nyen-ey ilenass-e.
know want-if, the.Korean.war-TOP 1950-year-in break.out-END
"If you want to know, the Korean War began in 1950."
(The optimal action: ??)
b. (?)nacwungey nwuka mul-umyen, hankukcencayng-un
later someone ask-if, the.Korean.war-TOP
1950-nyen-ey ilenass-e.
1950-year-in break.out-END.
"If someone asks (when the Korean War began) later, the Korean War began in 1950."
(The optimal action: informing the questioner that the Korean War began in 1950.)

The addressee's optimal action can be guided by not only the verbal remark but also nonverbal information. Example (11) shows that Type 1 BCs are perfectly acceptable in the context in which the addressee needs something urgently or immediately.

(11) (The addressee is shivering from the cold.)
kulehkey chwu-wumyen, oscang.an-ey tamyo iss-e.
like.that cold-if closet.inside-at blanket exist-END
"If you are cold, there's a blanket in the closet."

If the addressee is in urgent need of something, it is relatively easy for the addressee to think that the consequent gives information that helps her to resolve her problem. In other words, not much effort needs to be made to recognize the connection between her decision problem and the suggested solution. For a similar reason, a Type 1 BC with a demonstrative such as *yeki* "here" or *ceki* "there" is judged to be felicitous, as in (12). A Type 1 BC with a demonstrative involves an action that gives a clear message about the solution. For example, (12a) involves the action of handing over a blanket that leads the addressee to cover herself with the blanket.

(12) a. chwu-umyen, tamyo **yeki** iss-e.
cold-if, blanket **here** exist-END
"If you are cold, here's the blanket."
b. na-hanthe mwe mulepo-l key iss-umyen, nay cenhwapenho
me-to something ask-AD NML exist-if, my phone.number
ceki chacksang wui-ey iss-e.
there desk above-at exist-END
"If you want to ask me a question, there's my phone number on the desk."

3.3. Grammatical manipulations

We have seen that the acceptability of Type 1 BCs is closely related to how easy it is to figure out the best action. Thus the acceptability was greatly influenced by the contextual information. In Korean, however, there's also a grammatical way to manipulate relevance of the consequent. As in (13), the sentence-final rising tone makes the Type 1 BC sentences felicitous regardless of the context.

(13) nacwungey paykophu-myen, nayngcangko-ey phica iss-ta↗
later hungry-if fridge-at pizza exist-DEC
"If you are hungry later, there's pizza in the fridge."

I assume that this sentence-final rising tone contour corresponds to the LH%

intonation phrase-final boundary tone in Jun's (2000) K-ToBI system. According to Jun (2000), a LH% rising final boundary tone sharply rises within the final syllable of the intonation phrase (IP). This is different from H%, which begins to rise before the final syllable. Jun (2000) claims that a LH% rising tone is used primarily for questions, continuation rises, and explanatory endings.

I further claim that the sentence-final rising tone has a very similar meaning to that of Japanese sentence-final particle *yo* when it is used with a rising tone (i.e., *yo*↑). According to Davis (2009), using *yo*↑ marks its propositional content as relevant to the addressee. Although Korean does not have a particle like *yo*, the sentence-final rising tone indicates the relevance of the consequent to the addressee's decision problem.[5] For instance, (14) is naturally used in a context in which the addressee will need to know about whether the light is on (i.e., whether or not the light is on matters to the addressee). Using ↗ in (14) expresses that its propositional content is relevant to the addressee.

(14) (The last one out must turn off all the lights in the office. Anna talks to the colleague who is still working in the office.)

Anna:	ce	pwul	an	kku-ko	ka-pni-ta↗
	I	light	not	turn.off-and	go-HON-DEC

"I am leaving without turning off the lights."

The semantic representation of the sentence-final rising tone is shown in (15), adopted from Davis' (2009) semantics for *yo*↑ (Davis 2009: 337 (10a), 347 (23)).

(15) $\|\nearrow\| = \lambda F \lambda p \lambda c.\ \mathrm{F(p)(PB_{addr}(C) + } p \mathrm{):}\ \exists a \in \mathrm{A(C')}\ \forall \mathrm{w_i, w_j} \in \cap\ \mathrm{CG(C')}$
$[(a(\mathrm{addr})(w_i)\ \&\ w_i <_{C'} w_j) \rightarrow a(\mathrm{addr})(w_j)]$, where $\mathrm{C'} = \mathrm{CCP(C)}$

In (16), the addressee's decision problem is illustrated as a set of contextually salient possible actions based on desirability and practicality.

(16) $A(\mathrm{C}) = \{\mathrm{LO_{LEAVE(ad)}}\} <_c \{\mathrm{LO_{OFF(ad)}}, \mathrm{LF_{LEAVE(ad)}}\}$
(where $\mathrm{LO_{LEAVE(ad)}}$ = 'leave the lights on in the worlds in which the lights are on', $\mathrm{LO_{OFF(ad)}}$ = 'turn off the lights and leave in the worlds in which the lights are on', and $\mathrm{LF_{LEAVE(ad)}}$ = 'the lights are already off and leave without turning out the lights')

According to (15), ↗ indicates that performing the action *a* is better than not performing *a*. Thus, it helps the addressee to eliminate the worlds in which the lights are already off (i.e., LF worlds). In other words, (15) leads the addressee to perform the optimal action in the context—that is, turning off the lights before leaving (i.e., $\mathrm{LO_{OFF(ad)}}$).

Going back to the Type 1 BCs, the consequent serves as an indirect response to

the addressee's decision problem in the antecedent. The sentence-final rising tone indicates the relevance of the content of the consequent to the addressee's decision problem in the antecedent. Since the relevance connection in a Type 1 BC is indirect, Korean speakers prefer to use a grammatical marker (e.g., (13) vs. (8a)). If there is no grammatical marker, the addressee determines whether the consequent is relevant based solely on the context, and this results in context dependency and discrepancies between judgments.

3.4. Cross-linguistic comparisons

As noted in Davis (2009), English does not require the relevance relation to be expressed in syntax, as in (17c). In English, the relevance connection of the biscuit conditional is left as a matter of pragmatics. In Japanese, in contrast, the relevance relation must be realized by the sentence-final particle *yo* with a rising tone (i.e., *yo*↑), as in (17a). Similarly, the relevance relation is realized by the sentence-final rising tone in Korean (i.e., ↗), as in (17b). Otherwise the addressee determines the relevance connection based solely on the contextual information. This causes judgment discrepancy of Korean Type 1 BCs.

(17) a. nanika tabe-tai nara, reezooko-ni tabemono-ga aru-wa-*(yo↑).
something eat-want if fridge-at food-NOM exist-PAST-*yo*
b. mwe mek-ko siph-umyen, nayngcangko-ey mek-ul ke iss-ta ?(↗)
something eat -want -if, fridge-at eat-AD NML exist-DEC
c. If you want to eat something, there is food in the fridge.

4. Type 2 BCs: Overtly Expressed Speech Act Conditions

In this section, I will briefly explain Korean Type 2 BCs. In Type 2 BCs, the antecedent includes speech act words such as *yaksokha-* "promise" or *cilmwunha-* "ask a question", and the consequent clause performs that speech act. Unlike Type 1 BCs, Type 2 BCs are uniformly judged felicitous.

(18) a. hana **yaksokha**-ca-myen, celtay ne-l soki-ci anh-ul ke-ya.
one **promise**-EXH-if, never you-ACC deceive not-will NML-END
"If I may make a promise, I will never deceive you."
b. **cilmwun**-ul hana-man ha-ca-myen, edise naylyeya ha-na-yo?
question-ACC one-only do-EXH-if where get.off-must do-INT-HON
"If I may ask a question, where do we have to get off?"

I claim that the antecedent of a Type 2 BC is an explicitly expressed essential condition as in Searle (1965, 1969, 1985). The essential condition is one of Searle's constitutive rules of speech acts, which says the utterance will count as

a commitment to doing the act. For example, the antecedent of (18a) expresses the speaker's intention that the following utterance will be presented as committing the speaker to do the PROMISE act. Similarly, (18b) expresses that the utterance of the consequent will be presented as committing the speaker to do the QUESTION act.

In the current analysis, the antecedent is understood as modifying the speech act of the consequent. This means that the consequent has its own illocutionary force, and this is borne out as in the following examples. For example, the consequent of (19) performs a QUESTION act, and the addressee answers that question.

(19) A: cilmwun-ul hana ha-myen, makamil-un ency-ipni-ka?
question-ACC one do-if, due.date-TOP when-HON-INT.
"If I ask one question, when is the due date?"
B: The deadline is the 24th.

(20) A: coen-ul com ha-ca-myen, ku salam kakkai ha-ci-ma!
advice-ACC little do-EXH-if, the person near do-not-Imp.
"If I give you some advice, don't go near him!"
B: Don't push me around!

It must be noted that what the antecedent clause modifies is a speech act but not a clausal type (e.g., interrogative, imperative, etc.). In (21), for example, the consequent clause is an interrogative and its speech act is a REQUEST act. In this case, the antecedent clause must include the speech act word *pwuthakha-* "asking a favor," but not *cilmwunha-* "asking a question."

(21) pwuthak/#cilmwun hana-man ha-ca-myen, changmwun com
favor/#question one-only do-EXH-if, window little
yele-cwu-l swu iss-e?
open-give-AD chance exist-END?
"If I may ask a favor/#question, can you open the window for me?"

5. Conclusion

This paper investigated semantic and pragmatic properties of Korean BCs and provided an analysis that explains their judgment discrepancies. I divided Korean BCs into two types. In Type 1, I showed that the acceptability judgment is greatly influenced by the context. This is because the acceptability of the Type 1 BCs depends on how easy it is to infer a relevance connection between the utterance of the consequent clause and the addressee's decision problem in the antecedent clause. I also showed that if the relevance connection is not direct,

the relation must be expressed by the sentence-final rising tone. Otherwise, the addressee must infer the relevance connection based solely on the context, and that causes the diversity in judgments. In Type 2, I showed that a speech-act verb like *allyucwu-* "inform" must appear in the antecedent clause, and the consequent clause performs the speech-act of that verb. I claimed that the antecedent in a Type 2 BC modifies the speech act of the consequent by explicitly spelling out the essential condition, one of the constitutive rules of speech acts in Searle (1965, 1969).

Notes

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[1] Grice (1975) provided the conversation in (6) as an example in which no maxim is violated (Grice 1975: 51).

[2] The formalization in (7) comes from Davis (2009) with my own modification.

[3] Some native speakers don't seem to accept the sentences in (8) unless they are used with a particular rising tone (i.e., LH%). The relation between Type 1 BCs and a rising tone is discussed in section 3.3.

[4] In her judgment test of Japanese speakers, Oliveira (2000) had very similar results. Just like Koreans, the Japanese also do not call a waitress/waiter's name to get their attention.

[5] Here I treat, following Gunlogson (2003) and Davis (2009), a sentence-final tone contour as a morpheme.

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Discourse Functions of the Connective *Sorede* and its Variants in Japanese Oral Narrative

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1. Introduction

Discourse markers have been studied as an active field of Japanese linguistics. These markers that have attracted researchers' attention include *dakara* "therefore", *datte* "because", *demo* "although", and *dakedo* "but" (Sadler 2001). Compared with these discourse markers, however, *sorede* and its variants have attracted little attention in the field, despite the fact that *sorede* and its variants are the most frequently used discourse markers in spoken Japanese (NIJLL 1955, Onodera 2004). The connective *sorede* consists of the anaphora *sore* "that" and the gerund form of a copula *de* and roughly corresponds to "and then" and "so" in English. Japanese dictionaries define its primary meaning as conveying causality connecting the preceding sentence to the following sentence as well as a device to urge the interlocutor to move forward his/her talk (NKD 1972-1976). There are a variety of variant forms, some of which are phonologically reduced forms such as *nde* and *de*, while others are dialectal variants such as *horede* and *hoide*.

Only a few studies have examined how these expressions function in spoken language, it is still unclear how the expressions function in discourse. In particular, despite the fact that these expressions most frequently appear in narratives (Ito 1995, Sadler 2006), no research has been conducted to illuminate how these expressions contribute to narrative structure.

Previous studies have mainly focused on examining semantic relationship between the preceding and following sentences (Ariga 1993, Ishijima and Nakagawa 2004, Ito 1995, Sadler 2001, Yamamoto 2004). The two sentences can express either a causal relationship or a non-causal relationship. In the former case, the connective can be replaced with another connective that expresses a causal relational such as *dakara* "therefore" as in (1). In the latter

case, the connective conveys either a temporal relation as in (2) or a coordinative relation as in (3).

(1) a. *Temochi-no* *okene-ga* *nakatta.*
at.hand-GEN money-NOM not.PST[1]
"I did not have money."
b. *Sorede,* *sono* *hon-o* *kaenakatta.*
sorede that book-ACC buy.POT.not.PST
"**Sorede**, I couldn't buy that book."

(2) a. *Kinoo* *kaimono-ni* *itte,*
yesterday shopping-DAT go.and
"Yesterday, I went shopping,"
b. *sorede,* *atrashii* *fuku-o* *katta.*
sorede new clothing-ACC buy.PST
"**Sorede**, I bought new clothing."

(3) a. *Mise*-wa *kondeite,*
store-TOP crowded.and
"The store was crowed,"
b. *sorede,* *teeburu-mo* *amari* *nakatta.*
sorede table-also little not.PST
"**Sorede**, there were not so many tables as well."

Functionally, it has been identified that *sorede* and its variants advance the storyline, change the topic, signal the continuation of the current speaker's conversational turn, and precede a request for advancing the current speaker's talk (Ariga 1993, Ishijima and Nakagawa 2004, Ito 1995, Sadler 2001, 2006, Yamamoto 2004). Nevertheless, it is not clear why the expressions predominantly appear in narrative discourse and how they contribute to advancing the storyline, as their usage has not been analyzed in relation with narrative structure. For these reasons, the present study analyzes the usage of *sorede* and its variants in narrative discourse and how they interact with narrative structures.

2. Data

2.1. Corpus

A corpus was created based on oral narratives provided on the War Testimony Archives website by Japan Broadcast Corporation (NHK). The website provides roughly 800 videos of interviews about war time experiences during World War

II. Fifteen male and fifteen female native speakers of Japanese were randomly chosen and their transcribed narratives became the corpus for this study. Ages of the speakers ranged from their 70s to 90s with the average age of 86.5 for the men and 83.9 for the women. The length of the videos varies from interviewee to interviewee. Short videos last less than ten minutes, while long ones last approximately one hour. For each video, a segment that recounts one or two life threatening events was chosen for the corpus. The website provides a rough transcript for each video, but their accuracy is not high enough for linguistic analysis. For this reason, corrections were made to transcripts after watching each video to reflect more accurate language use. These corrected texts were used for the analysis.

2.2. Distribution of *sorede* and its variants

In the corpus, 252 instances of *sorede* and its variants were found. The distribution of all variants is provided in Table 1. *Sorede* was used 98 times and accounted for 38.9% of all instances. *De* was used second most frequently—78 times—and accounted for 31.0%. *Hoide* and *horede* were the third most frequent, used 49 times accounting for 19.5%. Other variants were *soide* 10 times (4.0%), *honde* 10 times (4.0%), *sonde* 1 time (0.4%), *unde* 1 time (0.4%), *nde* 4 times (1.6%), and *hode* 1 time (0.4%). These variants can be categorized into three groups according to mora length: *de* has only one mora and constitutes Group 1; *nde* and *hode* have two moras and these are categorized as Group 2; and *sorede*, *hoide* and *horede*, *soide*, *honde*, *sonde*, and *unde* all have three moras and they are labeled Group 3. When all variants were categorized in this fashion, it was found that Group 3 accounted for 67.0%, Group 2 for 2.0%, and Group 1 for 31.0%. In the subsequent portion of this paper, all variants will be referred to as *sorede*. This is because the primary goal of this paper is not about illuminating differences among these variants.

Table 1. Distribution of *Sorede* and its Variants

Type	Variant form	Token (ratio)	Total token (ratio)
Group 3 (3 mora-length)	*Sorede*	98 (38.9%)	169 (67.0%)
	Hoide / *Horede*	49 (19.5%)	
	Soide	10 (4.0%)	
	Honde	10 (4.0%)	
	Sonde	1 (0.4%)	
	Unde	1 (0.4%)	
Group 2 (2 mora-length)	*Nde*	4 (1.6%)	5 (2.0%)
	Hode	1 (0.4%)	
Group 1 (1 mora-length)	*De*	78 (31.0%)	78 (31.0%)

3. Analysis and Results

3.1. Discourse patterns

3.1.1. Narrative clause and non-narrative clause

The present study employs the frame of narrative analysis (Labov 1972, Labov and Waletzky 1967). In this framework, narrative text can be separated into narrative clauses that depict sequences of action and non-narrative clauses that provide background to the depicted event, which includes descriptions of scenes and the narrator's subjective evaluations of the event. The examples of narrative clauses are (4) and (5).

(4) *Soko-ni* *kanpooshageki-ga* *kita-no, fune-kara.*
there-at naval.gunfire-NOM came-N ship-from
"Then, there came naval gunfire, from ships."

(5) a. *Kuushuu* *keehoo-ga* *natte,*
air.raid siren-NOM ring.and
"Air-raid sirens went off, and"
b. *"kuushuu-da-zoo"* *tte* *iu-no-de,*
air.raid-COP-FP QT say-N-COP.and
"Because someone said, 'air-raid!'"
c. *"minna uchi-e haire"* *tte* *itta-n-desu-yo.*
everyone house-to enter.IMP QT say.PST-N-COP-FP
"I said, 'Everyone, go inside the house!'"

Narrative clauses are foregrounded segments of narrative. They describe what has happened and they constitute the backbone of narrative structure. Non-narrative clauses, on the other hand, provide background. As shown below, they describe circumstances as in (6a) and (6b) or express the narrator's evaluations of the event as in (6c) and (6d):

(6) a. *Soo, dakara naichi-no* *koto-wa*
so because within.Japan-GEN thing-TOP
zenzen *shiranakatta-desu.*
at.all know.not.PST-HON
"So, I did not know anything about the situations within Japan,"
b. *Taiki,* *iwayuru* *taiki-shite-mashita.*
standby so-called standby-do.and-HON.PST
"Standby, I was being on so-called standby."
c. *Honto,* *are* *itai-n-yo.*
really that painful-N-FP
"Really, that hurts, you know?"

d. *Datte* *honrai-naraba,*
because original-COP.if
daihonee-wa
Imperial.Headquarters-TOP
sono *futari-no* *sanboo-no* *jooshi,*
that two.CL-GEN army.staff.officer-GEN superior
tashika *Ida to* *iu-no-ga* *ita* *hazu-da-yo,* *Ida.*
surely Ida QT say-N-NOM exist.PST must-COP-FP Ida
"That's because, under normal circumstances, in the Imperial Headquarters, there must have been a guy called Ida, a superior to these two army staff officers, Ida."

3.1.2. Four narrative discourse patterns

When the narrative texts were grouped into narrative clauses (NACs) and non-narrative clauses (non-NACs) and the placement of *sorede* was examined with respect to these two clause types, it was found the majority of *sorede* appears immediately before a NAC. Table 2 shows the distribution of the discourse patterns in which *sorede* appears.

Table 2. Distribution of Discourse Patterns with *Sorede*

Discourse pattern	Tokens	Ratio
Discourse pattern I (NAC | *sorede* | NAC)	104	41.3%
Discourse pattern II (Non-NAC | *sorede* | NAC)	77	30.6%
Discourse pattern III (NAC | *sorede* | Non-NAC)	39	15.5%
Discourse pattern IV (Non-NAC | *sorede* | Non-NAC)	32	12.7%
Total	252	100%

3.2. *Sorede* in discourse pattern I

Of the four discourse patterns, Pattern I appeared most frequently—41% (104 instances). This is a case in which *sorede* appeared between two NACs. Excerpt (7) illustrates this.

(7) a. *Inaka-no,* *zutto* *noori-ni* *ukande* *kita-**n**-desu-yo.*
country.side-GEN always mind-on float.and came-N-HON-FP
"The hometown's image, it started to appear in my mind."
b. ***Sorede**, koreja* *shoomonai-na.*
sorede with.this cannot.be.helped-FP
"**Sorede**, like, 'oh well, nothing I can do.'"
c. ***Sorede**, mukoo-mo* *shinda* *to omotta-n-desu-ne.*
sorede over.there-also die.PST Q think.PST-N-COP-FP
"**Sorede**, he also thought I was dead."

d. *Utsu-no* *yameta-n-desu-yo.*
shoot-N stop.PST-N-COP-FP
"He stopped shooting."

This excerpt consists of a series of actions. In lines 2 and 3, *sorede* is inserted. For each instance, the preceding and following sentences are narrative clauses. It can be said that *sorede* is placed to connect temporally-ordered events or actions, and tougher create a larger unit of an action or event sequence.

Two narrative clauses connected with *sorede* constitute what Sadler (2001) calls a temporal sequence. When narrative clauses are put together and form a unit, they describe a succession of actions or how the entire event has materialized. In order to understand how *sorede* is placed in those temporal sequences, the types of narrative clause that appear with *sorede* were examined. It was found that most of *sorede* coincide with what appears to be a scene boundary where a jump in description takes place. Examples (8) and (9) below illustrate the notion of a scene boundary:

(8) *Kan-o* *akete,* *koppu-ni* *sosogi,* *ikkini* *nomihoshita.*
can-ACC open.and cup-DAT pour.and all.at.once drink.up.PST
"He opened a can, poured its content, and drank it up."

(9) *Shawaa-o* *abite,* *orenji juusu-o* *nonde,* *gakkoo-e itta.*
shower-ACC take.and orange juice-ACC drink.and school-to go.PST
"I took a shower, drank orange juice, and went to school."

Upon reading (8), the reader creates a mental image of a person engaging in a rapid succession of actions. Within the sequence, the same person carries out each action without any time gap in-between. Opening a can and pouring its content do not take more than a minute. Drinking what is inside of a cup can also be carried out in a relatively short period. The temporal sequence in this case, therefore, can be said to have taken place within the same scene. Sentence (9), on the other hand, involves a change in location as well as a small time gap between each action. In this case, the person carries out each action in a different scene: bathroom, kitchen, and school or on the way to school. A scene boundary can be defined as a boundary that crosses two separate scenes. Although there is individual variation in defining what constitute a scene, it seems reasonable to consider explicit linguistic expressions that convey change in time and location as markers of scene boundary.

Following this notion of scene boundary, 104 instances of *sorede* found in Discourse Pattern I were analyzed. As markers of scene boundaries, four types of linguistic expressions were considered. The first type is when the agent changes between two actions. The second type is when there is a time expression that indicates a passage of time such as *isshuukan go* "one week

later" and *shibaraku shite* "a while later". The third type is an indication of change in location. This could be signaled by the presence of a movement verb or a description of a new location, as well as an assumed change in location due to the audience's world knowledge. The last category involves the linguistic expressions *noda* and *teshimau*, both of which are known to segment discourse into smaller units (Fauconnier 2013, Yoshimi 2001). Using these four markers of scene boundary, the placement of *sorede* within temporal sequences was examined. The results are provided in Table 3.

Table 3. Markers of Scene Boundaries Co-occurring with *Sorede* in Temporal Sequences

Discourse pattern	Tokens	Ratio
Agent change	17	16.3%
Time phrase	0	0.0%
Location change	15	14.4%
noda or *teshimau*	9	8.7%
Any combination of above	41	39.4%
No marker of scene boundary	22	21.2%
Total	104	100%

The results show that the majority of *sorede* within temporal sequences appear at scene boundaries. 17 instances of *sorede* coincided with a change in agent, which accounts for 16.3 percent of all instances in temporal sequences. 15 instances coincided with location change, accounting for 14.4 percent. 9 instances of *sorede* appeared after *node* or *teshimau*, accounting for 8.7 percent. 41 instances of *sorede* coincided with more than one type of marker of scene boundary, accounting for 39.4 percent. Thus, in total, 82 cases of *sorede* appeared with one or more than one marker of scene boundary, accounting for 78.8 percent of *sorede* in temporal sequences.

3.3. *Sorede* in discourse pattern II

Pattern II was the second most frequent discourse pattern in which *sorede* appeared. 77 instances of *sorede* (30%) fell into this discourse pattern. As shown in (10), *sorede* connects a non-NAC that precedes with a NAC.

(10) a. *Yama-no* *ue-o* *minagara*
mountain-GEN up-ACC watch.while
ishookenmei *kono ue-o* *ikeba*
hard this up-ACC go.if
michi-ga *aru-n-da-tte* *yutte,*
road-NOM exist-N-COP-QT say.and
moo hagemashi-nagara *ue-ni iku yoo-na*
well cheer.up-while up-to go like-COP
jootai *data-n-desu-yo-ne.*
condition COP-N-COP-FP-FP
"While looking at the mountain top," we were climbing while encouraging one another, saying, 'there is going to be a road if we climb up patiently.'"

b. *De,* *ue-ni* *itte,* *tochuu-made* *kitara*
sorede top-DAT go.and in.middle-until come.if
moo mitsukatchatte *kotchi-no yama-kara*
well find.finish.and this-GEN mountain-from
ban-ban *utarechatta* *wake-desu-yo.*
bang-bang shoot.PSS. finish N-COP-FP
"**Sorede**, we climbed up to the top, and after reaching the mid-point, we got detected, and we got bombarded from this side of the mountain."

The preceding clause *moo hagemashi nagara ue ni iku yoo na jootai data n desu yo ne* "we were climbing while encouraging one another" is a description of the circumstances and a non-narrative clause. This is connected with the clause that follows, *ue ni itte, tochuu made kitara, moo mitsukatchatte* "we climbed up to the top, and after reaching the mid-point, we got detected".

3.4. *Sorede* in discourse pattern III

Discourse Pattern III was found in 39 instances and accounted for 15% of all instances in the corpus. *Sorede* in this case follows a narrative clause and introduces a non-narrative clause as in (11).

(11) a. *Sagatte-iku* *michi-ga* *aru-n-desu-yo,* *zutto fukaku-ne.*
descend.and-go road-NOM exist-N-COP-FP far deep-FP
Soko-ni *ano itta-n-desu-yo.*
there-at well went-N-COP-FP
Itte, *soko-de kanpooshageki-o* *mata ukechatte.*
go.and there-at naval.gunfire-ACC again receive.finish.and
"So, uh, well, there is a road that goes down, deep down. I went there. I went there and got bombarded by naval gunfire,"

b. *Sorede, sono roopu-ga ippon burasagatte-iru tokoro-ni*
sorede that rope-NOM one.CL dangle.and-RES place-at
oriru-koto-ga dekinakute.
descend-N-NOM capable.NEG.and
Un. Koko-de mata betsubetsuni nattara taihen dakara,
right here-at again separately become.if hard COP.because
orirareru hito, orirareru hito-ne,
descend.can person descend.can person-FP
dete-kimasu deshoo?
exit.and-come.HON right
"**Sorede**, we can't go down to the place where a rope is hanged. Because it would be hard if we got separated. There would be people who cannot go down, and those who can go down."

The preceding clause *Itte, sokode kanpooshageki o mata uke chatte* "I went there and got bombarded by naval gunfire" is a narrative clause. It depicts what happened. The clause that follows *sorede*, on the other hand, is a non-narrative clause, providing a description of the circumstances.

3.5. *Sorede* in discourse pattern IV

Discourse Pattern IV, connecting two non-narrative clauses, accounted for 13% of *sorede* (32 instances). Excerpt (12) illustrates this pattern of *sorede*.

(12) a. Kotchi-*no heitai-san-wa ude-ga tonjatteru.*
this-GEN soldier-mister-TOP arm-NOM blown.RES
"This soldier's arm is already ripped."
b. *Sorede, moo "chikushoo, yatta-naa" tte,*
sorede well damn did-FP QT
ashi-o bata-bata suru-n-desu-yo.
leg-ACC dangling do-N-COP-FP
"**Sorede**, he bangs his legs, like 'Damn it, you bastard!'"
c. *De, watashitachi-wa baribari utte-kuru kara,*
sorede we-TOP cracklingly shoote.and-come because
kowai kara moo koo shite shagande-iru-n-desu kedo,
scaring since well this.way do.and squat.down.and-RES-N-COP but
yashi-no ki-ga minna taore-chau-n-desu-yo,
palm-GEN tree-NOM all fall-finish-N-COP-FP
anoo tama-ni atatte, bakit-to.
well bullet-DAT hit.and zap-QT
"**Sorede,** we are crunching down like this, being scared because they are shooting at us, but palm trees fall down, getting sharply bent when bullets hit."

d. *De,* *sono yashi-no* *ki-ga* *atattara taihen-na-no-de,*
sorede that palm-GEN tree-NOM hit.if trouble-COP-N-COP
so, kore ga mata ki-o *tsukawanakuchanaranai-shi,*
well this-NOM again tree-ACC use.must-because
"uwaa, ki-o-tsuke-nasai-yo, *ki-o-tsuke-nasai-yo"* *tte*
oh qi-ACC-attach-IMP-FP qi-ACC-attach-IMP-FP QT
haha-ga *itte,*
mother-NOM say.and
"daijoobu daijoobu" tte itte.
okay okay QT say.and
"**Sorede,** because it would be awful if got hit by these trees, and that is something I need to be worried about. "Oh, be careful, be careful," my mother tells me, and I say 'I'm fine, I'm fine,'"

(12a) is a non-narrative clause; it describes the condition of the soldier. Each of (12b), (12c), and (12d) introduces an additional piece of information on the circumstances. None of them are a narrative clause. An insertion of *sorede* signals to the interlocutor that the narrator's story has not ended so it contributes to maintaining his or her floor.

To sum up, the analysis presented above explains why *sorede* most frequently appears in narratives. The results showed that the main functional role of *sorede* is to introduce a narrative clause: 71% of *sorede* was used to introduce a narrative clause. Since the narrative clause is the essence of narrative, this also explains why narratives is the genre in which *sorede* appears most often.

4. Discussion and Conclusions

As explained by Sadler (2006), one of the main functions of *sorede* is to signal the continuation of the current speaker's turn in conversation. *Sorede* seems to serve a similar function in narrative. The present study has shown that the majority of *sorede* and its variants appear immediately before the introduction of narrative clauses. Since narrative clauses constitute the backbone of narrative discourse, and without them one cannot narrate an event, this finding explains why *sorede* and its variants appear dominantly in narratives. It is possible that the high likelihood of *sorede* and its variants introducing a narrative clause creates an expectation on the part of the interlocutor that whenever such a connective is used a description of a crucial event will follow. Thus, the mere presence of *sorede* could prompt the interlocutor to wait for more talk. This, consequently, could allow the current speaker to hold the floor and serves as a device for speech continuation. Japanese has other expressions that signal the speaker's continuation of speech. Fillers such as *eeto*, *ano*, and *maa* can all function to signal continuation of speech. Nevertheless, it is *sorede* and its

variants that have the effect of making the interlocutor anticipate that a narrative clause is about to be introduced to the discourse. As a consequence, the listener will wait for the delivery of a narrative clause, and it helps the current speaker to hold the floor. Fillers such as *eeto*, *ano*, and *maa*, on the other hand, simply convey that the speaker needs more time, and do not necessarily foretell that a substantial contribution to the story will be imminent

It was also found that *sorede* mostly coincides with scene boundaries within temporal sequences. Scene boundaries are locations where a small gap appears in a series of depicted actions. Such a gap could present itself as a transition relevance place (Sacks, Schegloff, and Jefferson 1974), where the interlocutor can take the next conversational turn, mistakenly interpreting the scene boundary as the end of the temporal sequence. So, if a description of a temporal sequence appears to be discontinued at a scene boundary but if the speaker intends to continue the story, he needs to signal that his recounting of the event has not ended. By placing *sorede* at such scene boundaries, the speaker can effectively keep the floor without risking interruption. In contrast, if a description of a temporal sequence does not involve a scene boundary, then it is clear that the description of the sequence has not completed so that the interlocutor is less likely to interrupt the current speaker, not necessitating *sorede*. For these reasons, *sorede* and its variants are necessary for delivering narrative discourse.

The present study examined oral narratives produced by old native speakers of Japanese. Since ages ranged from their 70s to 90s, the findings of this study should be carefully interpreted. The results presented here do not claim that native speakers of all ages use *sorede* and its variants in the same way. In fact, it is more likely that this age group construct narrative differently than other age groups. To make such a claim, more research needs to be carried out on how speakers of different age groups construct narrative. Nevertheless, what was observed in this study is that speakers as old as 90 years old are capable of vividly recounting events. Currently one fourth of the Japanese population is 65 years-old or older (COJ, 2012). As Japanese society rapidly increases its elders, it becomes increasingly important to know and have capacity to access elder speakers' linguistic ability. This paper has contributed to forming such a knowledge base. More research on narrative needs to focus on different age groups, in particular, age groups other than young adults.

Notes

[1] The abbreviations for glosses are the following: ACC (accusative), CL (classifier), COP (copula), DAT (dative), FP (final particle), GEN (genitive), HON (honorific), IMP (imperative), N (nominalizer), POT (potential), PSS (passive), PST (past), QT (quotative), RES resultative), and TOP (topic).

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Syllabification of Diphthong plus Liquid Rhymes: Perception and Production

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1. Introduction

This paper focuses on the syllabification of English phoneme sequences traditionally considered to consist of a true diphthong [aj], [aw], or [ɔj] followed by one of the liquids [ɹ] or [l]. Examples include words like *tire, tower, toil, tile,* and *towel*. The rhymes of these words can be represented phonemically as /auɹ/, /aiɹ/, /aul/, /ail/, /ɔil/. Orthographically, some of these words are represented as two syllables (*tower, towel*), some as monosyllables (*tire, tile*). In terms of sonority, these sequences comprise a falling sonority slope and should therefore fit into a single syllable. However, given the discussion surrounding the syllabification of these sequences, they seem to fall somewhere between one syllable and two syllables, as noted by Moser (1960). Lavoie and Cohn (1999) label these sequences as *sesquisyllables*, noting that native speakers of American English tend to be influenced by orthography when it suggests two syllables but disagree on syllable count judgments for orthographic monosyllables. Their study is based on a written task where participants were asked to identify the number of syllables in written words. The current paper looks at the issue from a perception viewpoint. Native speaking American English raters were asked to listen to numerous tokens of each of these rhymes spoken by Native English speakers and identify the number of syllables heard in each case.

My approach to the question is threefold. First, I provide a survey of dictionary pronunciations of English monomorphemic words consisting of all possible combinations of these sequences in section 2. In section 3, I provide an overview of the theoretical approach and the predictions that come out of that approach suggesting the relative well-formedness of different permutations of these sounds. Third, I present the results of a perception study in section 4 in which these syllable rhymes were presented to raters who were asked to identify the number of syllables in each word. Results of the perception study are compared to the theoretical predictions and the dictionary pronunciations. Section 5 concludes the paper.

2. Dictionary Pronunciations

The *American Heritage Dictionary of the English Language, 4th edition* (AHD, Pickett 2000) provides pronunciations that are fairly consistent with the pronunciations provided by most major American English dictionaries. Other dictionaries may vary some in the details of individual words but the principles underlying the pronunciations are similar across dictionaries. Taking the number of monomorphemic lexical items with the phonemic sequences /auɹ/, /aiɹ/, /ɔiɹ/, /aul/, /ail/, /ɔil/, we get an indication of the productivity of each of these sequences in the lexicon of English as well as the dictionary pronunciation of each. Using the AHD pronunciation key (converted to IPA) as a guide, we get an indication of the target number of syllables for each rhyme as presented in (1)-(5) below.

The data in (1) provide the 14 monomorphemic words found in the AHD with the rhyme /auɹ/. On the left, we see the words identified by the dictionary as monosyllabic with optional pronunciations also indicated when provided by the AHD in the order given in the pronunciation key. On the right are the words provided with a bisyllabic pronunciation. A number of words that are transparently bimorphemic, as in *plower*, are not included in this table. According to this dictionary, the word *flour* is most commonly pronounced as a two syllable word with an alternate pronunciation of a single syllable. It has been counted as half bisyllabic and half monosyllabic in the totals at the bottom of the table.

(1) /auɹ/	[awɹ]	['aw.ɚ]	
	dour ([dʊɹ], [dawɹ])	*power*	*shower*
	sour	*tower*	*glower*
	scour	*cower*	*flower*
	our	*bower*	
	hour	*dower*	
		flour (['flaw.ɚ], [flawɹ])	
	5.5 (39.3%)	8.5 (60.7%)	

The majority of words (60.7%) with an /auɹ/ rhyme are treated as bisyllabic by the AHD, but some of the most common words with this rhyme are listed as monosyllabic. The dictionary pronunciation is clearly based on the orthography of the words. With the exception of *flour*, words with final *–our* are uniformly provided with monosyllabic pronunciations and those with *–ower* are uniformly treated as bisyllabic.

Words with the rhyme /aiɹ/ are provided in (2). Of the 18 words included in this list, the majority are considered to be monosyllabic (72.2%). Two words in the

two syllable column (*plier* and *flier*) could be considered bimorphemic by some but not transparently so (unlike *buyer, dryer, fryer*, etc.) and have been retained in the list. *Liar* is transparently bimorphemic and is not counted in the totals at the bottom of the table but is included because it will reappear in the perception task.

(2) /aiɹ/	[ajɹ]		[ˈaj.ɚ]
	tire	*hire*	*prior*
	dire	*mire*	*briar*
	fire	*wire*	*friar*
	sire	*ire*	*?plier*
	shire	*spire*	*?flier*
	pyre	*lyre*	*(liar)*
	choir		
	13 (72.2%)		5 (27.8%)

As was the case with /auɹ/ above, dictionary syllabification of /aiɹ/ words is tied to the orthography. Words with final *ire, yre, oir* are identified as monosyllabic and words with final *ior, iar, ier* are identified as bisyllabic.

While words with /aiɹ/ and /awɹ/ rhymes are fairly common in the lexicon, words with /ɔiɹ/ are not. *Coir* and *foyer* are the only monomorphemic /ɔiɹ/ words found in the AHD. *Coir* is identified as a monosyllable while *foyer* is provided with several pronunciations ([ˈfɔj.ɚ], [ˈfɔj.ˌej], [ˈfwa.ˌjej]), all of them bisyllabic. There are too few words with this rhyme to include in the current study and this rhyme will not be included in the remainder of the paper.

Presented in (3) are the 15 words with an /aul/ rhyme. These words are similar to the /aiɹ/ words in that the majority (70.0%) are identified as monosyllabic. Dictionary syllabification is again based on the orthography with final *–owl* and *–oul* indicating monosyllables and final *–owel* indicating disyllables. The exception in this case is *bowel* which is orthographically bisyllabic but has an optional monosyllabic pronunciation.

(3) /aul/	[awl]		[aw.ɬ]
	cowl	*yowl*	*towel*
	jowl	*owl*	*dowel*
	foul	*scowl*	*vowel*
	fowl	*prowl*	*trowel*
	howl	*growl*	
		bowel ([ˈbaw.ɬ], [bawl])	
	10.5 (70.0%)		4.5 (30.0%)

In (4), we see 19 words with an /ail/ rhyme. This group of words differs from the others in that no words are identified as purely bisyllabic. On the left in this

table are a number of words listed by the AHD as monosyllabic but the four words listed on the right are all provided with a bisyllabic as well as a monosyllabic pronunciation and are counted here as half in each category. Orthography is again the determining factor in syllabification, with the bi-/mono-syllabic words in the right-hand column sharing a final *–ial*. This is the category in which the most words (89.5%) are considered to be monosyllabic.

(4) /aɪl/	[aɪl]			[ˈaj.ɬ], [ajl]
	pile	*mile*	*smile*	*dial*
	tile	*nile*	*style*	*phial*
	bile	*rile*	*guile*	*vial*
	file	*while*	*isle*	*trial*
	vile	*wile*	*aisle*	
	15 +2 (89.5%)			2 (10.5%)

Finally, words with an /ɔɪl/ rhyme are provided in (5). Like /aɪl/, the 11 words in this group of words bear heavily monosyllabic dictionary pronunciations. An argument could be made regarding the two words in the bisyllabic column, *royal* and *loyal*, for an underlying three vowel sequence /ɔɪɑl/, but I follow other references like Moser (1960) in including them as potentially monosyllabic. We will find, however, that in the perception study *royal* is perceived as bisyllabic much more often than *boil*.

(5) /ɔɪl/	[ɔjl]		[ˈɔj.ɬ]
	toil	*roil*	*royal*
	coil	*oil*	*loyal*
	boil	*spoil*	
	foil	*broil*	
	soil		
	9 (81.8%)		2 (18.2%)

Of the five rhyme categories surveyed here, we find roughly the same number of words with each rhyme (ranging from 11 words with /ɔɪl/ to 19 words with /aɪl/). Minor differences in totals can be attributed to the overall frequency of these vowels and consonants in the lexicon as a whole. Of the vowels, [aj] is slightly more common than [aw], which is slightly more common than [ɔj]. Moser (1960) identifies these as #10, 13, and 16 in rank order frequency of vowels in English and our survey supports this with a total of 37 words with /aɪ/, 29 words with /au/, and 13 words with /ɔɪ/. Of the consonants, /l/ is more common than /ɹ/ (#5 and #18, respectively, on Moser's (1960) frequency list). This is also reflected in our survey with a total of 45 words with final /l/ and 34 words with final /ɹ/. Most of the lexical items in this survey are common words and most have a long history in English.

We have thus examined the dictionary pronunciations for words with /auɹ/, /aiɹ/, /aul/, /ail/, and /ɔil/ rhymes. The dictionary pronunciation guide is clearly based on orthography, so if the dictionary is an appropriate judge, we might expect to find that orthographic bisyllabicity will trigger a bisyllabic pronunciation which will consequently be heard as a bisyllabic production in the perception study presented in section 4. Acknowledging that orthography is generally more conservative than pronunciation, we might explain the orthographically inconsistent dictionary pronunciations of *flour* and *bowel* as indicative of pronunciations of the category moving in one direction or another ([ˈaw.ɚ] and [awl], respectively, in this case), but we have little evidence here to support this. Since we found that the majority of words with /auɹ/ fit into the bisyllabic category but that the other rhymes were more heavily represented by monosyllables, we might also expect to find that words with an /auɹ/ rhyme are more likely to be pronounced as bisyllabic than words with /aiɹ/, /aul/, /ail/, or /ɔil/ rhymes.

We are now in a position to compare the results of the dictionary survey to theoretical predictions based on the interaction between sonority and syllabification processes in the next section before moving on to the perception study in the following section.

3. Theoretical Framework

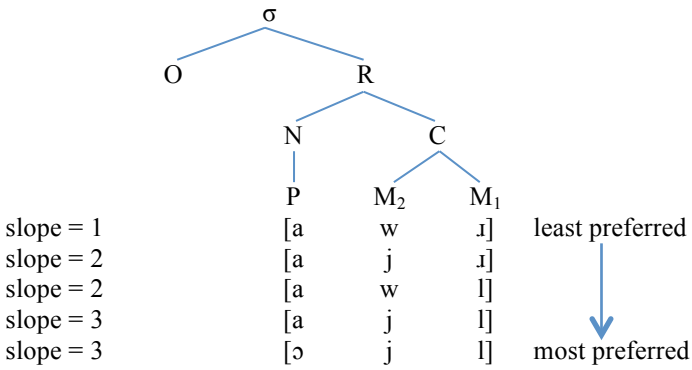
Syllabification is generally based in large part on the sonority profile of the segments in a word. Sonority is said to rise into a sonority peak, which is identified as the nucleus of a syllable, and then fall again in the coda of the syllable. A sonority peak (preferably a vowel) is required to justify a syllable, and a word with a single sonority peak should therefore constitute a single syllable. The words in this study have exactly one sonority peak, which would suggest that they should be parsed as monosyllables. However, the fall in sonority after the sonority peak is very shallow and also quite vocalic. It is possible for any of the segments included in the sequences studied here to be syllable peaks, and if a monosyllable becomes too complex, we might expect the sequence to be broken into two syllables.

Looking at the data from the perspective of consonant clusters and sonority distance parameters, we can say that the clusters created by a monosyllabic parse of these sequences are relatively marked. Taking up a fairly detailed sonority scale in which /u/ is less sonorous than /i/ and /l/ is less sonorous than /ɹ/, the sonority scale relevant to the current study becomes (from most sonorous to least sonorous) [-hi] > /i/ > /u/ > /ɹ/ > /l/. The detail in the sonority scale has been shown to be supported in English by previous work on sonority, syllabification, phonotactics, articulatory phonetics, and acoustic phonetics, including Baertsch (2008, 2012), Gick (1998), Parker (2008), Proctor & Walker

(2012), and Yamamoto (1996), among others. Clements (1990) argued that syllables should be split into onset demisyllables (onset through peak) and offset demisyllables (peak through coda) with no internal structure and that the sonority profile of the entire demisyllable should be judged. On his approach, a shallow sonority slope is the preferred offset demisyllable, which would predict that the clusters inherent in a monosyllabic parse of the sequences here are close to optimal. Baertsch (2012), on the other hand, argues that while high sonority singleton codas are preferred, very shallow sonority slopes in coda sequences are dispreferred, which would predict that the sequences in this study are very marked as monosyllables and that a bisyllabic parse of at least some sequences would be preferred. On this approach, even though syllabic liquids are quite marked, they may be preferable to even more marked coda sequences.

Under a Split Margin approach to syllabification (Baertsch 2012), an OT approach grounded in the interaction between sonority and syllable position, each segment of an underlying string will be parsed in such a way that the sonority preferences of each syllable position and the sonority slope preferences for higher nodes in the syllable (coda, rhyme) are maximally satisfied. What is important in this context is that if the sonority slope in a potential coda sequence is bad enough to overcome the comparative ill-formedness of what would potentially be a fairly low-sonority (thus dispreferred) peak, a two syllable production will occur. If not, a one-syllable production will occur. Assuming no epenthesis, deletion, or feature changes (in other words, all Faithful parses of the sequences under discussion, we have three possible syllabifications of these sequences. My focus here is on the one syllable productions shown in (6). Using the sonority scale above to calculate sonority slope, [awɹ] would be the least preferred coda cluster of the bunch with a sonority slope of 1. [ajɹ] and [awl] have a slope of 2, making them a better coda cluster and more likely to be pronounced as a single syllable. [ajl] and [ɔjl], with a slope of 3, are the most preferred clusters in the group and are most likely to be pronounced as a single syllable.

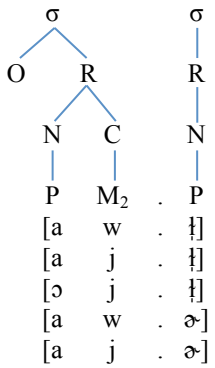
(6) Monosyllabic parses of underlying diphthong plus glide sequences



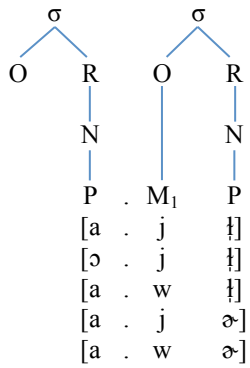
There are two possible two-syllable productions. The first is one in which the glide fills a coda position, on the left in (7). Because [w] is lower in sonority than [j] and codas prefer high sonority over low sonority, the [w] glides are less likely to be parsed as single codas than the [j] glides. And because [ɹ] is more sonorous than [l], syllabic [ɹ] is predicted to be more likely than syllabic [l]. As a result, [aj.ɚ] would be the most likely two syllable production with this parse.

(7) Bisyllabic parses of underlying diphthong plus glide sequences

Coda glide



Onset glide



The other two-syllable parse available is one in which the glide fills an onset parse, on the right in (7). Because onset position prefers low sonority segments, the lower sonority [w] glide is more likely to be parsed in this way than the [j] glide. Rhotic nuclei are still more likely than lateral nuclei within those two categories, making [a.wɚ] the most likely sequence to take this parse. While an

extensive discussion of the two syllable parses is beyond the scope of the current paper, what is most important about the bisyllabic parses for the current study is that [ə˞] is more preferred than [ɫ], and our expectation would be that diphthongs followed by /l/ are more likely to be parsed as monosyllables than diphthongs followed by /ɹ/.

The preference list for monosyllabic parses of the diphthong plus liquid sequences in (6) agrees at least partially with the dictionary survey results of the previous section. Assuming that the dictionary pronunciation is accurately reflected by speakers, we should find fewer monosyllabic lexical items with an /auɹ/ rhyme than any other rhyme. The remaining rhymes are quite heavily weighted toward monosyllabic lexical items. While we will see in the next section that the dictionary pronunciation for number of syllables is not accurately reflected by speakers, the relative likelihood of a monosyllabic production of each of these rhymes conforms quite well to the theoretical prediction made in this section.

4. Experimental Results

The perception stimuli were created from an existing corpus originally recorded as part of a larger data collection project consisting of a word list containing 80 real words followed by 20 nonwords. The data was collected from 75 native speakers of English who each produced two tokens of each word. The corpus includes 15 words with rhymes consisting of /auɹ/, /aiɹ/, /aul/, /ail/, and /ɔil/, listed in (8). Because the corpus has been adapted for use in this study, data are not evenly distributed among the five rhymes nor are they split evenly between orthographically one syllable and two syllable words.

(8) Words included in perception stimuli

	1 syllable	2 syllables
/auɹ/	*our, hour, scour, sour*	*flower, tower*
/aiɹ/	*tire, fire, wire*	*liar*
/aul/		*towel*
/ail/	*aisle*	*dial* (1 or 2 syllables)
/ɔil/	*boil*	*royal*

Of the 2250 total tokens, a number of tokens were discarded at the outset. A few files were corrupted and unusable, two speakers mispronounced *aisle* as [ajzɬ] and [æksɬ], several speakers produced *score* for *scour*, and several produced *tower* for *towel*. Because the focus of the present study is on the vowel-glide-liquid sequence, productions that eliminated the glide (primarily [ɑɹ] and [aɹ]) were also removed, leaving 2189 tokens remaining. Each token was cut into an individual file from which the onset consonant plus vowel transition was cut

from the beginning, leaving the equivalent of multiple instances of what would sound to raters like five real words: OUR, IRE, OWL, AISLE, OIL. The goal of cutting the onset consonant from the files was to prevent raters from making judgments based on their intuition of the number of syllables in the original word and force them to listen more carefully to the token itself when asked to identify the number of syllables in the word. The files were randomized within words, giving each file a number from 1-2250.

Five raters (including the author) were asked to listen to the files and identify the number of syllables in each file. Raters were given the files and a rating sheet with three choices (1σ, 1.5σ, 2σ) corresponding to each numbered file. They were asked to listen to each file, identify it as one or two syllables, and circle the appropriate response. If they found that they had to listen to a file several times and were still not able to make a decision, they were to circle the 1.5σ response. Raters were not asked to do the entire task in one sitting (it takes several hours), and were given approximately three weeks to finish the task at their leisure. While each rater was confident in their ability to identify the number of syllables in a word at the beginning of the task, they each came back soon after beginning and asked what constitutes a syllable. The question was answered with a simple "Do you hear one beat or two?" along with reassurance that they could trust their instincts and that there was no expectation that the raters would agree on every token.

Because the production corpus is a word list and therefore relatively formal, we might expect fairly careful productions, potentially maximizing the number of two syllable productions. The dictionary pronunciation is also a relatively formal pronunciation so we might expect the production corpus to reflect the dictionary (orthographic) pronunciations. If the dictionary pronunciation is followed, we would expect approximately 65.9% of the /auɹ/ tokens to be rated as monosyllabic, 74.5% of the /aiɹ/ tokens to be rated as monosyllabic, none of the /awl/ tokens to be rated as monosyllabic (the only word included in this group being *towel*), 74.7% of the /ail/ tokens to be rated as monosyllabic, and half of the /ɔil/ tokens to be rated as monosyllabic. The perception task, on the other hand, was geared toward monosyllables as the 'words' presented to the raters were all orthographically monosyllables. If the sonority-based approach outlined in the previous section is accurate, we might expect to find more bisyllabic responses in tokens with a final /ɹ/, which makes a better peak than /l/. And we might expect to find more monosyllabic responses to tokens with a steeper sonority slope (/ajl/).

After entering the results from the raters and averaging the syllable count for each token, tokens were categorized as 1 syllable (average ≤ 1.4 syllables), 2 syllables (average ≥ 1.6) or 1.5 syllables (average is exactly 1.5 syllables). Tokens that were categorized as 1.5 syllables were counted as half monosyllabic and half bisyllabic in the results below. The results indicate that the number of syllables in the perception task was remarkably consistent within rhyme

categories, regardless of the expectation based on the dictionary pronunciation, arguing that orthography does not affect pronunciation of these words. For example, the results for OUR productions are provided in (9). Very few of these tokens were heard as monosyllabic overall (3.3% while an orthographic production would be expected to return approximately 65.9%). OUR words that are orthographically one syllable (the first four on this list) are consistently pronounced as two syllables, as are the orthographically two syllable words.

(9)

OUR	1σ	2σ	total
our	5.5	139.5	145
hour	4.5	142.5	147
scour	5.5	128.5	134
sour	4.5	141.5	146
flower	6.0	142.0	148
tower	3.0	146.0	149
	29.0	840.0	869
	3.3%	96. 7%	

More IRE words, shown in (10), are pronounced as one syllable than OUR words, but the number of one-syllable productions in this corpus is still quite small (11.2%). It is not even close to the expectation (74.5%) based on the orthography. IRE words that are orthographically one syllable are much more likely to be pronounced as two syllables than as one syllable, as is the orthographically bisyllabic and bimorphemic *liar*.

(10)

IRE	1σ	2σ	total
tire	14.0	132.0	146
fire	19.5	124.5	144
wire	21.0	128.0	149
liar	11.5	138.5	150
	66.0	523.0	589
	11.2%	88.8%	

Words in the corpus with final /l/ were more likely to be heard as monosyllables than words with final /ɹ/. This is made surprisingly clear with the results for OWL (*towel*) provided in (11). The orthographic expectation here is of a bisyllabic word yet this word returned the largest number of monosyllabic responses of the whole corpus from the raters. The *towel* tokens are in marked contrast to the *tower* responses that were heard as monosyllables only 2% of the time.

(11)	OWL	1σ	2σ	total
	towel	55	91	146
		55	91	146
		37.7%	62.3%	

Looking a little more deeply at the responses, not only were the *tower* tokens rated much more often as bisyllabic, there was less inter-rater disagreement on these tokens than on the tokens for *towel*. Of the 146 *tower* tokens that were ultimately classified as bisyllabic, 116 (79.5%) were heard as bisyllabic by all of the raters and another 24 (16.4%) were heard as bisyllabic by 4 raters and identified as 1.5 syllables by one rater. On the other hand, only 60 tokens (65.9% of those classified as two syllables) of *towel* were heard by all five raters as 2 syllables with only 2 additional tokens (2.2%) heard as bisyllabic by 4 raters and 1.5 syllables by one. The remaining tokens garnered more varied responses from the raters.

Monosyllabic productions for AISLE words were slightly lower than for OWL, as we see in (12). Recall here that the dictionary pronunciations for the words in this category indicate that *aisle* should be produced as a monosyllable and *dial* can be produced either as bisyllabic or monosyllabic. In this corpus, they are heard as monosyllables 24% and 25% of the time, respectively.

(12)	AISLE	1σ	2σ	total
	aisle	34	108	142
	dial	37	111	148
		71	219	290
		24.5%	75.5%	

The OIL words in (13) were the only category in which there was a marked difference in the production within the category. Orthographically monosyllabic *boil* was heard as a monosyllable 23.1% of the time, and the production of the orthographic disyllable *royal* was heard as a monosyllable only 6.4% of the time.

(13)	OIL	1σ	2σ	total
	boil	34.0	113.0	147
	royal	9.5	138.5	148
		43.5	251.5	295
		20.7%	79.3%	

Overall, the results here show that the dictionary pronunciations have very little impact on the production of this group of words. Aside from *royal*, there was very little difference in these data between the production of orthographically monosyllabic vs. bisyllabic words with the same rhyme. OUR words are by far

the least likely to be produced as monosyllables and OWL is the most likely to be monosyllabic. IRE and AISLE/OIL fall in between, with IRE being heard less often as a monosyllable than AISLE/OIL.

5. Conclusion

While two syllable productions are the norm throughout the corpus, there are some differences in the frequency of one- vs. two-syllable productions depending on the rhyme. Rhymes with final /ɹ/ are rarely heard as monosyllables, comprising only 6.5% of the OUR and IRE tokens combined. Rhymes with final /l/ are much more often heard as monosyllables, comprising 27.4% of the /l/-final data (excepting *royal* which patterns differently from the rest of the data). This suggests, following the theoretical prediction, that there is a preference for syllabic [ɚ] over a complex rhyme with an unfavorable sonority slope. On the other hand, the dispreference for syllabic [ɬ] results in more monosyllabic productions of /l/-final words, even when the sonority slope of the postvocalic cluster is identical as it is with [ajɹ] vs. [awl].

While the results presented here are necessarily constrained by the tokens available in a pre-existing corpus, the rhymes studied here clearly call for a more thorough study, perhaps focusing only on rhymes with /ai/ and /au/ followed by the two liquids and including all of the lexical items in English with these rhymes. Orthography is a primary influence on the pronunciation keys included in dictionaries and is also influential in individual intuitions regarding the number of syllables in words, as Lavoie and Cohn (1999) have shown. Individuals are also willing to listen to their own productions of full words and indicate the number of syllables in their production of such words, even if that assessment goes against the 'official' pronunciation. But when asked to identify the syllables in a corpus like the one used in this study without knowing the original word, the issue becomes less clear and more interesting. This study and others like it will certainly benefit from a more detailed analysis of both the phonetic details of the data itself and analysis of the inter-rater differences in the responses.

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The Emergence of Sentence-Initial *Hopefully* in Present-Day English

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1. Introduction

The English adverb *hopefully* has been considered problematic by usage experts and so-called 'grammar mavens' when used to express speaker stance or discourse position (as in 1):

(1) Hopefully, the rains won't flood the town.

The online *Oxford English Dictionary* (*OED*), for example, offers an unusual amount of usage advice in its definition of the word. The *OED* presents the stance usage as American (itself a mild rebuke) and implies German influence, assumedly from immigrant populations:

It is hoped (that); let us hope. (Cf. German *hoffentlich* it is to be hoped.) orig. U.S. (Avoided by many writers.)

On the other side of the Atlantic, *The Chicago Manual of Style* (15th edition, 2003) adopts a grudging level of acceptance (p. 218), although it also distinguishes *careful* writers from other (perhaps *careless*) types:

hopefully. The old meaning of the word ("in a hopeful manner") seems unsustainable; the newer meaning ("I hope" or "it is to be hoped") seems here to stay. But many careful writers deplore the new meaning.

These positions have, in turn, been considered by most linguists to be reactive and excessively prescriptivist, non-scientific responses to a widely-recognized, general pattern of language change. Whitley (1983) examines the development of *hopefully* (he terms it a modern 'shibboleth,' particularly in writing) in Present-Day English and determines that, despite the objections lodged against

it, *hopefully* fits well with a larger class of sentence adverbs or *style disjuncts*, as Greenbaum (1969) calls them.

In his discussion of the sociolinguistic reaction to *hopefully*, Whitley (1983) groups the objections by usage experts into several broad topics, including

- linguistic reasons (i.e., adverbs should only modify verbs or the original meaning of *hopefully* is not preserved),
- linguistic patriotism (i.e., *hopefully* is 'un-English', a bad translation of German *hoffentlich*),
- general protests against 'sloppiness' of use, and
- accusations of linguistic 'faddishness'.

Whitley's discussion highlights the ridiculousness of many of the reasons behind the prescriptive backlash against *hopefully*. However, although the rationale that underlies the reaction may indeed be threadbare, the reaction itself may have some validity.

This paper explores some of the unusual qualities of *hopefully* when used as a stance adverb. Section 2 examines the morphosyntax of *hopefully*, including its categorization as a modal adverb and some approaches to adverbial syntax. Section 3 briefly discusses language change, considering grammaticalization and lexicalization. Section 4 presents the lexical semantics of the word and section 5 clarifies the problem under investigation. Section 6 is an exploration of data from the Corpus of Historical American English (Davies 2013), and section 7 offers concluding thoughts on *hopefully*.

2. Background, Part 1: Morphosyntax

2.1. Modality

Adverbs such as *hopefully* are generally considered to fall within the realm of modality. Modality (also comprising the traditional grammatical category *mood*) is often considered an umbrella term for expressing speaker attitudes. Hacquard (2011) defines modality as "the category of meaning used to talk about possibilities and necessities, essentially, states of affairs beyond the actual" (p. 1484).

In English, modality is frequently associated with modal auxiliaries, which are used to express meanings involving irrealis. However, modal adverbs are quite common as well. There are two traditional categories of modality:

- *epistemic* (possibility) and
- *root/deontic* (permission/volition/ necessity).

Other categories that are often discussed in the literature include *dynamic* (circumstantial) and *bouletic* (desired).

Bybee, Perkins, and Pagliuca (1994:177-181) make use of somewhat different criteria in order to categorize four different types:

- *agent-oriented* (obligation, necessity, ability, desire, intention, willingness, root possibility),
- *speaker-oriented* (imperative, prohibitive, optative, hortative, admonitive, permissive),
- *epistemic* (possibility, probability, inferred certainty, counterfactuals), and
- *subordinating* (forms used in complement clauses, concessives, and purpose clauses).

One type of speaker-oriented modality is known as *optative*, meaning "the wish or hope of the speaker expressed in a main clause" (Bybee et al. 1994:179). The use of *hopefully* as an adverb of stance, indicating speaker hope, belongs straightforwardly to the optative category. Other terms used for similar types of modality include *desiderative* and *volitional*.

2.2. The syntax of adverbs

Until fairly recently, the generative approach to the syntax of adverbs has been largely to ignore them. In some earlier discussions (e.g., Espinal 1987), sentence adverbs are held to be syntactic *operators*—in other words, modifiers that demonstrate scopal relations through c-command. Espinal distinguishes operators from predicates based on position: Operators can only occupy A'-positions, while predicates must be phrasal heads.

Cinque (1999) follows the operator approach of Espinal but turns his attention to a universal order of adverbs. He advocates a cartography of adverb order, dependent on syntactico-semantic subcategory. These adverb subcategories are tied to verbal mood/modality, aspect, tense, and voice (p. 106):

(2) $\text{Mood}_{\text{speech act}} > \text{Mood}_{\text{evaluative}} > \text{Mood}_{\text{evidential}} > \text{Mod}_{\text{epistemic}} > \text{T(Past)} > \text{T(Future)} > \text{Mood}_{\text{irrealis}} > \text{Mod}_{\text{necessity}} > \text{Mod}_{\text{possibility}} > \text{Asp}_{\text{habitual}} > \text{Asp}_{\text{repetitive(I)}} > \text{Asp}_{\text{frequentative(I)}} > \mathbf{Mod_{volitional}} > \text{Mod}_{\text{obligation}} > \text{Mod}_{\text{ability/permission}} > \text{Asp}_{\text{celerative(I)}} > \text{T(Anterior)} > \text{Asp}_{\text{terminative}} > \text{Asp}_{\text{continuative}} > \text{Asp}_{\text{perfect}} > \text{Asp}_{\text{retrospective}} > \text{Asp}_{\text{proximative}} > \text{Asp}_{\text{durative}} > \text{Asp}_{\text{generic/progressive}} > \text{Asp}_{\text{prospective}} > \text{Asp}_{\text{SgCompletive(I)}} > \text{Asp}_{\text{PlCompletive}} > \text{Voice} > \text{Asp}_{\text{celerative(II)}} > \text{Asp}_{\text{repetitive(II)}} > \text{Asp}_{\text{frequentative(II)}} > \text{Asp}_{\text{SgCompletive(II)}}$

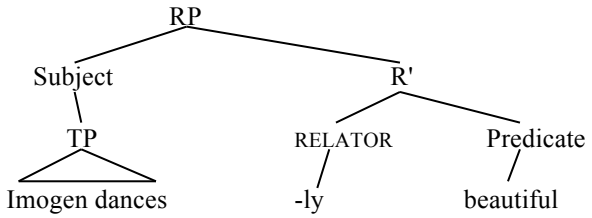
In this hierarchy, outside the VP/*v*P, *hopefully* demonstrates volitional modality (= optative). This is highlighted in (2).

2.3. Adverb predication

More recently, some attention has been focused on the presumed distinction between syntactic operators and predicates. Within the framework of the Minimalist Program, den Dikken (2006) examines predicate constructions of all types, and he includes both adjectival and adverbial modification in his study. He proposes a functional RELATOR head.

The RELATOR function does not assign θ-roles and is essentially non-directional; subject and predicate can align on either side of the RELATOR head. In particular, for this purpose, den Dikken singles out the *-ly* adverbial affix as a lexicalizing RELATOR. In example (3), a typical structure is illustrated in which the *-ly* morpheme acts as the head of a RELATOR structure, joining a VP-adverb with its verbal subject.

(3) 'Imogen dances beautifully.' (den Dikken 2006:30)



In a structure like the one in (3), the predicate, the adjective *beautiful*, will move to adjoin to the RELATOR head *-ly*, giving the appropriate sentence.

2.4. Combining Cinque (1999) and den Dikken (2006)

Combining the cartographic approach taken by Cinque (1999) and the predication approach to adverbs taken by den Dikken (2006) can help to explain sentence adverb constructions. If the functional heads listed in (2) are assumed to act as RELATOR heads, the *-ly* morpheme can behave functionally and the adjective can occupy the specifier position as a predicate. This will be the approach taken for *hopefully* (and similar words) when it is used as a sentence adverb.

3. Background, Part 2: Language Change

3.1. Grammaticalization

Grammaticalization is the name given to the sequencing or co-occurrence of several historical changes having to do with phonology, morphology, syntax, and semantics. There is a general shift, reflected in some or all of these linguistic subcategories, of the understanding and use of a word or construction in a language. Lexical words or constructions (i.e., from content categories like nouns, verbs, and adjectives) become grammatical in use and meaning. In recent years, grammaticalization has grown into a diachronic theory, with predictive and explanatory uses.

Reanalysis and *analogy* (Hopper and Traugott 2003) are the two main cognitive processes involved in grammaticalization. In reanalysis, target words or constructions are interpreted in new ways based (primarily) on their syntactic environment. An example in English is the shift in the phrase 'going to' from [participle + locative preposition] to [future/irrealis marker].

Analogy presumes patterning of like forms. A change that affects one example of a form (such as an adverb in *-ly*) may over time affect all examples of similar forms.

From a semantic/pragmatic perspective, *subjectification* (see, e.g., Traugott 1989) is a typical marker of grammaticalization. Traugott (1989:34-35) describes three tendencies of semantic change:

- Meanings based in the external described situation > meanings based in the internal (evaluative/perceptual/cognitive) described situation.
- Meanings based in the external or internal described situation > meanings based in the textual and metalinguistic situation.
- Meanings tend to become increasingly based in the speaker's subjective belief state/attitude toward the proposition.

It is clear that the change affecting *hopefully* (in its shift to stance adverb use) is one of subjectification. What is not clear (and what will be explored below) is whether that change is also an example of grammaticalization.

3.2. Lexicalization

In contrast to grammaticalization, lexicalization is a lesser-studied phenomenon, although recent work (e.g., Brinton and Traugott 2005) indicates a renewed interest in the subject. Lexicalization is focused on the shift from syntactic complexity to morphological complexity. It is studied synchronically, as a morphological process, and diachronically, as an example of language change. The diachronic process is important for this paper.

In Berry (2011), I have argued in favor of a lexicalization reading of evaluative, evidential, and epistemic adverbs, based on the phenomenon of *it*-extraposition and the use of the *-ly* affix in a predication structure. See (4):

(4) *that she won is clear > it is clear (that) she won > clearly she won*

However, for *hopefully* the adjective form is *hopeful*—not useful in an *it*-extraposition structure (cf. **It is hopeful that she won*). This unusual behavior for a stance adverb may hold a clue to the treatment of *hopefully* (and similar words such as *thankfully* and *regretfully*) by usage experts. Those who reject this usage may recognize the break in the pattern without realizing what exactly the pattern is.

4. The Lexical Semantics of *Hopefully*

Hopefully is an unusual modal adverb for English, an optative adverb. It is based on the word *hope*, of Germanic origin and found in Old English, for which there are/were noun and verb forms.

Givón (1995:131) regards *hope* and *fear* as verbs of 'epistemic anxiety', hybrid forms that encode both:

- epistemic uncertainty and
- preference (*hope*) or aversion (*fear*).

Therefore, *hopefully* lexically encompasses a weak epistemicity plus a psychological state. This ties in well with Bybee et al. (1994), who regard optative modality as speaker-oriented. All modality is based in a condition of irrealis/uncertainty.

As noted in section 1, *hopefully* is used in multiple ways. As noted by Chaemsaithong (2007), *hopefully* can act as:

- a modifier of a Verb Phrase,
- a modifier of a Noun Phrase/Infinitive Phrase,
- a modifier of a predicate (Verb + complements),
- a modifier of a clause/sentence.

In all of these cases except for the first one, *hopefully* is indicating speaker wish or hope (i.e., acting as a stance adverb with discursive meaning).

When used as a stance adverb, *hopefully* also demonstrates significant variance with regard to orientation. In all uses, *hopefully* reflects the wishes and beliefs of the speaker. However, grammatical number is not clearly marked in its use. Chaemsaithong (2007) notes that *hopefully* is inherently deictic. It can indicate:

- first-person singular *hope* ('I hope')
- first- + second-person plural *hope* ('we [inclusive] hope')
- first-person collective plural *hope* ('we [as a group/community/world] hope')

5. The Problem

With all of this disparate background, we can approach the problem at hand. How does *hopefully* change from being a manner adverb that contributes a sense of 'with hope' to a VP to being a stance adverb, attaching itself to other phrases/clauses?

One possibility to investigate focuses on grammaticalization (examining both reanalysis and analogy). Another possibility is lexicalization, using two models from previous research in Berry (2011): sentence adverbs that are associated with speech verbs (e.g., *hopefully* in 'speak hopefully') and those that are based on a revised it-extraposition structure.

6. Corpus Data

The theoretical approach to this problem is supplemented by an examination of the data at hand. Since *hopefully* is primarily considered an American innovation, this paper makes use of the 400-million-word Corpus of Historical American English (COHA; Davies 2013), which includes fiction and non-fiction, magazines, and newspapers. The COHA is one of the large corpora developed by Mark Davies of Brigham Young University, and it has a user-friendly interface that supports a large number of searches.

Table 1. Tokens of *hopefully* in the COHA, 1810-1939

Decade	Total tokens	ADJ modifier	Manner ADV: action verbs	Manner ADV: speech verbs	Stance ADV
1810s	2	2	–	–	–
1820s	4	1	3	–	–
1830s	13	–	12	1	–
1840s	21	2	13	6	–
1850s	70	2	47	20	1 (focus)
1860s	67	3	45	19	1 (focus)
1870s	71	2	50	19	1 (focus)
1880s	64	4	42	19	–
1890s	52	1	32	19	–
1900s	91	2	42	47	1 (focus)
1910s	120	1	60	58	1
1920s	186	4	103	75	2
1930s	142	–	72	69	1

In Table 1, the first thirteen decades of the COHA are examined. The period 1810-1839, which has a smaller number of source words, also shows a very limited number of tokens of *hopefully*. Later decades, however, are more consistent (and can be more easily compared) with regard to the number of words available to search.

Growth is fairly regular through the 19th and early 20th centuries, although limited. Increased frequency has often been associated with grammaticalization processes (see, e.g., Bybee et al. 1994). However, sentence adverbs are very few.

The sentence adverbs marked '(focus)' in Table 1 indicate examples that could lead to reanalysis. In these few cases, the manner adverb meaning 'with hope' has been focused and fronted in the sentence.

The concern with interpreting these examples as grammaticalizing is their extreme scarcity. One example per decade (where each decade includes 20 million words) of a focused adverb (as in example 5, from the 1870s) is probably not sufficient to prompt reanalysis.

(5) **Hopefully** we look forward to the time when our young people, following her example, will also be old-fashioned in purity of heart and simplicity of life, thus brightening like a sunbeam the atmosphere around them.
(Harriet Beecher Stowe, *Pink and White Tyranny*, 1871)

In addition, the sentence in (5), which includes a first-person pronoun and therefore should be available for reanalysis, does not lend itself to multiple

interpretations. Stowe is not indicating the personal uncertainty necessary for a stance interpretation, and such a reading is not available.

As the number of tokens increases, so does the association of *hopefully* with verbs of speech. However, this does not become a dominant element of the use of *hopefully*. It is therefore unlikely that *hopefully* lexicalizes from a speech-act clause formation (as has been argued for *frankly*—see 6).

(6) Possible stages in the lexicalization of *frankly* in English:

"May I speak frankly?" Farrell nodded. "Always, Pete." "Well, sir…"

I must speak frankly now and tell you that I see no reason for you…

If I might speak frankly, there's others [sic] still aboard more sickish…

To speak frankly, Barbara, do you think that this can be accepted…

Frankly speaking, if you're looking for good nutrition in a hot dog…

Frankly, in the spirit of free speech, that's good.

(Berry 2011:93)

The stance usage of *hopefully* does appear, however, even though the genres that dominate the COHA are written and somewhat formal, by the 1910s. Early examples of stance usage are in (7):

(7) a. 'The "Dutch" must be asleep,' I thought, 'or else they beat it.' **Hopefully** the latter!

(E. Morlae, 'A Soldier of the Legion', *The Atlantic Monthly*, 1916)

b. The very large need for nitrogen in agriculture and the fact that most legumes are food for livestock rather than for man have led to many and persistent experiments to determine whether some form of nitrogen-gathering organism could be induced to grow on the roots of other crops, **hopefully** the grasses or the grains, but thus far without success.

(Eugene Davenport, *The Farm*, 1927)

These are both earlier than the *OED*'s earliest attestation, from 1932. Shapiro (1999) claims a far earlier stance usage, in Cotton Mather's *Magnalia Christi Americana* from 1702 (see 8).

(8) Although a *Pastor* should be willing to encounter many Difficulties and *Infirmities* with his People; yet, in case that *Chronical Diseases*, which evidently threaten his Life, might **hopefully** be relieved by his removal, it should *then*, on all Hands, be allowed and advised.

This usage appears to be unclear, because the subject matter of the excerpt is religious. Many of the contexts surrounding *hopefully* in earlier texts (e.g., 19th century texts in the COHA) were religious, and in this case Mather may in fact mean that the relief will come through hope.

Table 2. *Hopefully* as a stance adverb from the COHA, 1940-2009

Decade	Total tokens	Stance ADV
1940s	184	–
1950s	220	4
1960s	232	65
1970s	158	65
1980s	173	91
1990s	214	123
2000s	368	262

Table 2 shows the dramatic growth of *hopefully* as a stance adverb in the latter half of the 20th and first decade of the 21st centuries. The few examples of stance-adverb *hopefully* from the 1950s are mostly from popular magazines (*Good Housekeeping*, *Sports Illustrated*), as well as one example from the economist and public intellectual, John Kenneth Galbraith, in a letter to the editor of the *New York Times*:

(9) One purpose of an election campaign, **hopefully**, is to get debate on new issues as well as old ones.

(*New York Times*, October 8, 1956)

The interesting point about the quote in (9) is the fact that this usage has appeared, fully formed, penned by a leading figure in a prestigious newspaper. This indicates that, whatever judgment has been hurled at it, stance *hopefully* is not necessarily a marker of low prestige.

In the 1960s, the stance usage becomes less rare; by the 2000s, it accounts for 71% of the tokens across the corpus. The growth is very rapid, yet again, there is no evidence for the reanalysis of a fronted adverb. In fact, the new form appears, essentially without warning.

7. Conclusions

It is perhaps easier to discard possible answers than to settle on a likely one. Two possibilities remain of the four initially considered.

The first is that *hopefully* becomes a stance adverb as a result of analogy. The growth of sentence adverbs in Modern English may be significant enough to 'pull along' *hopefully* (and similar adverbs like *thankfully* and *regretfully*). This is a possibility. However, there are similar adverbs, like *longingly*, that are not part of the same pattern. This weakens that particular theory.

The second returns to the question of lexicalization, but considers the affix between *hope* and *-ly*. The *OED* defines *-ful* below:

-ful, suffix

Forming adjs. In Old English the adj. *full*, like its equivalent in the other Germanic langs., was used in compounds with a preceding n., forming adjs., the etymological sense of which (= 'full of') is usually somewhat weakened, so that the words may be rendered 'having', 'characterized by' (the attribute denoted by the n.).

Notable in this definition is the origin of the affix, the word *full*. The semantic concept of possession/having is often defined as 'be with', which includes a copula meaning. The rendering of 'characterized by' is more obviously a copula meaning.

The *-ful*/*-ly* layering may be indicative of cyclicity. The original lexicalized RELATOR head *-ful* may have weakened over time and need to be supported by a productive RELATOR *-ly*.

However, another possibility here may be the function of the two affixes. *Hopefully* can be paraphrased as 'I hope'; *thankfully* as 'I thank/give thanks'; and *regretfully* as 'I regret'. In all of these cases, the *-fully* complex of morphemes carries the speaker from verb to adverb by way of nominal and adjectival meanings. It may in fact be the case that *-ful* is the necessary adjectival suffix that allows for the RELATOR *-ly* to attach.

Finally, the semantic composition of the root *hope* as an 'epistemic anxiety' verb may be the starting point for a grammaticalization process in which the deontic portion of the hybrid modal may be lost and the word may become completely epistemic. Models for similar change in English can be found in the history of the word *will*, which originally meant 'want' but lost its psychological shading in favor of a purely irrealis semantics.

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The Disjoint/Conjoint Form Distinction in Sotho

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1. Manifestations of the Disjoint/Conjoint Form Distinction in Sotho

In some Bantu languages the verb may have two distinct forms for all or some tenses: the disjoint form and the conjoint form. The disjoint form tends to be more morphologically complex and is typically used in clause-final environments. The conjoint form, on the other hand, tends to be morphologically simpler and favors non-clause-final environments. In this article I will discuss the disjoint/conjoint distinction in Sotho languages, which are represented here by Sesotho and Setswana. Morphosyntactic structures are practically identical in these two languages and thus I will draw data from both, noting the differences where needed.

The data in (1-3) illustrates the disjoint/conjoint distinction in Setswana.

(1) *Setswana*
a. *Conjoint Present*
bá-rék-á búkà
2PLSM-buy-FV CL9-book
"They are buying a book."
b. *Disjoint Present*
bá-à-rék-à
2PLSM-DISJ-buy-FV
"They are buying a book."

(2) *Setswana*
a. CONJOINT PERFECT FORM: **bá-tsh<u>á</u>mík-íl-é** di-kétó
CL2SM-play-PERF-FV CL10-keto
"We have played diketo."

b. DISJOINT PERFECT FORM: **bá-tshə̱mík-íl-è**
CL2SM-play.PERF-FV
"They played."

c. CONJOINT PERFECT FORM: **bá-tɬhə̱lʊ́χán-ts-é** sí-ǹtɬɛ̀
CL2SM-understand-PERF-FV CL7-good
"They understood well."

d. DISJOINT PERFECT FORM: **bá-tɬhə́lʊ̀χàn-ts-è**
CL2SM-understand-PERF-FV
"They played."

(3) *Setswana*

a. CONJOINT PRESENT NEGATIVE: **χà-ʊ́-tɬhàlʊ́χáɲ-ɪ́** sípɛ̀
NEG-2SGSM-understand-FV CL7-thing
"You do not understand anything."

b. DISJOINT PRESENT NEGATIVE: **χà-rí-tɬhàlʊ́χáɲ-ì** lí-rʊ̀ná
NEG-1PLSM-understand-FV with-they
"We do not understand either."

Observe that the disjoint/conjoint difference is manifested in terms of segmental material only in the Present tense: A form-medial "disjoint" morpheme /a/ appears in the Present disjoint form but not in the corresponding conjoint form. Due to this fact the discussion of disjoint/conjoint distinction in Sotho and other closely related languages has mostly been limited to present positive forms. Creissels (1996) provides clear evidence, however, that the disjoint/conjoint difference is found in all tenses and moods, although in all forms besides the Present the difference is manifested only in terms of tonal melody. In fact, in most moods and tenses conjoint and disjoint forms differ only in the way that the final syllable of the form behaves tonally. This kind of disjoint/conjoint distinction is illustrated in (3). In Perfect forms, however, the disjoint tonal melody is distinct from the corresponding conjoint melody form-medially.

In this article I propose an account for the disjoint/conjoint form differences that are observed form-medially, leaving to future research the disjoint/conjoint contrast that is limited to the tonal variation of the final as in (3). Therefore, the account will be limited to Present and Perfect positive forms of main clauses. Specifically, I will address the nature of the morpheme -a- in (1), its absence in (2), and the tonal alternations observed form-medially in (1) and (2). I will argue that these differences between disjoint and conjoint forms are due to the following factors: (a) v raises to T in conjoined environments but this movement is blocked in disjoint contexts; and (b) there is a PhWd-boundary before the verbal stem in disjoint forms.

2. Distribution of Disjoint and Conjoint Forms

In this section I will illustrate the environments that trigger disjoint and conjoint forms. I will show that in Sotho languages the distribution of disjoint and conjoint forms conforms to the following generalization: the disjoint form is used when the verb is not followed by any vP-internal material, while the conjoint form is used in all other environments. All examples in this section are provided in Sesotho orthography.

First of all, the "disjoint" morpheme -a- is missing when the verb is followed by its argument. This is illustrated in (4) below. Note that the morpheme -a- is absent whether the argument is in narrow focus or not.[1]

(4) *Sesotho*
- a. Ba-shanyana ba-no-a le-bese
  CL2-children CL2SM-drink-FV CL14 -milk
  "Children are drinking milk."
- b. Ba-shanyana ba-no-a le-bese
  CL2-children CL2SM-drink-FV CL14 -milk
  "Children are drinking MILK (not water)."
- c. Ba-shanyana ba-no-a eng?
  CL2-children CL2SM-drink-FV what
  "What are children drinking?"

The disjoint morpheme -a- is also absent when the verb is followed by a verbal adjunct. As (5) shows, the adjunct can be an adverb of manner or time or a prepositional phrase of some kind. The most important factor is that the adjunct is verbal, not clausal.

(5) *Sesotho*
- a. ba-sadi ba-bu-a ha-holo
  CL2.woman CL2SM-talk-FV PREP-much
  "The women talk a lot."
- b. b-ana ba-fihl-a kajeno
  CL2-child CL2SM-arrive-FV today
  "Children arrive today."
- c. ke-j-a ke foroko
  1SGSM-eat-FV by CL9.fork
  "I eat with a fork."
- d. ke-bin-a se-ntle
  1SGSM-sing-FV CL7-well
  "I sing well."

The disjoint morpheme is also absent in locative expletive constructions where the logical subject is postverbal:

(6) *Sesotho*
ho-bin-a ba-sadi
CL17SM-sing-FV CL2-women
"There are women singing."

The disjoint form, on the other hand, is used when the verb is not followed by any vP-internal lexical material. This is the case with intransitive predicates without any verbal adjuncts.

(7) *Sesotho*
a. ke-a- sebets-a
1SGSM-DISJ-work-FV
"I work/am working."
b. ba-sadi ba-a-bin-a
CL2-woman CL2SM-DISJ-sing-FV
"The women are singing."

Again, note that the verb may be in narrow focus or the focus may be broad. The most crucial factor for the choice of the disjoint form is that the verb is not followed by any vP-internal material. As expected then, sentential adjuncts do not trigger the conjoint form, since they are outside of vP.

(8) *Sesotho*
ke-a-sebets-a le nna
1SGSM-DISJ-work-FV with I
"I too work/am working."

Question enclitics are used with a conjoint form of the verb. Thus, in the example below the object WH-word *eng* appears in cliticized form *ng*.

(9) *Sesotho*
Ba-shanyana ba-no-a-ng?
CL2-children CL2SM-drink-FV-what
"What are children drinking?"

By contrast, object proclitics do not trigger the conjoint form:
(10) *Sesotho*
ba-shanyana ba-a-e-bal-a
CL2-child C2SM-DISJ-C9OM-read-FV
"Children are reading it."

Note also that it is not the object proclitics per se that trigger the disjoint form because the conjoint form is used with an OM, provided that there are other arguments or VP-adjuncts that follow the verb:

(11) *Sesotho*
ba-shanyana ba-e-bal-el-a mo-rena
CL2-child C2SM-C9OM-read-APPL-FV CL1-chief
"Children are reading it to the chief."

Clearly, the only factor that plays a deciding role in distribution of disjoint and conjoint forms is whether there is any vP-internal material that follows the verb or not.

Two circumstances result from this distribution of disjoint and conjoint forms. The first is that the verb in the disjoint form is always vP-final. The second is that the verb in the disjoint form is always PhPhr-final since vP-boundary coincides with PhPhr-boundary. I suspect that the disjoint/conjoint variation in the final (illustrated in [3]) has to do with the position of the verb in relation to PhPhr-boundary, but the concrete analysis remains outside of the scope of this article. Here I focus on the disjoint morpheme -a- and on the form-medial tonal alternation that are observed in Present and Perfect.

3. The Disjoint/Conjoint Distinction in Main Clauses

3.1. The nature of the "disjoint" morpheme in Present forms

The hallmark of the disjoined/conjoined contrast in the Present is the morpheme /a/ found in the disjoined form between the Subject Marker (SM) and the verbal stem. Crucially, the disjoint morpheme /a/ is absent in Perfect disjoint forms, as illustrated in (2). In this section, I will make a proposal regarding the nature of the disjoint morpheme and account for its absence in the Perfect.

I propose that the disjoint morpheme /a/ is a functional equivalent of the morpheme known as the Final Vowel (FV) in Bantu linguistics. The FV is the final vocalic suffix. In verbs, it reflects modal and aspectual features of the verb. Working in the framework of Distributed Morphology (Halle and Marantz 1993, 1994), I propose that both the disjoint morpheme and the final vowel of the verb are dissociated morphemes (i.e., morphemes that are added at MS) and thus do not correspond to any head in syntax. I will call these dissociated morphemes Theme Vowels (ThVs) in parallel with Oltra-Massuet and Arregi's (2005) analysis of Theme Vowels in Romance. A ThV is adjoined to every topmost terminal node X° at MS (Morphological Structure) by the following rule:

(12) Sotho ThV adjunction:

$[_{MWd}\ X^{\circ}] \longrightarrow [_{MWd}\ X^{\circ}\ \ ThV]$

The rule in (12) ensures that every Morphological Word (MWd) contains at least one ThV. A given word may, however, contain more ThVs if it is produced by merger of several MWds after the operation in (12) has already applied. In particular, the structure that is normally referred to as a "verb" in descriptive Bantu sources may contain as many as three or four ThVs. ThVs in verbs are assigned exponents by the following rule.[2]

(13) ThV ↔ <Ó> /[+1MF] __, where MF is a [+neg], [+perf]
↔ <a>

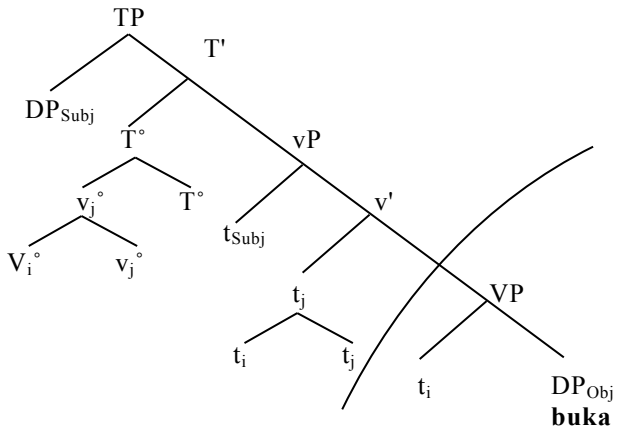
The rule in (13) states that the exponent of the ThV is a floating tone if the verb is marked with either [+neg(ative)] feature or with the [+perf(ect)] feature. In all other cases the exponent of the ThV is /a/. The two cases where the ThV is a floating tone are shown in (2) and (3). I propose that the finals seen in these two contexts consist of floating tones. The segment *-ɪ/e* that appears verb-finally is an epenthetic vowel.[3] In (2) the verb is marked with the feature [+perf], and the final consists of a floating tone,[4] and in (3) the verb is marked with the feature [+neg], and the final also consists of a floating tone. Note that when both features [+neg] and [+perf] are present, the exponent of the ThV is *-a*, since the rule in (13) specifies that the exponent of the ThV is a floating tone when the verb is marked with a single feature only:

(14) *Sesotho*
ha-ke-a-rek-a pudi
NEG-1SGSM -DISJ-buy.PERF-FV CL9-goat
"I have not bought."

Crucially, I propose that the "disjoint" morpheme is basically a ThV that is adjoined to T, and thus its exponent is also assigned by the rule (13). It is -a when the verb is unmarked or is marked with both [+perf], [+neg] (see on this below) and is a segmentally null morpheme when the verb is marked as [+perf] or [+neg]. The question that arises then is why the ThV is present only in disjoint forms, and I will now attempt to answer it.

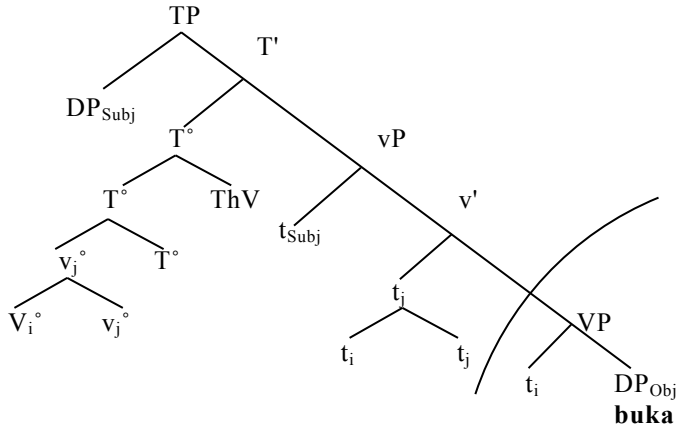
I propose that verb moves out of vP and raises to T in Sotho. However, this movement is subject to a condition that vP must be non-empty.[5] This is ensured in the following way. Assuming Phase Theory (Chomsky 2001, 2008), when the v-phase is complete, its complement reaches spells out and it is evaluated for content. The verb raises to T if one of the following is true: (i) vP contains at least a MWd; (ii) [Spec, vP] is filled. The result is the conjoint form of the verb with the structure at the input to morphology as shown in (15):

(15) Present Conjoint form



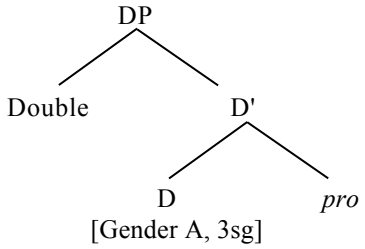
At MS the following two operations take place. First of all, ThVs are adjoined to each X° by the rule in (12) turning the structure (15) into (16).[6]

(16) Present Conjoint form



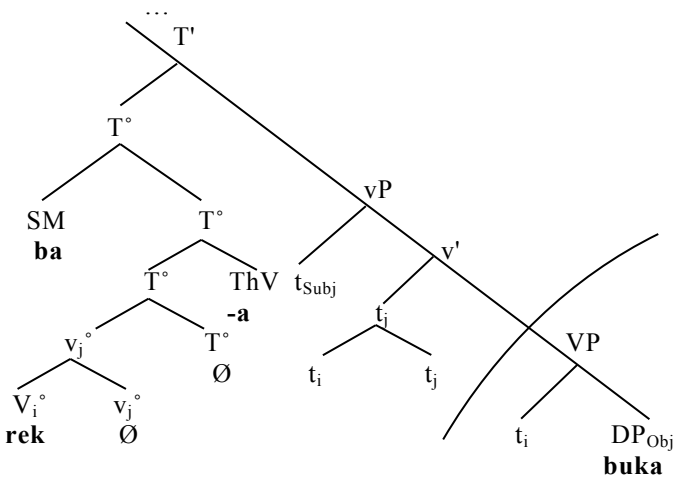
Assuming the "big DP" hypothesis (Uriagereka 1995), the DP$_{Subj}$ has the structure as shown in (17).

(17) Present Conjoint form



The element in D is the Subject Marker (SM), which is really a subject clitic. Following adjunction of ThVs the SM prefixes to T°. The result of this operation is a complex T that contains both the SM and the verbal stem.

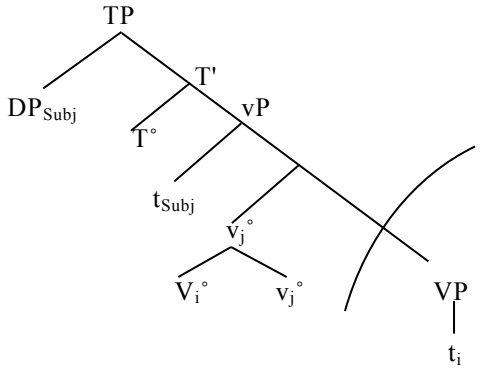
(18) Present Conjoint form



In (18), T is unmarked with either [+perf] or [+neg], and thus the ThV is assigned the default exponent /a/ by the rule in (13). The resulting structure spells out as /ó réká mòsé/ (I will derive the tonal contour in the next section).

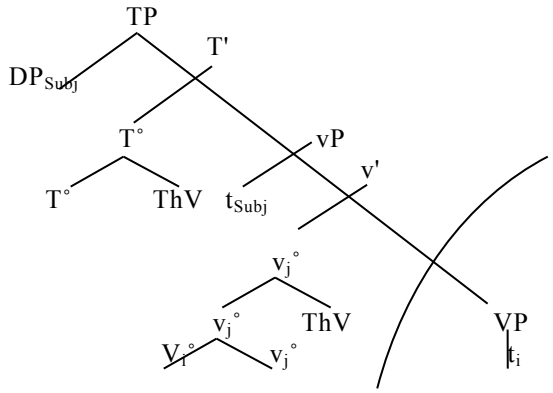
In disjoint forms, on the other hand, the complement of vP contains no lexical material. If [Spec, vP] is also empty (as is the case for all sentences with preverbal logical subjects) the movement of the verb to T is blocked. The tree in (19) illustrates the structure of the clause at the input to morphology:

(19) Present Disjoint form



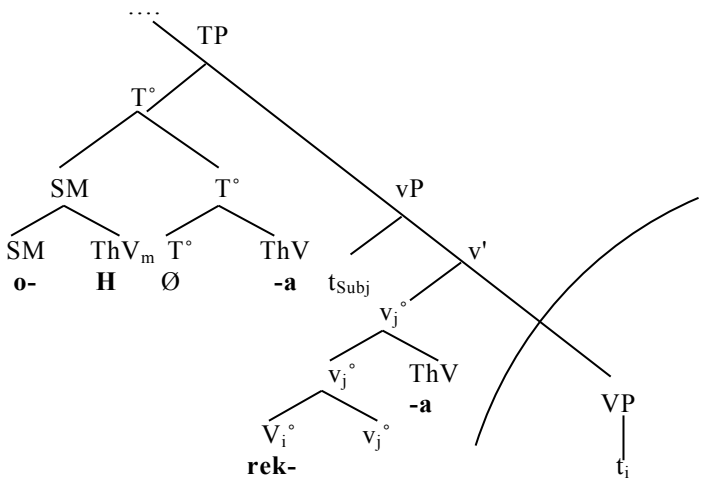
After adjunction of ThVs the structure looks as follows:

(20) Present Disjoint form



When the SM prefixes to T, it is not part of the same MWd as the verb because the verb remains lower in the structure. The ThVs that adjoin to T° and v° are both assigned the exponent /a/ since these nodes are not marked with any appropriate features. The structure that is generated is shown in (21). It spells out a string [ó a rɛ́ka], which is the correct output.

(21) Present Disjoint form



The ThVs in (21) both have the exponent /a/ because they are adjoined to unmarked head T and v. Since the disjoint morpheme /a/ is nothing else but a ThV adjoined to T°, it becomes clear why it is absent in the Perfect: the ThV has a segmentally null exponent in [+perf] contexts by the rule in (13). The floating H is deleted because it has no segmental material to link to, and thus nothing remains in the place of the "disjoint" morpheme. In the next section I will show, however, that division of the disjoint form into two words, as can be seen in (20), is still manifested in the tonal contour.

3.2. Tonal effects of disjoint/conjoint distinction

Since the verb moves to T and the SM prefixes to T°, in conjoined forms the SM forms part of the same MWd as the verb. The whole verbal complex is mapped to a single PhWd. On the other hand, in disjoint contexts, the verb is inserted in vP. When the SM prefixes to T°, it is not part of the same MWd as the verb. As (21) shows, the verbal complex is divided into two MWds in this case. These two MWds are mapped to two PhWds. Thereafter, the first MWd prefixes to the second in a way that creates a recursive PhWd (see Selkirk 1995 for the discussion of various types of clitics). Conjoint and disjoint forms of tensed main clauses are thus structured as follows:[7]

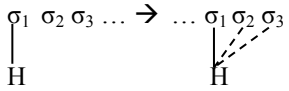
(22) a. CONJOINT FORM: {[((SM)-(V-v-T-**ThV**))]-~~(V-v-)~~-[(**OBJ**)]}
b. DISJOINT FORM: {[((SM)-(T-**ThV**))-[(V-v-**ThV**)]]}

In this section, I will show how these differences in structure are responsible for distinctions in the tonal contour of disjoint and conjoint forms. This section will concentrate exclusively on data from Setswana, since there exist significant differences in tonal processes of different Sotho languages.

Tonal rules can be divided into cyclic and post-cyclic. According to the theoretical framework assumed here (DM), Vocabulary Items are inserted into morphosyntactic structures cyclically from the root outward, and thus cyclic domain is basically the domain of MWd. Some phonological exponents are linked to H-tones underlyingly. The H-tones added to the phonological structure of the word at each cycle are then subject to the following two guiding principles of Bantu tonology: on one hand the H-tone seeks to spread as much as possible, on the other adjacency of H-tones is strongly disfavored. Therefore, we have two cyclic (i.e., MWd-internal) rules in Setswana: the rule of 2-syllable H-tone spread and the rule of H-domain fusion.

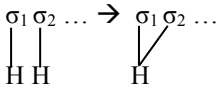
The rule of 2-syllable H-tone spread is formalized in (23). It states that if an H-tone has at least two toneless syllables to its right, it will spread up to two syllables. This rule does not apply if the H-domain expansion will result in H-tone adjacency within the same word.

(23) Cyclic 2-syllable H-tone spread:



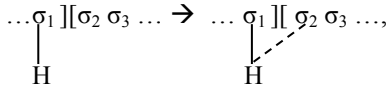
The second cyclic rule states that if at any cycle of VI, a monosyllabic H-domain becomes adjacent to another H-domain, the monosyllabic H-domain incorporates (fuses) with the following H-domain. This rule is formalized in (24) below:

(24) Cyclic H-domain fusion:



The rules (23) and (24) apply cyclically within MWds. Generally speaking, PhWds are mapped in alignment with edges of each MWd. Two rules apply at the junction of PhWds after they are mapped. H-domains that delimit the final syllable of a PhWd are evaluated in regards to the OCP. If a given H-domain is followed by at least two toneless syllables in the following PhWd, it expands one syllable across the PhWd boundary. This rule is formalized as (25).

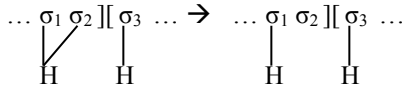
(25) Across PhWd-boundary 1-syllable H-tone spread:



where [is a PhWd-boundary

A polysyllabic H-domain is retracted if the following PhWd begins with an H.

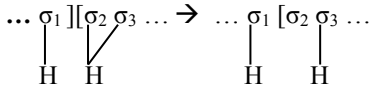
(26) Retraction from the final:



The H-domain that extends to the final syllable of the word is also retracted if it is followed by a pause (IntPhr-boundary). It is not retracted, however, if the two PhWds are separated by the PhPhr-boundary.[8]

When PhWds are merged to create a recursive PhWd, Left Branch Delinking (LBD) is used as a repair strategy for OCP-violations that arise in the course of this process.

(27) Left branch delinking (LBD)



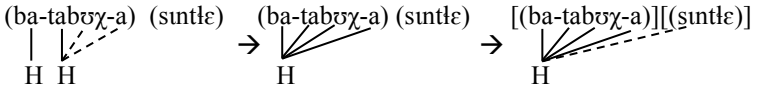
LBD obviously fails to apply when the OCP violation results from adjacency of two monosyllabic H-domains. In such cases the two H-domains are fused.

I will now show how these rules generate tonal patterns that are observed in disjoined and conjoined positive Present and Perfect forms in Main Indicative clauses.

As illustrated in (16) and (22a) in the conjoined form, the verb is inserted in T and is part of the same MWd as the SM. Thus, cyclic rules apply between all elements of this structure.

If the verb is H-toned, the H-tone of the root spreads two syllables to the right by the rule (23). If the SM is also H-toned, the rule (24) applies during the cycle when the SM is added, merging the monosyllabic H-domain of the SM with the adjacent H-domain formed by the H-tone of the root:

(28) Conjoined Present: H-toned verb *Setswana*

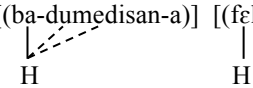


CL2SM-run-FV CL7-good
"They run well."

(Creissels 1997: 94)

With a toneless verb and an H-toned SM, the H-tone of the SM spreads two syllables to the right according to the rule (23):

(29) Conjoined Present: toneless verb *Setswana*



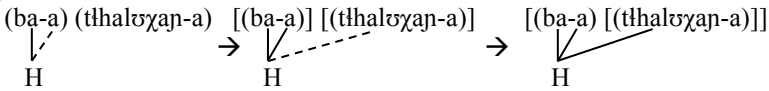
CL2SM-greet_each_other-FV only
"They greet each other only."

(Creissels 1997: 95)

In the disjoined present form, on the other hand, the verbal complex is comprised of two MWds. Prior to VI the SM prefixes to T. However, the verb, which remains in vP, is not part of this MWd.

During VI the H-tone of the SM spreads one syllable to the right by the rule (23). When MWds are mapped to PhWds, the verbal complex in the Disjoined Present form is initially mapped to two PhWds. As a result, the toneless syllable of the following stem is annexed across the PhWd boundary by application of the rule (25). No additional changes apply when the IS is prefixed to the MS.

(30) Disjoined Present: toneless verb *Setswana*

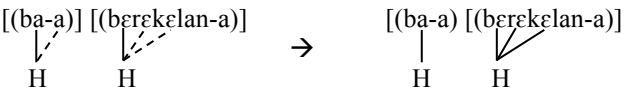


CL2SM-DISJ-understand-FV
"They understand."

(Creissels 1997: 90)

In the disjoint form of an H-toned verb the H-tone of the SM spreads to the final of the PhWd and then retracts by the rule (26) after PhWds are first mapped. When the IS prefixes to the MS, there is a toneless syllable that serves as the buffer between the two H-tones.

(31) Disjoint Present: H-toned verb *Setswana*



CL2SM.DISJ.work_for_each other-FV
"They work for each other."

(Creissels 1997: 90)

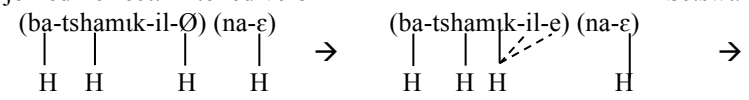
As mentioned in Section 1, in terms of the segmental content, there is no difference between the disjoined and the conjoined Perfect forms. As a result, the discussion of the disjoined/conjoined distinction in the literature has been largely limited to non-Perfect forms. However, Creissels (1996) deserves the credit for noting that there is a tonal difference. Compare the disjoined/conjoined pairs in (2).

One aspect of the tonal difference between disjoined and conjoined Perfect forms is due to the presence of a floating H-tone in the conjoined but not disjoined forms. I assume that the floating H-tone is present in both forms at the start of derivation but that it is deleted in disjoint forms. In conjoint forms the floating H-tone links to the second syllable of the stem and spreads to the end of the word.

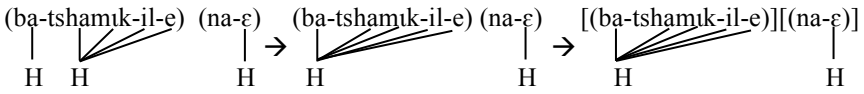
Another point of difference between disjoined and conjoined perfect forms has to do with tonal behavior at the juncture of the SM and the verb stem. As can be seen in (2), in conjoined Perfect forms of H-toned verbs the H-tone of the SM merges into the H-domain sponsored by the first syllable of the root. In disjoined Perfect forms of H-toned verbs, the H-tone of the SM triggers retraction of the neighboring H-domain instead, leaving the initial syllable of the verb stem toneless as a result. In my view, these differences in the tonal patterns of the disjoined and conjoined Perfect forms are due to the presence of a PhWd-boundary to the left of the verb stem in the disjoined but not in the conjoined form.

Starting with H-toned verbs, consider operations that apply. In the conjoined Perfect form, the SM prefixes to the V-ASP-T complex head, creating a structure like the one in (22a), except including an aspectual head. When the SM is H-toned, there are three H-tones that are within the domain of cyclic rules: the H-tone of the SM, the H-tone of the root, and the floating H-tone that links to the second syllable of the stem. This third H-tone is the only one that is able to spread. The monosyllabic H-domains fuse cyclically with the adjacent polysyllabic H-domains according to the rule in (24). As a result, the whole verbal complex presents a single H-domain. Post-VI the MWd is mapped to a single PhWd and no further operations apply.

(32) Conjoined Perfect: H-toned verb *Setswana*



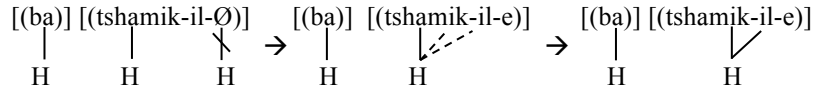
CL2SM-play-PERF-FV with-CL1
"We have played with him/her."



(Creissels 1997: 109)

In the disjoined form, on the other hand, the same segmental material belongs to two different MWds from the start (see structure [22b]). Because the SM and the verb stem belong to different MWds, cyclic rules do not apply between them. Instead, when the IS prefixes to the MS at PF and the two H-domains are brought into contact, the polysyllabic H-domain de-links from its leftmost syllable to avoid H-domain adjacency by the rule in (26). In other words, H-domain retraction is triggered.

(33) Disjoined Perfect: H-toned verb *Setswana*

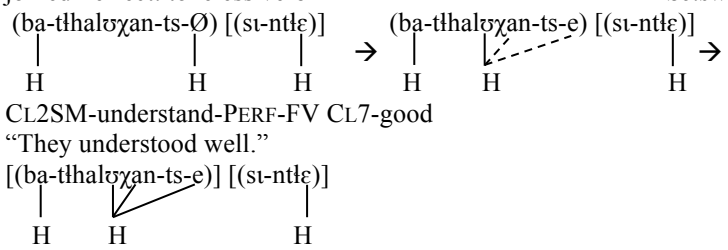


CL2SM-play-PERF-FV
"They have played."

(Creissels 1998: 173)

In the conjoined Perfect form of the toneless verb, the floating H-tone which links to the second syllable of the stem and spreads to the end of the verb (with the subsequent annexation of the toneless syllable across the PhWd-boundary) prevents the H-domain sponsored by the SM from expanding. No other processes apply.

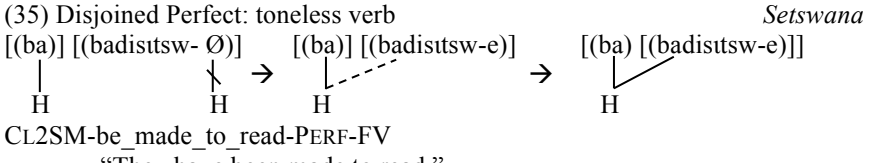
(34) Conjoined Perfect: toneless verb *Setswana*



(Creissels 1997: 110)

The same toneless verb in the disjoined Perfect form will have a PhWd boundary separating the SM from the verb root. The rule (25) applies, and the H-tone of the SM annexes one toneless syllable across the PhWd-boundary. No further changes apply when the IS is prefixed to the MS.

(35) Disjoined Perfect: toneless verb *Setswana*



CL2SM-be_made_to_read-PERF-FV

"They have been made to read."

(Creissels 1997: 105)

The present account ties the difference in the tonal contours of the disjoined and conjoined forms to the syntactic operation of V-to-T movement, and to the differences in the structure of disjoined and conjoined forms that result from this operation. The fact that the SM and the V belong to separate MWds is evidenced primarily by the fact that cyclic tonal rules do not apply between them. Furthermore, as (20) shows, when PhWd-boundaries are mapped in alignment with the edges of every MWd, the SM and the verb make part of two different PhWds. The PhWd-boundary is then manifested in post-cyclic tonal processes that apply between PhWds at PF.

In conclusion a few words need to be said about negative forms. The requirement that vP contains at least an MWd applies only to main positive clauses. Therefore, negative main clauses and all subordinate clauses do not manifest disjoint/conjoint distinction. The verb always moves to T in these clauses (provided they are tensed), and thus morphology (both tonal and segmental) is that of conjoint forms.[9] The only exception to this statement is the Perfect Negative form that is illustrated in (14). Surprisingly, this negative form has morphology that looks always disjoint, since it contains the form-medial morpheme /a/. I propose that in Perfect Negative forms the verb never raises to

T.[10] The two ThVs adjoined to T and to v are both -a's by the rule in (13), since the verb is double-marked as [+perf], [+neg].

Notes

[1] There are other Bantu languages where the disjoint/conjoint contrast is tied to the presence of narrow focus (see van der Wal 2006 for Makhuwa and Ndayiragije 1999 for Kirundi).
[2] Here I limit discussion to tensed clauses, leaving aside subjunctives, consecutives and imperatives.
[3] The final segment of the verb is /e/ specifically after the suffix -il-. In negative Present forms and in Perfect forms that do not use the suffix -il-, the final segment of the verb is /ɨ/.
[4] This H-tone deletes in disjoint forms (i.e., PhPhr-finally) and thus can only be observed in forms (2a, 2c).
[5] The reason for this seems to be tied to focus. vP must contain the focused constituent in Sotho.
[6] Only adjunction of ThVs relevant to the discussion is shown here.
[7] ~~Crossed-out~~ font = traces of moved elements, { = PhPhr boundary, [= PhWd boundaries, (= MWd boundary, SM = Subject Marker, T = Tense, V = Verb, M= Mood, OBJ = Object .
[8] There are some exceptions to this statement that have underlying reasons outside of this paper's scope. Thus an H-domain does not retreat from the final of the verb if the following PhWd is class 9 or 1a noun, or if the verb is a negative or participial form.
[9] Again, we are leaving aside the conjoint/disjoint distinction manifested in tonal association of the final only.
[10] This has to do with some properties of the negative perfect head. It appears that it must be realized in situ. Since in Sotho the perfect exponent of Asp is segmentally null in negative clauses, the verb has to stay in Asp.

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