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REFERENCE TO KINDS ACROSS LANGUAGES*

This paper is devoted to the study of bare nominal arguments (i.e., determinerless NPs occurring in canonical argumental positions) from a crosslinguistic point of view. It is proposed that languages may vary in what they let their NPs denote. In some languages (like Chinese), NPs are argumental (names of kinds) and can thus occur freely without determiner in argument position; in others they are predicates (Romance), and this prevents NPs from occurring as arguments, unless the category D(eterminer) is projected. Finally, there are languages (like Germanic or Slavic) which allow both predicative and argumental NPs; these languages, being the 'union' of the previous two types, are expected to behave like Romance for certain aspects of their nominal system (the singular count portion) and like Chinese for others (the mass and plural portions). This hypothesis (the 'Nominal Mapping Parameter') is investigated not just through typological considerations, but also through a detailed contrastive analysis of bare arguments in Germanic (English) vs. Romance (Italian). Some general consequences of this view, which posits a limited variation in the mapping from syntax into semantics, for current theories of Universal Grammar and acquisition are considered.

1. GOALS AND MAIN DATA

The current view of the syntax-semantics interface is based on the following set of guiding principles:

(1) a. Syntactic categories at the relevant level of representation, say LF, are mapped onto corresponding semantic types (thereby determining for each expression what its denotation is going to be).

b. Logical Forms are compositionally interpreted using a small set of universal rules (like functional application and abstraction).

   c. Local type mismatches can be solved through a highly con-
      strained set of universally available type shifting operations.
      These apply either in the lexicon or, possibly, as part of the
      compositional interpretation of phrases.

A central question in the endeavor of figuring out the architecture of
Universal Grammar is what variation, if any, there is in (1a–c) across
languages. One important stream of research seeks to locate all variation
in the lexicon. If one adheres to this basic idea, the issue remains whether
lexical variation is limited to morphological properties of words or may also
involve what words refer to. Differently put, the question is whether
variation in grammar can be couched using purely syntactic primitives or
whether semantic ones (like 'reference') must be resorted to as well. The
present paper explores this issue. To anticipate, I will argue that the
existence of interface conditions giving rise to semantic variation is both
empirically supported and theoretically well grounded (or groundable)
within current theories of UG and language learning. If this turns out to
be correct, there will be a wide range of consequences for, e.g., the status
of L(ogical) F(orm), acquisition, etc.
   The empirical domain on which I shall focus concerns the syntax and
semantics of bare nominal arguments, that is, determinerless noun phrases.
In particular, I would like to do mainly three things:

   (2) a. Assess the status of the ongoing debate on bare nominal argu-
           ments (bare plurals and mass nouns) in English;
        b. Extend the empirical coverage of current theories so as to address
           the differences between the distribution of bare nominals in
           English (and, more generally, Germanic) vs. Italian (and, more
           generally, Romance);
        c. Develop and defend a 'Neocarlsonian' view of kind reference
           within a theory of bare arguments that has if not universal, at
           least broad crosslinguistic applicability.

I will first elaborate on each of these points in turn. Then I will show
their relevance to the issue of semantic variation. To begin with point (2a):
Carlson (1977) in his seminal work has proposed that the complex
properties of bare plurals can be explained by assuming that they refer to
kinds. In more recent research, mostly inspired by Discourse Representation
Theory (DRT; Kamp 1981, Heim 1982) this view has come under attack
and been supplanted by the idea that English bare plurals are ambiguous.[1]

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[1]   Relevant references include Gerstner and Krifka (1995), Krifka (1988), Wikinson (1991),
Diesing (1992). Cf. also Longobardi (1994, 1996).

On the one hand, they do denote kinds, as Carlson claims. But they also have a second reading as (weak) indefinites.[2] On the latter reading, they introduce variables in the semantic representation that either wind up quantified by a generic operator or get existentially closed. This second view of bare plurals, which I will call the 'Ambiguity Approach' ('A-Approach' for short) appears to be currently dominant. In this paper, I will argue in favor of going back to what might be called a Neocarlsonian view, where bare arguments unambiguously refer to kinds. The proposal to be developed differs from Carlson's original one in several ways – most prominently, in that no appeal is made to the notion of 'stage'. My defense of a Neocarlsonian approach is based in part on a reconsideration of familiar (though sometimes forgotten) evidence drawn from English and in part on evidence taken from the Romance languages, in particular Italian (point 2b). The basic contrastive facts that any theory of bare nominals in these languages ought to address are the following. In both Germanic and Romance, bare singular arguments are totally impossible (if the noun is not mass).[3] Bare plurals and bare mass nouns are grammatical in Germanic while in Romance either they are not (French) or they have a much more limited distribution (Italian, Spanish, etc.). The following is a typical contrastive paradigm:

(3) a.*Dog loves to play/is playing outside/is rare
    b.*Cane ama giocare/sta giocando fuori/è raro
    c. Dogs love to play/are playing outside/are rare
    d.*Cani amano giocare/stanno giocando fuori/sono rari

To compensate for the non-existence or more limited distribution of bare plurals, Romance resorts to two strategies. For the existential readings of bare plurals, it uses devices of existential quantification, like plural forms of the indefinite article (Spanish) or partitive constructions (French, Italian):

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[2] The weak-strong contrast in the interpretation of indefinites is familiar from Milsark's (1974) work. Strong indefinites presuppose the existence of individuals satisfying their restriction; weak indefinites do not. The weak character of bare plurals is witnessed by contrasts of the following sort:

(i)   Some dogs were barking in the courtyard. Others were not.
(ii)   *Dogs were barking in the courtyard. Others were not.

[3] Except in contexts like (i):

(i)   The bird hopped from tree to tree.

We won't discuss such sentences here, although I think that the theory of bare arguments to be developed is relevant also in this connection.

(4) a. Unos chicos han   entrado.
        a-pl   kids   have entered

     b. Dei   cani stanno giocando fuori.
        of-the dogs are   playing   outside

        ('Dogs are playing outside.')

For the generic or kind reading, Romance resorts to the definite article, an option that appears to be ruled out in English:

(5) a. I   cani sono rari/ amano giocare.
        The   dogs are   rare/love   to play.

     b.*The dogs are rare.

     c.*The dogs love to play. (on the reading 'dogs in general')

Both language families admit generic or kind-oriented readings of the singular definite article:

(6) a. Il dodo è estinto.
     b. The dodo is extinct.

The data in (3)–(6) appears to represent the minimal empirical generalizations that any theory of bare arguments ought to derive in a principled manner. More detailed facts will be considered later.

Let me now elaborate a bit further on point (2c). The issue of kind reference is strictly intertwined with the issue of whether the category D of determiners always has to be projected in order to have a nominal argument. The canonical view on the syntax and semantics of NPs can be summarized as follows:[4]

(7) a. $[_{DP}$ the $[_{NP}$ dog$]]$

     b. DP $\Rightarrow$ e , GQ (Generalized Quantifiers)   [arg]
                                    DPs are arguments

     c. NP $\Rightarrow$ $\langle e, t \rangle$ [pred]
                                    NPs (common nouns) are predicates

A noun like *dog* belongs to the lexical category N that projects to a phrasal category NP. This is taken as complement by the category D which includes articles and quantifiers. Much richer syntactic structures than the one

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[4] Here and throughout I will use Montague's notation for type theory, where e (the type of individuals) and t (the type of truth values) are the basic types, while the complex ones are $\langle a, b \rangle$ (the types of all functions from a into b) and $\langle s, a \rangle$ (the intensional types of all functions from possible worlds to entities of type a). The type GQ of generalized quantifiers is $\langle\langle s, \langle e, t \rangle\rangle, t \rangle$.

illustrated in (7a) have been proposed for nominals (see, e.g., Giorgi and Longobardi 1991 or Zamparelli 1995). For our present concerns, only the contrast between the category NP and what is above it is relevant. Hence, it seems appropriate to leave aside more elaborate theories of NP structure, even though, insofar as I can see, what I have to say is consistent with them. Now, can bare NP arguments exist in English or, for that matter, in any language? Perhaps a comparison with the clause is appropriate. We know that the left periphery of the clause has a rather complex structure involving the category C(omp) and various other functional categories related to Topic and Focus (see, e.g., Rizzi 1996 for a recent view). Yet this rich structure is not taken to be always present when clauses occur in complement position. This is true even of the category Comp itself, which is absent from the so-called ECM (or, in an older terminology, 'raising-to-object') constructions (i.e., the complement of *believe*-type verbs) and from complement small clauses:

(8) a. I believe [$_{IP}$ Bill to be intelligent]
     b. I consider [$_{sc}$ Bill intelligent]

If the analogy between clausal and nominal constituents holds, it would seem natural to take bare NP arguments to exist as a nominal analogue of, say, small clauses. Yet there is a great deal of resistance to this view (see, e.g., Stowell 1991, Longobardi 1994, 1996). The objections are often based on semantics, the intuition being that somehow nouns need determiners to be made into arguments. One way of cashing out on this intuition is by exploiting the (allegedly) canonical mapping of nominal categories into their denotations shown in (7b–c). Bare nouns, qua restrictions of quantifiers, must be predicates, as the latter have an extension that can function to restrict the range of a quantifier (which, in Montague's notation, yields the mapping in (7c)).[5] On the other hand, DPs, qua arguments of verbs, must be of the canonical argumental types, namely e (for referential nominals) or G(eneralized) Q(uantifiers) (for quantificational nominals). This yields the mapping in (7b).[6] If such mapping is universal, then bare NP arguments cannot exist, as their type is not an argumental one. Each time one sees a bare NP argument, the category D must have been projected. While this (or some variant thereof) is plausible, it can be contrasted with another, a priori also plausible view. Suppose that bare NPs can, or some-

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[5] We are ignoring here proper names, to which we shall return in section 7.
[6] Here and throughout we will ignore DPs in predicative positions (as in 'John is an engineer'). We assume that the latter are obtained via type-shifting mechanisms of the kind discussed in Partee (1987).

times even must, refer to kinds. Kinds are entities of an argumental type (i.e., of type e). Hence, there is no semantic obstacle whatsoever to the existence of bare NP arguments as kind-referring NPs. The issue thus becomes whether and under what conditions NPs refer to kinds. The denotation of nouns might vary across languages, and this variation might be responsible for the different distributions of bare nominal arguments.

So it is clear what is at stake here. At stake is how arguments, other than very simple ones like *John*, are fed into the verb. It is also at stake how flexible and how variable across languages the mapping is between nominal categories and their meaning (namely, the issue of semantic variation).

Let me give a brief overview of what is to come. Throughout, I will be adopting the Principles and Parameters framework (as amended in recent work, such as Chomsky 1995). Since our main empirical topos is the distribution of bare plurals and mass nouns, some background assumptions concerning these constructions will have to be made. These will be spelled out in section 2. In section 3, I will develop a typology of kind reference, that is, a tightly constrained view of how the lexical category N (and its phrasal projection NP) is mapped onto its denotation across languages. Such mapping relies on principles of type shifting that have been argued in the literature to link various kinds of NP denotations (Partee 1987). The issue of type shifting is thus addressed and a principle governing its use ('Type Shifting as Last Resort') is proposed. In section 4, I will articulate my version of Carlson's proposal and show how it accounts for the behavior of bare arguments in English. In section 5, I will consider some objections that have been leveled against Carlson's original proposal and argue that they do not apply to my Neocarlsonian approach. In section 6, I will discuss the Italian facts and propose that the framework developed thus far allows us to reduce them to two simple generalizations: a different mapping between NPs and their denotations and the existence of a phonologically null determiner. The first of these facts differentiates Romance from Germanic quite generally; the second is particular to Italian (and, perhaps, to other languages of the Romance family, like Spanish). In section 7, I turn to other nominal structures of particular interest from the point of view we are adopting – namely, nominalized adjectives (like *the rich*) and proper names – discussing in this connection a pattern of N-to-D raising discovered by Longobardi (1994, 1996). Finally, in section 8 some general consequences for the theory of grammar and of acquisition will be drawn.

2. AN ONTOLOGY FOR UG: THE STRUCTURE OF THE DOMAIN OF DISCOURSE

The basic assumptions that we will be making regarding plurals are fairly standard at least since the work of Link (1983), Landman (1989), and many others. The assumptions we will make for mass nouns and kinds are not so standard (though they build on much recent work). Let us consider them in turn.

2.1. *Pluralities*

We will assume that the domain of quantification, besides ordinary singular individuals, contains also plural ones, which I will represent here as sets. The domain forms a complete atomic join semilattice, which can be visualized as follows:

(9) a.   {a, b, c}   . . . .

   {a, b}   {a, c}   {a, b}   . . . .

          a   b   c   . . . .

   b. i.   {a, b} ≤ {a, b, c}
      ii. a ≤ {a, b}
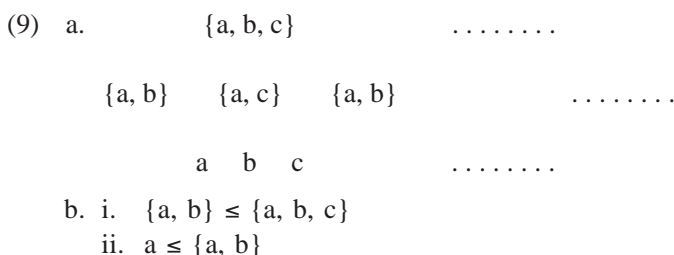
The individuals at the bottom of the structure in (8a) are the singular ones. They constitute the reference of singular definite DPs like *John* or *that table* (or also, as we shall see, *that kind of animal*). The individuals in curly brackets are the plural ones and constitute the reference of plural definite DPs (like *John and Mary* or *those tables*). The domain is ordered by a relation '≤'. The relation '≤' can be thought of as a 'subgroup' or 'part-of' relation, with the understanding that singular individuals are to be thought of as 'subgroups' or 'part' of any plurality they may belong to. The singular individuals constitute the 'atoms' of the domain, in that they have only themselves as 'subgroups.' In terms of '≤', a join operation '∪' can be defined in the usual manner (i.e., for any two elements a, b in the domain, a ∪ b is the smallest plural individual comprising them). Singular common count nouns like *dog* are (characteristic functions) true of individual dogs. Plural common count nouns like *dogs* are true of pluralities (sets) of dogs. Thus, pluralization is a function that applies to sets of atoms (or, rather, characteristic functions thereof) and turns them into the corresponding sets of pluralities. Such an operation, call it PL, can be defined as follows:

(10) a. $PL(F) = \lambda x\,[\neg F(x) \wedge \forall y[y \le x \wedge At(y) \rightarrow F(y)]]$

b. Example:

$$\text{dogs} \quad = \begin{bmatrix} \{f, b, s\} \\ \{f, b\} \qquad \{b, s\} \qquad \{f, s\} \end{bmatrix}$$

$$\text{PL}$$

$$\text{dogs} \quad = \qquad [\,f \quad b \quad s\,]$$

f = Fido   b = Barky   s = Spotty
(Characteristic functions are represented by enclosing their extensions in square brackets.)

So if Fido, Barky, and Spotty are all the dogs in the world, the singular noun *dog* will be true of them. The plural noun *dogs* will be true of Fido and Barky, Fido and Spotty, and all the other possible groups of which these three individual dogs may be part. We will also borrow from the literature the analysis of the definite determiner *the* (see, e.g., Sharvy 1980). The Frege-Russell definition of the iota operator 'ι' is generalized along the following lines:

(11) a. $\iota\,X$ = the largest member of X if there is one (else, undefined)
b. the dogs = $\iota\,DOGS$ = the largest plurality of dogs
c. the dog = $\iota\,DOG$ = the only dog (if there is one)

The ι-operator can be used to interpret the definite article *the* as indicated in (11b–c). If it applies to a set of pluralities (like the extension of the plural noun *dogs*) it will refer to the largest plurality in that extension (i.e., the one that comprises all of the dogs). If it applies to a set of singularities, it also seeks the largest one. But since no atom is larger than any other one (in the relevant sense, viz. with respect to '$\le$'), this will yield a result only when the predicate has just one object in its extension. The singularity presupposition of the definite singular article is thus accounted for in an elegant and natural manner.

2.2. *Masses*

Mass nouns are known to have a lot in common with plurals. The way this is generally captured is by assuming that next to a count domain (of the form in (8)) there is a second domain homomorphic to the former, which, however, is not required to be atomic (see on this, e.g., Link 1983 or Landman 1991). Mass nouns take their denotation from the latter domain. I believe that the similarity between mass nouns and plurals is best captured

in a different way. I will assume that mass nouns, unlike count ones, come out of the lexicon already pluralized. More precisely, I will assume that a mass noun, such as, say, *furniture* will be true in an undifferentiated manner of singular pieces of furniture, as well as of pluralities thereof.

(12)

$$\text{furniture} \quad \begin{bmatrix} \{a, b, c\} \\ \{a, b\} \quad \{a, c\} \quad \{a, b\} \\ a \quad b \quad c \end{bmatrix}$$

Thus, mass nouns are quite literally the neutralization of the singular/plural distinction. The extension of nouns like *water* is analogous to the one of nouns like *furniture*, the only difference being that what counts as a minimal portion of water is somewhat vague and may vary from context to context.

I cannot defend here in detail this view of mass nouns (see Chierchia 1996 for such a defense; see also Gillon 1992 for a similar view). But it might be appropriate to give an idea of how the standard properties of mass nouns can be naturally derived from the assumption just sketched. Consider, to start, the impossibility of pluralizing mass nouns. This follows immediately from the fact that they are already plural. They come out of the lexicon closed under the group forming operation '∪'. Hence pluralizing them makes no sense. And indeed, PL as defined in (9a) will yield the empty set if applied to a mass noun extension. Consider moreover the impossibility of directly counting with a mass noun (i.e., the ungrammaticality of phrases like *three furniture*). For counting we need to individuate a level at which to count (cf. on this Kratzer 1989). For natural language this has to be a set of atoms. But a mass noun, unlike count ones, does not correspond to a set of atoms. Hence it doesn't provide a suitable counting criterion.[7] That is why to count a mass noun denotation we need a classifier phrase (like *piece of* or *truckload of*) or a measure phrase (like *tons of*). Classifier phrases map mass noun denotations into sets of atoms. Measure phrases can be ultimately thought of as functions from objects into numbers (see, e.g., Krifka 1989, Higginbotham 1994).

Notice that under the present view the treatment of the definite article

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[7] M. Krifka (p.c.) suggests that plural morphology on nouns with numerals is just a matter of agreement, as attested by the grammaticality of sentences like (i):

(i)   The average Italian family buys 0.5 cars (/*car) per year.

For a different view, which comes to an essentially similar account of the ungrammaticality of numerals + mass nouns, however, see Chierchia (1996).

extends straightforwardly to mass nouns. Something like *the furniture* will denote the largest *plurality* (i.e. amount/quantity) of pieces of furniture of which the common noun *furniture* is true, which seems to be what we want (but cf. section 5.3 below for an important qualification). In fact, an arguably quite elegant theory of mass/plural quantification can be worked out on the basis of the ideas just sketched (cf. Chierchia 1996).

The main argument in favor of the present view of mass nouns is one of economy. The structure revealed by plurals suffices to account for the properties of mass nouns. Why hypothesize two different domains when all that is needed to account for mass nouns can be found in the familiar atomic domain of count objects? The intuition that a mass noun like *furniture* means something subtly but deeply different from a count counterpart like *pieces of furniture* is an optical illusion, a gestalt effect due to the different groupings of their denotations. Now, I am aware of the fact that I will not convince skeptics with these cursory remarks. Let me just ask the reader to accept the present view, at least provisionally. I think that ultimately what I have to say is also consistent with more traditional double-domained approaches. In the end, readers will be able to assess by themselves to what extent the present view of mass nouns simplifies things.

2.3. *Kinds*

There is a simple picture of what kinds are that stems from our assumptions on the structure of the domain of interpretation. From an intuitive, pretheoretical point of view, kinds are generally seen as regularities that occur in nature. They are similar to individuals like you and me, but their spatiotemporal manifestations are typically 'discontinuous'. To any natural property, like the property of being a dog, there corresponds a kind, viz. the dog-kind. Conversely, any natural kind will have a corresponding property (the property of belonging to that kind). By 'natural' kinds, we do not necessarily mean, in the present context, just biological ones or even 'well-established' ones. Artifacts (like chairs or cars) or complex things (like intelligent students or spots of ink) can qualify as kinds, to the extent that we can impute to them a sufficiently regular behavior (cf. on this Carlson 1977, pp. 26ff. and Krifka et al. 1995). What counts as kind is not set by grammar, but by the shared knowledge of a community of speakers. It thus varies, to a certain degree, with the context, and remains somewhat vague. Lexical nouns identify kinds. Complex nouns may or may not.

The correspondence between (natural) properties and kinds suggests that there must be ways (i.e. functions) to get from the one to the other. Let us introduce a piece of notation for that. If DOG (or, more precisely,

$\lambda wDOG_w)^8$ is the property of being a dog, then let $^\cap DOG$ be the corresponding kind. Conversely, if d is the dog-kind, let $^\cup d$ be the property DOG of being a dog. '$^\cap$' and '$^\cup$' are maps that allow us to get a kind from the corresponding property and vice versa.

(13) a.   PROPERTIES   KINDS
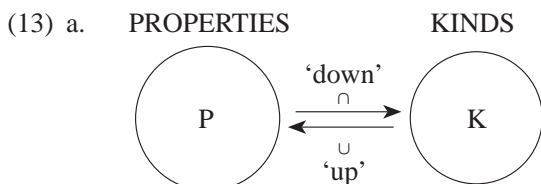
where properties are of type $\langle s, \langle e, t \rangle \rangle$ and kinds of type e

   b. Example: $^\cap DOG = d$ $^\cup d = DOG$

This was originally proposed in Chierchia (1984) and embedded there in a Fregean view of predication, whereby each property has an individual counterpart. The individual counterparts of the properties associated with common nouns are kinds (while, e.g., the individual correlates of properties associated with verbs, might be, say, action types). So kinds can be regarded as the 'nominalization' of (predicative) common nouns and predicative common nouns as the 'predicativization' of kinds. The 'down'-operator nominalizes, and the 'up'-operator predicativizes. Now, the more articulated view of the domain of individuals sketched above, which encompasses pluralities, enables us to say more on how the functions in (13a) can be defined. It seems natural to identify a kind in any given world (or situation) with the totality of its instances. Thus, the dog-kind in our world can be identified with the totality of dogs, the scattered entity that comprises all dogs, or the fusion of all dogs around. In our framework this entity is modeled by the set of dogs. This means that we can model kinds as individual concepts of a certain sort: functions from worlds (or situations) into pluralities, the sum of all instances of the kind. A kind may lack instances in a world/situation (as is the case, presently, for the dodo), in which case the corresponding individual concept will be undefined. This is similar to thinking of an ordinary individual like you and me as a 'transworld line' – that is, a function that in every world picks the mani-

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festation (or counterpart) of that individual. Similar proposals have been
made in the literature; for a recent one see Ojeda (1993).

Let me immediately qualify: I am not saying that kinds *are* individual
concepts. Kinds are whatever your favorite worldview says that they are.
However, in a compositional semantic system that computes truth condi-
tions they can be represented as individual concepts of sort. For simplicity's
sake, let us assume that such individual concepts are members of the domain
of individuals (i.e., they live in the domain of quantification U). Not all
individual concepts are going to be kinds. Only those that identify classes
of objects with a sufficiently regular function and/or behavior will qualify.
Moreover, kinds, as noted above, will generally have a plurality of instances
(even though sometimes they may have just one or none). But something
that is necessarily instantiated by just one individual (e.g., the individual
concept or transworld line associated with Gennaro Chierchia) would *not*
qualify as a kind. So here is how the domain is designed:

(14) a. U is a join atomic semilattice   (cf. 9 above)
     b. AT is the atoms of U
     c. S is the set of situations
     d. $K \subseteq U^S$ is the set of kinds
     e. $K \subseteq AT$

Reflecting the structure of the domain of individuals[9] we will use unsorted
type e variables x, y, . . . , next to sorted ones of the form x_σ. The latter
will include variables over plain singular objects x_o, variables over plural-
ities x_p, variables over kinds x_k (where kinds are individual concepts), and
possibly more. We can now spell out the nominalizing and predicativizing
functions in a simple manner. Let us begin with '$^\cup$':

(15)   Let d be a kind. Then for any world/situation s,

$$^\cup d = \begin{cases} \lambda x \, [x \leq d_s], \text{ if } d_s \text{ is defined} \\ \lambda x \, [\text{FALSE}], \text{ otherwise} \end{cases}$$

        where d_s is the plural individual that comprises all of the atomic
        members of the kind.

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[9] The expert semanticist might have noted that the set of equations in (14) is nontrivial,
as the cardinality of U^S is larger than U, yet we require that kinds be a subset of U. To put
it plainly, if K is too big a subset of U^S it might not fit into U. The question is whether
there are domains with this structure capable of supporting what we need for semantics. The
answer is affirmative, but the most elegant solutions involve, I believe, nonstandard
set theories (such as Property Theory; Chierchia 1984; Chierchia and Turner 1988).

Formally, the extension of the property corresponding to the dog-kind is the *ideal* generated by the totality of dogs – a natural enough move. Note that the property of being an instance of a kind does not differentiate between singular and plural instances. Fido is as good an instance of the dog-kind as Fido and Barky are. This means that the property corresponding to a kind comes out as being mass, on the definition of mass given in section 2.2.

By the same token, we can define the 'down'-function as follows:

(16)   For any property P and world/situation s,

$$\cap P = \begin{cases} \lambda s \; \iota \; P_s, \text{ if } \lambda s \; \iota \; P_s \text{ is in K} \\ \text{undefined, otherwise}^{10} \end{cases}$$

where Ps is the extension of P in s.

So a kind can be manufactured out of a property by taking the largest member of its extension (at any given world). As is clear from the previous discussion, not any old property will have a corresponding kind. The property of being a broken old shoe that Leo left behind is unlikely to have a corresponding kind. If '$\cap$' applied to a property P does not yield a kind, we will simply say that $\cap P$ is undefined.[11] Note that if P is a singular property (i.e., a property true of just singularities), ιP_w will necessarily be a singular individual (when defined). Since kinds, as understood here, cannot have a singular instance in every world, '$\cap$' will not be defined for singular properties. It will only be defined for plural ones. This will play an important role in what follows. The $\cap/\cup$ mappings have some desirable properties that enable us to go back and forth between properties and the corresponding kinds. I leave it to the reader to check that the following holds:

(17) a. For any kind d, $\cap\cup d = d$
         If $\cap P$ is a kind, then:
     b. If P is mass, $\cup\cap P = P$
   c. If P is plural, $\cup\cap P = P \cup AT_P$ (where AT_P is the set that generates P under PL)

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[10]   In Montague's IL, where reference to worlds is implicit, the 'down'-operator could be defined as follows:

(i) $\cap P = {}^\wedge \iota \; x \; P(x)$

Thus '$\cap$' can be seen as a restriction of ${}^\wedge \circ \iota$ (i.e., the composition of '$^\wedge$' with 'ι'). See section 3.2 on this.

[11]   This is a departure from the use of the 'down'-operator in Chierchia (1984) or Chierchia and Turner (1988). I adopt it to simplify the exposition; in fact, the theory to be developed here is still to be cashed out eventually in terms of a theory of properties such as the one developed in the papers just quoted.

It should be clear that kinds and (plural) properties can in a way be seen as two modes of packaging the same information. Using Frege's (1891) metaphor, properties are unsaturated, something that (at a world) is true or false of individuals. Kinds are saturated, something that at a world has concrete, if possibly spatiotemporally discontinuous, manifestations. Thus, taking the schema in (18) as instantiating a world w, the workings of '$^\cup$' and '$^\cap$' can be visualized as follows:

(18)   PROPERTIES   INDIVIDUALS
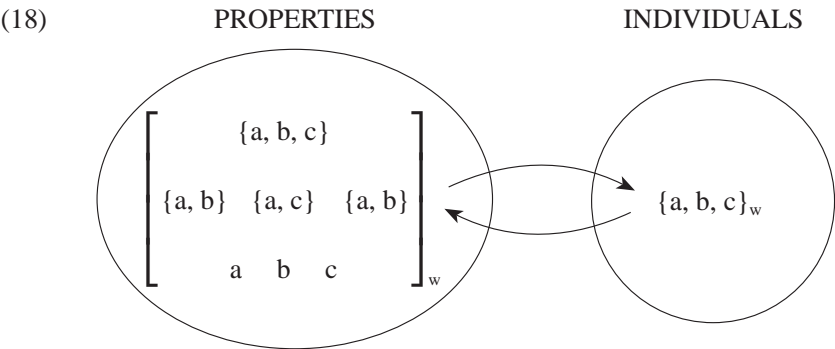
In a way, the plural individual {a, b, c} can be taken as a representative of the property true of all its parts, which justifies viewing the kind as a 'nominalization' of the corresponding property (and vice versa, viewing the property as a predicativization of the kind). The structure of individuals has become sufficiently rich to enable us to individuate among them representatives of the properties that interest us.

3. THE NOMINAL MAPPING PARAMETER

In this section we will explore the ways in which languages may conceivably refer to kinds. We will first set up a typology of NP denotations and consider some predictions it makes. As in some cases this typology will exploit type shifting, we will then turn to a discussion of how that device works in general.

Our starting point is the following. Generally speaking, nouns appear to play a double role. On the one hand, as restrictors of quantifiers (as in *every man*) and in predicate position (as in *John and Bill are doctors*) they must be predicates. On the other hand, as devices for kind reference they must be arguments (names of kinds). These options presumably are available in some form or other in every language. The problem is *how* they are actualized in different languages. Here is one way of thinking about it. Take [±arg], [±pred] as features constraining the way in which the

syntactic category N (and its phrasal projection NP) are mapped into their interpretations. For any such feature a, [+a] means that N's can be mapped onto things of type a, [–a] that they cannot. Thus, for example, NP[+arg, –pred] tells us that members of the category N (and their phrasal projections) can be mapped into arguments (i.e., for common nouns, kinds) but cannot be mapped into predicates. In a language with this setting, nouns and their phrasal projections uniformly denote kinds. The game to play now is to assume that all combinations of [±arg] , [±pred] are possible (with the exception of the [–arg, –pred] option, which would prevent NPs from having any interpretation at all) and see what characteristics languages with these features are expected to have.

3.1. *A Typology of Kind Reference*

What would things look like in a language where nouns refer to kinds – that is, an NP[+arg, –pred] language? In such a language every NP is of type e (or of the argumental type umbrella arg). One immediate property of such a language is that since NPs are argumental, bare nouns will be allowed to occur freely as arguments. So in this language one ought to be able to say things like *Girl saw boy* quite freely. Now, determiners, being quantificational devices, want a restriction (i.e., a predicate). Since determiners look for predicates but NPs denote kinds, we seem to have a problem. However, given an ordinary determiner meaning DET, it is completely trivial to define a variant of it, call it DET', that applies to kinds:

(19) a. $\mathrm{DET}'(x)(P) = \mathrm{DET}(^{\cup}x)(P)$

 b. Example, assuming *dog* to be of type e and *barks* of type $\langle e, t \rangle$:
  $\mathrm{EVERY}'(\mathrm{dog})(\mathrm{barks}) = \mathrm{EVERY}(^{\cup}\mathrm{dog})(\mathrm{barks})$

So in argumental languages, determiners will have to apply to kinds; but this can be obtained in a straightforward way by assuming that determiner meanings have predictable kind-taking variants (as shown in (19)) and that languages are free to pick and choose the variant fitting their NP type.

 Here comes, however, an interesting twist. '$^{\cup}$', being an ideal-forming operator, assigns to the predicate counterpart of a kind a *mass* denotation, as shown in section 2.3. This means that in a NP[+arg, –pred] language, all nouns are going to be, in some sense, mass. This has further immediate consequences. Plural marking, of the kind familiar from many western languages, will be absent, since with every noun being mass the function PL will have no argument for which it is defined. So in this language there won't be alternations of the kind 'boy/boys'. Moreover, numerals

will not be able to combine directly with nouns: a classifier will be necessary to individuate an appropriate counting level. So in such a language we won't be able to say things like 'two boys'. We will have to say 'two portions of boy', or some such thing. This clustering of properties seems to follow in a very direct way from the assumption that there are languages where NPs are argumental:

(20)   *NP[+arg, –pred] languages*
    i.   Generalized bare arguments
    ii.   The extension of all nouns is mass
    iii. No PL
    iv. Generalized classifier system

But these are of course the properties of many well-known languages, such as Chinese and Japanese. Here are some examples from Chinese:

(21) a. yí   lì   mǐ
       one   CL   rice

       'one (grain of) rice'

    b. liǎng lì   mǐ
       two   CL   rice

       'two (grains of) rice'

    c. yí   zhāng   zhuōzi
       one   CL   table

       'one (piece of) table'

    d. liǎng zhāng zhuōzi
       two   CL   table

       'two (pieces of) tables'

    e. wò   kànjiàn   xióng le
       I   see   bear   ASP

       'I saw (some/the) bears.'

It is important to observe that the properties in (20) are not logically related. For example, a language with the plural–singular contrast and a generalized classifier system is certainly logically conceivable; it could, in principle, exist. The point of view we are adopting offers us a seemingly principled way for ruling it out. If we assume a domain structured as argued in section 2 (which is plausible on independent grounds), the four properties in (20) can be reduced to just one: a category–type mapping that makes NPs argumental.

At this level of generality, I have to skip over many important issues. For example, the syntax and semantics of modification needs to be carefully looked at. Moreover, saying that all members of category NP are mass-like does not mean saying that something resembling the mass/count distinction cannot be found in such languages (see, e.g., Cheng and Sybesma 1996). Obviously, liquids or 'granular' substances (like rice, sand, etc.) have important structural properties in common (for example, their minimal parts are inherently vaguer than those of things like furniture) and this may well be registered in aspects of the syntax of the corresponding nouns (e.g., in the classifier system). Still, the obligatoriness of classifiers and the absence of 'true' plural marking sets these languages apart from, say, the Romance ones, and we may just have put our finger on what it is that sets them apart.

Let us now turn to NP[–arg, +pred] languages. In a language of this sort every noun is a predicate, and since predicates by definition cannot occur in argumental positions, such a language should disallow bare nominal arguments altogether. Moreover, since the mass/count distinction concerns the *extension* of predicates, there is no reason not to expect that some nouns will have a count extension, while others will have a mass one.[12] This in turn entails that PL (plural marking) will be active in such language for the count portion of the lexicon. As is well known, these are the characteristics of, e.g., French, which basically disallows bare arguments:

(22) a.*Enfants sont venus chez nous.
        'Kids have come by us.'

   b.*J'ai mangé biscuits dans mon lait.
        'I ate cookies with my milk.'

To be more precise, what we actually expect is that in an NP[–arg, +pred] language an NP cannot be made into an argument without projecting D. It is of course conceivable that a language has a phonologically null D. French, evidently, doesn't. Other languages might. However, phonologically null structure needs, generally, to be 'flagged'; that is, it is subject to licensing conditions. A familiar way to license null structure is by it being close to a suitable head (see, e.g., Rizzi 1990). This entails that we may find languages similar to French which do allow bare arguments, but only, say, in positions governed by a lexical head. That seems to be roughly what happens in Italian or Spanish, where the counterpart of (22a) stays ungram-

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[12]   There seems to be no language in which every noun is count. In Chierchia (1996) it is argued that this does not follow from the architecture of grammar, but from the interaction of the latter with some more general properties of other cognitive modules.

matical, but the counterpart of (22b) is acceptable (see Contreras 1986, Torrego 1989):

(23) a.*Bambini sono venuti da noi.
          'Kids came by us.'

     b.*Ho preso biscotti con il mio latte.
        '(I) had cookies with my milk.'

In (23a,b) we have a canonical subject-object asymmetry. This can be blamed on the fact that Italian has the same semantics for NPs as French. Hence, we have to project D to turn NPs into arguments. However, Italian has a null D^0, and null D^0s need to be licensed by a lexical head (a condition we will later refine). Thus in object position the null D^0 will be licensed by the verbal head. But in subject position there is no suitable head that can act as a licenser. So we seem to be able to derive in one fell swoop the basic characteristics of Romance languages from the assumption that they are NP[–arg, +pred] languages: modulo the availability of a null D, we will have either no bare arguments or bare arguments restricted by conditions that typically govern the distribution of phonologically null elements.

The final case to be considered is that of a NP[+arg, +pred] language. What does this setting entail? It entails that in a language of this sort members of the category NP can freely be either predicative or argumental. More specifically, lexical entries can either denote kinds or predicates. And, presumably, their phrasal projections can be freely shifted back and forth through the available type shifting operators. Let us look into this more closely. If a lexical noun is of type arg, it would have to be predicativized (in its role as quantifier restrictor) via '$^{\cup}$'. This will result in a mass denotation. Hence nouns of type arg are going to be mass nouns and have all the corresponding characteristics. Among other things, such nouns will be able to occur as bare arguments. We will be able to say things like 'water is dripping on the floor', etc. If, on the other hand, a noun chooses to be of type pred (i.e., $\langle e, t \rangle$), it will have a set of atoms as its extension; that is, it will be count (given that mass nouns can be more economically obtained via the NP $\Rightarrow$ arg option). So, plural marking will be able to apply to such a noun (and will in fact have to occur if one wants to talk about groups or sets of the relevant atoms). This entails that in a language of this sort PL will be active and the singular/plural contrast will, consequently, show up overtly. Moreover, since count nouns are predicates, they won't be able to occur bare as arguments. We won't be able to say things like 'table is on the corner'. However, since the language does admit both

arg and pred as possible NP denotations, nouns can be freely shifted via '$\cap$', as this is consistent with the category–type assignment of the language. But '$\cap$' applied to a singular won't in general yield a kind, as we saw in section 2. So $^\cap$TABLE will be undefined. Per contrast, '$\cap$' applied to a plural will, normally, yield a kind in our sense. So $^\cap$TABLES will be defined. Hence plural nouns will be able to occur bare in argument position. To summarize, here are the major characteristics we expect to find:

(24)   *NP[+arg, +pred]*
    a. The language has the mass/count distinction (the N $\Rightarrow$ arg option yields mass nouns, whereas N $\Rightarrow$ pred yields count nouns).
    b. Mass nouns will occur as bare arguments; (singular) count nouns won't.
    c. Free use of '$\cap$' is allowed by the category–type mapping. But it is defined (it yields kinds) only for plurals; as a consequence plurals will be able to occur as arguments.

This is of course what happens in English and in most Germanic languages. In a way, these languages are the union of Chinese-like ones and Romance-like ones.

One question that comes to mind in connection with the present proposal is this. As shown in Partee (1987) and in much work inspired by it, the system of natural type shifting devices that link predicative and argumental types does not consist solely of '$\cap$' and '$\cup$'. Why should just these two be singled out and used freely by a language with the type assignment in (24)? Why shouldn't one go for some other type shifting device? This question deserves close scrutiny and will be addressed in the next section. But before doing so, it might be appropriate to give some more general predictions that the hypothesis we have developed seems to make.

Besides the clusterings of properties we have considered (and derived by varying the setting of NP denotations), there are a host of other clusterings one might a priori expect but which are in fact ruled out, if things work as proposed. Here is an example, suggested to me by I. Heim. Logically speaking, there might be a classifier language in which the distribution of bare arguments displays subject-object asymmetries. In such a language nouns would all be mass-like, but bare arguments in, say, subject position would be ungrammatical. In other current theories there is nothing that leads one not to expect the occurrence of such a language. By contrast, here we have a straightforward reason not to expect such a language to exist. For it to be a classifier language, the setting of NP must be [+arg, –pred]

as in Chinese – how else could all its nouns be mass-like? But this makes ipso facto projecting D unnecessary for argumenthood. Hence grammatical occurrences of bare arguments across the board are expected. Notice that this does by no means entail that bare arguments will have the same range of interpretations throughout. And if there are different readings in different positions (as argued for by, e.g., Li 1997), it is an interesting empirical issue how to derive them. Their derivation might involve null structure. What on the present theory one would *not* expect in a language like Chinese is an overt alternation of the kind we see in (23). Insofar as I know, languages of this sort are indeed unattested.

Remarkably simple paradigms appear to emerge. Given certain assumptions on the nature of the domain of quantification, minimal changes on what NPs can denote (which we will call the 'Nominal Mapping Parameter') lead one to expect certain clusterings of properties of bare nominal arguments. Such clusterings appear to be exactly what differentiates important language families.[13] While this seems promising, it needs to be tested by taking a closer look at the grammar of bare arguments of particular languages. We begin to do so by first sharpening the role of type shifting in the system we are proposing and then looking more specifically at the contrastive analysis of English and Italian.

3.2. *Type Shifting as a 'Last Resort'*

Partee (1987) has shown that there is a restricted number of type shifting devices that appear to be used in the languages of the world. Her system (in a slightly updated form) can be summarized as in the following diagram:

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[13]   Krifka (1995) takes a different stand on the semantic differences between nouns in Chinese and English. His basic line can be schematically summarized as follows. He views the domain of interpretation as a lattice whose atomicity is left unspecified. Then there is a function that applies to kinds k and associates with them an extension ATOM(k) which creates count noun denotations. He proposes that this function applies in the lexicon in English and in the syntax (through overt classifiers) in Chinese, and that this is the main difference between the two languages. While something in the spirit of Krifka's proposal might be added to what I am proposing, I have some doubts about it that prevent me from doing so. The first is that arguably classifier phrases exist also in English (see, e.g., Selkirk 1977 for a classical point of reference which can be reinterpreted in current terms as arguing for the existence of such phrases). If this is so, the difference between the two languages cannot be simply that classifiers are lexical in English and syntactically realized in Chinese. The second is that Krifka's proposal, as it addresses primarily the difference in noun *extensions*, does not seem to have much to say on the distribution of bare arguments across languages (and how it correlates with the mass/count distinction).

(25)   Type shifting in general
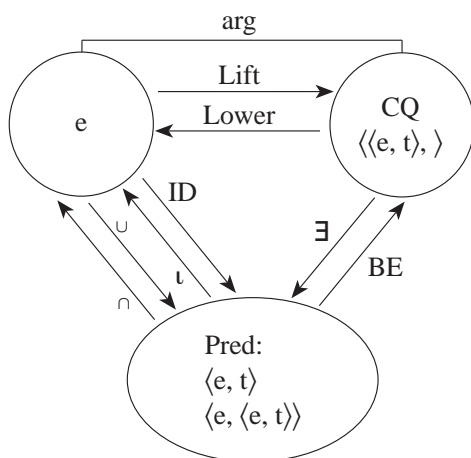
a. Lift: e → GQ   Lift(j) = $\lambda PP(j)$
b. Lower: GQ → e   Lower($\lambda PP(j)$) = j
c. ∃: $\langle$e, t$\rangle$ → GQ   ∃X = $\lambda P \exists y[X(y) \wedge P(y)]$
d. BE: GQ → $\langle$e, t$\rangle$ $\lambda P \lambda x[\{x\} \in P]$
e. Id: e → $\langle$e, t$\rangle$ Id(x) = $\lambda x[x \leq y]$

The argumental types e and GQ are linked via LIFT (which turns an indi-
vidual into a GQ by taking all of the sets to which it belongs) and its inverse
LOWER. The type of GQ and pred are linked via an operation of existential
closure, which turns a property into an existential generalized quantifier.
This is traditionally taken to be the meaning of the indefinite article 'a'. The
inverse of this is Montague's BE. Partee argues that these operations are
involved in the analysis of copular constructions. Finally there are two pairs
of operations that link pred and e. One pair, viz. '∩' and '∪', we have already
discussed. These operations map properties (i.e., intensional entities) into
individuals (and vice versa). The other pair is constituted by the ι-operator
and its (partial) inverse, which Partee calls Id. This pair, too, maps property
extensions into individuals (and vice versa). The ι-operator, also discussed
above, selects the greatest element from the extension of a predicate and
constitutes typically the meaning of the definite article (for languages that
have it). This operator can be undone via the 'part-of' relation in terms
of which Id is defined.[14] Notice that the analysis of '∩' and '∪' proposed

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[14]   Note that if x is a singularity, then Id(x) = $\lambda y[y = x]$. That is, in the case of singulari-
ties, Id boils down to the identity map (whence the label 'Id'). This is the only case Partee
considers. But in a domain with plurals, the natural counterpart to ι is the one given in the
text.

above simply amounts to an intensionalized version of ι and Id. The two pairs of type shifting that link pred and e are, thus, closely interrelated. Following again Partee, I assume that Montague's operators '$^\wedge$' (cap) and '$^\vee$' (cup) are the standard devices to switch back and forth between intensions and extensions. In a representation language with variables over worlds, these correspond to λ-abstraction over and application to the actual world variable (i.e.: $^\wedge$DOG = λw DOG$_w$). Thus '$^\cap$' is the composition of '$^\wedge$' and ι (restricted to the set K of kinds).

The question one would like to answer in a principled manner is the following. Consider an NP[+arg, +pred] language, such as English. Why should it adopt as shifting device '$^\cap$' and '$^\cup$', as opposed to any other of the pairs in (25)? There is a principle that seems to be fundamental for the architecture of grammar which says, roughly, 'Language-particular choices win over universal tendencies' (cf. the 'Elsewhere Condition'), or 'Don't do covertly what you can do overtly.' In the case at hand, this principle comes into play as follows. Suppose the language has a morpheme (or a structure of some kind) whose semantics amounts to one of the type shifting operations in (25). Then even if the type assignment allows for it, such a type shifting should not be used covertly because the language has an overt way of achieving the same effects. Thus, in particular, if there is a determiner D whose meaning is a particular type shifting, then use of that operation as an automatic type-changing functor is blocked. This kind of 'elsewhere' or, in more current terminology, 'last resort' character of type shifting can be formalized, in first approximation, as follows:

(26) *Blocking Principle* ('Type Shifting as Last Resort')
      For any type shifting operation τ and any X:

      *τ(X)

      if there is a determiner D such that for any set X in its domain,

      D(X) = τ(X)

Now, English has articles. The interpretation of the definite article is ι. Traditionally, that of the indefinite article is taken to be '∃'. This leaves '$^\cap$' as the only option that the language can use in an automatic, covert way.

This approach makes an obvious, immediate prediction. There might be languages with the same type assignment as English which, however, happen to lack articles. Here is what one would expect the properties of such languages to be. First, since in such languages NPs can be both pred and arg and, as we saw, since this correlates with count and mass respectively, such languages ought to have the mass/count distinction in more or less the same form as English does (i.e., impossibility of pluralizing mass

nouns, impossibility of combining them directly with numerals, etc.). This entails, of course, that these languages will have the plural/singular contrast (in the count domain), just like English does. Moreover, the type assignment lets such languages shift freely from pred to arg. But, unlike what happens in English, in such languages there would be no article to block any of the type shifting operations that Universal Grammar makes available. Hence, languages of this type ought to use '∩' for kind reference (and this will be restricted to plurals, just as in English). But they would also be able to resort to ι and ∃. Which means that bare arguments would occur freely and have a generic, definite, or indefinite meaning, depending, presumably, on the context. This is what one would expect on the basis of last resort, as applied to the system we have developed.

It does not take much typological sophistication to know that such languages are widely attested. For example, many of the Slavic languages appear to be of precisely this sort. The following is a set of key examples from Russian:

(27) a. Ja   kupil   khleb (*khliby)
        I   bought   bread (*breads)

   b. Ja   kupil   3 *(batona) khleba
      I   bought   3 *(loafs) of bread

   c. Na stole   bylo   neskolko *(sortov) syra
      on the table   were   several   *(types of) cheese

   d. V komnate   byli   malcik i devocka.
      in (the) room were   (a) boy and (a) girl.

      Ja   obratilsja k malciky.
      I   turned   to (the) boy

   e. Dinosavry vymerli   (*Dynosavr)
      dinosaurs (are) extinct

   f. sobaka   obycnoe   zyvotnoe
      dog   common   animal   ('The dog is a common animal.')

Sentences (27a–c) show that Russian has the mass/count distinction and that such distinction manifests itself in the same form as in English. Sentence (27d) illustrates that bare count nouns can occur in argument position and have both indefinite and definite interpretation. The first occurrences of *malcik* 'boy' and *devocka* 'girl' in a presentational context are interpreted as indefinites. The second occurrence of *malcik* is anaphoric to the first and, hence, definite. Finally, (27e) shows that normally bare plurals are used for kind reference. However, as shown in (27f), singulars used generi-

cally are also possible, by analogy with the generic definite singular (on which see section 5.3 below).

I should hasten to add that, as with Chinese, the behavior of bare arguments in Russian needs to be carefully scrutinized. For example, everything else being equal, we would expect Russian bare nominals on their indefinite readings to have roughly the same range of scopal properties as English indefinite singulars. While prima facie this seems tenable, it clearly deserves a much closer look than we can give it here. One also needs to look at languages that lack only one of the articles and see what happens there. While I know of several languages that have the definite article but lack the indefinite one (e.g., Attic Greek or Hebrew, which has a definiteness marker in the construct state), I am not sure that languages with just indefinite articles are attested (and if there aren't, I don't know why). Furthermore, it is well conceivable that the Blocking Principle as presently stated is too strong and might need to be qualified in various ways. But that something very much like it must be at work seems very plausible. Such a principle fits well the search for economy that characterizes much current work. It also integrates perfectly with the idea we are exploring of a flexible and tightly constrained syntax-semantics map. And moreover, it makes prima facie correct typological predictions.

It is now time to look at what happens in some languages at a closer range.

4. REFERENCE TO KINDS IN ENGLISH: TWENTY YEARS LATER

The view of bare arguments in English that has become dominant in recent years can be summarized as follows:

(28)   *The A-Approach:*
         a. Bare arguments are ambiguous between a kind reading and a (weak) indefinite reading.
         b. Qua indefinites, bare arguments are interpreted as variables, subject to existential closure or to quantification by a generic operator.
         c. The domain of existential closure is the VP (Diesing 1992).

The A-Approach is being pursued in several variants. As considering them all is impossible here, I will stick to a general discussion of the theses in (28), which are common to most variants of the A-Approach.

The A-Approach is in many ways appealing and has led to a better understanding of many properties of bare plurals. It is also compatible with the mapping hypothesis proposed in the previous sections: such a hypothesis

explains why bare plurals and mass nouns in English can refer to kinds, but does not exclude the possibility that they be amenable to other interpretations. I think, however, that the A-Approach is in fact wrong and that a Neocarlsonian approach is more on the right track. If this were to turn out to be correct, we would be in an optimal situation. The English category–type assignment allows bare NPs to refer to kinds. And that would be *all* that is needed to explain their behavior.

Here is how I will try to make my case. First, I will sketch a Neocarlsonian approach. Then I will show some advantages it offers over the dominant view (having to do with familiar noun-like properties of bare arguments). Finally, I will discuss some additional predictions of the Neocarlsonian line (having to do with the suspension of these noun-like properties for certain kinds of bare arguments).

4.1. *A Neocarlsonian Approach*

According to Carlson's original theory, bare arguments reveal their true nature in the following contexts:

(29) a. Gold is rare $\Rightarrow$ rare (gold)
     b. Dogs are widespread $\Rightarrow$ widespread ($^{\cap}$dogs)

Predicates like *rare* and *widespread* are kind-selecting. Mass nouns are kind-denoting and (plural) count nouns can be turned into names of kinds via '$^{\cap}$'. Thus the logical forms of the sentences in (29) are completely straightforward. However, a key characteristic of bare arguments is that they also occur with non-kind-selecting predicates. In the latter case, they typically give rise to a universal reading in generic contexts and to an existential one in episodic contexts – a behavior they have in common with indefinites. The question is whether a Neocarlsonian approach can explain this behavior in a principled manner.

I think that the answer to the latter question is positive. Let me show why by considering first episodic contexts. There are NPs that uncontroversially denote kinds and occur naturally in episodic contexts. Following Carlson's insight, we can let those be our guide in deciding what happens with bare arguments. Here are some relevant examples:

(30) a. That kind of animal is ruining my garden.
     b. [Pointing at the picture of a lion in a biology book] That is what you saw this morning at the zoo.

On the face of it, the subject NP in sentence (30a) seems to be a definite NP referring to a kind. The demonstrative *that* in (30b), a prototypical

referential definite, also can be naturally construed as referring to the kind *Felix leo*.[15] Yet, clearly *ruin my garden* and *see* are predicates that apply in the first place to objects (i.e., non-kinds). What is going on? The sentences in (30) are grammatical and seem to be about instances of the kind. We are thus led to conclude that whenever an object-level argument slot in a predicate is filled by a kind (in an episodic frame), the type of the predicate is automatically adjusted by introducing a (local) existential quantification over instances of the kind. This can be done by a simple type shifting mechanism that assigns to the sentences in (30) the interpretations in (31a,b). The general mechanism at play, call it 'Derived Kind Predication' (DKP), can be formulated as in (31c):

(31) a. $\exists x[^{\cup}\text{that kind of animal}(x) \wedge \text{ruin my garden}(x)]$

   b. $\exists x[^{\cup}\text{that}(x) \wedge \text{saw in the zoo}(\text{you}, x)$

   c. *Derived Kind Predication (DKP):*
      If P applies to objects and k denotes a kind, then
      $P(k) = \exists x[^{\cup}k(x) \wedge P(x)]$

Thus, the source of existential quantification over instances of the kind in episodic sentences is an automatic, local adjustment triggered by a type mismatch.[16] Some such mechanism seems to be at work in contexts like (30); if bare arguments refer to kinds, then it will automatically extend to them as well. Thus a sentence like (32a) ends up being interpreted as in (32b):

(32) a. Lions are ruining my garden.

   b. ruining my garden ($^{\cap}$lions)
      $\Leftrightarrow$ (via DKP) $\exists x[^{\cup\cap}\text{lions}(x) \wedge \text{ruining my garden}(x)]$

Note that variable x in (32b) ranges over both singularities and pluralities. Thus, whatever device governs the behavior of plural arguments can play a role in cases of this sort.[17] Notice, moreover, that unlike what happens

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[15] For an analysis of the 'kind-of' construction, see Carlson (1977, pp. 208ff.), Wilkinson (1995), and Zamparelli (1995). The analysis I have in mind is a variant of Carlson's, but I won't get into it here. At any rate, the point I am making is independent of the proper way of analyzing the 'kind-of' construction, since there are kind-denoting NPs that do not involve such construction, yet behave in similar ways. A case in point is (30b), which is unlikely to be analyzable as an instance of the 'kind-of' construction.

[16] DKP can be generalized to relations using the usual pointwise definition (cf. Partee and Rooth 1987):

   (i)   If R is an *n*-place relation and k is a kind, then
            $R(k) = \lambda x_1, \ldots, \lambda x_{n-1} \exists y[^{\cup}k(y) \wedge R(y)(x_1) \ldots (x_{n-1})]$

[17] In particular, Schwarzschild (1990, 1996), building on previous work, has argued that

in Carlson's original proposal, DKP is not a lexical operation on predicates but a type shifter that applies on demand. This turns out to be useful for sentences like the following:

(33) a. Dogs were biting themselves.
     b. Goldfish were biting people who were admiring them.
     c. $\lambda x_k[\text{bite}(x_k)(x_k)](^\cap\text{dogs}) = \text{bite}(\text{dogs})(\text{dogs})$
     d. $\lambda x_o[\text{bite}(x_o)(x_o)](^\cap\text{dogs}) = \exists y[^{\cup\cap}\text{dogs}(y) \wedge \text{bite}(y)(y)]$

Sentences like (33a) or (33b) have two readings. One is kind-oriented (roughly equivalent, in the case of (33a), to 'Dogs are biting dogs'). The other is object-oriented (roughly equivalent to 'Each dog is biting itself'). These readings can be obtained depending on whether the relevant pronoun is interpreted as a kind-level or as an object-level variable. If the pronoun is kind-level we will get interpretations like (33c). Here DKP will apply, speaking procedurally, *after* λ-conversion, resulting in the 'Dogs are biting dogs' reading. If instead the pronoun is an object-level one, DKP will be called upon to solve the mismatch *before* λ-conversion, so to speak, resulting, modulo a suitable theory of plurals, in the 'Each dog is biting itself' reading.[18]

In van Geenhoven (1996) a proposal similar to the present one can be found. Her proposal has been developed for noun incorporation in West Greenlandic Eskimo, but van Geenhoven suggests extending it to bare plurals in English as well (see also McNally 1995). The idea is that (bare common) nouns simply denote properties; since verbs take objects as arguments, this creates a mismatch that can be solved with an operation essentially similar to DKP, which introduces an existential quantifier over instances of the property. Such operation, whose effects on a simple verb are illustrated in (34), is conceived of as a lexical operation on the predicate.

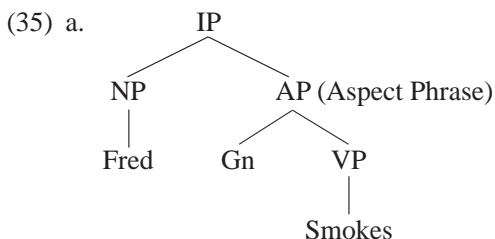(34)   walk $\Rightarrow \lambda P \exists x[P(x) \wedge \text{walk }(x)]$

Obviously the insight here is very similar to the one we are adopting (and which, ultimately, can be traced back to Carlson's original work). However, there are two major problems I see with van Geenhoven's proposal. The first is that whatever fixes the relevant type mismatch with English bare

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predicating something of a plurality involves relativization to a contextually supplied partition (or 'cover') of the plurality that determines how the predicate distributes to singularities or subgroups. I will be tacitly assuming such an approach. See Landman (1996) for further relevant discussion.

[18] The reader should be made aware of the fact that this procedural talk, while perhaps useful in getting the idea across fast, is ultimately misleading. The different readings result simply from the way abstraction is defined and the way semantic recursion works.

plurals cannot be a *lexical* operation, as shown by the examples in (33).
Of course, this lexicalist view might be abandoned without giving up on the
idea that bare NPs are property denoting, but this would get us in trouble
with the scopelessness of bare plurals (see section 4.2). The second diffi-
culty is that an approach along these lines leaves us totally in the dark as
to why in languages like English we find bare plurals and bare mass nouns
but not bare singular count nouns. Van Geenhoven's proposal clearly applies
to any sort of properties (short of stipulations ad hoc). On the present
analysis, by contrast, we have the beginnings of a plausible story as to
why mass nouns and bare plurals pattern alike – a story which crucially
rests on what kinds are. So while van Geenhoven's approach might be
well motivated for cases of noun incorporation (and might plausibly be
extended to other similarly 'local' processes) it appears to be unsuited to
account for what goes on in English.

Let us now turn to generics. There is widespread agreement that the
generic operator is a modalized universal quantifier, akin to quantificational
adverbs, which have been discussed extensively in recent literature (Lewis
1975; see also the papers in Carlson and Pelletier 1995). I will assume
that the generic operator Gn is part of the verbal aspect and, thus, licensed
within an appropriate aspectual functional head (cf. Chierchia 1995a and
the references there). Accordingly, the structure of a simple generic sentence
such as *Fred smokes* will be as shown in (35a) and its semantic interpre-
tation will be as in (35b).

(35) a.

```
                     IP
                    /  \
                  NP    AP (Aspect Phrase)
                  |     /  \
                Fred  Gn    VP
                            |
                          Smokes
```

   b. Gn s [C(f, s)] [smoke(f, s)]
       'Every situation s of the appropriate type containing Fred is a
       situation in which Fred smokes.'

Here is how the interpretation in (35b) comes about. 'C' in (35b) is a
variable, whose value is supplied by the context. Intuitively, its purpose
is to restrict the domain of Gn to appropriate individuals and situations.
In the case at hand, it restricts the domain of Gn to situations where the
factors that typically trigger smoking for Fred are satisfied. The scope of
Gn is its c-command domain, while its restriction is what locally c-

commands it (in the case at hand, the subject). Let us say that the variables bound by Gn are obtained from material in its restriction via a process of accommodation (see, e.g., Kratzer 1995, Chierchia 1995a, and many others). In cases like (35a), the only kind of variable that can be accommodated is an event/situation involving the subject Fred. Consider, however, the following sentence:

(36) a. That kind suckles its young.
     b. Gn x, s[$^\cup$that kind(x) $\wedge$ C(x, s)][suckles its young (x, s)]

In this case, the subject is a kind-denoting definite and what gets accommodated in the restriction of Gn are variables over instances of the kind. The process whereby this happens is analogous to that illustrated in (37):

(37) a. Those boys are mostly/for the most part/in minimal part Italian.
     b. most x[x $\leq$ those boys][Italian (x)]

In (37a) the quantificational force of the definite subject varies depending on the quantificational adverb. For example, with *mostly* we get the reading given in (37b). Thus a variable over members of the relevant group of boys gets accommodated in the restriction of the quantificational adverb (see Berman 1991, Lahiri 1991 for discussion of other similar cases involving free relatives and wh-questions). Clearly, the interpretation of (36a) is obtained by a mechanism which is similar to the one operative in (37). If bare arguments are kind-denoting, the mechanism operative in (36a) cannot fail to extend to them as well. Hence, a sentence like (38a) winds up being interpreted as in (38b):

(38) a. Dogs bark.
     b. Gn x, s [$^{\cup\cap}$dog(x) $\wedge$ C(x, s)][bark(x, s)]

This is how the universal reading of bare plurals in generic contexts comes about.

It should also be noted that structures such as (35a) are subject to the usual scope shifting operations available at LF. In our setup, these are (i) reconstruction of the subject within the VP and (ii) fronting of VP-internal material (be it via QR or scrambling). If either of these options is made use of, we may get readings where the subject is interpreted existentially while some VP internal argument receives universal interpretation. For example, the most salient reading of a sentence like (39a) would be obtained by assigning to it the Logical Form in (39b):

(39) a. Computers route modern planes
     b. [modern planes$_i$ Gn [$_{VP}$ computers route t$_i$]]

In the LF (39b), *modern planes*, being in the restriction of Gn, is interpreted universally, while *computers*, having been reconstructed within the VP, is in the scope of Gn and will be interpreted existentially (via DKP). We thus derive at no cost, using the standard scope shifting operations, Diesing's (1992) generalization, namely that bare plurals are interpreted as weak existentials within the VP and as universals outside of the VP.[19]

It would seem that we have the making here of a truly minimal theory. Fully general mechanisms whose functioning can be independently observed are responsible for the behavior of bare arguments in episodic and generic contexts and (on the assumption that those are kind-denoting) yield the correct readings. We will now see that the present Neocarlsonian approach has further consequences of interest.

4.2. *Scopelessness*

As is well know, proper nouns are scopally inert. For example, a sentence like (40a) contrasts with (40b) in that it has only one reading, unlike the latter:

(40) a. I didn't see John.
     b. I didn't see a spot on the floor.

The reason for the non-ambiguity of (40a) lies in the fact that scope shifting operations will yield logically equivalent interpretations in virtue of the semantics of proper names. Thus in particular, (41a,b) will turn out to be logically equivalent:

(41) a. not [I saw John]
     b. $John_i$ [I didn't see t_i]

Fox (1995) argues that whenever that is the case, scope shifting operations are banned by economy considerations. With this is mind, let us look at the case of bare plurals and consider whether scope-shifting operators can have any impact on them. For concreteness, consider a case analogous to (40):

(42) a. I didn't see spots on the floor.
     b. $spots$ on the $floor_i$ [I didn't see t_i]

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[19]   For individual-level predicates, I will assume some version of Chierchia's (1995a) hypothesis that they are inherently generic and that that is why they induce universal readings of bare plurals.

The key question to ask here is what the type of the trace (or copy, if traces are copies) is going to be. The natural answer is that the trace is of the same semantic type as its binder (or, in the case of quantified NPs, the lowest type associated with the category). This can mean one of two things. If by 'type' we mean logical type, then bare plurals will leave behind an unsorted variable of type e. If by 'type' we actually mean 'sort', then bare plurals will leave behind a sorted kind-level variable. Thus (42b) winds up being interpreted as shown in (43a,b) (depending on whether we choose the first or the second option):

(43) a. $\lambda x \neg [see(I)(x)](^{\cap}spots \text{ on the floor})$
      b. $\lambda x_k \neg [see(I)(x_k)](^{\cap}spots \text{ on the floor})$
      c. $\neg [see(I)(^{\cap}spots \text{ on the floor})]$
      d. $\neg \exists y [^{\cup\cap}spots \text{ on the floor}(y) \wedge see(I)(y)]$

      e. $\lambda x_o \neg [see(I)(x_o)](^{\cap}spots \text{ on the floor})$
         $= \exists y [^{\cup\cap}spots \text{ on the floor}(y) \wedge \neg see(I)(y)]$

(43a,b) are equivalent to (43c). Which, via DKP, is equivalent to (43d). But that is the interpretation that (42) would have if the bare plural were left in situ. Speaking again procedurally, in cases such as (42b) the mismatch fixing operation DKP will always apply *inside* the body of the abstract, for outside there is no mismatch to fix. The reason for this is remarkably simple: there is no rhyme or reason why a kind-level expression should leave behind a sorted object-level variable. The only way to give the existential quantifier wider scope than the negation in (42) is via a logical form like (43e), which is tantamount to saying that the trace of *spots on the floor* is interpreted as an object-level variable. But traces of kind-level nominals are kind-level. Contrast this with what happens with overt pronouns (illustrated in (33) above). Pronouns can clearly be used to refer to kinds or to objects; hence we are forced to interpret them as suitably sorted variables. But traces are just the shadows of their antecedents; they have no independent reference.[20]

In our reconstructed Carlsonian account we thus get a clear prediction,

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[20] D. Fox (p.c.) is exploring the idea that scopelessness of bare plurals may depend on economy considerations in a different way. In highly schematic terms, his suggestion is that one first look at structures like (i), independently of type shifting of any sort (i.e., assuming that type shifting or DKP does not apply).

(i)   a. $\lambda x \phi(\alpha) \leftrightarrow \phi[x/\alpha]$
       b. $ants_i \text{ not } [t_i \text{ widespread}] \leftrightarrow \text{ not } [ants \text{ widespread}]$

If the two formulae in (i.a) and (i.b) are equivalent (as would be the case), then economy prevents bare arguments from undergoing QR.

namely that scope-shifting operations won't affect bare plurals.[21] This is of course what Carlson (1977) has shown to happen, pretty conclusively to my mind. Besides the very clear contrast between (40b) and (42a), I discuss here briefly three further properties that set bare arguments apart from overt indefinites. All of the relevant examples are adapted from Carlson.

(44)   Property 1: Opacity
       a. Miles wants to meet policemen.   [only opaque]
       b. Miles wants to meet a policeman.
                                         [both opaque and transparent]

It is considerably harder to get a de dicto/de re ambiguity for (44a) than for (44b). If (44a) is ambiguous at all, the ambiguity concerns the characterization of the sort of objects Miles wants to meet as 'policemen'. That is, we might use (44a) in a situation where Miles would not characterize the sort of people he wants to meet in that way. But it would be odd (or pragmatically uncooperative) to use (44a) in a situation where all that Miles wants is to meet, say, Bud and Chuck, who, unbeknownst to Miles, are in fact policemen. Quite clearly, (44a) is understood with an existential quantifier over instances of the relevant kind having narrow scope with respect to *want* – as the Neocarlsonian approach would predict.

(45)   Property 2: Differentiated scope
       a. Miles killed a rabbit repeatedly.
                                    [narrow scope for 'repeatedly']
       b. Miles killed rabbits repeatedly. [wide scope for 'repeatedly']

In VP-final position an adverb-like *repeatedly* appears to have narrower scope than any other scope-bearing element (presumably because it combines directly with the verb; see Carlson 1977, pp. 89ff.). If *rabbits* was an indefinite, one would expect it to behave on a par with *a rabbit*. But it does not. Related to this, there are also differences involving anaphora:

(46)   Property 3: Anaphora
       a. John is trying to find some policemen and Mary is trying
          to find them too.
       b. John is trying to find policemen and Mary is trying to find
          them too.

In sentences like (46a), the presence of the pronoun *them* forces the

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[21]   This holds except when Gn is involved, as Gn has a built-in device for introducing variables of the appropriate type. See Chierchia (1995a) for one implementation.

interpretation of the indefinite *some policemen* as having wide scope over *try* (and this seems to happen even with the unstressed *sm*, which is usually held to be weak in Milsark's (1974) sense). Not so for the bare plural.

Properties 1–3 (to which I collectively refer with the label 'scopelessness') follow in a natural way from the assumption that bare plurals are names of kinds. I will not go through the argument again. It is not obvious that all such properties can be derived in an equally natural way if one assumes bare plurals to also have a weak indefinite reading. Consider for example property 3 ('differentiated scope'). If the scope of existential closure is the VP and the scope of *repeatedly* is narrower than that, we would be predicting for (45b) precisely the reading it does not have (viz. the existence of a group of rabbits that gets repeatedly killed). If, on the other hand, *repeatedly* is allowed to scope over the VP, then that ought to be possible also in (45a) and that sentence should having a reading corresponding to that of (45b) and sound a whole lot better than it does.

There are other general conceptual worries that the A-Approach raises. For example, why is it that one and the same device should be used to express kind reference and indefinites? No answer seems to be readily forthcoming. If bare nouns are used both for kind reference and indefinite readings in lots of unrelated languages (like, say, English and Chinese – as seems to be the case), one would want to know why. Another question is the following. Why is the ambiguity that the dominant theory posits an ambiguity between kind reference and *weak* indefinites? Why shouldn't bare plurals alternate between kind reference and *strong* indefinites? This too appears to be accidental, on the dominant view. Just as it is stipulated that NPs alternate between referring to kinds and introducing variables (which yields weak indefinite behavior), they could alternate with an indefinite presuppositional, generalized quantifier reading. Now, as we will see in section 4.3, this in fact does happen in certain cases, but in ways that appear to be totally mysterious from the vantage point that the A-Approach offers us.

A Neocarlsonian approach provides principled responses to these questions.The availability of existential readings for kind-referring terms is due to DKP. While this might not be universal, it is certainly an option that UG makes available and which languages can resort to in appropriate conditions. As for the second question, the quick answer is that there is no issue of bare arguments being weak or strong indefinites, simply because they are not indefinites in the first place. We saw, however, how DKP predication induces narrow-scope, weak readings of bare arguments in certain contexts. And we will now see that our Neocarlsonian approach

predicts that in other contexts wide-scope, presuppositional readings of bare arguments are indeed expected to arise.

4.3. *Suspension of Scopelessness*

NPs can be modified, and not every modified NP is going to be associated with a kind. This will depend on whether it picks a class of objects that display a sufficiently regular behavior. What counts as sufficiently regular is determined by the shared knowledge and beliefs in the community of speakers (and is thus subject to a certain degree of variation). Our theory makes a prediction in this connection. Imagine having a bare plural α whose nominalization does not denote a kind. This means that $^{\cap}\alpha$ will be undefined. The English category–type assignment leaves us free to turn an NP into an argument. But if $^{\cap}\alpha$ is undefined, some other type shifting device will have to be used. Now, English has a plural definite article; hence the blocking principle prevents us from using ι as a shifter. It lacks, however, a plural indefinite article. This makes $\exists$ an available option. So non-kind-denoting NPs should behave like regular existentially quantified NPs (and should therefore also have 'strong' interpretations). This is, in essence, the prediction.

This prediction appears to be borne out. The facts were pointed out by Carlson (1977) himself. It seems unlikely that NPs like *boys sitting here*, *people in the next room*, *parts of that machine* could be associated with anything sufficiently lawlike as to be regarded as a kind. And in fact, the typical kind-selecting predicates are marginal with these types of NPs:

(47) a. ??Boys sitting here are rare.
     b. ??Parts of that machine are widespread.
     c. ??People in the next room come in three sizes.

This means that $^{\cap}$ applied to the NPs in (47) will be undefined. Hence, the only way to make them into arguments will be via $\exists$. So the argumental meaning of, for example, *parts of that machine* will have to be:

(48) $\exists$(parts of that machine) $= \lambda P \exists x[\text{parts of that machine}(x) \wedge P(x)]$

This is a regular existential generalized quantifier and it should behave as such. More specifically, it should interact scopally with other scope-bearing elements, much like any genuine (not noun-like) quantifier does. This is indeed so. Bare NPs like *parts of that machine* pattern with overt quantificational elements (like *some parts of that machine*) and unlike kind-denoting bare plurals with respect to all of the properties discussed in section 4.2. Here are the relevant data:

(49)   Property 1: Opacity
        a. John is looking for parts of that machine.
        a′. John is looking for machines.

        Property 2: Differentiated Scope
        b. John killed people sitting here repeatedly.
        b′. John killed people repeatedly.

        Property 3: Anaphora
        c. John is looking for parts of that machine and Paul is looking
            for them too.
        c′. John is looking for cars and Paul is looking for them too.

        Property 4: Narrow scope with respect to negation
        d. John didn't see parts of that machine.
        d′. John didn't see machines.

Sentence (49a) admits of both an opaque and a transparent reading, unlike
(49a′). In (49b) the reading we seem to get is that there is some group of
people sitting here that gets repeatedly killed. Again, this contrasts with
what we get in (49c′). The pronoun *them* in (49c) forces a wide scope
reading of the bare plural, while this is not so in (49d′). Finally, sentence
(49d) is clearly ambiguous. On one reading it means that John didn't see
any part of the machine; on the other it says that there are parts of the
machine that John didn't see. Evidently, the existential quantifier associated
with the bare plural interacts scopally with negation, in a way that con-
trasts sharply with the minimally different (49d′).

   There is an issue that needs to be addressed in this connection. While
English lacks an indefinite plural article, it has a plural determiner gener-
ally thought to have an existential reading, namely *some*. However, in recent
work on indefinites (Reinhart 1997, Winter 1997, Kratzer 1996) it has
been argued that determiners like *some* are interpreted as choice functions,
in order to account for their special scopal properties. According to this
proposal a sentence like (50a) is interpreted as (50b):

(50) a. John loves some cat.
     b. $\exists f[\text{love (John, f(cat))}]$

Here the meaning of the indefinite as such is the variable f over choice
functions (i.e., functions that apply to sets and arbitrarily select one of
their members). So, (50b) says that there is a choice function that applied
to the set of cats selects a member x of it that verifies the sentence 'John
loves x'. While in this case we get the same truth conditions that we would
have obtained interpreting *some* as $\exists$, the choice function approach enables

one to get 'long distance' indefinites in a natural manner (by allowing existential closure of choice functions at any site). Now, the indefinite article too allows for wide scope readings, but it differs from *some* in several key respects, a prominent one being that it allows for generic readings:

(51) a. A dog barks.   [generic interpretation possible]
     b. Some dog barks.   [generic interpretation impossible]

This and other related facts have led Kratzer (1996) to assume that the indefinite article is ambiguous between a choice function interpretation (which lets it get wide scope reading) and an existential one (in our terms $\exists$) which is the source of generic readings. This would explain why *a* blocks covert uses of $\exists$ (and hence bare singulars are always out, since '$\cap$' is undefined for singulars and the articles block the other options) while *some* does not block covert use of $\exists$ in the case of plurals.

We now need to say something as to why in the case of plurals type shifting with '$\cap$' is generally preferred (and why only when '$\cap$' is undefined for some argument, we resort to $\exists$). The reason might be rather simple. There is a clear sense in which '$\cap$' is more meaning preserving than $\exists$. '$\cap$' merely changes the type of its argument, leaving the information associated with it otherwise unchanged. A property P is a function from worlds into characteristic functions true of individuals. The corresponding kind $^\cap$P (when there is one) is a function from worlds into the largest individual (i.e. set) of which P is true. This is like changing (world by world) from characteristic functions to sets, which are two different ways of coding the same information. Not so for $\exists$, which adds existential import. Since of the available options, '$\cap$' is the more meaning preserving one, it gets picked over $\exists$ whenever possible.

While the facts in (49) were known since Carlson's dissertation, they have always been regarded as exceptional and have never been picked up in the subsequent literature. We now see that they in fact follow from general principles. The view of type shifting developed here predicts that if an NP does not denote a kind, it gets existentially closed (other options being blocked). It is perhaps worth noting that these facts appear particularly mysterious from the point of view of the A-Approach. According to such an approach NPs are ambiguous between denoting kinds and being weak existentials. However, we see that one must also derive that if there is no kind for a bare NP to denote, all of a sudden it starts behaving like a strong NP. Why? Our perspective has something principled to offer on this point.

5.   OBJECTIONS

There are a number of objections that have been raised against Carlson's approach and have led to its abandonment. In the present section I will consider three important kinds of objection and argue that they have no force against the Neocarlsonian approach developed here. Of particular interest will be the third one (section 5.3), which involves generic uses of the definite article and will therefore force us to analyze such uses more fully.

5.1. *Wide Scope Effects*

Sometimes bare plurals appear to give rise to wide scope effects with anaphora. Consider for example the following sentence:

(52) a. John saw apples. Mary saw them too.
     b. saw (John, apples) $\Leftrightarrow$ (via DKP) $\exists x[\text{apples}(x) \land \text{saw}(\text{John},x)]$
     c. saw (Mary, x)

Sentence (52a) has a reading according to which Mary saw the same apples as John. The question is: how is this reading to be obtained on a Neocarlsonian approach? The first sentence gets interpreted as in (52b). The existential quantifier over *apples* introduced via DKP will have narrow scope. It will, therefore, be unable to bind the pronoun in the second sentence. And scoping out *apples* in (52a) will not make any difference, because *apples* is just a kind-referring term. So it seems that there is no way to obtain the intended reading on a Neocarlsonian approach. The problem is that the bare plural in (52a) is interpreted existentially, but the existential quantifier associated with it seems to take wide scope.

It is interesting to point out that a version of DRT that uses the VP as the only site of $\exists$-closure runs into the same problem. The only way for *apples* to get its proper force is by staying within the VP. But then the pronoun in the second sentence will be left unbound. However, in recent years we have learned quite a lot about the semantics of unbound pronouns, especially thanks to the systematic development of ideas due to G. Evans (1980), which have given rise to the so-called E-type strategy for pronoun interpretation. The basic idea is that unbound pronouns are interpreted as elliptic descriptions, whose content has to be retrieved from the context. There are various fairly articulated theories around that show how this can be accomplished in systematic ways. Assuming that some version of the E-type strategy is available, we would expect that the pronoun *them* in (52a), while unbound, would get interpreted as roughly equivalent to 'what John saw'. Hence, sentences like (52a) are no problem.

The above-mentioned approach is not the only way to go. Versions of DRT with a text-level rule of ∃-closure and theories that use a dynamic semantics for the existential quantifiers (like the Dynamic Binding framework; cf. Chierchia 1995b) would also predict the correct readings for (52a), even within a Neocarlsonian framework. The effect of dynamic binding is that the semantic scope of existentially quantified variables is extended in systematic ways beyond their syntactic scope. Such an approach, then, would get the pronoun 'them' in (52a) linked to the variable introduced by DKP.[22]

In conclusion, a Neocarlsonian approach coupled with a modern theory of anaphora involving non-c-commanding antecedents (like the E-type approach or Dynamic Binding) makes the right predictions in connection with cases like (52), where bare plurals have an existential reading that seems to take wide scope in the sentence.

5.2. There-*sentences*

According to a Neocarlsonian approach, bare arguments are names of kinds, and hence, in a sense, to be regarded as definites. Now, there are contexts where definites are disallowed. One such context, much discussed in the literature, is constituted by *there*-sentences. They display, as is well known, a so-called definiteness effect (DE), whereby proper names and other definites are ruled out (or subject to a special 'list' interpretation):

(53)　　* There is John/that boy/the boy.

If bare arguments are names of kinds, they should be ruled out in such contexts. But they are not:

(54)　　There are dogs.

The question is how this is possible. In contrast with the apparently wrong prediction of the Neocarlsonian approach, we seem to get the right result on the A-Approach. For if bare arguments are ambiguous between a kind reading and a weak indefinite one, the kind reading will be ruled out in (54) by whatever rules out (53). This leaves, appropriately, only the weak indefinite reading surviving in *there*-sentences.

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[22]　Both the E-type and the dynamic binding strategies extend to other examples discussed in the literature, such as Kratzer's (i).

(i)　　　John intentionally put belladonnas in the salad because he mistook them for cherries.

See van Geenhoven (1996) and Carlson (1996) for a discussion of these cases.

One way to go, for the Neocarlsonian, is the following. Interestingly enough, overt kind-level NPs as well are grammatical in *there*-sentences (a fact which is also well known; see e.g. McNally 1992):

(55) a. There is that kind of animal in the zoo.
     b. There is every kind of student in my class.

So however the DE comes about, kind-level NPs must be exempted from it. This in a way already constitutes an answer to our problem. The proper formulation of the principles that determine the ungrammaticality of (53) must let in sentences like those in (55). On a Neocarlsonian approach, a sentence like (54) has the same interpretation as (55a). Hence the latter will be grammatical, in contrast with (53).

But can we say something more? To do so, we will have to take a line on the definiteness effect. In what follows, I will give an indication of how to proceed, by adopting a version of the approach to *there*-sentences proposed by Barwise and Cooper (1981). I do so for illustrative purposes, as I believe that a variety of solutions are available on other approaches as well. The basic idea that Barwise and Cooper adopt is that the interpretation of *there*-sentences is as follows:

(56)   There be DP $\Rightarrow$ DP exists

To exist is a property that is true of everything there is (in the domain of quantification). So the sentence to the right of the arrow in (51) can be spelled out in the following way:

(57) $DP(\lambda x\ [x = x])$ [assuming the type of the DP to be GQ]

Now, the noun phrases that are ungrammatical in these contexts are those for which a sentence like (57) is either tautologous or contradictory (i.e. uninformative). These turn out to be precisely the strong DPs in Milsark's sense.[23] Taking this as a starting point, it is plausible to maintain that *exist* in the sense relevant for *there*-sentences is an object-level predicate: it holds primarily of objects, and only in a derivative sense does it also hold of other entities, such as kinds. One way of implementing this is by restricting (57) sortally to objects:

(58) $DP(\lambda x_o[x_o = x_o])$

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[23]   This approach can be extended to cases where *there*-sentences are derived from small clauses, as proposed by Stowell (1981). See also Moro (1996). Moreover, Barwise and Cooper's approach can be easily modified so as to make sentences like 'There is John' presuppositionally deviant. See Zucchi (1995) for relevant discussion.

Suppose now that the DP in (58) is kind denoting, as in (54). Here is what we would get:

(59) a. There are dogs.
  b. $\lambda P P(^{\cap} dogs)(\lambda x_o[x_o = x_o])^{24}$
  c. $\lambda x_o[x_o = x_o](^{\cap} dogs)$

Formula (59b) is equivalent to (59c). The latter, via DKP, yields:

(60) $\exists x[^{\cup \cap} dogs(x)]$

So 'there are dogs' winds up saying that the dog-kind has instances. This is a contingent statement and hence will be ruled in, on Barwise and Cooper's approach to DE.

  Many details remain to be worked out. For example, something like (61a) is severely ungrammatical:

(61) a.*There were dogs in the garden and there were them in the house as well.
  b. $\lambda P P(x)(exist)$

The logical form of the relevant portion of (61a) would be (61b). On the intended reading, x should pick out $^{\cap} dogs$ and hence, ultimately, (61b) ought to be interpreted just like (59b). Yet clearly something of the form in (61b) ought to be ruled out independently of how x winds up being interpreted. Possibly this can be done in a reasonable manner, consistent with the spirit of the present approach. Notice that while $\lambda PP(x)$ and $\lambda PP(^{\cap} dogs)$ in a given context might have the same *value*, they would still have different *meanings* (as the first is sensitive to the assignment function, while the latter isn't). Hence a proper semantics for *there*-sentences, where presuppositions are computed locally, can duly distinguish between the two. I believe that this idea is sound and can be worked out, even though its execution might be nontrivial and cannot be attempted here.[25]

  So there are clear empirical as well as theoretical considerations that converge in pointing towards principled ways to account for the behavior of kind-denoting terms (such as bare arguments on a Neocarlsonian approach) in *there*-sentences.

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[24] I am assuming that the type of *dogs* has been lifted to that of GQ via LIFT, as this is required by the semantics of *there*-sentences. There are various alternatives to this which, I think, yield equivalent results.
[25] An alternative in the spirit of Wilkinson (1995) would be to analyze things like *that kind of animal* as equivalent to *an animal of that kind* (assuming, that is, that *kind* is not the head of the NP). However, I don't quite see how this would extend to cases like (55b); i.e., I don't see how NPs like *every kind of animal* can be treated as indefinites in disguise.

5.3. *Singular Generic 'The'*

Another well-known but poorly understood phenomenon is constituted by the generic and kind-level uses of the definite singular article illustrated in (62):

(62) a. The tiger is rare.
      b. The tiger roars.

In contrast with this, in English plural 'the' does not have a generic inter-pretation (a fact we noted in section 1 and to which we shall return in section 6.3). From the point of view of a theory of bare arguments, the main problem posed by the generic singular is the following. The generic singular 'the' does not occur felicitously in episodic sentences. One gets contrasts such as the following:

(63) a.   Tigers are roaring in the zoo.
      b.??The tiger is roaring in the zoo.

Sentences like (63b) do not readily admit a generic interpretation. Such an interpretation is only possible if the described episode is somehow 'momentous' for the kind as such. For instance, if tigers were on the wedge of extinction and were saved through a courageous program carried out in the Bronx Zoo, a sentence like (63b) would become acceptable. In such a case, the tigers in the Bronx Zoo would be seen as representative for the whole kind.[26]

    On the A-Approach one could account for the contrast in (63) as follows. The deviance of (63b) shows that object-level predicates cannot apply to kinds (contrary to what we are assuming). Bare arguments, on the other hand, are ambiguous. Their kind reading must be excluded in (63a) by whatever excludes it in (63b). This leaves us with the existential reading, which is unproblematic. But, if bare arguments unambiguously denote kind, how are we ever going to explain the contrast in (63)? Evidently, we cannot try to answer this question without getting into the semantics of the definite generic *the*, whose behavior is difficult to understand. This is vividly put in Heim's (1991) words: "The question whether the definite article has a special generic reading and, if so, how it relates to its 'normal' meaning is not even ripe for intelligent speculation." I believe that the theory of kinds developed here does offer some grounds to be more optimistic, as I will illustrate in what follows.

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[26]   See on this Krifka et al. (1995). They also observe a related fact, namely that the singular definite generic is somehow limited to 'well-established' kinds. I am not sure whether this fact is semantic or pragmatic in nature.

On the basis of much previous work, we are assuming that the definite article means 'ι'. In order to see the role this operator plays in singular definite generics, we need to integrate into our framework three ideas that have been put forth in the literature. I will sketchily present them in turn.

The first concerns the semantics of collective (count) nouns like *group* or *bunch*. According to the line we are taking, the extension of these nouns will be a set of singularities. So groups, bunches, collectives, etc. are *singular* individuals, not pluralities (see, e.g., Schwarzschild 1996; Barker 1992 for relevant arguments). So on the one hand we have pluralities (modeled as sets); they are the denotation of definite plural noun phrases like *the boys* or *John and Bill*. On the other hand we have groups, bunches, teams, and the like; they are singularities, the denotation of definite NPs like *that group*. Any plurality can in principle be also viewed as a group. John and Mary can be viewed as a unit, a team, or a group, as the case may be. In our terms this means that for each plurality there may be a corresponding group whose members are that plurality. The distinction between pluralities and groups/collectives is related to the Russellian distinction between classes-as-many and classes-as-one.

The second idea concerns the semantics of definite mass nouns like *the furniture*. We have assumed so far that something like *the furniture* denotes the largest plurality of pieces of furniture. This has as a consequence that a morphologically singular definite NP winds up denoting a plurality, which is arguably awkward (and leads, in fact, to empirical problems; see e.g. Gillon (1992) or Chierchia (1996) for discussion). Singular definites ought to denote singularities (atoms). Now that we have introduced collective items, it seems more appropriate to take as the denotation of definite mass nouns something like the group (or quantity) that comprises all of the relevant parts of the mass noun denotation. To make this more concrete, if a, b, and c are all the pieces of furniture there are, instead of having *the furniture* denote the plurality {a, b, c}, we have it denote g({a, b, c}), where the latter is some atom (a group or quantity) that comprises all the pieces of furniture. Accordingly the semantics of *the* might be something like:

(64)   ⎡ ιP, if P is a count noun denotation
        THE P = ⎢ g(ιP), if P is a mass noun denotation
                     ⎣ (where g is a function from pluralities into groups)

Finally, recall that count nouns can be pushed, in certain cases, into a mass mold. One way of doing so is through something like Lewis's 'universal grinder' (and this will not concern us here). Another way of doing

so is by neutralizing the singular-plural distinction. For example, we can define a massifying function MASS as follows:

(65)   MASS(tiger) = tiger $\cup$ PL(tiger)

By simply taking the union of the singular denotation (the atoms) and the plural one (the sets of atoms) we obtain what in our terms is a mass denotation. Interlinguistically, this is the operation that links the Italian count noun *mobile* to its English mass counterpart *furniture*. Intralinguistically, it expresses the relationship between nouns like *coins* and nouns like *change*.

Now suppose that the definite article can compose with the type shifter MASS, yielding:

(66)   the tiger $\Rightarrow$ THE(MASS(tiger)) = g(ι MASS(tiger))

At any given point of reference, the expression in (66) will denote the totality of tigers (or the group containing all tigers). This is consistent with the fact that the noun has singular morphology, the usual morphology of mass expressions. In the literature, the definite generic has been observed to have mass-like behavior (see, e.g., Kleiber 1990), which manifests itself in the fact that singular definite generics cannot combine with numerals and with predicates that require a count interpretation:

(67)   * The tiger is three/many/numerous.

So the idea of a massifying character of the definite generic seems to have some empirical support. Let us see what further predictions this would make.

Consider first occurrences of this type of definites in generic contexts. As we know, the Gn operator quantifies over situations and possibly instances/parts of what is in its restriction. So a sentence like (62b), repeated here as (68a), by the usual mechanism of generic interpretation will end up with the reading in (68b):

(68) a. The tiger roars.
     b. Gn x, s [member-of (x, g(ι MASS(tiger)) $\wedge$ C(x, s)][roar (x, s)][27]

This is the right reading and, what is more important, it is obtained without appealing to anything special. Note that Gn is a modal. Hence uses of generic singular definites do not commit us to the actual existence of tigers – another welcome result.

Consider next kind-level predicates. So far we have analyzed kinds as functions from worlds into plural individuals. We might call these 'plural

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[27]   We cannot use '$\leq$', as that is defined only for pluralities, not for groups.

kinds'. Now, the intension of a mass description is a function from worlds into a collective or totality of some sort. We might call it a 'singular kind'.

(69) $\cap$tigers = $^\wedge\iota$ PL(tiger) = $\lambda w[\iota$ PL(tiger$_w$)])]   'plural kinds'
        $^\wedge$THE (MASS(tiger)) = $^\wedge g(\iota$ MASS(tiger))
                                = $\lambda w[g(\iota$ MASS(tiger$_w$))]
                                                            'singular kinds'[28]

What we are suggesting is that *dogs* (as in *Dogs are common*) refers to a class-as-many (a set, in our formal reconstruction). *The dog* (as in '*The dog is common*') refers to a class-as-one (a collective, which in our reconstruction is an atom). Kind-level predicates apply to individual concepts. Strictly speaking, a singular generic *the* denotes a collective. But its type can easily be adjusted using Montague's cap operator (i.e., abstraction over the actual world variable):

(70)   The tiger is rare $\Rightarrow$ rare ($^\wedge$THE(MASS(tiger)))

In other words, kind-level predicates are intensional predicates that tell us something concerning the distribution of a plurality or totality of things across worlds and times. Since there is a natural way of adjusting the sort mismatch constituted by the application of a kind-level predicate to a definite generic, the result is grammatical (see again Partee 1987 for an independent justification of uses of '$^\wedge$' as a type shifter).

Consider finally the case of definite generic *the* in episodic sentences like (63b), repeated here:

(71) a. The tiger is roaring in the zoo.
     b. roaring in the zoo (g(ι MASS(tiger)))

Suppose that the massifying interpretation of the definite article is selected, thereby obtaining the reading in (71b). Here we are applying an *object*-level predicate to an *object* (viz. the totality of tigers). There is no sort mismatch to be adjusted. The reading we get says of the totality of the tigers that they are roaring in the zoo. Under normal circumstances, this will be patently false (which can be taken to induce a presupposition failure of some kind) –unless we are in a context where the specimen we are referring to can be viewed as representative of the totality of tigers, in which case the acceptability of the sentence should improve. This contrasts with what happens with bare arguments like 'tigers'. The latter are *kind*-denoting. When we apply to them an object-level predicate, there is a sort mismatch that has

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[28]   The importance of 'singular' vs. 'plural' kinds has been discussed by Dayal (1992). The ideas put forth in the text owe a lot to that paper and to discussions with Dayal.

to be adjusted. That is done via DKP, which yields an existential reading. Thus the contrast in (63) appears to fall into place.

According to the present view, the only thing which is special about generic uses of the singular definite article is the fact that it induces a mass reading on the noun it combines with. These kinds of shifts are attested elsewhere in the grammar. Other than that, *the* has its ordinary meaning. This simple hypothesis seems to predict correctly the readings of the singular definite. It furthermore relates in a not too far-fetched way the meaning of the generic *the* to its 'normal' one. And it explains why bare plurals behave differently from singular definite generics, when they do. This seems to constitute progress. But it hinges crucially on our theory of the mass/count contrast and the view of kinds that comes with it.

6.   Reference to Kinds in Romance

It is now time to consider in more detail the behavior of bare arguments in the Romance languages and see what a Neocarlsonian approach has to say about it. The hypothesis we have put forth is that the syntax-semantics map for the category NP in Romance is NP[–arg, +pred]. As pointed out above, a language with this setting will have the mass/count distinction, but will systematically tend to disallow bare arguments, as the semantic type of NPs is unsuited to canonical argument position. French basically fits this bill. Things are more complicated in other Romance languages. In what follows I will discuss the case of Italian.

6.1. *The Basic Patterns*

In Italian bare arguments are allowed in certain contexts. Their occurrences appear to be linked to a somewhat 'elevated' or 'literary' register (with the exception of a few more common, quasi-idiomatic phrases). The facts concerning their distribution are controversial, and this in itself can be taken as evidence for the somewhat marked status of even relatively acceptable occurrences of bare arguments. In what follows I reproduce data from my own dialect, but will signal when they are in contrast with claims made in the literature. Bare NPs are generally acceptable when governed by a lexical head like P or V (a fact also pointed out for Spanish in Contreras 1986 and Torrego 1989; see Benincà 1980 and Longobardi 1994 for Italian):

(72) a. Leo ha   mangiato patate.
       Leo PAST eat   potatoes

    'Leo ate potatoes.'

    b. Leo stermina   ratti.
       Leo exterminates rats

    c. Leo è   andato da amici.
       Leo PAST go   to friend

       'Leo visited friends.'

In the left periphery of the clause, bare nominals are acceptable in two contexts: in a focus position (which requires contrastive focal stress) and in Clitic Left Dislocated position (CLLD), followed by the partitive clitic *ne* (see on this Cinque 1990 and Cardinaletti and Giusti 1992):[29]

(73) a. POLLO   io voglio, non pesce.
       CHICKEN I want,   not fish

    b. Studenti, ne   ho   molti.
       students of-them (I) have many

       'I've got many students.'

    c. Soldi,   non ne ho.
       money not of-it I have

       'I haven't got money.'

In subject position, both pre- and postverbal, bare arguments are generally ungrammatical:

(74) a.*Studenti hanno telefonato.
      Students have   phoned

    b.*Hanno telefonato studenti.
      have   called   students

However, if bare NPs are made 'heavy,' either by being coordinated with other NPs or by various kinds of modification, the degree of acceptability in subject position increases considerably:

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[29] The working of the CLLD construction is closely related to that of so-called bare partitives (cf. (4b) above, repeated here).

(i)   Dei cani   stanno giocando fuori.
      of-the dogs are   playing   outside

      'Dogs are playing outside.'

Discussing such constructions here would take us too far afield. In Chierchia (1998) an approach to bare partitives (and their clitic counterpart *ne*) is developed in the spirit of the present approach. In what follows, I will limit myself to a discussion of bare plural licensing through focus.

(75)a. Studenti e   colleghi   hanno telefonato.
      students and colleagues have   telephoned

   b. Hanno telefonato   studenti che volevano sapere
      have   telephoned students that want to find out

      la data   dell'esame.
      the date of the exam

Controversy surrounds the status of bare arguments with kind-selecting predicates. Sentences like the following are not very good (heaviness notwithstanding):

(76) ??Ragazze in minigonna sono estinte.
      girls   in miniskirt   are   extinct

Facts of this tenor have led researchers like Longobardi (1994) to conclude that bare NPs in Italian cannot refer to kinds. Note, however, that adjectives like 'extinct' require what Krifka et al. (1995) call 'well-established' kinds. If one chooses more liberal kind-selecting predicates, things are different:

(77) a. Qui, ragazze in minigonna sono rare.[30]
      here girls   in miniskirt   are   rare

   b. Dopo il   disastro nucleare, purtroppo,
      after the nuclear disaster,   unfortunately,

      cani con difetti con geniti sono molto comuni.
      dogs with birth defects   are   very common

   c. Insegnanti davvero dediti nella scuola di oggi sono quasi
      really devoted teachers   in today's school   are   nearly

      estinti.[31]
      extinct

Notice also that in the object position of kind-level transitive verbs like *sterminare* 'exterminate', bare arguments appear to be acceptable (cf. 72b).

    Another peculiarity of the distribution of bare arguments concerns their behavior with so-called individual-level predicates. Generally they are bad even in lexically governed positions (cf. 78b):

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[30]   I owe this example to C. Casadio.
[31]   Some informants find (77c) more marked than the others. Again, this is probably due to the choice of the adjective *extinct*, requiring well-established kinds. For me 'dedicated teachers' are evidently a sufficiently well-established kind.

(78) a.*Linguisti sono bravi.
        'Linguists are clever.'

    b.*Leo odia gatti.
        'Leo hates cats.'

Fact (78a) is expected; fact (78b) is not. Modification improves things, but only if the NP is made extra-heavy or if we have a coordinated structure:

(79) a.??Leo odia gatti neri.
        'Leo hates black cats.'

    b. Leo ama quasi tutti gli animali ma odia gatti neri a pelo lungo.
        'Leo loves almost all the animals but hates black long-haired cats.'

    c. Leo odia gatti e cani.
        'Leo hates cats and dogs.'

Similar effects are obtained in subject position.

Taking these to be the basic empirical generalizations, let us see how they can be understood on the basis of the apparatus we have developed.

6.2. *The Account*

If NPs in Italian are predicates like in French, they can only be arguments if a D position is projected. We are thus led to conclude that Italian bare arguments are in fact DPs with a null D. For example, the null object of (72a), *patate* 'potatoes', will have the following structure:

(80)
```
         DP
        /  \
       D    NP
       |    |
       ∂    potatoes
```
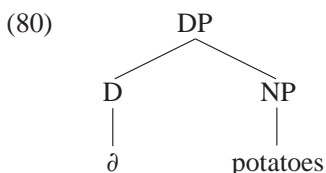
Here ∂ is the phonetically null head of D. The difference between Italian and French is simply that Italian has a null D while French does not. Syntactically, one expects null structure to be subject to licensing conditions that permit us to detect its presence. A crosslinguistically common condition of this sort is licensing by a suitable head.[32] In Italian the licensing

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[32]   Delfitto and Schroten (1992) argue that the availability of the null determiner is linked to the presence of 'audible' plural features on the noun. French, having lost such features, cannot have the null D. We could accommodate this view by maintaining – in line with,

conditions for ∂ appear to be either licensing by a lexical head (perhaps by a process of LF incorporation) or by the functional head of a Focus Phrase, via Spec-Agreement (under the assumption that focalized constituents are moved to the Spec of FP; see Rizzi 1996, and references quoted there). The latter process takes place either before Spell-out (as in (73a)), in which case the dislocated constituent has to have focal stress, or after Spell-out (i.e. at LF), in which case the moved constituent is subject to a somewhat looser condition of prominence (satisfied by making it 'heavy'). Some story along this line accounts for the basic syntactic distribution of bare plurals in Italian. It is a slight variant and update of what has been proposed in the work of Contreras, Torrego, and Longobardi. The innovation contributed by the present account is that the necessity of projecting D in Romance is motivated by the category–type assignment hypothesized for this language family. Further differences concern the semantics, to which I now turn.

Semantically, what function would one expect ∂ to perform? Evidently, the expectation is that ∂ is just a device to shift the semantic type of the NP to that of an argument. One way to implement this is to assume that the meaning of ∂ is just 'SHIFT'. Its content is then provided by whatever principles govern the choice of specific type shifting operations, which we have seen at work already. Thus, ι is blocked by the presence of the definite article. The unmarked choice is ∩, as it minimally affects the meaning of the NP; when ∩ is unavailable (because the NP has no kind-correlate) one resorts to ∃. This leads one to expect that bare arguments in Italian, when grammatical, should have the same semantics as their English counterparts. This expectation is correct, as I illustrate in what follows.

First, bare arguments ought to be selected by kind-level predicates, as they are kind-denoting. As we saw, this seems to be so. Moreover, one ought to get existential readings in episodic sentences and universal ones in (appropriate) generic contexts. This too seems to happen. The following are minimal pairs (the available reading of bare plurals is indicated in brackets):

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say, Rizzi's (1990) approach – that besides licensing, an empty category must also be 'identified' by overt morphological features (in the case of the null D, by plural nominal features of the noun). This move forces one, however, to assume that mass nouns have some kind of abstract Φ-features in common with plurals. While there might well be something correct to Delfitto and Schroten's idea about plurals from a historical point of view, the case of mass nouns makes me doubt that it is a good account for the synchronic pattern we currently observe in Romance, even though positing abstract features for mass nouns and similar moves are of course always possible and can hardly fail to attain descriptive adequacy.

(81) a.   Leo questa estate ha corteggiato belle ragazze.   [∃]
          'Leo last summer courted nice girls.'

     b.   Leo corteggia sempre belle ragazze.   [∀]
          'Leo always courts nice girls.'

     c.   Butteri maremmani stanno invadendo l'area.   [∃]
          'Cowboys from Maremma are invading the area.'

     d.(?) Butteri di qui domano un cavallo in pochissimo tempo.   [∀]
          'Cowboys from here tame a horse in very little time.'

In preverbal position, some speakers find the universal reading of bare
plurals somewhat degraded. In out-of-the-blue contexts, there seems to be
a preference for the definite article. This is more evident in examples like
the following:

(82) a.??(I) butteri maremmani domano un cavallo in 2 o 3 sedute.
          'The cowboys from Maremma tame a horse in 2 or 3 sessions.'

     b.   . . . invece, butteri di qui lo fanno in una seduta.   [∀]
          '. . . instead, cowboys from here do it in one session.'

Sentence (82a) is pretty bad without the article. Sentence (82b), however,
viewed as a continuation of (82a), is perfect (despite its being structurally
similar to the former, except for the absence of the initial determiner).
Thus in a contrastive setting, the bare plural (interpreted universally) is
perfect. This is plausibly due to the fact that the bare plural in preverbal
position is licensed only in Focus Phrase (and not in subject position). Focus
typically requires a contrast. With this being provided by (82a), sentence
(82b) is grammatical on a universal (i.e. generic) interpretation of the initial
bare plural.

    Second, one would expect that when a bare NP is kind-denoting it should
display scopelessness. The relevant cases are the following:

(83) a.   Voglio conoscere belle ragazze.   [opacity]
          '(I) want to meet beautiful girls.'

     b.   Non ho conosciuto belle ragazze.   [narrow scope]
          '(I) didn't meet beautiful girls.'

     c.   Ho ucciso conigli ripetutamente.   [differentiated scope]
          '(I) killed rabbits repeatedly.'

     d.   Leo accetta studenti senza libretto. Paolo li caccia via. [anaphora]
          'Leo examines students without I.D. Paolo sends them away.'

The behavior of bare arguments parallels in full that of their English coun-

terparts. Sentence (83a) only admits an opaque reading. Sentence (83b) can only mean that it is not the case that I met any nice girl. In sentence (83c), the adverb *ripetutamente* has scope over the object. And finally, in (83d) the anaphoric link does not force a transparent reading (as is the case with overt indefinites). At the same time, if the NP is not kind-denoting, scopelessness should be suspended. And in fact it is:

(84) a. Voglio conoscere ragazzi che abitano lì.
    '(I) want to meet boys living there.'

   b. Non ho conosciuto belle ragazze che avrei voluto conoscere.
    '(I) didn't meet beautiful girls I would have liked to meet.'

   c. Ho ucciso ragazzi seduti di là ripetutamente.
    '(I) killed repeatedly boys sitting over there.'

   d. Paolo voleva incontrare ragazzi che abitano li. Leo pure li vuole incontrare.
    'Paolo wanted to meet boys that live there. Leo too wanted to meet them.'

Sentence (84a) admits both a transparent and an opaque reading. Sentence (84b) also has two readings: one according to which I didn't meet any girl I wanted to; and one according to which there are some girls I wanted to meet and didn't. In (84c) the object has wide scope over the adverb. And finally, in (84d) the anaphoric link forces wide scope of the existential quantifier associated with the bare plural. The important thing is that we have to say nothing about this seemingly intricate pattern, beyond the fact that Italian has a null determiner ∂ (subject to licensing).

   Let us address, finally, the seemingly idiosyncratic restriction that prevents bare arguments from occurring with individual-level predicates. Following Chierchia (1995a),[33] individual-level predicates are inherently generic: they have to occur in the (immediate) scope of a generic operator (much as negative polarity items have to occur in the scope of negation). This means that the LF of a sentence like (85a) is something like (85b):

(85) a. Dogs hate cats.
    b. cats$_i$[dogs$_j$ [Gn[t$_j$ hates t$_i$]]]
    c.*Cani odiano gatti.

The Gn operator, which we have assumed is generated in Aspect Phrase, has to be present in (85b) to license the individual-level predicate *hate*.

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[33]   For influential, alternative views see Diesing (1992) and Kratzer (1995).

In (85a) both subjects and objects are interpreted universally. This means that they both must be in the restriction of Gn, which in our framework is achieved by adjoining the object *cats* at LF to the clause. Presumably the Italian counterpart of (85a) – that is, (85c) – will have that same LF (i.e. (85b)). But notice, now, that Aspect Phrase is not a lexical head (nor is it the head of Focus Phrase). Hence it cannot license ∂. This is why sentence (85c) is ungrammatical. In English, on the other hand, there is no null D^0 in need of licensing. Hence no problem arises. The point, in more theory-neutral terms, is that individual-level predicates, qua polarity items, are in a sense defective: they cannot stand by themselves and are in need of a proper licenser. Their incapacity to license the null determiner can plausibly be linked to this.

This approach makes an interesting prediction, having to do with facts pointed out in Dobrovie-Sorin and Laca (1996).[34] If there are individual-level predicates that allow one of their arguments to be interpreted existentially, the result of having a bare argument in the relevant slot should be acceptable. The reason for this is that existential interpretation in generic sentences arises via DKP by leaving (or reconstructing) the relevant argument in its original site within the VP. In such a position, the argument in question would be head governed and no problem should arise. Verbs that allow us to check this prediction are *own* and *contain*, which license an existential interpretation of their objects. Consider, for example, the following sentences:

(86) a. John owns houses around here.
     b. This paper contains mistakes.

The most prominent reading of (86a) is that it is a property of John to own (some) houses around here. Similarly, sentence (86b) says that it is a property of this paper to contain some mistakes. This means that the logical forms of these sentences are as given in (87a,b).

(87) a. John[Gn [t owns houses around here]]
     b. This paper [Gn [t contains mistakes]]

In (87) *houses* and *mistakes* remain in their original VP-internal position, where they undergo DKP, which is responsible for their existential interpretation. We should expect the Italian counterparts of sentences like (86) to be grammatical, as the bare argument remains in a lexically governed position. And indeed this is so:

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[34] Dobrovie-Sorin and Laca offer a very different account from the one provided in the text.

(88) a. Leo possiede case qui intorno.
         'Leo owns houses around here.'

     b. Questo lavoro contiene errori.
         'This work contains mistakes.'

In sum, a seemingly very intricate distributional pattern reduces to few assumptions: (i) Italian has a null D^0; (ii) the null D^0 is licensed by a lexical head or by Focus; (iii) the null D^0 acts semantically as a type shifter.[35] These conditions are induced by the category–type mapping of Italian that forces D to be projected in order for a nominal to be able to occur in argument position.

6.3. *Plural Generic 'The'*

As the distribution of the null D^0 is restricted, Italian has to resort to other devices to obtain in full generality the existential readings of DKP and the generic and kind-level readings associated with bare arguments. To obtain the former, there are various devices of existential quantification. The one that seems to correspond most directly to the existential reading of bare plurals is the bare partitive illustrated in (89):

(89)   Dei ragazzi sono arrivati in ritardo.
         of-the boys   arrived   late

         '(Some) boys arrived late.'

However, unlike bare arguments, the 'di + definite article' construction is a regular existential quantifier (with all the scopal properties of quantifiers). It combines with plural and mass nouns and has the existential readings of English bare arguments as a proper subset of its own readings. The structure of bare partitives appears to be the same as that of full partitives (like *molti dei ragazzi* 'many of the boys'), minus the initial determiner. This construction occurs in several of the Romance languages, like French or Rumanian, but not in all (e.g., Spanish has a plural form of the indefinite article instead). It has a very interesting grammar. The typologically most striking observation is that the bare partitive construction appears to be impossible in languages with bare arguments: nothing like it seems to exist in the Germanic or Slavic languages. This generalization, if correct,

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[35] I am assuming that the ungrammatical structures with individual-level predicates can be rescued by the usual strategy of moving the relevant phrases into the Spec of Focus Phrase at LF. I have nothing to say on the observation that this seems to require the bare argument to be 'extra heavy' (assuming that to be a fact).

calls for a principled explanation. I believe that the present framework has something to offer on this score; but that must be left to some other occasion (see Chierchia 1998).

Insofar as generic and kind-level readings are concerned, Romance fills its gaps by means of the plural definite article. Unlike what happens in English, the definite plural readily admits of generic and kind-oriented interpretations. The line we will take on this matter is foreshadowed by our analysis of the definite generic singular in English. Here is how the story might go. We know that the definite article essentially means ι. We also know that the nominalizing operator $^\cap$ is an intensionalized version of ι. It follows that in appropriate (intensional) contents we will be able to obtain with ι (i.e. the definite article) what we can get in English with $^\cap$ (i.e. bare nominals). The relevant contexts are two: generic sentences and sentences with kind-level predicates. Let us consider them in turn. Take a generic sentence, like (90a). The familiar interpretive strategy for Gn will yield a logical form like (90b).

(90) a. I   cani   abbaiano.
       the dogs bark

       'Dogs bark.'

   b. Gn x, s [x ≤ ιdogs ∧ C(x, s)][bark(x, s)]

This immediately accounts for the universal, modal reading of the definite article with plural and mass nouns in generic contexts. Consider next what happens when a kind-seeking predicate like *widespread* tries to combine with a definite plural or mass. It won't be able to do so directly as there will be a type mismatch. However, to get at the kind (given what kinds are) it suffices to abstract over worlds/situations, an option we know to be available. Accordingly, the interpretation of (91a) will be (91b):

(91) a. I   cani   sono diffusi.
       the dogs are   widespread

       'Dogs are widespread.'

   b. widespread ($^\wedge\iota$dogs)
   c. widespread ($^\cap$dogs)

Our semantics validates the logical equivalence of (91b) and (91c). This approach explains in a principled manner the kind-denoting and generic uses of the definite plural/mass article, by linking them into its regular meaning. Something essentially similar happens with the singular definite generic, with the additional assumption that the latter 'massifies' its argument.

One question that arises in this connection is the following. Italian winds up having two devices for kind reference: the null determiner ∂ (interpreted as SHIFT) and the definite article. How come there is no blocking effect of the latter on the former, if they are so close in meaning? The answer to this is straightforward. Even though they are close enough in meaning so that in some contexts they give rise to equivalent formulas, the definite article as such does not mean the same as $\cap$. Only an overt morpheme whose meaning is identical to one of the available shifters blocks that shifter from being used covertly. Hence, use of $\cap$ as the meaning of ∂ is unaffected by the presence of the definite article.

The second question concerns English, which, while being of type NP[+arg, +pred], also has the definite article, but disallows generic or kind-oriented uses of it:

(92) a. (*The) dogs bark.
     b. (*The) dogs are common.

Why should that be? A natural answer, within our framework, is the following. English, given its category–type map, can apply SHIFT at the NP level, something that is impossible in Italian. Evidently, when this option is available, it must be chosen over one which involves projecting D. We seem to be in the presence of an instance of 'Avoid Structure', part of a family of economy-based constraints much discussed in the recent literature:

(93)   *Avoid Structure*
         Apply SHIFT at the earliest possible level.

I think this principle can be formalized in more than one way. Consider for example (92a). In the terminology of current syntactic approaches, the variants with and without the D have (i) identical meanings and (ii) identical enumerations except for the choice of D. We can formulate an economy principle which, whenever that happens, forces us to choose the smaller enumeration. I will not try to make this more precise at this point. Notice also that what we just said does not extend to singular definite generic *the*. The latter involves what we have called *singular* kinds – whereas plural *the* and $\cap$ involve *plural* kinds. These two sorts of entities (pluralities and collective singularities) are distinct in our ontology – a distinction we had to countenance on independent grounds. Hence the condition that the meanings be identical is not met when singular generic *the* is involved and Avoid Structure becomes irrelevant. The presence of bare arguments in the language won't, therefore, bleed uses of singular *the*; but it will bleed generic uses of the plural *the*.

In conclusion, we have a simple account of the generic reading of the plural/mass definite article in Italian that integrates nicely into our proposal for the definite generic singular. Plural/mass definite articles can refer to the totality of the instances of a kind and hence can be used to say something about the kind as such. We also have a good handle on why English-like languages, in spite of having the definite article, must use bare NPs for generic and kind predication.
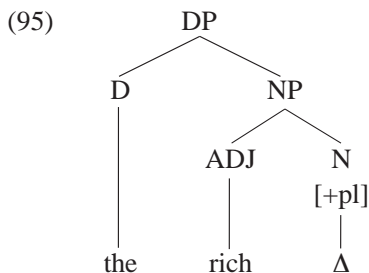
7.   FURTHER RELEVANT NOMINAL STRUCTURES

There are several other nominal structures that are directly relevant to a theory of bare arguments. Here we will discuss two, as they raise very important theoretical (and empirical) issues for the line we are taking. The first is a certain kind of nominalized adjective; the second are proper names, an issue we have avoided to address thus far. Let us consider them in turn.

7.1. *Nominalized Adjectives*

English has a curious but relatively productive form of adjective nominalization, which can be used for generic and kind reference:

(94) a.*(The) rich are greedy.
     b.*(The) poor are common.

These nominalized adjectives trigger plural agreement on the predicate and must be accompanied by the definite article, which turns out to be obligatory in these constructions. The question is why a language that allows for bare arguments all of a sudden in some cases requires the presence of a determiner. Presumably, in the syntactic structure of these constructions there is a null nominal head with plural features, along the following lines:

(95)
```
              DP
            /    \
           D      NP
           |     /  \
           |   ADJ   N
           |    |   [+pl]
           |    |    |
          the  rich  Δ
```

The phonological matrix of such a head (indicated as 'Δ' in (95)), has been lost. The null nominal head, being plural (i.e. count) starts out as a

predicate and gets modified, in the usual manner, by the adjective. The question becomes why the resulting structure cannot be shifted to denoting a kind *without* resorting to the definite article. The answer to this lies, I think, in the commonplace observation that phonologically null items must somehow be licensed. And, as we saw for Italian, selection by a suitable head (in the case at hand, D) is a standard way to do so. Now, English lacks null determiners. The reason for that, in the present framework, is quite clear. Null determiners are ways of shifting the type of the noun from predicative to argumental. But English can do this at the NP level, without any need to project D. Hence, Avoid Structure prevents English from having a null determiner. It follows that the presence of a null head with nominalized adjectives can be licensed in English only by an *overt* determiner.

The next question is why *the* is picked for this licensing role rather than any other determiner. This might be related to the meaning of the missing head. Ultimately, the missing head looks for an adjective. Suppose the meaning of Δ is that of a function that applies to adjectival meanings to return something true of the totality of people having the property ascribed by the adjective:

(96) a. $\Delta \Rightarrow \lambda P \lambda x[x = \iota P(\text{people})]$
     b. $[_{NP}$ rich $\Delta] \Rightarrow \lambda P \lambda x[x = \iota P(\text{people})](\text{rich}) = \lambda x[x = \iota \text{rich}(\text{people})]$

A meaning such as (96b), being a property, is suitable as a quantifier restriction; but, arguably, it is only compatible with a determiner carrying a uniqueness presupposition, since the property in (96b) can be true of at most one (plural) thing (more on this in section 7.2). Whence the necessity of combining with *the* (as opposed to other determiners). Now, this assumption on the meaning of Δ is a stipulation. But somewhere one must record the meaning of these structures, and this might well be the place where the need for *the* (rather than some other determiner) is coded. What is not a stipulation is that phonologically null elements are subject to licensing conditions. For null nominal heads, in a language that for principled reasons lacks null determiners, the licensing can only be done in a natural way by an overt D.

In this connection it is interesting to note that Italian has the very same construction:

(97) a.*(I) ricchi sono avidi.
        'The rich(-pl.) are greedy.'

     b. Ho visto (i) ricchi rubare.
        '(I) saw (the) rich steal.'

The significant difference with English is that while the determiner cannot be omitted in subject position, it can, however, be omitted in object position. This makes perfect sense. The null head present in nominalized adjectives must be licensed by D, as we just saw. But Italian does have a null D (which is semantically compatible with the meaning of nominalized adjectives); and so, where independent factors make its presence grammatical, the null D can evidently license the head of the adjectival complex, giving rise to the alternation in (97b). This illustrates how our theory does not exclude from bare argument languages the possibility that in some cases D need be projected. However, one would expect this need to arise for specific purposes, such as the licensing of a null nominal head.

7.2. *Proper Names*

I take it as uncontroversial that proper names are syntactically of category N, just like common nouns. Semantically, proper names are taken to be prototypical referential terms. In fact, Kripke (1972) has argued that proper names refer rigidly to individuals. Whether one buys into the rigidity thesis or not, there are essentially two ways of dealing with the semantics of proper names. The first and most straightforward one is to assume that their semantic type is e, that of singular terms. This means that in each world a name will denote an individual (possibly the same individual across all worlds). Alternatively, one can assign proper names to the semantic type pred ($\langle e, t \rangle$), with the understanding that they are predicates true of just one individual (which, if Kripke is right, would be the same across all worlds). This second line has been proposed, in the philosophical literature, by e.g. Quine (1939). From a linguistic point of view, this second option is clearly more marked, as it requires more apparatus.

   With these fairly straightforward assumptions on the semantics of proper names, let us look at how one would expect proper names to behave in the various language families. Consider first NP[+arg, –pred] languages. In these languages, there is no choice. Proper names will be mapped into the argumental type e and will of course be able to occur freely in argument position. Consider next NP[+arg , + pred] languages, like the Germanic ones. Here we have, in principle, a choice. Names can be mapped into the argumental type e, in which case they will be able to occur in argument position. But they might also be mapped onto the predicative type pred and hence be unable to occur in argument position. In this latter case, it will be impossible to apply type shifting to names, for '$\cap$' is undefined for proper names (as singular individuals are not kinds) and other shifters

are blocked (by the articles). It follows that in Germanic languages, if a proper noun is set to $\langle e, t \rangle$ it can be made into an argument only by projecting D. The question is, which D. For considerations analogous to those that applied in the case of nominalized adjectives, only the definite determiner will do. Generally, we use a quantifier (other than the definite article, which has a uniqueness presupposition) when it doesn't follow from the common ground that just one individual can satisfy its restriction. Cf. the following contrast:

(98) a. Some man that is named John was at my party.
     b.*Some man that is John was at my party.

In Chierchia (1995b, ch. 2) the ungrammaticality of sentences like (98b) is blamed on a presupposition of 'nonvacuity'. It essentially says that the restriction of a genuine quantifier has to be nontrivial (i.e., not necessarily limited to singletons). In the case of proper names, we know that if construed as predicates they must be true of exactly one singular individual. Hence nonvacuity will prevent us from using with them any quantifier other than one having a uniqueness presupposition, namely the definite article.

Summing up, if a language assigns a proper name to the semantic category pred, its only option for turning the proper name into an argument will be to project the category D. Furthermore, the only choice of determiner is *the*. The latter has, in fact, a uniqueness/maximality presupposition which is guaranteed to be satisfied by a proper name. All genuine quantifiers are, instead, subject to nonvacuity, which is the exact opposite of uniqueness. Thus proper names that are mapped semantically as predicates are predicted to be able to occur in argument position only with the definite article. As is well known, proper nouns with the definite article are attested in several of the Germanic languages. In English, we find the definite article obligatorily with plural family names (*the Whites*) and things like *the sun*, *the Gulf Stream*, etc.

Let us now finally turn to NP[-arg, + pred] languages, like Romance. In a way these present the most interesting case, as a clear type clash arises between the (unmarked) semantics of proper names and the prevailing map for the syntactic category proper names belong to. Proper names want to be argumental. But their syntactic category, in these languages, has to be mapped into predicates. What is going to happen then? Well, the marked option of mapping names into predicates will be available. And names that are so mapped will appear with the definite article. This option is chosen by several Romance languages (e.g., most northern Italian dialects). But we also see plenty of Romance languages where proper names occur bare

in argument position. This means that they must be of an argumental type
after all. Now, our theory makes a clear prediction here. In their argu-
mental role, proper names cannot occur within the category NP, for such
category is not argumental. Hence a proper name must move from the
position typical of its lexical category to some neighboring argumental
position. What can such position be? D, obviously. DPs are of a type arg.
Proper names in the Romance languages must be promoted to (intransi-
tive) D's. This is what we expect then: proper names should occur not in
the N position (i.e., within NP) but in the D position (i.e., within DP).
Now, Longobardi (1994, 1996) has discovered precisely this: a pattern of
N-to-D raising for proper names throughout Romance. The core Italian facts
are the following:

(99) a. La   sola   Milano fra le città italiane
         the alone-fem   Milan   among the Italian cities

         è stata prescelta.
         has been chosen

     b. Milano sola   fra le città italiane   è stata prescelta.
        Milan   alone   among the Italian cities   has been chosen

     c.*Sola   Milano fra le città italiane   è stata prescelta.
        alone Milan   among the Italian cities   has been chosen

In (99a) the proper noun *Milano* clearly occupies the canonical N position.
As is well known, in Italian most adjectives occur after the nominal head
(see Cinque 1994 for a recent discussion). There are a few adjectives that
are allowed to occur prenominally, and *solo/-a* is one of them. The NP
complex Adj + N in (99a) is then taken as argument by the D *la*. Sentence
(99c) shows that the Adj + N sequence cannot occur bare, as one would
expect, since (singular) bare NPs are disallowed quite generally. However,
sentence (99b) is grammatical. In it, the proper noun occurs *before* the
typically prenominal adjective *solo/-a* – that is, it occurs in the canonical
D position. This alternation, as Longobardi argues, has a straightforward
account: we see the proper noun occurring in the D^0 position in comple-
mentary distribution with overt determiners. We actually see, that is, that
proper names are promoted to the status of (intransitive) D^0s, a status
analogous to that of pronouns in the DP analysis. Longobardi observes
that this is also possible with a handful of common nouns like *casa* 'home'
or *camera* 'room', which presumably are idiosyncratically reanalyzed as
proper nouns. The pattern pointed out by Longobardi is just what we
would expect. N-to-D raising is driven by a mismatch between the unmarked

semantics of proper names and the category–type assignment of the Romance languages.[36]

Longobardi develops an account very different from the one presented here. His idea is that the semantic character of proper names somehow endows them with a syntactic feature [+r] (something like '+rigidly referential') that needs to be checked by raising it to D. I believe that this approach leads to a theory which is less general than the one developed here. Here is why. A [+r] feature should be the syntactic projection of a semantic property – the property of being a rigid designator. But if a name denotes an individual, then that by itself should permit its occurrence in argument position. Why, then, would the feature [+r] and its checking in D be needed? Why would grammar project syntactically what is already taken care of by something we surely need anyhow, namely the way in which syntactic categories are mapped onto their meaning? Suppose, on the other hand, that names are not arguments but predicates. Then again, a parallel question arises. If nouns are predicates, they do not refer. Isn't the feature [+r] supposed to say that they do?

Our mode of reasoning exploits a minimal, logically necessary property of language: syntactic categories must be mapped into objects to be interpreted. This mapping is tightly and universally constrained. By varying minimally the reasonable candidates for the semantic values of members of the category NP, we expect to derive different patterns. In an NP[–arg, +pred] language, proper names can have their unmarked semantics only if they get out of NP. In a language that allows (or forces) NP to be argumental, no such process can be attested.

8. CONCLUSIONS: SEMANTIC VARIATION AND THE THEORY OF GRAMMAR

Let us summarize what we have done. Nouns appear to have a double nature. In their role as quantifier restrictors, they seem to be predicates. In their role as names of kinds they appear to be argumental. We have explored the possibility that languages can choose how the denotation of NPs is set and that this determines some of their major typological characteristics. One can think of it as a mapping of the syntactic category N and its phrasal projection NP into the semantic 'features' +/–pred, +/–arg. For any type, if an NP is +a, it can get things of type a as its values; if it is

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[36]   Longobardi links N-to-D raising in interesting ways to the construct state, familiar from the Semitic languages. What he says is perfectly consistent with the hypothesis I am making on the syntax-semantics map. But I cannot get into it within the limits of the present paper.

–a, it cannot. This is embedded in a rather simple view of how the domain
is structured, what kinds are, and how the denotation of mass nouns differs
from that of count ones. Also, a standard system of shifting operations is
adopted, under the assumption that it can be freely used, but only as a
last resort (in a sense that we've tried to spell out). Banning, for obvious
reasons, the [–pred, –arg] option, this leaves us with three possible settings,
summarized as follows:

(100)   *The Nominal Mapping Parameter (NMP)*: N $\Rightarrow$ [±pred, ±arg]

         [–pred, +arg] every (lexical) noun is mass $\Rightarrow$ Chinese

Mass/count languages

[+pred, +arg]	bare arguments allowed	$\begin{cases} \text{no article} \\ \text{articles} \end{cases}$	$\Rightarrow$ Slavic $\Rightarrow$ Germanic
[+pred, –arg]	bare arguments disallowed	$\begin{cases} \partial \\ \text{no } \partial \end{cases}$	$\Rightarrow$ Italian $\Rightarrow$ French

We have tried to substantiate this system not only through typological
speculations but also through a fairly detailed contrastive analysis of Italian
and English.

   Whenever we are in the presence of systematic crosslinguistic varia-
tion, issues of acquisition arise. And the NMP is no exception. What are
the steps one should expect the child to go through? Obviously, we cannot
address this question properly within the limits of the present work. I will
try, nonetheless, to sketch some consequences of the present theory for
acquisition. One of the best studied, and much discussed, principles of
acquisition is the subset principle (Wexler and Manzini 1987), according
to which one should start with the setting that rules out the most, so that
the child can revise his hypothesis, if need be, on the basis of positive
evidence. From this point of view, one should expect the Chinese setting
of the NMP to be the initial one, for that setting excludes the most, namely
it excludes the existence of plural morphology and numeral quantifiers com-
bining directly with nouns. Upon discovering that either of these possibilities
does in fact hold, the child is led to reset the NMP. So in a sense the
syntax of the nominal system in early child grammar would be Chinese.
And consequently, the child would be taking every noun to be mass
(vindicating Quine 1960). This idea has interesting consequences. First,
since the Chinese setting freely allows bare arguments, the child should
systematically drop the determiners, something that is indeed known to
happen. The interesting point is that the child wouldn't do so because his
grammar differs from the adult one, but because he is speaking a language

that allows him to do so. Second, the information through which the child learns whether the initial setting is wrong should be readily available to him. Such information, namely the presence of overt plural morphology, should, consequently, make its appearance relatively early on in child language. For the singular-plural contrast this seems indeed to be so (cf. De Villiers and De Villiers 1973). The logic of the subset principle leads us to expect the second setting to be the Romance one, for that rules out bare arguments altogether. Finally, upon encountering bare arguments (in ungoverned positions) in the adult language, the child should, in the end, revert to the Germanic/Slavic pattern.

An interesting expectation that arises out of this hypothetical acquisition procedure is that the decrease of bare arguments and the convergence towards the adult grammar should be relatively more rapid in languages like French (or Italian) than in a language like English. In French, bare arguments are out, so as soon as the child figures out that the singular-plural contrast exists and/or that numerals can combine directly with nouns, he will assume the right setting for the parameter, which disallows bare arguments. He will thus be forced to project D for argumenthood. On the other hand, the speaker of a mixed language like English will have to figure out item by item whether a noun refers to a kind (and hence is mass and can be a bare argument) or to a predicate (and hence is count and, in the singular, cannot be a bare argument). This process will unavoidably take time. Whether this expectation is born out remains to be seen. But we do have a rather striking empirical prediction here.

One of the unconventional features of our idea is that the NMP governs the way in which the reference of the syntactic category NP is set. This means that there is some semantic variation, parallel to syntactic (and phonological) variation. We seem to have run into a semantic parameter. Notice that this does not mean that LF changes or that the structure of the domain of interpretation changes. What changes is the way in which certain distinctions are made, the route one follows to get at certain meanings. This can give rise to gestalt effects. 'Coin' and 'change' feel different. But the difference really boils down to a different way of grouping the denotation of these words. Similarly, on a larger scale, Chinese might seem to embody a different world view. But in fact it just has a slightly different way of referring to kinds: all nouns start out as kind denoting. Nonetheless, the difference is real and it concerns the reference of lexical items. Such difference is learned in the same manner in which every other structural difference is learned: through its overt morphosyntactic manifestations. It thus meets fully the reasonable challenge that all parameters must concern live morphemes.

   The present view contrasts with the one that the syntax-semantics map
is universally fixed and that, as a consequence, the category D must always
be projected for argumenthood. According to the latter school of thought,
bare argument languages must be languages in which some operation in
the covert portion of grammar makes the presence of the empty D invis-
ible. This must happen in a limited fashion to plural and mass nouns in
English-like languages, and in a more generalized form in Slavic or Chinese.
Consider now the following question. Couldn't there be a classifier language
like Chinese, which however lacks the operation, whatever it might be,
that covertly satisfies at LF the needs of the empty D? On the 'Always
Project D' ideology, there is no reason to expect such a language not to
be possible. Such a language would be a classifier language that actually
disallows bare arguments. To the best of my knowledge, languages of this
sort don't exist. From our perspective, on the other hand, it is by now
obvious why a language of this sort should be impossible. Such a hypo-
thetical language, being a classifier language, would only allow
kind-denoting nouns. But this automatically licenses argumenthood for bare
NPs.

   Ultimately, a grammar which allows for some flexibility at the
syntax/semantics interface might turn out to be closer to 'virtual perfec-
tion' than one that doesn't. But there is a lot more to say and to do to
find out. The present paper is an attempt-in-progress to explore whether
the perspective we are adopting, though in some ways unconventional, is
fruitful.

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