Semantic Layers in DP

This paper provides two sources of evidence that ordinary DPs selecting mass nouns and plurals like (1-a) and pseudopartitives like (1-b) are surface manifestations of the same underlying syntactic and semantic structure.

(1)  
   a.  some water/cherries  
   b.  three gallons of water/cherries

On the one hand, evidence from kind anaphora in Spanish supports a decomposition of DP structure into a layer introducing kind meanings and a layer converting kinds into property meanings; on the other, a restriction against montonic measure phrases as attributive modificatiers of nouns, exemplified in English, supports the same conclusion. Ultimately, the evidence presented supports a universal DP structure whose constituents only become overtly separable in pseudopartitives.

Introducing the Paradigm. Chierchia (1998) argues that bare plurals in Romance are ruled out in subject positions because Romance plurals require a determiner to manifest kind meanings, while null determiners are limited to lexically-governed (i.e., non-subject) positions. (2) illustrates the restriction exemplified in Italian.

(2)  
   a.  *Studenti hanno telefanato  
       students PST phone  
       ‘Students have phoned’
   b.  Leo ha mangiato patate  
       Leo PST eat potatoes  
       ‘Leo ate potatoes’

While in (2-b), Chierchia argues, a governed null determiner allows patate to be interpreted as a kind (which is then interpreted existentially via a type shift), the determiner is ungoverned in (2-a).

Kind Anaphora in Spanish. By the same logic, null determiners can be discovered in Spanish sentences containing kind anaphora; that is, pronouns that, with an appropriate antecedent, can be interpreted as kinds.

(3)  
   a.  Los perros son el animal favorito de Juan, porque son fieles  
       the dogs be.PL the animal favorite DE Juan because be.PL loyal  
       ‘Dogs are Juan’s favorite animal, because they are loyal’
   b.  Juan tiene algunos perros, porque son animales fieles  
       Juan have.SG some dogs because be.PL animals loyal  
       ‘Juan has some dogs, because they are loyal animals’
   c.  *Los perros son el animal favorito de Juan, y por eso están en su casa  
       the dogs be.PL the animal favorite DE Juan and for that be.PL in his house  
       ‘Dogs are Juan’s favorite animal, and because of that they are in his house’

In (3-a) the anaphoric null subject in the second clause pro receives a kind interpretation. (3-b) shows that such anaphora is also possible when the antecedent has an existential interpretation. (3-c) shows that the reverse direction is impossible: existentially interpreted pro cannot have the kind-referring los perros as its antecedent. While these facts lack explanation on an analysis of bare plurals on which they are always kind-referring (Carlson, 1977), or one on which the kind meaning undergoes a type shift (Chierchia, 1998), they are predicted on the “universal pseudopartitive” analysis of DPs alluded to above. (4) illustrates the composition of the DP algunos perros, in which the layer FP is responsible for extracting a property from a kind meaning (small caps represent kinds). k is the type of kinds.

\[
\lambda P_{\{a,t\}} \lambda Q_{\{a,t\}} P \cap Q \neq \emptyset \quad F \quad \lambda k, \lambda x_0 x \leq k \quad \text{NP}
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\]
(3-b) allows the quantifier phrase to antecede kind-referring pro because the kind-meaning is properly contained in it (NP in (4)). On the other hand, a kind meaning does not contain an existential one, ruling out (3-c). Moreover, following Italian, the null element F that introduces properties may not project over pro in (3-c), since it is in subject position. The account therefore predicts that a pronoun in object position, where it is lexically-governed, should be acceptable. (5) shows that the prediction is borne out, though the example is still not completely felicitous.

(5) Los perros son el animal favorito de Juan, y por eso tiene en su casa the dogs be.PL the animal favorite DE Juan and for that have.SG in his house ‘Dogs are Juan’s favorite animal, and because of that he has them in his house’

**Attributive Modification.** Schwarzchild (2006) notes a restriction against monotonic measure phrases as modifiers of plurals and mass nouns.

(6) a. three-ounce water/cherries
b. thirty-degree Celsius water/cherries

In (6-a), for example, water is infelicitous and cherries must be interpreted distributively, so that each cherry weighs three oz. While Schwarzchild’s account stipulates this restriction, it is predicted on the current account, assuming kind meanings are subject to modification. In particular, following the theory of kinds in Chierchia (1998), though allowing for attributive modification, I assume water denotes a property of water kinds, i.e., functions from worlds to their maximal sums of water. Then, assuming thirty degrees denotes an ⟨e, ⟨s, t⟩⟩-type function characterizing thirty-degree portions, it may undergo the type shift in (7). k is again the type of kinds, where \( D_k \subseteq D_{(s, e)} \).

(7) \[ \text{[thirty degree]}_{\text{kind}} = \lambda k_w. \forall w_3[\text{[thirty degree]}(k(w))(w)] \]

(6-b) is then interpreted from (7) via Predicate Modification, after which the entire expression may be interpreted as a kind via an t-shift (Partee, 1987; Chierchia, 1998). However, the type shift in (7) yields an empty property for three oz, ruling out (6-a), because of the characterization of kinds as maximal individuals satisfying a particular property. That is, since three-oz portions are not partially ordered by the part-of relation of Link (1983), their maximum is undefined. As a result, for no kind will three oz be true of the individual it returns in all worlds. Moreover, this result relies crucially on a theory in which plurals and mass nouns have a kind-based semantics in all of their occurrences, while functional structure mediates between kind meanings and properties. The only way for three oz to modify water or cherries (with a collective interpretation) is to attach it above the mediating functional head F, in which case it is spelled out as in (8), where F is spelled out as ‘of’ (the construction descriptively referred to as a “pseudopartitive”).

(8) three ounces of water/cherries

**Conclusion and Further Prospects.** The analysis presented here unifies the syntax and semantics of pseudopartitives with that of DPs containing mass nouns and plurals in general, by proposing that in all cases, a single functional head F is involved. This functional head results in the asymmetric pattern of anaphora to kinds observed in Spanish as well as the non-monotonicity of attributive modifiers exemplified in English. A further benefit is the unification of pseudopartitives with partitives, like three gallons of the water, in which the selected DP has an individual-based semantics, and the functional head F extends by simply changing its type. Last, the analysis predicts that the head F appearing with existential interpretations of plurals and mass nouns should appear overt in some cases, which I claim is exemplified by de in French.
