WCCFL 33
Simon Fraser University
March 29, 2015

# Semantic Layers in DP

THE UNIVERSITY OF CHICAGO

Julian Grove
juliang@uchicago.edu

Department of Linguistics
University of Chicago

## Kinds, existentials, and NP meaning

Two dominant theories of bare plurals and mass terms—Carlson (1977a; 1977b) and Chiercha (1998)—regard them as either uniformly kind-denoting or kind- or property-denoting (subject to crosslinguistic variation).

### Carlson

Bare mass nouns and plurals denote kinds (type e), while existential interpretations come from the predicates containing them.

- Obligatory narrow scope:

(1) A dog is in this room, and a dog is not in this room

(2) #Dogs are in this room, and dogs are not in this room

- Non-referential anaphora:

(3) Bill is seeking a unicorn, and Susan is seeking it too (*a unicorn* > *seek*, **seek* > *a unicorn*)
⇒ There are unicorns

(4) Bill is seeking unicorns, and Susan is seeking them too (**unicorns* > *seek*, *seek* > *unicorns*)
⇏ There are unicorns

- Apparent type-shifting under anaphora:

(5) John likes apples$_{\text{kind}}$, which is why he bought them$_{\text{existential}}$ yesterday

- Existential interpretations: $[\![\textit{John bought apples}]\!]$ =
$\lambda P_{\langle e,t\rangle}.P(\textsc{apple})(\lambda x_e.\exists y_e[R(y)(x)$ & **j** bought $y])$ =
$\exists y_e[R(y)(\textsc{apple})$ & **j** bought $y]$, where $R$(a)(b) iff a instantiates b.

### Chierchia

The **Nominal Mapping Parameter**: Bare mass nouns and plurals denote kinds in classifier languages, properties in, e.g., Romance, and either one in, e.g., Germanic or Slavic. Kind-denoting expressions may undergo a type-shift—"Derived Kind Predication" (DKP)—to receive existential interpretations.

- Bare nouns occur with existential interpretations in classifier languages via DKP:

(6) wò kànjiàn xióng le
1SG see bear ASP
'I saw some/the bears' (Mandarin)

- Kind-denoting expressions require determiners in Romance, as bare nouns must denote properties:

(7) A Juan le gustan *(los) perros
to Juan 3SG likes the dogs
'Juan likes dogs' (Spanish)

- In Germanic, bare nouns can denote kinds:

(8) Juan likes (*the) dogs

On both views, existential interpretations arise from factors other than noun-phrase structure. For Carlson, they are due to the predicate containing the noun, and for Chierchia, to a type-shift that applies to kind-denoting terms.

### Diesing

A third approach, represented in Diesing (1990), regards bare nouns as property-denoting, while kind versus existential interpretation is determined by a noun's position within the clause.

- The stage- versus individual-level contrast in readings of bare nouns (Carlson 1997a, 1997b):

(9) Firemen are available (Existential and kind readings)

(10) Firemen are friendly (Kind reading only)

The **Mapping Hypothesis**:

- Bare nouns denote properties.
- To receive kind interpretations, they raise to [Spec,IP] to be bound by a genericity operator. [Spec,IP] is also the position required for NPs by individual-level predicates.
- To receive existential interpretations, they stay in [Spec,VP] and are subject to existential closure.

## Kind anaphora

**Preview of the proposal**: It is not type shifts or external syntax, but the internal syntax of DP, that is responsible for existential interpretations of plurals and mass nouns. This claim is supported by kind anaphora, i.e., pronouns whose interpretations are determined by kind-denoting antecedents.

### Background: discovering null structure

Chierchia (1998) argues that bare plurals are prohibited in subject positions in Romance because they require a null determiner to manifest kind meanings, while null determiners are limited to lexically-governed (i.e., non-subject) positions (Rizzi, 1990).

- Bare plurals in Italian—subject versus object:

(11) *Studenti hanno telefonato
students PST phone
'Students have phoned'

(12) Leo ha mangiato patate
Leo PST eat potatoes
'Leo ate potatoes'

### Null structure and kind anaphora

The same logic can be used to discover null structure in Spanish sentences containing kind anaphora, i.e., pronouns that appear to be interpreted as kinds.

- ✓ Interpretion of PRO as a kind on anaphora to a kind:

(13) Las manzanas son la fruta favorita de Juan porque PRO son dulces
the apples are the fruit favorite of Juan because PRO are sweet
'Apples are Juan's favorite fruit because they are sweet'

- ✓ Interpretion of PRO as a kind on anaphora to a property:

(14) ?Juan tiene algunas manzanas porque PRO son frutas dulces
Juan has some apples because PRO are fruit sweet
'Juan has some apples because they are sweet fruit'

- ✗ Interpretation of PRO as a property on anaphora to a kind:

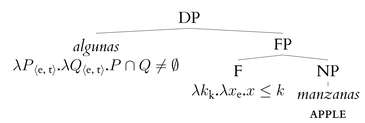
(15) *Las manzanas son la fruta favorita de Juan, y por eso PRO están en su cocina
the apples are the fruit favorite of Juan and for that PRO are in his kitchen
'Apples are Juan's favorite fruit, and because of that they are in his kitchen'

The unacceptability of the second clause in (15) can be explained if PRO is selected by an unlicensed null head. This null head would not be necessary, however, in the two preceeding examples.

## Proposal

The above examples are explained if *algunas manzanas* has the structure in (16) (k is the type of kinds):

(16)




- $\leq$ is Link (1983)'s part-of relation between individuals, but extended to a relation between individuals and kinds.
  - In general, $x \leq k$ iff $^{\cup}k(x)$, where '$^{\cup}$' is Chierchia's "up"-operator; that is, $x \leq k$ in $w$ iff $x \leq k(w)$.
- The semantics of kinds is adopted from Chierchia (1998), where they are functions from worlds to maximal individuals, so that $D_k \subset D_{\langle s,e\rangle}$. In particular:
  - APPLE := $\lambda w_s.\textsc{max}(\lambda x_e.x$ is a plurality of apples in $w)$
- As any analysis would likely predict, PRO may be interpreted as a kind on anaphora to a kind-denoting expression, as in (13).
- On the given analysis, PRO can be interpreted as a kind on anaphora to a kind-denoting expression ( NP) contained in a property-denoting expression (FP), as in (14).
- But as the unacceptable (15) shows, PRO cannot be interpreted as a property on anaphora to a kind-denoting expression. This is because, given (16), there is no property previously introduced to refer back to. Nor can PRO be interpreted as a kind but project a null FP to introduce a property meaning, since it is in subject position.
- Prediction: Sentences like (15) should improve when the pronoun is in object position, where a null F would be licensed:

(17) ?Las manzanas son la fruta favorita de Juan, y por eso compró PRO ayer
the apples are the fruit favorite of Juan and for that bought PRO yesterday
'Apples are Juan's favorite fruit, and because of that he bought them yesterday'

## Restrictions on extensive modifiers

There is a restriction on prenominal modifiers noted in Schwarzschild (2002; 2006) ensuring that they denote properties involving "non-monotonic" measurements. While Schwarzschild's proposal stipulates this restriction, it is instead predicted by the current proposal.

### Intensive modifiers only

- Schwarzschild notes restrictions like the following, where only the intensive modifier may occur attributively:

(18) ??three-ounce water/cherries

(19) thirty-degree water/cherries

  - In (18), *three-ounce cherries* is acceptable only if each cherry, not the entire collection, is taken to be three ounces.

### Kinds as maximal individuals

Since the current analysis follows Chierchia (1998) in assuming that kinds are functions from worlds to maximal individuals, but proposes DPs have the structure in (16), the restriction is explained. In particular:

- To allow prenominal modification of kind-denoting nouns, assume they actually denote properties of kinds, as in, e.g., Anderson and Morzycki (To appear).
- So that prenominal modifiers can compose with NPs denoting properties of kinds via Predicate Modification, assume they undergo a type-shift from $\langle e, \langle s, t\rangle\rangle$-type meanings to $\langle k, t\rangle$-type meanings.
  - $[\![\textit{thirty degrees}]\!]_{\text{kind}} = \lambda k_k.\forall w_s[\exists x_e[\langle w, x\rangle \in k] \rightarrow [\![\textit{thirty degrees}]\!](k(w))(w)]$
- However, such a type-shift yields an empty property for *three ounces* (or any extensive modifier), since three-ounce portions are not partially ordered by Link (1983)'s part-of relation.
- Alternatively, an extensive modifier like *three ounces* might attach above FP, after the kind denoted by *water/cherries* has been converted into a property. In that case, F is spelled out as *of*:

(20) three ounces of water/cherries

## Overt realizations of F

The current proposal predicts the existence of languages that realize F overtly in all contexts. I argue that this is precisely what happens in French, in which F is spelled out an allomorph of *de*.

- French realizes preposition-determiner sequences involving *de* ('of') as contractions in certain contexts, as in the following:

(21) Jean aime les photos des pommes
Jean likes the photos of.the apples
'Jean likes photos of apples'

- Kind-denoting nouns are realized with determiners, as in other Romance languages:

(22) Les pommes sont délicieuses
the apples are delicious
'Apples are delicious'

- But property-denoting nouns (i.e., with existential interpretations) overtly project F above above the expression denoting the kind (as (21) showed, the resulting sequence is realized as a contraction *des*):

(23) Jean a des pommes
Jean has of.the apples
'Jean has apples'

- French has an object clitic pronoun *en* which constitutes an overt realization of FP, so that sentences may introduce properties on anaphora to kinds.

(24) Les pommes sont les fruits préférés de Jean, et il en a acheté hier à cause de ça
the apples are the fruit favorite of Jean and he of.them has bought yesterday at cause of this
'Apples are Jean's favorite fruit, and because of that he bought them yesterday'

**References** Anderson, C. and M. Morzycki. (To appear). Degrees as kinds. *Natural Language and Linguistic Theory*. • Carlson, G. (1997a). Reference to kinds in English. Doctoral Dissertation, University of Massachusetts, Amherst. • Carlson, G. (1977b). A unified analysis of the English bare plural. *Linguistics and Philosophy* 1:413–457. • Chierchia, G. (1998). Reference to kinds across languages. *Natural Language Semantics* 6:339–405. • Link, G. (1983). The logical analysis of plurals and mass terms: A lattice-theoretical approach. In *Meaning, Use, and Interpretation of Langauge*, ed. R. Bäuerle, C. Schwarze, and Arnim von Stechow, 302–323. Berlin: de Gruyter. • Schwarzschild, R. (2002). The grammar of measurement. In *Proceedings of the 12th Conference on Semantics and Linguistic Theory*, ed. B. Jackson, 225–245. Cornell, Ithaca. • Schwarzschild, R. (2006). The role of dimensions in the syntax of noun phrases. *Syntax* 9(1): 67–110. • Diesing, M. (1990). *Indefinites*. MIT Press, Cambridge. • Rizzi, L. (1990). *Relativized Minimality*. MIT Press, Cambridge.

**Acknowledgments** Thanks to Helena Aparicio, Helena Mateos Fernandez, Melania S. Masià, and Verónica Moraga for the Spanish judgments, and to Rafael Abramovitz for the French sentences. Thanks very much to my four anonymous abstract-reviewers for helpful comments. Thanks also to Andrea Beltrama, Emily Hanink, and Melania S. Masià for comments.