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Syntactic Complexity and Competition: The Singular-Plural Distinction in Western Armenian

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There is much debate in the linguistic literature about what mechanisms are responsible for accessing, implementing, and restricting grammatical competition. Building on this line of research, this article explores competition between plural and singular marking in Western Armenian, a language where grammatical competition results in a restricted interpretation of singular nouns. Of interest to competition theories in general, this restriction only occurs in certain grammatical environments: namely, definite NPs. As argued here, an adequate treatment of these facts requires comparing utterances in terms of their syntactic complexity (as Katzir (2007) proposes).

Keywords: Western Armenian, singular-plural competition, local pre-supposition, syntactic simplicity

1 Introduction

Ever since Jakobson's (1932) discussion of gender underspecification and Grice's (1975) introduction of implicatures, there has been much speculation about meaning and grammatical competition. This speculation has influenced the semantic analysis of number marking. For example, Krifka (1989), Sauerland (2003), and Spector (2007) all argue that plural nouns are semantically underspecified for number but often communicate a strict plural meaning because of competition with singulars (for discussion of the contrast between semantic and syntactic plurality, also see Hoeksema 1983, Van Eijck 1983). Supporting this type of theory is the fact that plural nouns often quantify over singular objects in environments that typically reverse the effects of competition, such as questions like (1a) and downward-entailing constructions like (1b).

- (1) a. Do you have children? (can be answered affirmatively if the addressee has only one child)
- b. Every woman that has children will get a tax break. (implies that even mothers who have only one child will get a tax break)

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Furthermore, pluralia tantum nouns—nouns that have no singular counterpart—often refer to singular objects even in upward-entailing or nonmonotonic contexts, as shown in (2).

(2) Those scissors are mine. (can be used to refer to one paper-cutting tool)

Although previous works have argued convincingly that competition plays a role in meaning (whether pragmatic or semantic), there is much debate about what mechanisms are responsible for accessing, implementing, and restricting this competition. In an effort to build on this line of research and broaden the empirical perspective, this article explores competition between plural and singular marking in Western Armenian. Western Armenian has a slightly different semantics than English in that the so-called singular nouns are underspecified for number while plural nouns always have a strict plural interpretation. Furthermore, grammatical competition results in a restricted interpretation of singular nouns rather than plurals. Of interest to the analysis of number marking and theories of grammatical competition in general, this competition only occurs in certain grammatical environments: namely, when a noun phrase has a definite interpretation but critically not when it has an indefinite interpretation. As argued here, an adequate treatment of these facts requires comparing utterances in terms of their syntactic complexity (as Katzir (2007) proposes).

Section 2 presents data from Western Armenian demonstrating when competition occurs and when it is blocked. Section 3 demonstrates that traditional approaches to competition (such as Grice's (1975)) cannot account for the lack of competition in certain environments without auxiliary hypotheses. Section 4 discusses a potential syntactic explanation that does not involve competition. As demonstrated, this account requires many stipulations to deal with problematic data points. Sections 5 and 6 argue that Katzir's (2007) hypothesis that syntactic structure restricts competition provides the best account of Western Armenian.

2 Meaning and Number Marking

In many different syntactic environments, so-called singular nouns in Western Armenian have an inclusive semantic denotation (consisting of both individuals and groups) and thus resemble bare nouns that are assigned a general number interpretation in other languages (see Corbett 2000). However, unlike many of these other languages, Western Armenian has a productive plural marker that is associated with a strict plural interpretation. Furthermore, bare nouns do sometimes have a strict singular meaning in certain grammatical contexts.

2.1 Singular Nouns and General Number

Plural nouns in Western Armenian consist of a noun stem, such as *dəgha* 'boy', plus a plural marker *-(n)er*. Thus, *dəgha-ner* is the plural denoting boys whereas the bare noun *dəgha* represents the singular. As Donabédian (1993) notes, so-called singular nouns do not behave like their counterparts in English. For example, singular nouns in indefinite contexts are often used to talk about groups of two or more. Consider (3).

(3) *Dəgha vaze-ts.*
 boy(SG) run-PST
 'One or more boys ran.'

As reflected in the translation, this sentence can be used to talk about one boy running or a group of boys, depending on the context.

Independent of these indefinite contexts, the behavior of nouns in predicate position provides further support that singulars contain groups in their denotations (see Bale, Gagnon, and Khanjian 2011a). As shown in (4), *dəgha* can be predicated of singular individuals (such as *John-ə*) or of groups (such as *John-ə yev Brad-ə*).

- (4) a. John-ə dəgha e.
 John-DEF boy(SG) is
 ‘John is a boy.’
 b. John-ə yev Brad-ə dəgha en.
 John-DEF and Brad-DEF boy(SG) are
 ‘John and Brad are boys.’

There are two possible explanations for this fact. Either singular nouns contain both groups and singular objects in their denotations, or they contain only singular objects but NP-predication critically involves a distributive operator (i.e., an operator that distributes the NP predicate over each member of the plural subject). The latter explanation is unlikely given that Western Armenian (like most other languages) does not permit a distributive interpretation of NP predicates. For example, consider (5a–c).

- (5) a. John-ə yev Brad-ə yergu dəgha-ner en.
 John-DEF and Brad-DEF two boy-PL are
 ‘John and Brad are two boys.’
 b. ??John-ə yev Brad-ə meg dəgha en/e.
 John-DEF and Brad-DEF one boy are/is
 ‘John and Brad are one boy.’
 c. ??John-ə yev Brad-ə dəgha mən e.
 John-DEF and Brad-DEF boy INDEF(SG) is
 ‘John and Brad are a boy.’

Sentence (5a) is an example of an NP predicate coherently applying to a group-denoting NP subject. Such an application does not require a distributive operator. In contrast, it is not possible to get a coherent interpretation of (5b) and (5c) (i.e., an interpretation that can be paraphrased as ‘John is a boy and Brad is a boy’), even though such an interpretation should be available if a distributive operator were present.¹ Since these types of sentences do not permit a distributive interpretation, the data in (4) strongly suggest that the denotations of bare singular nouns contain not only individuals but also groups. (See also Donabédian 1993, Bale and Khanjian 2009, Bale, Gagnon, and Khanjian 2011b.)

¹ The difference between (5b) and (5c) is that the NP predicate in the former contains the numeral modifier *meg* ‘one’, while the latter contains the indefinite singular morpheme *mən*.

2.2 *Plural Nouns and Strict Plurality*

The semantics of singular nouns contrasts sharply with that of plurals. Unlike their singular counterparts, plurals can only be predicated of groups, as shown in (6), where *dəgha-ner* cannot be predicated of the singular subject *John-ə*.

- (6) a. John-ə yev Brad-ə dəgha-ner en.
 John-DEF and Brad-DEF boy-PL are
 ‘John and Brad are boys.’
 b. *John-ə dəgha-ner e.
 John-DEF boy-PL is

Such facts suggest that the denotations of plural nouns only contain groups consisting of two or more individuals.

Further support for this conclusion comes from indefinite existential sentences like (7).

- (7) Dəgha-ner vase-ts-in.
 boy-PL run-PST-3PL
 ‘Two or more boys ran.’

Although the singular noun can be used to existentially quantify over singular boys and groups (see (3)), its plural counterpart can only be used to quantify over groups consisting of two or more.

Such a distinction surfaces even in downward-entailing contexts, as in (8).

- (8) a. ?Amen mart vor bəzdig-ner uner vodk-i gajne-tsav.
 all person that child-PL had foot-DAT stand.up-PST
 ‘Everyone that had two or more children stood up.’
 b. Amen mart vor bəzdig uner vodk-i gajne-tsav.
 all person that child(SG) had foot-DAT stand.up-PST
 ‘Everyone that had one or more children stood up.’

Unlike their counterparts in English, plural nouns that appear in the restrictor of a universal quantifier, like the one in (8a), maintain their strict plural meaning. Thus, insofar as (8a) is acceptable,² it is true in situations where people with only one child remain seated. This contrasts with (8b), which is false in such situations.

2.3 *Singular-Plural Contrasts in Western Armenian and Beyond*

In summary, the singular-plural contrast in Western Armenian is one between general number and strict plurality. We can represent these facts semantically with the denotations in (9).

² Western Armenian speakers prefer singular nouns in these types of contexts. However, when forced to interpret such sentences, they assign an interpretation like the one presented in (8a).

- (9) In a context where the boys are *a*, *b*, and *c*:
 a. $[[d\grave{a}gha]] = \{a, b, c, ab, ac, bc, abc\}$
 b. $[[d\grave{a}gha-ner]] = \{ab, ac, bc, abc\}$

Note that there is some corollary evidence beyond predicate distribution that supports this type of interpretation. As Donabédian (1993) notes, numeral modifiers in Western Armenian can combine with both plural and singular nouns, as shown in (10).

- (10) a. Yergu d\grave{a}gha vaze-ts.
 two boy(SG) run-PST
 ‘Two boys ran.’
 b. Yergu d\grave{a}gha-ner vaze-ts-in.
 two boy-PL run-PST-3PL
 ‘Two boys ran.’

Since plural nouns do not contain any singular individuals, the semantics of such modifiers cannot be based on mapping singular denotations to a plural denotation as suggested by Ionin and Matushansky (2006).³ If singular nouns were underspecified for number, the optionality demonstrated in (10) would be predicted. Modification of the singular noun in (10a) would involve the same semantic process as modifying the strict plural noun in (10b). If singular nouns had a strict singular interpretation, then one would need to hypothesize an ambiguity for numerals that is otherwise unattested.⁴

Thus, the singular-plural contrast in Western Armenian is quite different from that found in English, where singular nouns have a strict singular interpretation and plural nouns are underspecified for number. It is important to note that Western Armenian is not unique in this respect. As Kang (1994) and Kim (2005) discuss, Korean also has a singular-plural contrast whereby the so-called singular nouns are used to quantify over both individuals and groups, but the plural nouns are only used to quantify over groups of two or more. Turkish has similar properties as well (see Bale, Gagnon, and Khanjian 2011a). Thus, there is a class of languages where plurals have a strict plural meaning and singulars have a general number interpretation (for discussion, see Corbett 2000, Bale, Gagnon, and Khanjian 2011a).

³ As noted by Borer (2005) and Bale and Khanjian (2009), plural nouns in Western Armenian are incompatible with classifiers. Thus, it is not plausible that such nouns would combine with hidden classifiers as suggested by Ionin and Matushansky (2006).

⁴ Another interesting fact about Western Armenian is that the numeral *zero* cannot be used as a modifier with either a plural or singular noun, as shown in (i).

- (i) a. *Zero d\grave{a}gha vaze-ts.
 zero boy(SG) run-PST
 b. *Zero d\grave{a}gha-ner vaze-ts-in.
 zero boy-PL run-PST-3PL

If modification by *zero* were permitted, it would present challenges to the simple semantics outlined in this section, where singular is underspecified and plural is specified for pluralities. Since such modification is not permitted, there is no need to address this issue in this context.

However, other languages (e.g., English) do allow modification by *zero*. Such facts are a challenge for any theory that views numeral modification as restriction. The intricacies of this issue will not be discussed here.

There are at least two possible connections between singulars having a general number interpretation and plurals having a more restricted meaning. First, with respect to acquisition, the Principle of Contrast (Clark 1987) predicts that children should favor a meaning for plural nouns that is different from the meaning of singulars. Since singular nouns clearly have a general number usage in these languages, children should adopt a strict plural interpretation. Indeed, if Western Armenian, Turkish, or Korean had a plural operator similar to that of English, then the meaning of the plural noun would be semantically identical to the meaning of the singular.

Second, it is possible that English-type plural morphemes require strict singular denotations in terms of their semantic input. In other words, the plural function that derives a general number interpretation might be defined only for denotations that contain individuals and only individuals. Since Western Armenian, Turkish, and Korean do not have such denotations, it might be impossible for them to have an English-type plural operator.

This discussion of the crosslinguistic nature of plurality is purely speculative and warrants further investigation. However, such an investigation is beyond the scope of the present article. More important for the discussion at hand are the empirical facts. Western Armenian plurals do, in fact, have strict plural denotations, while singulars do, in fact, have a general number interpretation. As will be shown, such denotations are a critical piece of the puzzle in examining competition effects.

2.4 *When Singular Means Singular*

Even though in most environments the so-called singular nouns in Western Armenian are consistent with the paraphrase ‘one or more’, there are certain environments where such nouns have a strict singular meaning. For example, consider the contrast in (11).

- (11) a. Dəgha vaze-ts.
 boy(SG) run-PST
 ‘One or more boys ran.’
 b. Dəgha-n vaze-ts.
 boy(SG)-DEF run-PST
 ‘The (single) boy ran.’

Although the indefinite noun phrase has a meaning that is consistent with an underspecified denotation, its definite counterpart does not. The definite morpheme *-n*,⁵ which can also be used with plural nouns but appears as the phonologically triggered allomorph *-ə*, forces a strict singular interpretation. Similar facts hold for Turkish (see Bliss 2004) and Korean (see Kim 2005).

⁵ Sigler (1997) identifies this morpheme as a specificity marker, of which definiteness is a subcase. It makes very little difference to the present analysis whether this morpheme has a broader usage in different syntactic contexts. What is important here is that the morpheme marks definiteness in the sentences discussed in this article.

This type of strict interpretation even extends to bound possessives. As Sauerland, Andersen, and Yatsushiro (2005) discuss, one can test whether a noun permits reference to individuals and/or groups in definite DPs by putting the noun in a bound, possessive construction. For example, consider (12).

- (12) Every boy bought his books.

The plural noun *books* is contained within a possessive DP. Under the bound interpretation, where *every boy* binds *his*, the DP *his books* does not refer to anything globally (i.e., within the context of the entire sentence). Rather, for each boy in the domain, *his books* locally refers to the book or books that the boy is assigned to buy (“locally” being within the scope of the quantifier phrase). In English, the plural noun *books* can be used to locally refer to singular books as well as groups. For example, (12) is true in a scenario where every boy bought the book or books assigned to him but where some of the boys (a proper subset) were only assigned one book.

The facts surrounding bound, possessive-DP constructions are different in Western Armenian. For example, (13a) would not be true in the scenario specified above. The sentence is only true if each boy was assigned two or more books and each boy bought those books. This is not surprising given the strict interpretation of plurality in Western Armenian.

- (13) a. Amen dəgha ir kirk-er-ə kənadz e.
 every boy 3SG.HUMAN.GEN book-PL-DEF buy.PERF be.3SG
 ‘Every boy has bought his (two or more) books.’
 b. Amen dəgha ir kirk-ə kənadz e.
 every boy 3SG.HUMAN.GEN book-DEF buy.PERF be.3SG
 ‘Every boy has bought his (one) book.’

What is slightly less expected is the interpretation of (13b). This sentence specifies that every boy bought the one book that he was assigned to buy. The sentence cannot be used felicitously in situations where some of the boys were assigned more than one book. In other words, the singular noun locally refers to single books only, not groups, even though such nouns can quantify over groups in predicate position and indefinite constructions.

This difference between definite and indefinite noun phrases also arises for cases of numeral modification. For example, consider the contrast between (10), repeated here, and (14).

- (10) a. Yergu dəgha vaze-ts.
 two boy(SG) run-PST
 ‘Two boys ran.’
 b. Yergu dəgha-ner vaze-ts-in.
 two boy-PL run-PST-3PL
 ‘Two boys ran.’
 (14) a. *Yergu dəgha-n vaze-ts.
 two boy(SG)-DEF run-PST
 ‘The two boys ran.’

- b. Yergu dəgha-ner-ə vaze-ts-in.
 two boy-PL-DEF run-PST-3PL
 ‘The two boys ran.’

Numerals greater than one can modify either singular or plural nouns within indefinite noun phrases but are restricted to only modifying plural nouns when they appear with definite markers (hence the unacceptability of (14a)).

In summary, definite marking forces a strict singular interpretation for bare nouns in Western Armenian.

3 Gricean Competition

It is possible, although as we will show unlikely, that strict singular interpretations are a result of traditional Gricean reasoning, based on either informativeness (as in Krifka 1989, Spector 2007) or Maximize Presupposition (as in Sauerland 2003). As noted in section 1, such reasoning is often hypothesized to explain the strict plural interpretation in English. According to this type of explanation, the singular and plural nouns are members of the same scale (e.g., $\langle d\grave{e}gha, d\grave{e}gha-ner \rangle$), or at least the number-marking morphemes themselves are. In hearing a statement, audiences calculate potential alternatives by substituting scalar mates for one another. Thus, for example, an alternative to (15a) would be (16a): substitution of *dəgha-ner-ə* for *dəgha-n*. (Note that the definite marker appears as [ə] after consonants and as [n] after vowels.)

- (15) a. Dəgha-n vaze-ts.
 boy(SG)-DEF run-PST
 b. $\text{RAN}(\sigma(\{x : \text{BOY}(x) \ \& \ |x| \geq 1\}))$
- (16) a. Dəgha-ner-ə vaze-ts-in.
 boy-PL-DEF run-PST-3PL
 b. $\text{RAN}(\sigma(\{x : \text{BOY}(x) \ \& \ |x| \geq 2\}))$

There are two relevant relationships between (15a) and (16a). First, given their literal meanings, as specified in (15b) and (16b), sentence (16a) is more informative than sentence (15a); that is, in any context where (16b) is true, (15b) is true but not vice versa. (Note that σ , the interpretation of the definite morpheme, is a function that takes a set and yields the supremum contained within that set. Such functions are undefined for sets that do not contain their own supremum—that is, that do not have a unique, maximal member equal to the generalized join of all other members of the set.) Second, (16a) presupposes the existence of at least two boys. In contrast, (15a) only presupposes the existence of one boy. Thus, (16a) has a stronger presupposition than (15a).

These two properties both lead to a strict singular meaning for (15a). For example, according to scalar reasoning based on informativeness (see Grice 1975), in uttering the less informative sentence with singular marking, the speaker implies that he or she believes that the more informative alternative with plural marking is false. Similarly, according to scalar reasoning based on Maximize Presupposition (see Heim 1991, Sauerland 2003), in uttering the sentence with a weaker

presupposition, the speaker implies that the presuppositions of the stronger alternative could not be met. Either way, the speaker implies that there is no group consisting of two or more boys.

Unfortunately, the straightforward Gricean explanation of the strict singular interpretation cannot explain all of the facts in Western Armenian. Such an explanation predicts strict interpretations in environments where they do not surface. For example, consider (17a) and (18a).

- (17) a. Dəgha vaze-ts.
 boy(SG) run-PST
 b. $\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| \geq 1$
- (18) a. Dəgha-ner vaze-ts-in.
 boy-PL run-PST-3PL
 b. $\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| \geq 2$

According to the Gricean account, (18a) is an alternative to (17a). Furthermore, given the literal meanings of the sentences specified in (17b) and (18b), the alternative in (18a) is more informative than the sentence in (17a); that is, in any context where (18a) is true, (17a) is true but not vice versa. Hence, the Gricean account predicts that (17a) should have a strict singular interpretation. (In uttering (17a), the speaker should imply that he or she believes (18a) to be false.) Yet empirically it has a broad, inclusive interpretation.

Traditional Gricean reasoning yields the wrong empirical predictions. Although it can account for the facts with respect to definite noun phrases, it cannot explain why singular, indefinite noun phrases have a broad, inclusive interpretation.

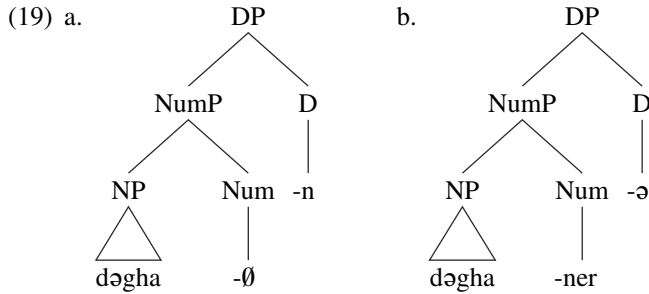
4 The Purely Syntactic Solution

Another possible explanation for the contrast between definite and indefinite noun phrases denies the possibility of competition between singular and plural nouns and instead suggests that singular indefinites have a different syntactic structure than the other phrases. For ease of discussion, let's label this account the *purely syntactic solution*. This section describes one such solution proposed by Bliss (2004) for Turkish, although here it is adapted to Western Armenian.⁶

The purely syntactic solution hypothesizes that root nouns in Western Armenian are underspecified for number. However, DPs do not consist only of a determiner head and the root noun. There is an additional syntactic level, labeled as a number phrase or *NumP* for short. The syntactic head of this phrase (Num) is realized either as the plural morpheme *-ner* or as a phonologically null singular morpheme. The plural morpheme restricts its complement to sets that only contain pluralities. The singular morpheme restricts the noun to sets that only contain singular atoms.

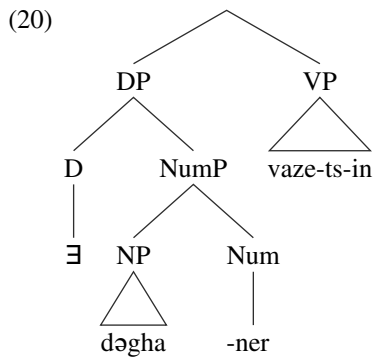
This syntactic structure and its corresponding semantic interpretation predict a contrast between singular and plural definite noun phrases. For example, the syntactic distinction between *dəgha-n* and *dəgha-ner-ə* would be represented as in (19).

⁶ A somewhat more complex but similar account appears in Borer 2005.

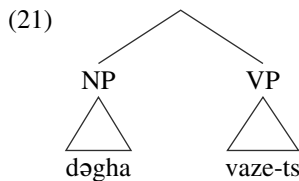


The root noun denotes a set containing all the singleton boys in the domain and all groups consisting of these boys. The null singular morpheme restricts this noun to the set of singulars (i.e., $\llbracket -\emptyset \rrbracket = \lambda P.\{x : \text{ATOM}(x) \ \& \ P(x)\}$). In contrast, the plural morpheme restricts this noun to the set of plural groups (i.e., $\llbracket -ner \rrbracket = \lambda P.\{x : \neg \text{ATOM}(x) \ \& \ P(x)\}$). The definite determiner applies to either set. The result is that the definite noun phrase with the singular noun picks out a unique singular individual whereas the definite noun phrase with the plural picks out a unique maximal group.

With respect to existential quantification, Bliss (2004) hypothesizes that sentences with singular nouns as opposed to plurals have different syntactic structures. The plural noun, owing to the presence of a plural morpheme, appears within a full DP with a phonologically null existential quantifier serving as the head (see (20)).



In contrast, the so-called singular, indefinite noun does not appear with a full DP, as shown in (21).



As Bliss (2004) suggests, the lack of a covert determiner in structures like (21) implies that existential quantification cannot be introduced by the subject. Rather, she proposes that the VP

introduces existential quantification. This is not a novel hypothesis. Carlson (1977) suggested that verbs are ambiguous in languages like English. They either have a semantic meaning that combines with DP arguments or they have a meaning that combines with predicates/kinds, as represented by bare NP arguments. In the latter case, the verb itself introduces existential quantification (see also Chierchia 1998). For example, abstracting away from the theory of kinds, the meaning of the VP *vaze-ts* could be either $\lambda x.\text{RAN}(x)$ or $\lambda P.\exists x.\text{RAN}(x) \ \& \ P(x)$. The first meaning combines with DP arguments; the second combines with predicates.⁷ It is this second meaning that serves as the interpretation of the VP in (21).

A critical consequence of the structure in (21) is that it does not contain a phonologically null head as part of a number phrase. Thus, the predicate $\llbracket d\acute{a}gha \rrbracket$ is true of both groups and individuals. As a result, the sentence in (21) will have truth conditions equivalent to the formula in (22).

$$(22) \ \exists x.\text{RAN}(x) \ \& \ x \in \{z : |z| \geq 1 \ \& \ \text{BOY}(z)\}$$

These truth conditions specify that the sentence is true if and only if one or more boys ran. Such truth conditions accurately reflect the attested empirical meaning of the sentence.

Although not discussed in Bliss 2004, facts concerning negation add further support for the reduced syntactic structure in (21). There are two common assumptions in the semantic literature with respect to main clause negation: either it is analyzed as a modifier of verbal predicates (e.g., $\llbracket \text{not} \rrbracket = \lambda P.\lambda x. \neg P(x)$), or it is analyzed as an operator that negates a proposition formed from the verbal predicate and an internal subject (e.g., $\llbracket \text{not} \rrbracket = \lambda p. \neg p$).⁸ Either option predicts that negation should always take scope over existential quantifiers contained within the interpretation of the verb.

In contrast, if existential quantification is introduced by the DP, then operations such as Quantifier Raising (QR) and/or reconstruction predict the possibility of a scope ambiguity. (Depending on where the base position of the DP is situated, the DP could either raise above negation or reconstruct below it.) Note that such operations are independently needed to account for the ambiguity of utterances like (23a–b).

- (23) a. John didn't insult many teachers.
 b. Many teachers didn't insult John.

Sentence (23a) can be true in a situation where there are many teachers that John didn't insult and many that he did. This situation is only consistent with the wide scope reading of the DP *many teachers* (i.e., there are many teachers that John didn't insult). The sentence is also true in

⁷ According to Carlson (1977), the meanings are connected to each other through a lexical rule (also called a meaning postulate). Chierchia (1998) hypothesizes a similar mechanism, but derives the ambiguity through semantic coercion rules. He calls this type of coercion Derived Kind Predication. Note that both Carlson (1977) and Chierchia (1998) assume that verbs take kinds as arguments. However, they also hypothesize that kinds can be coerced into sets for certain operations (and vice versa). For simplicity, we will represent Derived Kind Predication as an operation on sets, although nothing hinges on this decision.

⁸ Given the Geach Rule (Geach 1970), both meanings can be derived from a single source.

the situation where there are four teachers and John only insulted two. This situation is only consistent with the wide scope reading of negation (i.e., it is not the case that John insulted many teachers). Similar observations hold for (23b). The sentence is true in a situation where there are many teachers that didn't insult John but many that did. It is also true in a situation where there are four teachers and only two insulted John. Any adequate linguistic theory must hypothesize some type of grammatical mechanism to account for the scope interactions between negation and DPs.

Thus, considering the standard assumptions about negation and the adoption of a mechanism that derives scope ambiguities, Bliss's theory predicts that singular nouns should not be able to induce scope ambiguities whereas the opposite holds for plural nouns, since they are full DPs. As shown in (24) and (25), this prediction is borne out.

- (24) a. Dəgha chi vaze-ts.
 boy(SG) not run-PST
 'No boys ran.'
- b. $\neg\exists x.\text{RAN}(x) \ \& \ \text{BOY}(x) \ \& \ |x| \geq 1$
- (25) a. Dəgha-ner chi vaze-ts-in.
 boy-PL not run-PST-3PL
 'No boys ran/Some boys didn't run.'
- b. *Meaning 1*: $\neg\exists x.\text{RAN}(x) \ \& \ \text{BOY}(x) \ \& \ |x| \geq 2$
Meaning 2: $\exists x.\text{BOY}(x) \ \& \ |x| \geq 2 \ \& \ \neg(\text{RAN}(x))$

Sentence (24a) contains the Western Armenian morpheme for verbal negation, *chi*, and a singular noun. The sentence only has one meaning: namely, that no boys ran. As a result, (24a) is not true when some boys ran but others did not. In contrast, (25a), which contains a plural noun, is ambiguous. It can mean that no boys ran, but it can also mean that there is a group of boys that did not run (although others could have). The presence of a full DP in (25a) accounts for this ambiguity, whereas the absence of a DP in (24a) accounts for the lack of ambiguity.

Despite the evidence supporting the purely syntactic solution, it has some weaknesses. First, its account of the facts relies on a stipulated meaning for the phonologically null Num head, that is, a singular meaning. There is no corollary evidence to support this stipulation. Second, it is critical to the explanation that the plural indefinite does not compete with the singular indefinite; if it did, the sentence whose structure is shown in (21) would have a strict singular meaning. Once again, this lack of competition is stipulated without corollary evidence. In addition, if the analysis of English is correct, this stipulation would have to be language-specific. (Recall that competition is required to derive the strict plural meaning in English.) Third, the purely syntactic solution has difficulty accounting for (26a) and (27a).

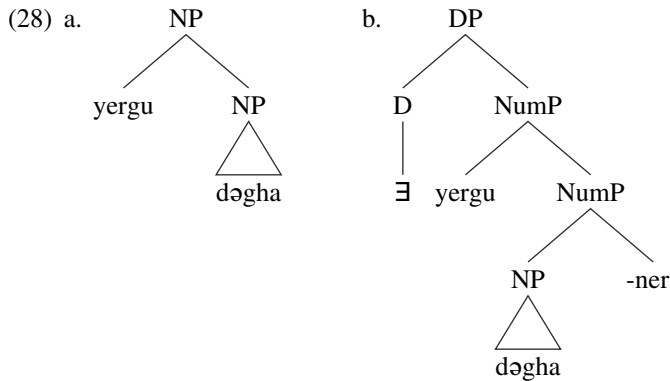
- (26) a. Yergu dəgha chi vaze-ts.
 two boy(SG) not run-PST
 'Two boys didn't run.'

- b. *Meaning 1*: $\neg\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| = 2$
Meaning 2: $\exists x.BOY(x) \ \& \ |x| = 2 \ \& \ \neg(RAN(x))$

(27) a. *Yergu dəgha-ner chi vaze-ts-in.*
 two boy-PL not run-PST-3PL
 ‘Two boys didn’t run.’

- b. *Meaning 1*: $\neg\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| = 2$
Meaning 2: $\exists x.BOY(x) \ \& \ |x| = 2 \ \& \ \neg(RAN(x))$

As shown in (27a), the numeral *yergu* ‘two’ can be used to modify plural nouns. Such modification suggests that *yergu* restricts nouns containing groups. In order to do so in (26a), *yergu* would need to combine with a root noun that is not contained within a DP (by hypothesis, within a DP, the denotation of the singular noun would not have any groups as members). Thus, the syntactic structures of the two subjects in (26a) and (27a) would ideally have the representations in (28a–b), respectively.



Such structures suggest that the verb phrase would need to introduce existential quantification for (26a) but not for (27a). There are two reasons that these cannot be the correct representations. First, the modified singular NP is not consistent with a kind-denoting denotation. As Carlson (1977) and Chierchia (1998) discuss, non-kind-denoting NPs are not able to combine with verb phrases that introduce existential quantification. Second, if (28a) were the correct syntactic structure, then (26a) should not have an interpretation where the existential quantifier takes scope above negation. However, as noted in (26b), this sentence can be true in situations where two boys ran and another two boys did not. In fact, the range of interpretations for (26a) is completely equivalent to the range for (27a).

To explain these facts, the purely syntactic solution would need to stipulate that the numeral modifier *yergu* is being used ambiguously in Western Armenian. Either there would need to be two lexical entries for *yergu*, one that modifies singular nouns and another that modifies plurals, or *yergu* would have to be able to occupy two separate syntactic positions: the position that modifies a NumP where the head is the plural morpheme, and the head position of the NumP.

Furthermore, this type of ambiguity would be required for all numerals greater than one. Once again, there is no corollary evidence that supports this kind of ambiguity.⁹

5 Syntax, Complexity, and Competition

The main weakness of the purely syntactic solution is that it attempts to ignore competition, or at least nullify its effects. Ironically, this account can be strengthened if competition is reintroduced with certain restrictions on morphological complexity, such as those discussed by Katzir (2007).

In his reanalysis of scalar implicatures, Katzir (2007) hypothesizes that alternative sentences, the kind used to calculate quantity-based inferences, are grammatically constrained. Specifically, a sentence is a viable alternative to an utterance if and only if the sentence can be derived from the utterance via a series of one or more of the following three operations: (a) lexical substitution (i.e., replacement of a morpheme with another morpheme of the same category), (b) contextual substitution (i.e., replacement of a phrase with a contextually salient phrase in the discourse of the same category), and (c) node reduction (i.e., the deletion of syntactic structure via operations like tree-pruning). For present purposes, we can ignore the intricacies of contextual substitution and concentrate on operations (a) and (c). The purpose of these two operations is to eliminate (as viable alternatives) sentences that have an augmented syntactic structure in comparison to the original utterance.

As Katzir (2007) discusses, the motivation for eliminating such sentences stems from certain types of pragmatic asymmetries that are unexpected in the standard Gricean approach or even in the neo-Gricean framework (i.e., Horn's (1972, 1989) reformulation of Grice). Consider (29a–b).

- (29) a. John swam.
 b. John swam quickly.

Sentence (29b) entails sentence (29a), but not vice versa. Following standard Gricean reasoning, (29b) is more informative. Thus, upon hearing the less informative utterance (29a), an audience should conclude that the speaker had “good reason” not to utter the more informative sentence (29b). (Under Grice's Principle of Cooperation, the audience assumes that the speaker is providing the appropriate amount of information, Maxim of Quantity.) There are several possibilities that the audience might consider in Grice's theory, none of which are fully satisfactory.

One possibility, probably the one that is expected given the ease with which audiences compute scalar implicatures, is that the speaker does not believe that the stronger sentence is true and hence that uttering the stronger sentence would violate the Maxim of Quality (i.e., Say what you believe to be true).¹⁰ If the audience assumed that this was the reason for not uttering the stronger sentence, then they would derive a scalar implicature (i.e., they would understand the sentence *John swam* as communicating *John swam, but not quickly*, or at least as communicating

⁹ Kim (2005) offers a solution to these types of problems similar to Bliss's (2004). Kim stipulates that competition occurs within NumP but not within DPs that do not contain a NumP. The account covers the same data as Bliss's (2004) and also suffers from the same weakness: namely, that of arbitrary stipulation. The only difference between the two accounts is that Bliss proposes semantic restrictions that apply only to NumP, whereas Kim proposes competition that is restricted only to NumP.

¹⁰ Actually, to derive the standard scalar implicature, the audience would have to assume that the speaker is extremely opinionated or knowledgeable. See Sauerland 2004 for discussion of the need for this assumption.

that the speaker doesn't know whether John swam quickly or not). However, audiences do not derive such implicatures from this utterance.

Another possibility is that the speaker believes that the stronger sentence is not relevant and hence that uttering the stronger sentence would violate the Maxim of Relation (i.e., Be relevant). However, it is arbitrary to assume that (29b), a sentence with adverbial modification, is irrelevant whereas (29a), a sentence without adverbial modification, is relevant. In fact, scalar effects between similar sentences suggest that sentences with and without adverbial modification do indeed compete with one another. Consider (30a–b).

- (30) a. John didn't swim quickly.
b. John didn't swim.

Sentence (30b) entails sentence (30a) but not vice versa. Thus, by standard Gricean reasoning, (30b) is more informative. Interestingly, in uttering (30a) the speaker implies that he or she believes that (30b) is false (i.e., the speaker implies that John did in fact swim). This is a scalar implicature: the audience assumes that the speaker did not utter the more informative utterance because he or she does not believe that it is true. However, to derive the scalar implicature the audience must assume that the sentence with the adverb and the one without are both relevant.

The contrast between (29) and (30) is particularly interesting with respect to the hypothesis advanced by Katzir (2007). Since (29b) contains an adverb, it contains more syntactic structure (within the VP) than (29a). Thus, Katzir predicts that (29b) should not be an alternative to (29a), even though it is a stronger, relevant sentence. In other words, Katzir's theory makes the correct predictions without any stipulations about relevance. Furthermore, (30b) does not contain an adverb and hence it has less syntactic structure (within the VP) than (30a). Thus, Katzir predicts that (30b) should be a viable alternative to (30a) and hence audiences should derive an implicature. Once again, Katzir's theory makes the correct predictions.

These types of asymmetries do not just exist in structures that involve negation. They also exist with respect to conditionals. For example, by uttering (31a) a speaker implies that he or she does not believe (31b), despite the lack of an implicature in (29).

- (31) a. If John swims quickly, he will win the prize.
b. If John swims, he will win the prize.

As with negation, the difference between (29) and (31) involves syntactic complexity. In (29) but not (31), the stronger, more informative sentence has an augmented structure compared to the weaker sentence that constitutes the utterance. It is this interaction between informativeness and syntactic structure that is most relevant in reanalyzing the Western Armenian data.

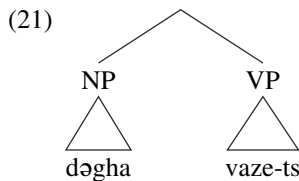
Let's reconsider the syntactic structures from Bliss 2004 but without the stipulations that were a central part of the purely syntactic account. For example, let's drop the assumption that the null NumP head induces a singular interpretation. Instead, let's assume that such a head makes no contribution to the meaning of the noun phrase. In other words, singular nouns always have an inclusive, broad denotation in all syntactic environments. Furthermore, let's drop the assumption that singular and plural are not in competition and assume that they are (as they are in English). Finally, let's assume a simple account of numeral modification: one where there is only one type of numeral modifier, a modifier that applies to denotations with groups and restricts

those denotations to groups of a certain cardinality (i.e., $\llbracket yergu \rrbracket = \lambda P.\{x : |x| = 2 \ \& \ P(x)\}$). With the removal of the stipulations in the purely syntactic solution, in combination with Katzir's (2007) theory of competition, the facts in Western Armenian fall out naturally. Let's reconsider some of the more problematic data points.

Recall that the purely syntactic solution needed to hypothesize that singular nouns do not compete with plurals. This hypothesis is needed to explain the lack of a strict singular interpretation for sentences like (3), repeated here.

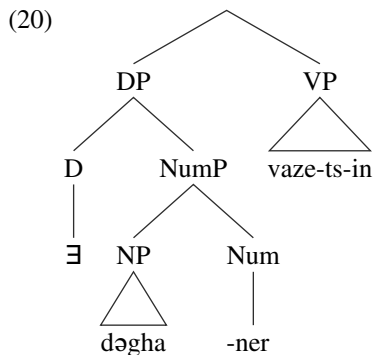
- (3) Dəgha vaze-ts.
 boy(SG) run-PST
 'One or more boys ran.'

However, with Katzir's (2007) proposal, the lack of a strict singular meaning stems from the syntactic structure of the singular indefinite as opposed to the plural indefinite. As discussed in section 4, the interaction between negation and singular noun phrases like the one in (3) suggests that such sentences do not contain a DP (existential quantification is introduced by the verb). Thus, (3) has the structure in (21), repeated here.



In contrast, evidence from negation demonstrates that sentences with plural nouns, like (7), have a full DP containing an existential quantifier. Hence, the syntactic structure of such sentences can be represented by the tree in (20), repeated here.

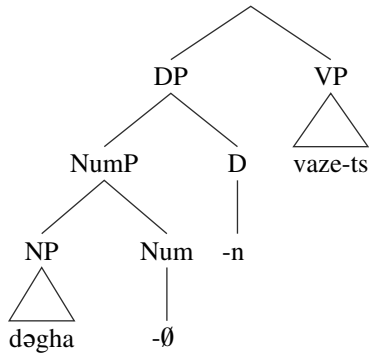
- (7) Dəgha-ner vaze-ts-in.
 boy-PL run-PST-3PL
 'Two or more boys ran.'



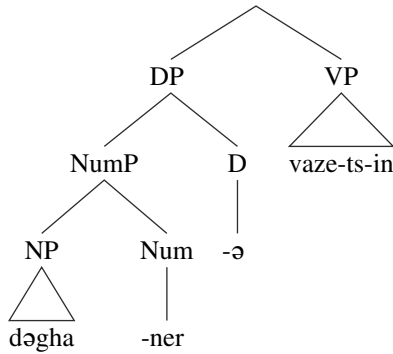
To derive a strict singular meaning for (3) requires that (7) be a viable alternative sentence. However, (7) clearly contains more syntactic structure than (3). Thus, by Katzir's hypothesis, (7) is not a viable alternative. Syntactic complexity rules out competition.

In contrast, the presence of definite marking requires a full DP structure for both singular and plural nouns, as shown in (32a) and (32b).

(32) a.



b.



Structure (32b) can be derived from (32a) by replacing the null head with the plural marker.¹¹ Since the two structures are equal in syntactic complexity, (32b) is a viable alternative to (32a). Hence, the strict singular meaning can be derived via regular Gricean reasoning as discussed in section 3.

The addition of Katzir's proposal can even account for the lack of competition effects for (10a–b), repeated here.

(10) a. Yergu dəgha vaze-ts.

two boy(SG) run-PST
'Two boys ran.'

b. Yergu dəgha-ner vaze-ts-in.

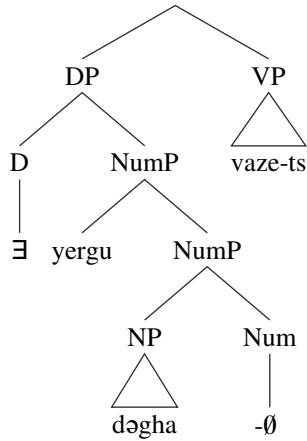
two boy-PL run-PST-3PL
'Two boys ran.'

As shown in section 4, both subjects in (10a) and (10b) demonstrate an ambiguity with respect to negation (see (26a) and (27a)). This suggests that both subjects are full DPs headed by existential

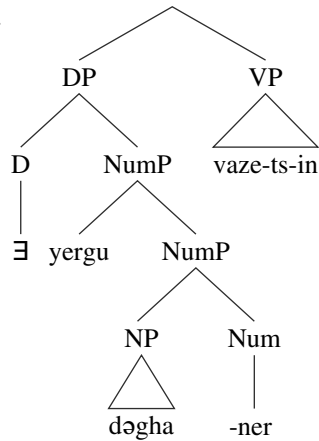
¹¹ Recall that *-n* is a phonologically triggered allomorph of *-ə*.

quantifiers (DPs that can undergo QR or reconstruction). Thus, the syntactic structures of (10a–b) are as shown in (33).

(33) a.



b.



Structure (33b) can be derived from (33a) by substituting the plural marker for the phonologically null Num head. Thus, (33b) is a viable alternative to (33a). However, since (33b) has exactly the same meaning as (33a) (compare the truth conditions in (34b) to those in (35b), where the last formula represents the contribution of the numeral modifier), such competition does not change the underlying meaning of the original utterance.

(34) a. Yergu dəgha vaze-ts.

two boy(SG) run-PST

b. $\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| \geq 1 \ \& \ |x| = 2$

(35) a. Yergu dəgha-ner vaze-ts-in.

two boy-PL run-PST-3PL

b. $\exists x.RAN(x) \ \& \ BOY(x) \ \& \ |x| \geq 2 \ \& \ |x| = 2$

In summary, the data that were problematic for the purely syntactic solution, and hence led to a series of stipulations, fit perfectly with the hypothesis that competition is mediated by syntactic complexity.

6 Local Application of Maximize Presupposition

Thus far, the data from Western Armenian support Katzir's (2007) theory that competition is mediated by syntactic complexity. However, there is one more piece of data that needs to be addressed: namely, the contrast between (14a) and (14b), repeated here.

- (14) a. *Yergu dəgha-n vaze-ts.
 two boy(SG)-DEF run-PST
 ‘The two boys ran.’
 b. Yergu dəgha-ner-ə vaze-ts-in.
 two boy-PL-DEF run-PST-3PL
 ‘The two boys ran.’

Under a competition analysis, it is difficult to explain why (14a) is unacceptable. Although it is predicted that (14b) is a viable alternative to (14a) (i.e., both subjects contain a full DP), it is not clear how the literal meaning of (14b) would affect (14a). Broadly speaking, the truth conditions of the two sentences should be as in (36).

- (36) a. $\text{RAN}(\sigma(\llbracket \text{yergu} \rrbracket (\{x : \text{BOY}(x) \ \& \ |x| \geq 1\})))$
 $= \text{RAN}(\sigma(\{x : \text{BOY}(x) \ \& \ |x| = 2\}))$
 b. $\text{RAN}(\sigma(\llbracket \text{yergu} \rrbracket (\{x : \text{BOY}(x) \ \& \ |x| \geq 2\})))$
 $= \text{RAN}(\sigma(\{x : \text{BOY}(x) \ \& \ |x| = 2\}))$

As represented in (36a), *yergu* modifies a broad inclusive denotation in (14a). In contrast, as represented in (36b), it modifies a strict plural denotation in (14b). However, this difference in modification makes little difference to the overall meaning of the two sentences. Both sentences end up having the same truth conditions and both end up requiring the same preconditions for evaluation (i.e., they both induce the same presuppositions). As a result, the overall truth conditions for (14b) should not have any effect on the meaning of (14a). (14b) is not more informative than (14a), nor does it induce a stronger presupposition.

Although this data point is problematic, there is a possible explanation. As Winter (2001) discusses, it is coherent, perhaps even desirable,¹² to analyze definiteness with two functions rather than one. Thus far, we have analyzed definiteness with one function: namely, the partial

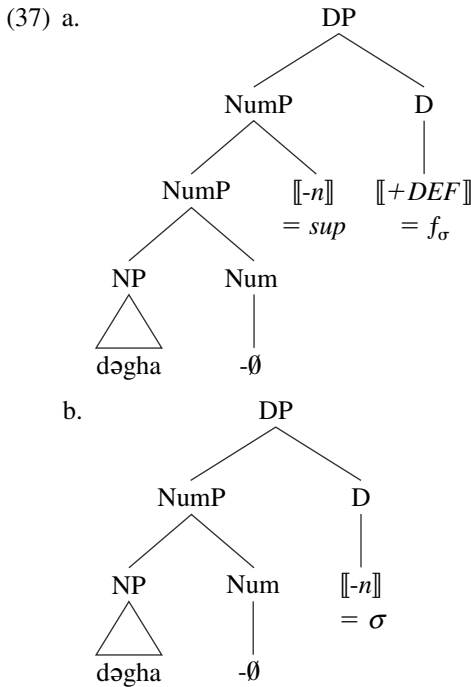
¹² In fact, Winter (2001) argues that an adequate treatment of *and* as set intersection requires such a hypothesis. Winter discusses sentences like (i).

(i) The two boys from Boston and three girls from New York met at a coffee shop.

It is difficult to account for the compositional nature of this type of sentence without moving the DPs out of a coordinate structure via QR. However, by splitting the interpretation of definiteness into two separate operations (one limiting a set to the supremum that is contained within the set and another selecting a member from a set), one can avoid QR and yet still provide an accurate compositional, Boolean account of the sentence's truth conditions.

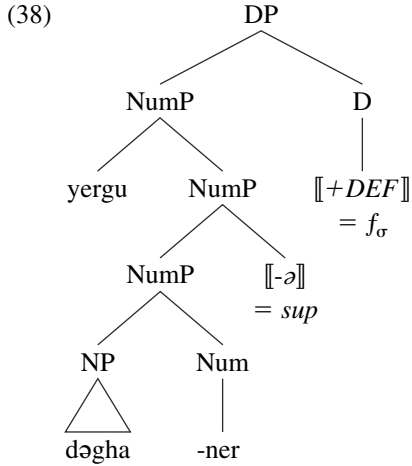
function σ that maps sets that have a supremum contained within them (i.e., sets that have a unique largest member equal to the generalized join of all other members) to that supremum (see Link 1983). This partial function is equivalent to the composition of two other partial functions: a choice function from singleton sets to the members of those singleton sets, let's call this function f_σ (e.g., for all singleton sets $\{x\}$, $f_\sigma(\{x\}) = x$), and a function that maps sets that contain their own supremum to the singleton set with that supremum as its only member, let's call this function sup (e.g., for all sets X that contain its own supremum y , $sup(X) = \{y\}$). Since the range of sup is a subset of the domain of f_σ , it follows that $\sigma = (f_\sigma \circ sup)$; that is, for any set Y that is in the domain of σ , $\sigma(Y) = f_\sigma(sup(Y))$.

Given this split interpretation of definiteness, it is possible to treat the so-called definite marker in Western Armenian as a modifier that restricts sets to supremums contained within the sets, rather than as a determiner. In other words, $[-n/\partial] = sup$. The application of the choice function could then serve as the interpretation of a phonologically null determiner. For simplicity, let's label this determiner $+DEF$ (i.e., $[+DEF] = f_\sigma$). As a result of this interpretation, the compositional structure of *dəgha-n* would be as shown in (37a) rather than (37b).



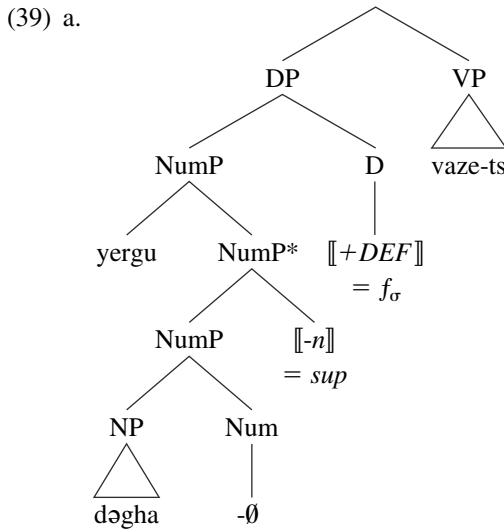
Despite the slight difference in syntactic structure, there is no difference in the interpretation of definiteness.

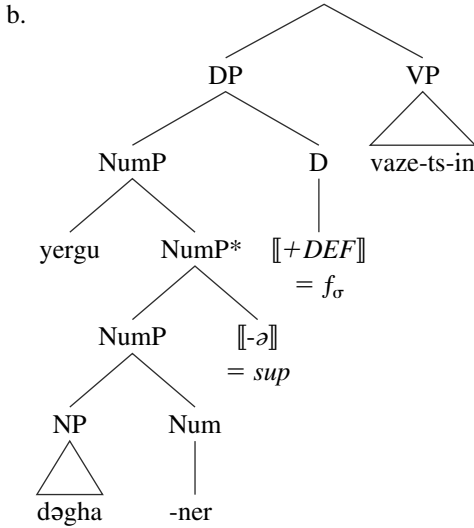
The advantage of representing definiteness in this way is that the definite marker can modify a noun before it combines with a numeral, thus more accurately mirroring the phonological properties of $-n/\partial$, which appears affixed to the noun independently of the modifier. Consider the structure in (38).



In cases where $\llbracket yergu \rrbracket(\llbracket dəgha-ner \rrbracket)$ contains a supremum, $\sigma(\llbracket yergu \rrbracket(\llbracket dəgha-ner \rrbracket))$ is equivalent to $f_\sigma(\llbracket yergu \rrbracket(\sup(\llbracket dəgha-ner \rrbracket)))$. The modifier *yergu* restricts the singleton set $\sup(\llbracket dəgha-ner \rrbracket)$ to groups with a cardinality of two. If the supremum contained within $\llbracket dəgha-ner \rrbracket$ is a group with only two members, then the result of this restriction will not be empty and the result of applying f_σ will be the two-member supremum. If the supremum contained within $\llbracket dəgha-ner \rrbracket$ is not a two-member group, then the result of the restriction will be empty and hence f_σ will not be able to apply. The interpretation will be undefined.

Another advantage of representing definiteness in this way is that it might be able to explain the unacceptability of (14a). Consider the syntactic representations of (14a–b) given in (39a–b), respectively.





In terms of overall meaning, these sentences are equivalent. They both presuppose the existence of a unique maximal group of boys with two members. They both assert that this maximal group ran.

However, in terms of their composition there is a slight difference. At the point where *sup* combines with the NP (marked as *NumP** in (39a–b)), the two structures induce different presuppositions. For *sup*($[[dægħa-\emptyset]]$) to be defined, there must be at least one boy in the denotation of *dægħa*. In other words, the function induces the presupposition (among others) that at least one boy exists. In contrast, for *sup*($[[dægħa-ner]]$) to be defined, there must be a group consisting of two or more boys in the denotation of *dægħa*. In other words, the function induces the presupposition (among others) that at least two boys exist. Locally speaking, the structure in (39b), at the point in the derivation where *NumP** is formed, induces a stronger presupposition than (39a). It is only at the point where f_σ combines with *NumP* (i.e., the DP level) that the presuppositions induced by the two sentences become equivalent.

This local difference might be the cause of the unacceptability of (14a). As noted by Singh (2011), the oddness of the English sentence (40a) compared to (40b) suggests that Maximize Presupposition applies locally to constituents, rather than globally to the entire sentence. (Alternatively, one might introduce a system of comparison that has the same effect as local application of Maximize Presupposition, such as the one in Percus 2006. The choice of theory makes little difference in the present analysis.)¹³

¹³ We have chosen to describe the data point with Singh's (2011) analysis because of its relative simplicity compared to Percus's (2006) analysis.

- (40) a. #If John has exactly two students and he assigned the same exercise to all of his students, then I'm sure he'll be happy.
 b. If John has exactly two students and he assigned the same exercise to both of his students, then I'm sure he'll be happy.

An important aspect of (40a–b) is that neither induces a presupposition with respect to the number of students that John has. (The sentential connector *if* blocks the projection of presuppositions from its antecedent.) Furthermore, the two sentences have the same truth conditions. As a result, global application of Maximize Presupposition should not have any effect on (40a).

Singh (2011) argues that the unacceptability of (40a) could be explained if Maximize Presupposition applied to the subconstituent [*John has exactly two students and he assigned the same exercise to all of his students*]. An alternative to this subconstituent would be [*John has exactly two students and he assigned the same exercise to both of his students*]. The presupposition induced by this alternative—namely, that John has exactly two students—is much stronger than the one induced by the original subconstituent. Thus, use of this subconstituent should imply that the presuppositions of the alternative could not be met. However, this assumption would render the sentence unusable, since the presuppositions are explicitly stated to be true in the first conjunct. In effect, Maximize Presupposition applied at this local level would rule out the use of this subconstituent in the same way that it rules out the use of (41a) through a comparison to (41b).

- (41) a. #John has exactly two students and he assigned the same exercise to all of his students.
 b. John has exactly two students and he assigned the same exercise to both of his students.

This kind of local application of Maximize Presupposition might also be at play in Western Armenian. If so, then the fact that the subconstituent *dəgha-ner-ə* has a stronger presupposition than *dəgha-θ-n* should have consequences for the derivation of a definite noun phrase. Given that these subconstituents are a part of a DP that will be used to refer to a contextually salient group of two boys, the stronger presuppositions of the plural noun will always be satisfied in the context of use. Thus, Maximize Presupposition should rule out the use of the singular construction at the local level (at NumP* in the derivations in (39)) in favor of the plural construction with the stronger presupposition. (Use of the singular would imply that the presuppositions of the plural could not be met, but this would render the singular unusable in a DP that refers to a group of two boys.)

It should be noted that this explanation relies, critically, on the syntactic structures in (39) in two different ways. First, Maximize Presupposition must apply before the combination/evaluation of the D head. (It is only when the choice function f_σ applies that the presuppositions for the two constructions become equivalent.) Such a hypothesis receives some corollary support in that in many syntactic theories, the complement of D constitutes a phase for interpretation (Chomsky 2001). Second, the morpheme *-n/ə*, which is interpreted as *sup*, must apply before the numeral modifier. As mentioned above, there is some independent evidence that supports the

application of *sup* before numeral modification: the morpheme *-n/ə* is within the same word boundary as the noun stem whereas the numeral *yergu* is outside of this boundary. This fact might be language-specific. If so, and if there is evidence that the *sup* function applies after numeral modification in some languages, then it would be predicted that such languages would allow numerals to modify both singular and plural nouns within definite DPs. Further research will determine whether these predictions are borne out.¹⁴

7 Conclusion

The contrast between indefinite and definite NPs in Western Armenian supports a theory of competition that is sensitive to syntactic complexity (Katzir 2007).¹⁵ According to this theory, indefinite singular nouns are not in competition with plural indefinites because plurals are embedded within a DP while singulars are not. However, singular and plural definite nouns are both embedded within DPs and hence they both should be in competition with one another. As a result, singular definites have a strict singular meaning even though their underlying semantic interpretation is underspecified for number.

There are several advantages to this theory. Not only does it account for the facts in Western Armenian, but it is also consistent with the hypothesis that competition among morphemes that mark number is universal—a hypothesis that would have to be abandoned under the purely syntactic solution. Furthermore, it opens up a new avenue of research with respect to number marking and competition. As shown in section 5, sentences that contain nouns embedded within DPs should not be viable alternatives if the original utterance contains nouns that are not embedded.¹⁶ Such a hypothesis should have consequences in other languages that allow verb phrases to combine directly with NP predicates.

References

Bale, Alan, Michaël Gagnon, and Hrayr Khanjian. 2011a. Cross-linguistic representations of numerals and number marking. In *Proceedings of SALT 20*, ed. by Nan Li and David Lutz, 582–598. Available at <http://elanguage.net/journals/salt/issue/220>.

¹⁴ Korean might be a language where these predictions hold. In Korean, the demonstrative morpheme clearly applies after numeral modification. Like Western Armenian, Korean has a plural marker. It also has singular nouns with a general number interpretation as well as plural nouns with a strict plural meaning. Critically, singular nouns in Korean have a strict singular interpretation within the context of a definite DP (actually a demonstrative DP since Korean does not have nondemonstrative definite markers). However, unlike in Western Armenian, in Korean singular nouns can combine with numerals within definite DPs (i.e., demonstrative DPs). See Kim 2005 for discussion of the facts. Unfortunately, Korean numerals have classifier morphology, which complicates the analysis of the data. A much closer examination of this classifier morphology would be needed before any firm conclusions about Korean could be made.

¹⁵ The theory advanced in section 5 can also account for the distribution of singular and plural in Turkish, a language that has many of the same properties as Western Armenian. However, since numeral modifiers can only be used with singular nouns in Turkish, the purely syntactic account makes exactly the same predictions as the account based on competition.

¹⁶ Unless such sentences were made contextually salient by being explicitly mentioned in the discourse.

- Bale, Alan, Michaël Gagnon, and Hrayr Khanjian. 2011b. On the relationship between morphological and semantic markedness: The case of plural morphology. *Morphology* 21:197–221.
- Bale, Alan, and Hrayr Khanjian. 2009. Classifiers and number marking. In *Proceedings of SALT 18*, ed. by Tova Friedman and Satoshi Ito, 73–89. Available at <http://elanguage.net/journals/salt/issue/281>.
- Bliss, Heather. 2004. The semantics of the bare noun in Turkish. In *Calgary papers in linguistics* 25, ed. by Ilana Mezhevhich and Michael B. Dobrovolsky, 1–65. Available at <http://www.ucalgary.ca/lingcpl/volume25.html>.
- Borer, Hagit. 2005. *Structuring sense*. Oxford: Oxford University Press.
- Carlson, Gregory N. 1977. Reference to kinds in English. Doctoral dissertation, University of Massachusetts, Amherst.
- Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6:339–405.
- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.
- Clark, Eve. 1987. The Principle of Contrast: A constraint on language acquisition. In *Mechanisms of language acquisition*, ed. by Brian MacWhinney, 1–33. Hillsdale, NJ: Lawrence Erlbaum.
- Corbett, Greville G. 2000. *Number*. Oxford: Oxford University Press.
- Donabédian, Anaïd. 1993. Le pluriel en arménien moderne. *Faits de Langues* 2:179–188.
- Eijck, Jan van. 1983. Discourse Representation Theory and plurality. In *Studies in modeltheoretic semantics*, ed. by Alice G. B. ter Meulen, 85–106. Dordrecht: Foris.
- Geach, Peter. 1970. A program for syntax. *Synthese* 22:3–17.
- Grice, H. P. 1975. Logic and conversation. In *Speech acts*, ed. by Peter Cole and Jerry L. Morgan, 41–58. *Syntax and Semantics* 3. New York: Academic Press.
- Heim, Irene. 1991. Artikel und Definitheit. In *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, ed. by Arnim von Stechow and Dieter Wunderlich, 487–535. Berlin: Mouton de Gruyter.
- Hoeksema, Jack. 1983. Plurality and conjunction. In *Studies in modeltheoretic semantics*, ed. by Alice G. B. ter Meulen, 63–84. Dordrecht: Foris.
- Horn, Laurence R. 1972. On the semantic properties of logical operators in English. Doctoral dissertation, UCLA, Los Angeles, CA.
- Horn, Laurence R. 1989. *A natural history of negation*. Chicago: University of Chicago Press.
- Ionin, Tania, and Ora Matushansky. 2006. The composition of complex cardinals. *Journal of Semantics* 23: 315–360.
- Jakobson, Roman. 1932. Structure of the Russian verb. In *Russian and Slavic grammar: Studies 1931–1981*, 1–14. Berlin: Mouton de Gruyter (1984).
- Kang, Beom-Mo. 1994. Plurality and other semantic aspects of common nouns in Korean. *Journal of East Asian Linguistics* 3:1–24.
- Katzir, Roni. 2007. Structurally-defined alternatives. *Linguistics and Philosophy* 30:669–690.
- Kim, Chonghyuck. 2005. The Korean plural marker *tul* and its implications. Doctoral dissertation, University of Delaware, Newark.
- Krifka, Manfred. 1989. Nominal reference, temporal constitution and quantification in event semantics. In *Semantics and contextual expressions*, ed. by Renate Bartsch, Johan van Benthem, and Peter van Emde Boas, 75–116. Dordrecht: Foris.
- Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In *Meaning, use, and interpretation of language*, ed. by Rainer Bäuerle, Christoph Schwarze, and Arnim von Stechow, 302–323. Berlin: de Gruyter.
- Percus, Orin. 2006. Antipresuppositions. In *Theoretical and empirical studies of reference and anaphora: Toward the establishment of generative grammar as an empirical science*, ed. by Ayumi Ueyama, 52–73. Tokyo: Japan Society for the Promotion of Science.
- Sauerland, Uli. 2003. A new semantics for number. In *Proceedings of SALT 13*, ed. by Robert B. Young and Yuping Zhou, 258–275. Available at <http://elanguage.net/journals/salt/issue/296>.

- Sauerland, Uli. 2004. Scalar implicatures in complex sentences. *Linguistics and Philosophy* 27:367–391.
- Sauerland, Uli, Jan Andersen, and Kazuko Yatsushiro. 2005. The plural is semantically unmarked. In *Linguistic evidence*, ed. by Stephan Kepser and Marga Reis, 413–434. Berlin: Mouton de Gruyter.
- Sigler, Michele. 1997. Specificity and agreement in modern Western Armenian. Doctoral dissertation, MIT, Cambridge, MA.
- Singh, Raj. 2011. Maximize Presupposition! and local contexts. *Natural Language Semantics* 19:149–168.
- Spector, Benjamin. 2007. Aspects of the pragmatics of plural morphology: On higher-order implicatures. In *Presuppositions and implicatures in compositional semantics*, ed. by Uli Sauerland and Penka Stateva, 243–281. New York: Palgrave Macmillan.
- Winter, Yoav. 2001. *Flexibility principles in Boolean semantics: The interpretation of coordination, plurality, and scope in natural language*. Cambridge, MA: MIT Press.

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