An Overview of Dependent Plurals in English, and Some Interesting Cases

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1   Introduction

In the intuitive approach go English grammar, there are three modalities in which one may assert grammatical number. First, they can use a noun or pronoun's singular form, asserting that the number of the object is 1. They can assign the plural morpheme or plural form of these entities to create a bare plural, asserting that the number is some value other than 1 or 0. Or, they can use a numerical quantifier to specify a unique number or range, e.g. *eleven oranges* or *between eight and and ten syringes*.

However, dependent plurals, bare plurals that are not in the matrix position and whose readings are dependent on a matrix plural noun or plural pronoun, stand and counterexamples to this intuition. Instead, they derive their number from properties of the matrix plural. For example, in the sentence *The dogs have legs*, it is incomplete to say that the plurality of *legs* is ≥ 2, since we know by our definition that *The dogs* must have plurality ≥ 2, and for each dog our intuition states that there needs to be a plurality of legs. Thus, the intuitive model is insufficient for characterizing the behavior of such examples.

In this paper, I identify some of the common interpretations of dependent plurality in English, and provide some novel fringe cases to test the merit of these approaches. I offer support to certain approaches based on these findings, and provide generalizations about what they imply about plurality at large in the language.

2 Canonical Treatment

A common treatment of dependent plurals in English, like the theory supported in Zweig (2008), relies on the treatment of all plural nouns as being unspecified for number. That is, they do not have the intuitive interpretation of being ≥ 2, but rather having no number constraints at all. Their place within a larger context provides them with the implication of a specific kind of plurality.

However, the need for this context dependents also creates an inherent ambiguity. That is, there are necessarily two readings for each dependent plural sentence (the complexity increases combinatorialy for sentences with multiple or nested dependent plurals). The first reading, which I call the intuitive reading, is one in which the plurality of the matrix plural is distributive to the dependent plural. In these cases, the plurality of the dependent plural is a multiple of the plurality of the matrix plural, and can be equal to the plurality of the matrix plural. The second reading, which I call the unintuitive reading, does not hold distributivity. Instead, the matrix plural is treated as a single entity with respect to the dependent, and the dependent plural has no additional constraints given to it by the matrix plural.

3 Cardinality

One illuminating way to test the constraints of dependent plurals in various readings is to explore the salient cardinality of each entity. In practice, this means that we asses the minimum number of entitites that must exist with some context for an utterance to hold true. For example, given the sentences:

(1)   The girls are selling knick-knacks.

(2)   The two girls are selling pincushions.

To see this more clearly, consider the example from Joh (2012):

(3)   Unicycles have wheels.

If only one unicycle exists in the world, then there need only be one salient wheel for this sentence to be true. If there are no unicycles, then the number of wheels do not matter. In (2), we know that the matrix plural has cardinality 2. This implies that the cardinality of the dependent *pincushions* is ≥ 2 in the distributive reading.

On the other hand, the non-distributive reading makes no constraints on the cardinality of either entity. Unlike the distributive reading, for the non-distributive reading (1) and (2) have the same cardinality constraints.

3.1 Interference of External Pragmatics

To fully asses the cardinality of a given utterance, it is necessary to consult intuitive pragmatic information about each of the plurals. For example, in the sentence, *Unicycles have wheels*, the fact that a single unicycle may only have one wheel is constrained by real-world information. Therefore, the cardinality of wheels is such that $|\text{unicycles}| \leq |\text{wheels}|$ within the salient space. However, for the sentence

(4)   The bicycles have wheels.

the fact that each bicycle should ideally have two wheels yields that $|\text{bicycles}| \leq 2|\text{wheels}|$. When compared to the constraints in (3), we see the impact of pragmatics on cardinality.

These constraints may also be grammatically explicit. In the sentence *The three-wheeled Reliant Robins have small wheels*, we do not need prior knowledge about the Reliant Robin or its manufacture, the non-intersective adjective provides us with sufficient information for computing salient cardinality of *small wheels*.

3.2 Other Interference

Interference can also occur at a level higher than the lexicon. Consider the following utterance:

(5)   The Alvarez triplets have brothers.

If we want to know how many brothers there are, we must consult both implicit lexical plurality and real-world constraints. For sake of convenience, I produce three possible scenarios and the associated combinatorics.

We implicitly know that the plurality of the Alvarez triplets is 3. Now, assume that one of the triplets is a woman, and that the triplets have no other siblings. Then from an group reading, there are 2 brothers. However, we have said that dependent plurals have a standard distributional reading as well. In this case, there are still only two unique brothers, however the female triplet will map to two brothers, and each of the male triplets will map to one brother each, yielding four ordered pairs of brother relations.

If we instead assume the triplet has the same constitution, but that the triplets additionally have one male sibling who is not a triplet, then in a non-distributional viewpoint there are

There is additionally an interpretation in which matrix plurals cannot be split into individual entities. In this case, the only brothers we can account for are male relations who are not one of the triplets. So the cardinality of brothers will be equal to however many brothers exist outside of the triplet

The validity of the third reading has a correlate in the case of split dependent plural pronouns in English. In Dimitriadis (1999), the example sentence

(6) John and Mary think they are sick.

there are a few possible readings. In one, the dependent plural pronoun *they* can be split so that anaphora occurs for the individual entities John and Mary, as in (7a). In another, the individuals are a single entity, and refer to themselves as such, as in (7b).

(7) Possible Readings:

    a. John thinks John is sick. Mary thinks Mary is sick.

    b. (John and Mary) think (John and Mary) are sick.

The reading in (7b) corresponds to the collective third reading of the common bare plural in (5).

4 Anti-Quantifiers

One way that the un-intuitive reading of dependent plurals is blocked is through the use of so-called anti-quantifiers. Anti-quantifiers are words like *each* and *each other* that restrict the kind of distributions that readings can have (Choe 1987). For example, (6) cannot have the reading that both John thinks Mary is sick and Mary thinks John is sick, but neither thinks themselves are sick. However, the sentence

(8)   John and Mary think each other are sick.

does indeed have this interpretation, as well as the interpretation given in (7b).

The use of anti-quantifiers also prohibits the non-distributive reading of dependent plurals. For instance in the sentence

(9)   The dogs have bones.

there is a distributive and non-distributive reading. In the distributive reading, each salient dog possesses a bone. In the non-distributed reading, we allow for dogs to share bones. However, in

(10)   The dogs each have bones.

the distributed reading is enforces, and the number of salient bones is constrained by the number of dogs. In addition, the number of bones possessed by a single dog is individually constrained by the definition of plurality adopted by the analysis, whether it indeed be the "more than one" conception or the neutral analysis.

The user of anti-quantifiers with dependent plurals allows us to test the boundaries of their properties. Consider the sentence

(11)   The men with two noses each have noses.
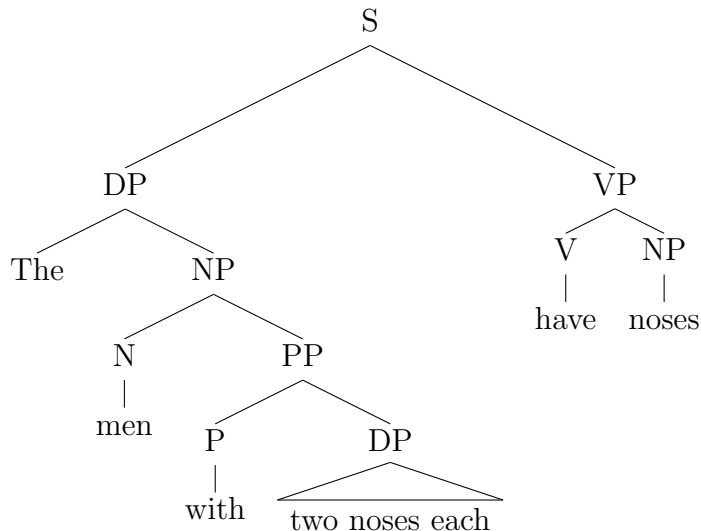
whose structure is given in Figure 1.

Figure 1: Syntactic structure of example sentence

In this sentence, the matrix plural *gives* is anti-quanitified with a numerically quantified plural (*two noses each*). From this, we know that $|\text{noses}| \leq 2|\text{men}|$ and *men with two noses each* corresponds to $\lambda x.[\text{man}(x) = \text{has-two-noses}(x) = 1]$. We know that the DP functionalizes this set, which can then apply to the VP *have noses*. However, we have already quantified the plurality of salient noses in the embedded PP, so we are pragmatically constrained to say that the cardinality of the dependent plural *noses* in the VP is also $\leq 2|\text{men}|$.

5 Comparison of Frameworks

The proposed conceptions of the properties of dependent plurals offer interesting implications for plurality. For example, the example given in (11) seems to support the assertion in Zweig (2008) that plurals are neutral, and are assigned number by their context. However, the notion of neutral plurality is forces the intuitive and unintuitive readings to have equal logical weight, which is not ideal.

In either stance of plurality, the approach of comparative cardinality can be used to reduce the possible numerical space of dependent plurals in either reading.

6 Conclusion

Dependent plurality occupies an interesting grammatical space. The plurality of bare plurals that are dependent on some external contextual plurality is both intuitive and logically ambiguous. Examples of dependent plurality can cause us to question the implications of plurality in general. These different approaches illuminate the properties of dependent plurals, like which interpretations are possible and what they imply about cardinality, distribution, etc.

References

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