8   Bare Plurals

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1   The empirical issues

It is normally believed that noun phrases (NPs) in argument position must be introduced by a determiner, that is, they are in fact, under the so-called "DP-hypothesis," determiner phrases (DPs). This requirement does not hold for NPs which do not count as arguments, for instance, NPs in predicative position (English is rather idiosyncratic in that respect) or vocatives. This contrast is shown in (1):

(1) a.   Bill è medico. (Italian, predicative)
      Bill is a doctor.
   b.   Doctor, come here! (vocative)
   c.   *Doctor came immediately.
   d.   *I saw doctor.
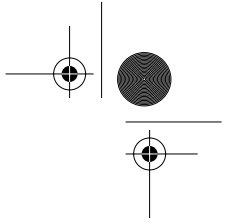
However, this observation does not seem entirely correct, since a large variety of languages apparently admit determinerless nouns in argument position. In certain languages (such as Chinese, where the count/mass distinction is apparently neutralized) there does not seem to be any restriction on the occurrence of bare nouns in argument position.[1] In many other languages, what seems to be relevant in order to establish which cases are grammatical is the count vs. mass distinction. Bare forms of mass nouns are admitted, but bare count nouns can be realized only as bare plurals (BPs).[2] This is shown, for English, in (2) below:

(2) a. Water is scarce in this country.
     b. Dogs are intelligent.
     c. *Dog is intelligent.

Nevertheless, it would not be correct to conclude that *every* language allows at least certain uses of bare nouns in argument position. There are in fact languages, exemplified by Modern French, where bare nouns are uniformly excluded from argument positions, quite independently of the interpretation they are assigned. Moreover, even in languages that allow bare nouns (bare plurals and bare mass nouns) to occur as arguments, there are, it seems, important constraints on their distribution. A relatively well-studied case is the fact that in most Romance varieties subject BPs tend to be excluded from the subject position unless modified or coordinated, whilst BPs occurring in other argument positions are more freely admitted as bare nouns.[3]

   It should be noticed, at this point, that the distributional issue cannot be satisfactorily settled if we abstract away from the *interpretation* that BPs receive in argument positions. At first sight, it seems that BPs are interpreted as if a determiner were in fact present, with extralinguistic information deciding the choice between the universal and the existential reading of this (implicit) determiner. This is shown in (3):

(3) a. Dogs are mammals. (universal reading)
     b. Dogs were sitting on my lawn. (existential reading)

However, matters are arguably somewhat more complex. It is clear what a sentence like (4a) should mean if the subject BP were assigned the existential reading (something like *some dogs are black (around here)*), on strict parallelism with one of the admissible interpretations of the subject BP in (4b) (*some firemen are available around here*). Nevertheless, no possible contextual setting is able to rescue the existential reading in (4a), whereas this interpretation is readily accessible in the case of (4b):

(4) a. Dogs are black.
     b. Firemen are available.

Similarly, stressing the subject BP in (5a) strongly favors an existential reading, whereas assigning prosodic emphasis to the subject BP in (5b) is not sufficient
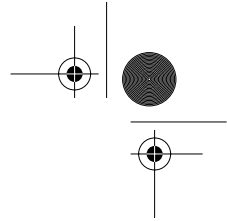
to elicit an existential reading (notice that, on pragmatic grounds, there is no compelling reason why the existential reading should be most readily accessible in (5a) than in (5b)):

(5) a. She thinks that COUNTEREXAMPLES are known to us.
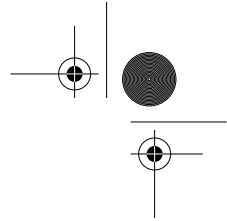   b. Dogs are altruistic. (only: *all dogs are altruistic*)

On comparative grounds, it becomes clear that interesting constraints also apply to the universal reading. In Romance, for example, the universal interpretation of BPs appears to be uniformly ruled out (see however Chierchia 1998 for different idealizations concerning this set of data and the discussion in section 6 below). BPs are exclusively licensed with the existential reading, as shown by the ungrammaticality of (6a) and (6b) in Italian:

(6) a. *Cani sono mammiferi.
         'Dogs are mammals.'
     b. *Cani sono altruisti.
         'Dogs are altruistic.'

This sketchy survey of some of the empirical issues that arise suffices to show that an empirically adequate theory of bare plurals has to account at least for the following facts:

(i)   the relevance of argumenthood for the licensing of BPs (it is the distribution and interpretation of *argument* BPs that appears to be severely constrained in many languages);
(ii)   the relevance of the mass/count distinction for the licensing of bare plurals and bare singulars (there is a rather solid cross-linguistic generalization according to which bare singulars of mass nouns and bare plurals of count nouns behave similarly);
(iii) the typological variation as to the presence of subject-object asymmetries in the licensing of BPs (for instance, Spanish does not allow bare nouns in subject position, contrary to English);
(iv)   the total prohibition on bare nouns in languages such as modern French;
(v)   the prohibition on the existential reading of subject and object BPs with certain predicates, even in contexts where this reading would be perfectly felicitous on pragmatic grounds (cf. 4a);
(vi)   the interaction with focus (focusing a BP not only affects its informational status but also favors the existential reading in certain contexts, whereas it does not affect the quantificational reading in other contexts);
(vii) the strong comparative contrast found with respect to the licensing of BPs interpreted universally: the universal reading is possible and in some cases compulsory in English, but is arguably excluded in Romance, quite independently of the nature of the predicates/contexts involved.
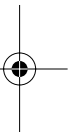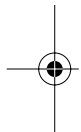
To these, many other facts should be added, some of which we will take into account in the following sections. However, the data reviewed above suffice to show that the analysis of bare nouns is likely to involve many delicate issues concerning the syntax–semantics interface.
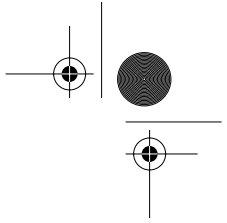
2   Theoretical issues

One might think that the analysis of BPs raises a number of intriguing but relatively circumscribed problems. However, it should be emphasized that BPs have constituted, especially in the last 20 years, one of the central and most inspiring case studies into the logical form of natural language and one of the most challenging empirical domains for generally (and quite often implicitly) accepted hypotheses on the syntax–semantics interface. Here are some of the reasons why a relatively peripheral set of facts has acquired a central role within the theorizing in formal linguistics (both syntax and semantics).

(i)   The ambiguity of noun phrases which are not introduced by some quantifier, determiner or article cannot be easily explained in terms of other well-known cases of quantification. We have seen, for instance, that this ambiguity might be tentatively expressed in terms of optionality between existential and universal quantification. Unfortunately, a closer examination of the data immediately reveals that this position is not tenable (cf. Carlson 1977a). Consider the sentences in (7):

(7)   a.   Dogs are mammals.
      b.   Dogs bark.
      c.   Musk-rats were brought to Europe in 1906.
      d.   Dogs are common.

If universal quantification (*all dogs*) seems to represent a convenient formal device for the expression of the interpretation of the BP in (7a), it cannot certainly be claimed that it constitutes an adequate solution in the other cases exemplified in (7). As for (7b), it is clear that the sentence would remain true even though not all, but just most dogs barked (as is probably the case in the real world). One might thus think that BPs are ambiguous between quantificational forms involving either the determiner *all* or the determiner *most*. This cannot be correct, however, since the truth of (7c) does not require that most musk-rats were brought to Europe in the year mentioned; rather, it suffices that a certain representative set of the kind of musk-rats has been imported to Europe, even though the actual cardinality of such a set is quite small (in fact, only some musk-rats have been brought to Europe). Finally, notice that the meaning of *dogs* in (7d) does not admit any logical paraphrase of the sort *all dogs*, *most dogs* or *some dogs*. In the

presence of these facts, it is quite an issue to establish what all instances of BPs exemplified in (7) have in common, that is, which semantics must be associated to determinerless nouns.

Similar complications have been detected in the case of the existential reading of BPs. Consider the sentences in (8):

(8)   a.   John didn't see spots on the floor.
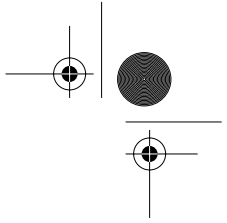   b.   Dogs were everywhere.

At first sight, the BPs in (8) behave as the plural counterparts of the indefinite article *a(n)*, receiving the same reading as unstressed *some* in English (often referred to as *sm*). In other words, (8) should be logically equivalent to the sentences in (9):

(9)   a.   John didn't see some spots on the floor.
      b.   Some dogs were everywhere.

This is not quite true, however. As for (9a), it is easily assigned a quantificational reading involving wide scope of the indefinite object (*John possibly saw many spots on the floor, but there are some that he failed to see*). This reading is not available in (8a), which can only mean that John saw no spots on the floor (and not that he failed to see some of the spots). A solution to this asymmetry might consist in the assumption that the set of readings realized with BP indefinites is a subset of the readings realized with other lexical existential determiners (like *a* or *some*). Carlson 1977a shows that there are reasons to assume that the two class of readings are actually partially disjoint, as revealed by the observation that the narrow scope of the subject BP (*for every relevant place, a different group of dogs was present at that place*) is naturally instantiated in (8b), but is simply impossible in (9b) (which can only receive the absurd reading according to which a certain group of dogs was omnipresent), in spite of any consideration of pragmatic plausibility.

In view of these observations, which represented some of the main reasons for Carlson to reject the quantificational approach to BPs (cf. section 3.2 for a full discussion), the view that the semantics of BPs can be easily accounted for in terms of an ambiguity between canonical existential and universal quantification turns out to be more problematic than was expected at the onset.

(ii)   The inquiry into the syntax and semantics of BPs revealed itself a productive tool in order to achieve a better understanding of the distinction between episodic and generic sentences in natural language (that is, the nature of genericity as represented in the logical form of natural language). Notice that all the sentences in (7) (including (7c), which seems to be about a specific event) appear to involve a sort of *generic* reading of the BP, in the sense that the relations involved by these sentences intuitively concern the kind of *dogs* or the kind of *musk-rats*, independently of the number of members of the kind

which enter the relations expressed by the different predicates. Consider now (10) below:

(10)   Smokers are rude.

Although (10) would be naturally assigned the existential reading (*some smokers are rude*) on pragmatic grounds, this reading is completely inaccessible to (10), which exclusively exhibits the universal/generic reading of the BP. In other words, the problem raised by BPs is not limited to the difficulty of characterizing their interpretation in logical terms. It is also clear that sentences involving BPs are not simply ambiguous among different readings. There are many contexts in which only the universal/generic reading is available, and also contexts where the BP exclusively receives an existential reading.[4] Further inquiry reveals that lexical factors such as the choice of the predicate involved (for instance, *to be rude* vs. *to be available*) and morphosyntactic factors such as aspectual morphology might play a crucial role in explaining the absence of ambiguity in many contexts. An investigation into the nature of these factors is apparently of great importance to establish some of the properties of generics.

   (iii)   The interpretive properties of BPs, and in particular the traditional idea that BPs count as the plural counterpart of singular indefinites, are certainly relevant in order to evaluate the different theoretical approaches to indefinites, for instance the hypothesis that indefinites correspond to free variables, as has been developed in the framework of Discourse Representation Theory (cf. especially Kamp 1981; and Heim 1982). At first sight, singular indefinites appear to behave as BPs, in that, for example, the former can give rise to the same sort of ambiguity detected with the latter, as shown in (11):

(11)   a.   A dog was sitting on my lawn. (existential)
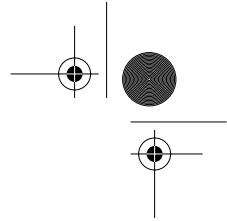   b.   A dog is intelligent. (universal)

A closer scrutiny immediately reveals that only a subset of the cases in which the BP can be assigned a universal/generic interpretation preserves this reading when the BP is replaced with a singular indefinite. This is shown by the paradigm in (12–13):

(12)   a.   Madrigals are polyphonic.
       b.   A madrigal is polyphonic.

(13)   a.   Madrigals are popular.
       b.   ??A madrigal is popular.

Carlson 1977a provides other empirical arguments against the view that BPs are just plural indefinites, concerning the different behavior of singular and (allegedly) plural indefinites in pronominalization and deletion contexts (to be further
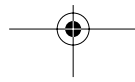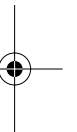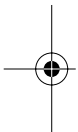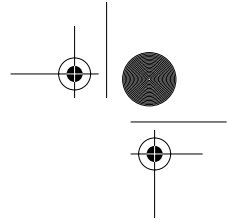
discussed in section 3.2). For instance, the interpretive effects of NP-deletion in coordinate structures seem to depend on the nature of the indefinite that has been deleted: deletion of the singular indefinite turns the sentence in (14a) into a pragmatically strange one (as shown in (14b)), whereby the same building must appear in two different cities. This effect is simply not detected in (15):

(14)   a.   A building will collapse in Berlin tomorrow, and a building will burn down in Boston the day after.
       b.   A building will collapse in Berlin tomorrow, and ___ will burn down in Boston the day after. (the same building must be involved, differently from 14a)

(15)   a.   Buildings will collapse in Berlin tomorrow, and buildings will burn down in Boston the day after.
       b.   Buildings will collapse in Berlin tomorrow, and ___ will burn down in Boston the day after. (different groups of buildings may be involved, exactly as in 15a)

   Despite these observations, which show that merely assimilating BPs to other well-known instances of indefinite NPs would leave many facts completely unexplained, we will see that many scholars assumed that BPs can indeed behave as indefinites in certain circumstances. The behavior of BPs has constituted an important empirical argument in favor of the hypothesis that indefinites provide free variables with a predicative restriction which have to be bound from outside (that is, DP-externally), as in the different versions of the so-called Mapping Hypothesis.[5] Proponents of this approach assume that the nature of the binder depends on the syntactic position of the indefinite: indefinites realized VP-internally undergo a restricted operation of existential closure, whereas indefinites realized VP-externally are bound by some (implicit) adverb of quantification (roughly corresponding to frequency adverbs such as *often*, *always*, etc.), and are therefore mapped into the restrictive clause of the adverb of quantification. It has been argued that there are languages, such as German and Dutch, in which the syntactic position of the indefinite relevant for the mapping into quantificational structures is computed in overt syntax:[6] the VP-internal BP in (16a) can only be interpreted existentially, whilst the VP-external BP in (16b) is assigned a universal/generic interpretation (a crucial assumption here is that the adverbial particle *ja doch* in German marks the VP-boundary, cf. the discussion in Diesing 1992b):

(16)   a.   Weil [$_{IP}$ ja doch [$_{VP}$ Haifische sichtbar sind]]
             . . . since 'indeed' sharks visible are
             '. . . since there are sharks visible'
       b.   Weil [$_{IP}$ Haifische ja doch [$_{VP}$ sichtbar sind]]
             . . . since sharks 'indeed' visible are
             '. . . since (in general) sharks are visible'
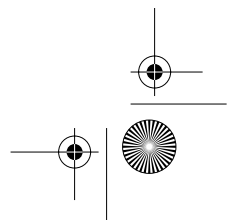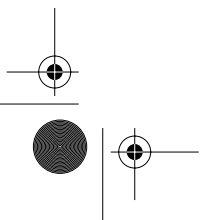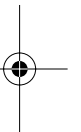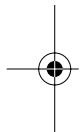
Given these considerations, it is difficult to escape the conclusion that accounting for the syntactic and interpretive properties of BPs has to be an essential ingredient of any general theory of indefinites.

(iv)   Last but not least, it seems that the inquiry into the semantics of BPs may have important consequences for an exact characterization of the domain of quantification presupposed by the semantics of natural language. In particular, the claim that BPs denote *kinds* (as in Carlson 1977a) entails that the domain of discourse must contain "pluralities" as a specific sort of individual objects and that a multi-sorted (first order) language (that is, a logical language endowed with different sorts of variables) may well be needed in order to provide an adequate representation of the logical forms associated with the sentences of natural language.
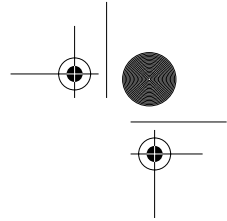
Again, these sketchy considerations suffice to show the considerable theoretical potential of the topic we are investigating. In the next three sections, we will consider the main theoretical contributions that have been produced in this area of research, starting with the seminal hypothesis put forward in Carlson (1977a) for the analysis of English BPs and considering successively how the enlargement of the empirical domain has brought about significant changes in the theoretical formulations of the issues around the syntax and semantics of BPs.

3   Bare plurals as names of "kinds"

The ambiguity of the sentences containing BPs between an existential and a universal reading has long been analyzed in terms of the presence of an ambiguous null determiner.[7] As noticed in Carlson (1977a) there has also been a certain amount of discussion over which form (either the zero determiner or unstressed *some*) can be assumed to constitute the plural correlate of the indefinite article *a*.[8] The quantificational analysis of BPs as the plural counterpart of a singular determiner has been rejected by Carlson (1977a), which represents the most influential approach to BPs that has been elaborated in the framework of formal semantics and generative grammar. We will first present Carlson's proposal about the nature of BPs (section 3.1) and successively discuss the empirical motivation used by Carlson in order to discard the quantificational analysis.

3.1   *Individuals and stages*

Carlson's main hypothesis is that BPs are kind-referring expressions (roughly, names for kinds). Formally, a kind is conceived of as a particular sort of individuals in the domain of discourse, on a par with the ordinary objects which provide the reference of pronouns and names.[9] Carlson does not provide any extensive discussion of the relation between his notion of *kind* and the philosophical notion of *natural kind*. Kinds are objects, and most BPs are assumed to refer to kinds, even those which cannot be easily assumed to refer to natural or well-established

kinds (for example, one might be inclined to think that a predicate like *Coke bottle* more readily individuates a kind than a predicate like *green bottle*, but in fact both *Coke bottles* and *green bottles* are assumed to denote kinds).[10] There are of course some enigmatic instances of BPs that appear to resist the kind-referring inter-pretation (cases such as *parts of that machine*, *people in the next room*, *books that John lost yesterday*, *bears that are eating*, etc.), but these are assigned a marginal and unclear status in Carlson's analysis (cf. Carlson 1977a: 5.4). If BPs uniformly denote kinds (and do not necessarily involve the presence of an ambiguous empty determiner or two phonetically unrealized homonymous determiners), the source of the apparent quantificational ambiguity must be independent of the semantics (and syntax) of BPs. Carlson's insight is that it is the predicate with which the BP combines that determines the observed variation between an existential and a universal reading. Roughly, verbal predicates may either make reference to specific events or ascribe a (stable) property to an individual. This bipartition has been extremely influential and has been successively analyzed, as we will see, in terms of a difference in argument structure, as in Kratzer (1995) and Diesing (1992a). However, Carlson's technical implementation of the pro-posed bipartition relies on a primitive ontological distinction between predicates denoting individuals (*i(ndividual)-level predicates*) and predicates denoting spatio-temporal "slices" of those individuals (*s(tage)-level predicates*). Event predicates (that is, predicates that refer to specific events rather than ascribing a stable or essential property to an individual) are analyzed as stage-referring predicates. On conceptual and technical grounds, it is relatively easy to see why Carlson has adopted an *ontological* solution for the ambiguity between event and non-event predicates. The hypothesis that *kinds* are particular sorts of objects in the domain of discourse entails that what is needed for an adequate representation of the logical form of English sentences is a multi-sorted language (that is, a formal language containing at least two sorts of variables, one ranging over common objects and the other ranging over *kinds*). It is thus not particularly costly, from a conceptual perspective, to enrich the domain of quantification with a third sort of objects, corresponding to "stages," that is, spatio-temporal slices of the first two sorts of individuals. Let us briefly see how the proposed account actually works.

Consider the sentences in (3), repeated below:

(3) a. Dogs are mammals. (universal reading)
     b. Dogs were sitting on my lawn. (existential reading)

Let us start with (3a). Since *to be a mammal* is an individual-level predicate, that is, a predicate which denotes a set of individuals, and individuals are analyzed, within the formal language into which Carlson translates sentences of English (some version of Montague's Intensional Logic), as sets of properties, sentences such as (3a) will correspond to the assertion that the property denoted by the predicate belongs to the property set denoted by the subject BP. This means that (3a) will be true in the world w if and only if the kind referred to by the BP is in
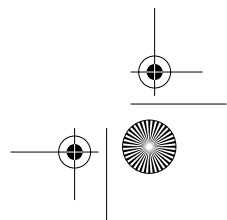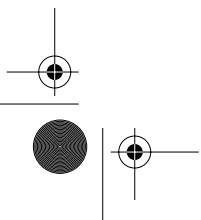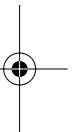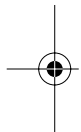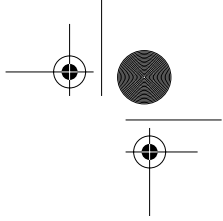
the extension of the predicate at *w*. These truth-conditions are formally expressed in (17):

(17)   λP P(d) (is ___ a ___ mammal) = is ___ a ___ mammal(d),

where 'd' is the individual constant which refers to the kind *dogs*.
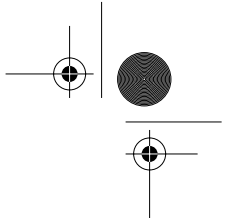
   If (17) is the logical form assigned to (3a), the apparent quantificational ambiguity exhibited by some of the sentences in (7) receives a rather straightforward explanation. The facts that a different quantifier seems to be involved in (7a, b) (*all* and *most* respectively) and that no form of quantification over the set members yields a convenient logical paraphrase in (7d) can be uniformly attributed to the pragmatically-conditioned vagueness typical of properties ascribed to kinds and of relations involving kinds. Kinds are inherently "plural" objects. Associating a certain property with a "plural" object does not entail that the same property holds of the individual members of this plurality. The same ambiguity arises in fact with the so-called "collective" reading of singular definites (Carlson 1977a: 4.1).[11] An important consequence of this analysis is that the quantificational structures that seem to be associated with *generic* BPs are not part of the semantic interpretation, but rather correspond to the application of extralinguistic cognitive tasks directed at establishing what counts as "evidence" for the claim expressed by the logical representations associated with a given sentence. This becomes extremely clear when Carlson's analysis is applied to *habitual* sentences, that is, sentences that have been traditionally interpreted as involving quantification over events/times (cf. Lawler 1973 and others). A sentence like (18) is likely to be perceived as true if there is more than one event in which Abigail is involved in car-chasing activities, whereas (19) appears to indicate that Abigail always (or at least most of the times) barks when the mailman arrives:

(18)   Abigail chases cars.

(19)   Abigail barks at the mailman.

In other words, the nature of the implicit quantifier over events seems crucially to depend on the lexical meaning of the predicate and, more indirectly, on the complex cognitive systems involved in our knowledge of the world. Carlson argues that this complies quite well with the predictions made by the analysis that he proposes. According to this analysis, the meaning expressed by the logical representation associated with (18) is merely that there is a set of individuals chasing cars and that Abigail belongs to this set. Similarly, the truth-conditions expressed by the logical form associated with (19) roughly establish that Abigail belongs to the set of individuals barking at the mailman. We know, of course, that (18) is true (that is, the individual referred to by Abigail belongs to the set of individuals that chase cars) if and only if Abigail has chased cars on a certain number of occasions. However, this knowledge corresponds to the pragmatic
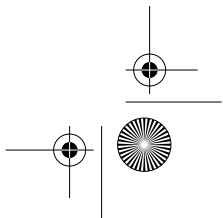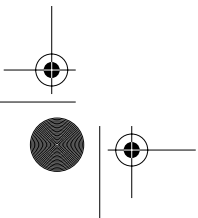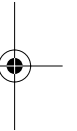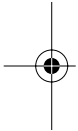
knowledge that we need in order to look for empirical evidence that the truth-conditions established by the semantic component are actually satisfied. Quantification over events is certainly relevant, as well as the question how we infer this sort of quantification as part of the process of assessing the truth of sentences like (18) and (19). However, quantification over events is not part of the logical forms which express the meaning of these sentences, just as quantification over the members of a kind is not part of the semantic representation of *generic* sentences containing BPs. As a result of this discussion, it should be emphasized that Carlson's approach is not intended as a "solution" of the quantificational puzzles that arise with BPs interpreted generically, but rather as a proposal to shift the burden of explanation from the semantic component (or, better, the system of formal representations which is assumed to encode the truth-conditions associated to the sentences of natural language) to the pragmatic component of linguistic knowledge.

Having examined Carlson's proposal with respect to the set of issues raised by sentences like (3a), let us now consider Carlson's solution to the issue raised by (3b), that is, sentences which apparently involve an existential interpretation of the BP. In intuitive terms, this interpretation has to follow from the presence of an s-level predicate: since s-level predicates refer to stages, the truth-conditions associated with (3b) should correspond to the claim that there exists a stage of the kind *dogs* (that is, a particular set of dogs at a given spatio-temporal location, not necessarily consisting of all or most dogs) and that this stage belongs to the set of stages referred to by the predicate *be_sitting_on_my_lawn*. However, on conceptual and technical grounds, this solution is not acceptable. Remember that Carlson's proposal is mainly motivated by the need of a unitary analysis of BPs (to be further justified, empirically, in section 3.2). This unitary analysis essentially consists in the hypothesis that BPs are names for kinds. This entails that the combination of a BP with a stage-denoting predicate (such as the predicate in (3b)) would give rise to a "sortal" mismatch: the subject BP refers to a sort of objects (an *individual*, in Carlson's terminology) which cannot be a member of the set of objects (*stages*) referred to by the predicate. The solution consists in assuming that the relation between the subject and the predicate is mediated by a relation R (*realizes*) such that R(a, b) means that *a* is a stage of *b*. S-level predicates are thus formally defined as properties of individuals who have a stage-level predicate applying to one of their stages:

(20) $\lambda x \, \exists y \, [R(y,x) \text{ and } P'(y)]$,

where y is a variable ranging over *stages*, that is, spatially and temporally bounded sorts of things and P' is a stage-denoting predicate. In the case of a sentence like (3b), for instance, there will be an existential quantifier over stages introduced as a part of a predicate of individuals. In this way, the sortal mismatch is avoided while the logical representation can be reduced to one expressing the claim that there is a stage to which a predicate of stages applies, exactly what we were looking for:
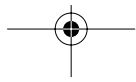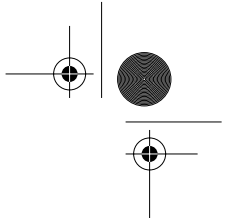
(21) $\lambda P\ P(d)\ (\lambda x \exists y[R(y,x)\ \text{and}\ S'(y)]) = \exists y[R(y,d)\ \text{and}\ S'(y)],$

where *d* is a constant for the kind 'dogs' and S′ is the predicate *be_sitting_ on_my_lawn*, applying to stages of things.

Notice that the source of the existential reading of the BP contained in (3b) is the existential quantifier introduced as part of the predicate (appearing not only when the subject is a BP, but also when the subject is a pronoun, a proper name or a quantified DP) and not a hidden existential quantifier associated with the subject BP.[12] As we will see in section 3.2, this is intuitively the key for the solution of the puzzle posed by the narrow scope properties of existential BPs.
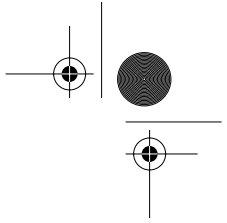
This completes our discussion of Carlson's proposal. The reader is referred to Carlson (1977b) (in particular section 5.2) for interesting amendments of the original approach.[13] The main fact to be kept in mind is that BPs are assigned a uniform analysis (they are names of kinds). The fact that BPs denote plural objects explains why they appear to be ambiguous among many quantificational readings. As for the existential reading that BPs are obligatorily assigned in certain contexts, it depends on the nature of the predicate with which the BP combines. The relevant distinction between stage-level and individual-level predicates is technically implemented in terms of a primitive ontological distinction between individuals and stages.

3.2   *Against a quantificational analysis of BPs*

In the course of the preceding discussion, we have already examined some of the observations that Carlson used as empirical evidence against the quantificational analysis of BPs (that is, the idea that the different readings of BPs are brought about by the interpretation of the empty determiner counting as their head). Here is a brief summary.

(i)   Given the large variety of quantificational readings exhibited by BPs, it is very hard to establish what the quantificational interpretation of the empty determiner should actually be in order to produce the correct empirical results. A solution in terms of inherent ambiguity is quite problematic, since different lexical choices often force a particular interpretation and exclude others. Moreover, Carlson shows that modifying the semantics of the implicit operator in apparently ingenious ways (for example, by treating the generic quantifier as a universal operator ranging over *normal* instances of a certain kind) leads to wrong truth-conditions and even to contradictions (Carlson 1977a: ch. 3). Conversely, as we have seen in section 3.1, the hypothesis that generic sentences involving BPs essentially correspond to instances of predication over kinds permits an account in terms of the inherent vagueness of the semantics associated with structures where a property is applied to "plural" objects, even though this simply shifts the issue concerning the inferred modes of quantification from semantics to pragmatics.
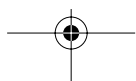
(ii)   Existential BPs are always assigned a narrow-scope reading with respect to other scope-taking elements (cf. 8a), even in contexts where this reading is excluded with other indefinites (cf. the interpretive contrast (8b/9b)). This fact is nicely accounted for as a direct consequence of the logical form associated to sentences like (8a). Namely, we have seen that the existential quantifier associated with the BP is formally represented as part of the logical form associated with the predicate (see the discussion about (21) as the logical representation of (3b)). If this is the case, the narrow scope of existential BPs can be directly reduced to the impossibility for a quantifier "within" a (verbal) predicate to hold scope over elements that combine with that predicate (i.e., the actual arguments of the predicate). Under the usual hypothesis concerning the relevance of hierarchical structural conditions for the determination of relative scope, this is intuitively the correct result. Moreover, narrow scope is predicted to arise even in cases where it is blocked, for some reason or another, with other existential arguments (thus accounting for the contrast between (8b) and (9b)).

(iii)   A similar explanation can be invoked in order to account for the lack of the "transparent" reading of existential BPs realized in the scope of *intensional* predicates. It is well-known that (22) cannot be assigned the reading according to which "there are certain policemen that Miles wants to meet," whereas this interpretation is naturally available in the case of (23):

(22)   Miles wants to meet policemen.

(23)   Miles wants to meet some policemen.

Again, the source of this phenomenon lies in the fact that the existential quantifier associated with the BP is formally part of the predicate *meet* and cannot therefore be assumed to hold scope over the higher intensional predicate *wants*.
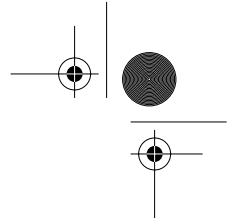
(iv) In addition to the ellipsis facts already reviewed in (14–15), the deviant behavior of BPs with respect to quantificational arguments is further confirmed by the observation that pronominalization forces the transparent reading of indefinites in coordinated structures such as (24), but is perfectly compatible with the opaque reading of a BP in the analogous (25):

(24)   Paul is trying to find a policeman, and Kate is trying to find him, too.

(25)   Paul is trying to find policemen, and Kate is trying to find them, too.

The interpretive effect detected in (24) easily follows from the requirement that a pronoun, in order to be interpreted as a variable, be in the scope of the quantifier that semantically binds it. After the raising of *a policeman* to a position from which it holds scope over both conjuncts, the interpretation will be something like "there is a certain policeman such that both Paul and Kate are trying
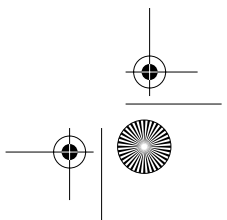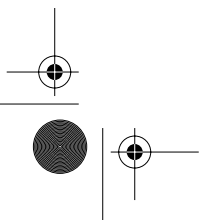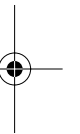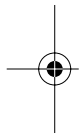
to find him." Since wide scope is impossible with BPs, the prediction seems to be that (25) is anomalous, contrary to the facts. However, notice that raising of *policemen* in (25) to a position where it gets scope over both conjuncts and correctly binds the pronoun is likely to yield, under Carlson's approach, a semantic representation of the sort "there is a kind p (*policemen*) such that Paul is trying to find some stage of p, and Kate is trying to find some stages of p." These stages may well be different in the two cases (giving rise to the apparent opaque reading), but notice that the kind is always the same (*policemen*), accounting for the striking compatibility between opacity and wide scope exhibited by the BP in (25).[14]

(v)   The same kind of explanation can be provided for the fact that a BP that is assigned an existential interpretation can serve as antecedent for a pronoun which is interpreted universally/generically (26). This is impossible with quantificational arguments, as shown by the fact that (27) cannot be assigned the pragmatically plausible reading according to which "several critics left the movie, even though all critics have strong stomachs":

(26)   Bill trapped eagles last night, even though he knows full well that they are on the verge of extinction

(27)   Several critics left the movie, even though they had strong stomachs

Under the hypothesis that that BPs uniformly refer to kinds, with the existential interpretation brought about by the presence of an existential operator over stages in the formal definition of the predicate, even this contrast receives a direct explanation. Both the BP and the pronoun represent in fact a kind-referring expression: the interpretive difference between pronoun and antecedent depends on their combination with two different sorts of predicates.

3.3   *Problems with Carlson's analysis*

Carlson's analysis is conceptually appealing and empirically well motivated. Although not all the empirical arguments he provides against the quantificational analysis are equally convincing (cf. for instance the doubts expressed over the argumentation at point (iv) of section 3.2), there is a large consensus, in the literature, that some of Carlson's insights still retain all their validity. However, many authors have pointed out (as well as Carlson himself in later work) that the theory as a whole has to face serious empirical difficulties. These problems have led to the proposal that at least some instances of BPs are in fact quantificational (or "predicative," under the view of indefinites as free variables provided with a restriction), as we will see in section 4, and that the presence of an empty determiner, to be syntactically licensed and semantically interpreted, might well play a crucial role in explaining some of the most intriguing distributional and interpretive properties of BPs, as shown in section 5. In the remainder of this section,

I want to offer an overview of the problems that arise with Carlson's analysis, discussion of which has led to a number of influential proposals over the syntax–semantics interface.

(i)   Carlson's analysis is essentially limited to English. It is not immediately obvious whether and how it can be extended or adapted in order to account for the comparative differences in the distribution and interpretation of BPs that we have observed above. How to derive, for instance, the prohibition on generic BPs that is almost generally observed in Romance? Or the neutralization of the count/mass distinction that is arguably found in another group of languages (like Chinese and Japanese)?

(ii)   It has been observed that there are cases where a subject BP combining with an i-level predicate can be assigned an existential reading, a fact that is absolutely unexpected under Carlson's theory (see the discussion in section 3.1), as in (28) below:[15]

(28)   a.   Hurricanes arise in this part of the Pacific.
       b.   Computers compute the daily weather forecast.

It has also been suggested that this reading is possible (or at least particularly plausible) with subject BPs of unaccusative predicates and/or when the subject BP is focused (Kratzer 1995), raising the question, which does not receive an immediate explanation in Carlson's framework, why this should be the case.

(iii)   There are also somewhat less debated cases in which a predicate that seems to express a transient property, and is thus likely to be s-level, is not compatible with subject BPs receiving an existential interpretation, as in the cases below:[16]

(29)   People are sad/at work/rich. (*only generic*)

How can we derive the contrast between (29) and the cases, also involving non-verbal predicates, in which the existential reading is a rather natural option, as in *Firemen are available*? Moreover, there seem to be cases where s-level verbal predicates admit individual-referring subject BPs, as in (7c), repeated here as (30a), whose truth-conditions are intuitively distinct from those associated with the "existential" (30b):

(30)   a.   Musk-rats were brought to Europe in 1906.
       b.   Some musk-rats were brought to Europe in 1906.

(iv)   The narrow scope effects to which BPs give rise, while remaining one of the most convincing empirical arguments in favor of Carlson's analysis, are quite problematic in a number of respects. Subject BPs can in fact be assigned wide scope in certain contexts. As for generic BPs, this is certainly the case with sentences
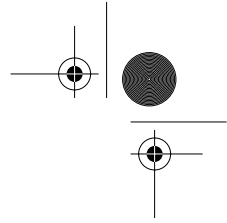
like *Beavers have a tail*, and the formalism Carlson develops in ch. 5 (consisting among other things in the introduction of an intensional operator *G′* which maps predicates of individuals into predicates of kinds) is intended to provide an explanation for these facts, under the hypothesis that the object (*a tail* in the case under consideration) finds itself in an intensional context after the application of *G′* (in this way, the narrow scope of *a tail* is arguably reduced to the narrow scope of *a unicorn* in sentences like *John believes that a unicorn is approaching*). However, this solution cannot be applied to cases such as (31), where it is an existentially interpreted BP that may hold wide scope (since the predicate is s-level, no intensional operator is arguably present). Wide scope of subject BPs thus constitutes a problem for Carlson's approach:

(31)   Influential scientists have endorsed many wrong ideas.

4   Bare plurals as indefinites

As mentioned in the previous section, sentences like (28a) (repeated below), discussed in Milsark (1974) and Carlson (1989), represent a serious difficulty for Carlson's (1977a, b) approach:

(28)   a.   Hurricanes arise in this part of the Pacific.

The point is that (28a) admits an interpretation according to which "it is a property of this part of the Pacific that there are some hurricanes arising there." In other words, there is a reading of (28a) in which the subject is interpreted existentially. In Carlson's approach, however, the existential reading is a function of the "hidden" existential operator contained in s-level predicates, and the verb *arise* in (28a) is *not* an s-level predicate, to the effect that the reading of (28a) under discussion cannot be derived.[17] Facts like this have been taken to strongly suggest that the unitary interpretation of BPs proposed by Carlson cannot be maintained on empirical grounds and BPs *do* behave as indefinites in certain contexts, for instance in (28a) (cf. in particular Wilkinson 1986; and Krifka 1987). Similarly, it has been proposed that the analysis of genericity in terms of intensionally interpreted subject-predicate structures should be abandoned in favor of a view in which genericity may correspond to inherently relational meanings, whereby a relation is established between two classes of intensional objects, which are defined by an apparently arbitrary partition of the lexical material contained in the sentence (cf. especially Carlson 1989). According to this view, clearly inspired to the analysis of indefinites as free variables developed in the framework of Discourse Representation Theory (cf. especially Kamp 1981; and Heim 1982), a sentence such as (28a) would receive a logical representation of the kind exemplified in (32) below, at least under the assumption that definites are also interpretable as free variables:
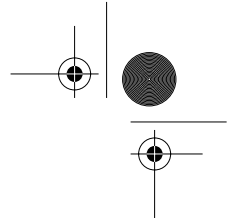
(32)   Gen x [x is this part of the Pacific]$_{restrictor}$ [∃y (y are hurricanes and y arise in x)]$_{scope}$

A logical form such as (32) encodes the view that genericity expresses a relation between two sets (in the case under scrutiny, the set of locations which are in this part of the Pacific and the set of locations which have some hurricanes arising in them). The intensional/nomic force typically associated with generic sentences depends here on the *modal* interpretation of *Gen*, which is in fact analyzed as the intensional counterpart of extensional adverbs of quantification (or Q-adverbs, cf. Lewis 1975) such as *often*, *always*, etc.[18] As for the subject BP whose interpretation was problematic in Carlson's framework (*hurricanes* in our case), it is proposed that it corresponds to a *propositional function* of the form *Px*, mapped into the nuclear scope of the quantificational structure and hence undergoing, by hypothesis, an operation of existential closure of the kind proposed by Heim and Kamp. The generic reading that was not problematic for Carlson will obviously correspond, within this framework, to the logical representation with the BP in the restrictive clause, as in (33) below:[19]

(33)   Gen x [x is a hurricane] [∃y (y is this part of the Pacific and x is in y)]

This view of genericity has especially gained support when the interpretation of indefinites as free variables has been combined with the Davidsonian analysis of predicates as endowed with an additional event argument, which seems able to provide suitable variables for *Gen* to quantify over in contexts where there are no other expressions interpretable as free variables. A case in point is constituted by (34), which is roughly assigned the logical form in (35) under the quantificational approach to genericity under discussion here (cf. Chierchia 1995b):

(34)   Fred smokes.

(35)   Gen s [C(F,s)] [smoke (F,s)]

The formal representation in (35) expresses a relation between a set of situations in which Fred is somehow involved (this is the meaning of the context variable *C*) and the set of situations in which Fred smokes. Here, the basic insight is that the modal force of *Gen* imposes the satisfaction of a specific set of felicity conditions to the situations in which we check the smoking habits of Fred. Accordingly, (35) encodes the fact that (34) will be true if and only if a pragmatically constrained set of situations involving Fred (for instance, those in which there is sufficient oxygen for Fred to engage in smoking, Fred feels compelled to smoke, etc.) overlaps with the situations in which Fred actually smokes.

Let us try to determine what all of this implies for the analysis of BPs. The essential hypothesis concerning BPs is that Carlson's kind-referring BPs are variables bound by an (often implicit) adverb of quantification provided with modal force (*Gen*), whereas Carlson's stage-referring BPs are existentially quantified
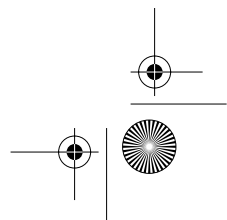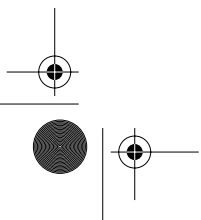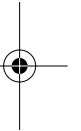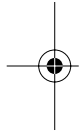
variables.[20] Since the domain of existential closure is assumed to correspond with the scope of *Gen*, it follows that the instances of BPs interpreted as kind-referring have to be mapped into the "restrictor" of *Gen*, whereas the instances of BPs interpreted as existentially quantified variables have to be mapped into the "scope" of *Gen*. This clearly entails that the explicative power of the theory that regards BPs as indefinites crucially depends on the possibility of providing an explicit clause-splitting algorithm for the production of the tripartite quantificational structures associated with Q-adverbs (cf. (32)), that is, on the possibility of determining in a principled way whether an arbitrary instance of BP is to be projected into the restrictor or the scope of the Q-adverb. In this respect, the strongest hypothesis that has been formulated is Diesing's Mapping Hypothesis (MH), according to which there exists a straightforward mapping between syntactic structures and tripartite logical representations which encode either the generic or the existential reading of BPs. Namely, *the material contained in the VP is uniformly projected into the scope, whereas the material present outside the VP is mapped into the restrictive clause of the relevant Q-adverb, possibly Gen* (cf. Diesing 1988a, 1992b). Empirically, MH is supported by the existence of languages in which the mapping procedure arguably applies to surface syntactic structures, as in the case of German subjects exemplified in (16) above (where the adverbial particle *ja doch* is assumed to mark the VP-boundary). The same facts essentially hold in Dutch, where the possibility of filling the spec-of-IP position with the expletive particle *er* gives rise to the sort of syntactic alternations exemplified in (36) (cf. Reuland 1988):

(36)   a.   Fred denkt dat koeien op het dak liggen.
              'Fred thinks that cows are on the roof.'
       b.   Fred denkt dat er koeien op het dak liggen.
              'Fred thinks that there are cows on the roof.'

The relevant observation is that only (36b) can be assigned an existential interpretation (*Fred thinks that there are some cows on the roof*). This reading is completely excluded in (36a), which can be interpreted only generically (*Fred thinks that cows have the habit of lying on roofs*): the truth of (36b) is still compatible with a scenario in which Fred is experiencing vision problems at the moment of utterance, whereas the truth of (36a) is likely to raise some more serious concerns about Fred's mental conditions. Under the reasonable hypothesis that the subject occupies the spec-of-IP position in (36a), but not in (36b), where this position is arguably filled by *er*, we might propose that the generic/existential reading of the subject depends on its overt syntactic position: subject BPs which are realized VP-internally, as in (36b), can be existentially closed (giving rise to the episodic reading of (36b)), whereas subject BPs which are external to VP are necessarily projected into the restrictor of an (implicit) Q-adverb (giving rise to the generic reading of the embedded clause in (36a)).

   A related but more controversial claim is that the same interpretive effects are detected, in German and Dutch, with object scrambling: BPs that appear to the
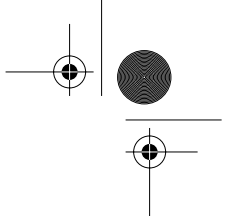
left of an adverbial can be interpreted only generically, as shown by the contrast in (37) (cf. de Hoop 1992):

(37)   a.   Fred denkt dat de politie gisteren taalkundigen opgepakt heeft.
            'Fred thinks that yesterday the police arrested some linguists.'
        b.   ?*Fred denkt dat de politie taalkundigen gisteren opgepakt heeft.
            'Fred thinks that yesterday the police arrested some linguists.'
        c.   Fred denkt dat de politie taalkundigen altijd opgepakt heeft. (*only generic*)
            'Fred thinks that the police always arrested linguists.'

The trouble with MH is that there are many languages, English among them, in which the surface position of the verb's arguments is not really telling with respect to the possibility that these arguments be interpreted generically or existentially.[21] This is revealed by the contrast detected with minimal pairs like (38): in both sentences the subject BP surfaces VP-externally (as a consequence of the Extended Projection Principle (EPP) or related conditions, let's assume), but only (38a) allows the existential reading of the subject BP (*there are some firemen available around here*), which is uniformly blocked in the case of (38b), independently of prosodic or contextual considerations:

(38)   a.   Firemen are available.
        b.   Firemen are altruistic.

In order for MH to be empirically feasible, one has to resort to extra hypotheses, for example the assumption that "reconstruction" of subjects into their original VP-internal position (spec-of-VP, let's assume) applies in English. Furthermore, one has to assume that reconstruction is possible in the case of predicates such as *to be available*, but is ruled out with predicates such as *to be altruistic*. Again, the explicative power of such a theory would essentially depend on the possibility of deriving the required constraints on reconstruction in a principled way. Two proposals can be found in the literature. Diesing (1992b) suggests that the contrast between (38a) and (38b) essentially overlaps with the demarcation line between s-level and i-level predicates, in the sense of Carlson (1977a) (see the detailed discussion in section 3). The subject of i-level predicates would originate in spec-of-IP, and would be coindexed with an empty category (PRO) generated in spec-of-VP. The subject of s-level predicates, on the other hand, would be directly generated in spec-VP, and would successively undergo movement to spec-IP for independent syntactic reasons (say, case and EPP). Under this hypothesis, the difference detected in (38) reduces to the familiar contrast between control structures (38b) and raising structures (38a), whereby only the latter permit reconstruction, that is, obliteration of an NP-trace in the original VP-internal position. The syntactic difference argued for by Diesing receives some conceptual foundation within the analysis of i-level predicates put forward in Kratzer (1988) and Kratzer (1995), according to which the opposition between
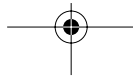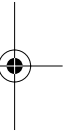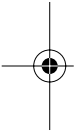
the two predicate classes individuated by Carlson reduces to a difference in argument structure. Kratzer capitalizes on Davidson's proposal (cf. Davidson 1967) that predicates are endowed with an additional event argument by suggesting that the requirement that one of the predicate's arguments be realized VP-externally (cf. Williams 1980; Rothstein 1983) is satisfied, in the case of the s-level predicates, by the extra event argument. Thus, this is the reason why the subject BP *firemen* in (38a) can be generated VP-internally (undergoing existential closure as a consequence of MH). Conversely, i-level predicates are analyzed as inherently non-eventive, that is, as devoid of the event argument which counts as "external" in the case of stage-level predicates. This immediately explains why the subject BP in (38b) must be generated VP-externally (being mapped into the restricted clause of an implicit Q-adverb and receiving thus a generic interpretation).[22]

Diesing/Kratzer's view is apparently corroborated by the observation that subjects of unaccusative predicates (for which it has been independently argued that they are generated VP-internally) lend themselves to the existential interpretation more easily than the non-unaccusative i-level predicates, for which this interpretation is virtually excluded, as emphasized above. The behavior of unaccusative i-level predicates is exemplified in (39) below, with (39a) corresponding to example (5a) of section 1, where the existential reading is actually favored, at least if the subject BP is assigned narrow focus:

(39)   a.   She thinks that COUNTEREXAMPLES are known to us.
       b.   PONDS belong to this lot.

A weaker version of MH, still fully compatible with a quantificational analysis of genericity and with the view of BPs as indefinites has been developed in Chierchia (1995b), where both Kratzer's analysis of the s-level/i-level distinction and Diesing's proposal that the domain of existential closure be identified with the VP are rejected.[23] As reasons for this choice, Chierchia provides both empirical and conceptual arguments. Empirically, one of the problems with Diesing's version of MH concerns the behavior of the predicates which are ambiguous between an s-level and an i-level interpretation, which already represented a serious issue within Carlson's approach (see section 3). A case in point is constituted by sentences involving non-unaccusative predicates such as (40) below:

(40)   Computers route modern planes.

This sentence easily admits the interpretation according to which "it is a general property of modern planes that they are routed by (some) computers" (the existential reading of the subject BP is especially prominent when the subject is focused). However, in Kratzer's terms the interpretation of the predicate in (40) is arguably i-level, since the predicate is assigned a non-eventive reading, consisting in the ascription of a property to an object. The subject BP should therefore count as the designated *external* argument, which originates VP-externally
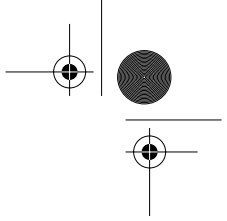
and does not admit reconstruction into a position in which it can undergo existential closure. In order to circumvent this empirical difficulty, Chierchia proposes a version of MH *according to which the restrictor corresponds to the lexical material that is not c-commanded by the Q-adverb (say, Gen) in the (covert) syntactic representation*. *Gen* is assumed to freely adjoin to any "propositional" projection (VP, IP, CP), and arguments may be (covertly) scoped out of its c-command domain via adjunction. In this way, the scope of *Gen* may but need not be identified with VP, subsuming Diesing's proposal concerning the "syntactic domain" of existential quantification as one of the cases that may arise. In particular, the reading of (40) which has the subject interpreted existentially will correspond to a covert syntactic representation in which *Gen* has been adjoined to IP, with the direct object scoped out of IP:

(41)   [$_{IP}$ modern planes$_i$ *Gen* [$_{IP}$ computers [$_{VP}$ route t$_i$]]]

This analysis has two important implications. First of all, the ambiguity of a large class of predicates between an s-level and an i-level interpretation is attributed to aspectual morphology: imperfective aspect is assumed to realize a polarity feature which has to be licensed by *Gen*. In this way, the burden of the explanation is partly shifted from the lexical meaning of predicates to *morphosyntax*. Second, the proposed approach can fully dispense with the idea that the subject of i-level predicates is generated VP-externally and represents thus an exception to the VP-internal subject hypothesis. Given the format of the LF-representations which are assumed to constitute the input for the mapping into quantificational structures, the fact that a subject BP is generated in spec-IP is not sufficient to ensure that it be projected into the restrictor, as shown by (41), apparently the correct empirical result. It is thus possible to adopt the VP-internal subject hypothesis in its most general form, assuming that subjects are uniformly generated in spec-VP, a position for which there seems to exist independent syntactic motivation. However, the issue becomes now how to account for the observation that unambiguous i-level predicates are *not* compatible with the existential interpretation of the subject BP: sentences such as (42) (cf. also (38b) above) cannot be assigned the pragmatically plausible meaning "some smokers are rude," a fact that is elegantly explained under Diesing/Kratzer's version of MH but might well constitute a problem for Chierchia's weaker version:

(42)   Smokers are rude.

Chierchia's proposal consists in the so-called "inherent genericity hypothesis," according to which the polarity feature triggering the presence of *Gen* is *lexically* encoded in the case of unambiguous i-level predicates, instead of being optionally realized as an *aspectual* feature in the extended projection of the predicate, as is the case with verbs that are ambiguous between an s-level and an i-level interpretation. Since the polarity feature which is part of the lexical endowment
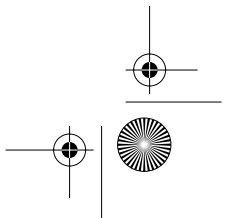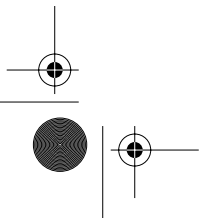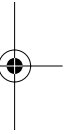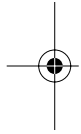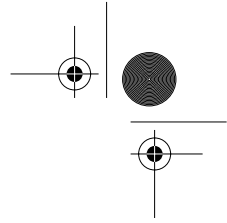
of the predicate must be locally licensed, *Gen* has to be obligatorily realized in the checking domain of the predicate (that is, as adjoined to the maximal projection of the predicate, VP in the case of verbs). This local licensing requirement explains why the subject of *inherent generic* predicates cannot be interpreted existentially: subjects are displaced to spec-IP for independent syntactic reasons, and thus find themselves outside the c-command domain of *Gen* (which cannot be inserted into a position higher than VP for local licensing reasons).[24]

Let us try to summarize. The view that BPs are indefinites seems to be supported by several empirical facts. It accounts for the existential interpretation of BPs in cases such as (28) and (40), which were problematic for Carlson's analysis. Moreover, it arguably explains the parallelism found between the cases of unselective binding that involve singular indefinites and those that involve BPs. This parallelism is shown in the minimal pair below (both sentences naturally admit the interpretation according to which "most dogs are easy to train"):

(43) a.   Dogs are usually easy to train.
      b.   A dog is usually easy to train.

There are two distinct ways of interpreting these facts. We may assume that BPs can behave as indefinites (roughly, this is the position originally taken in Wilkinson 1986; Krifka 1987). If this is the case, however, it is not obvious how to account for the asymmetries between BPs and singular indefinites detected in Carlson (1977a) (for instance, the scope asymmetries exhibited by the canonical pair *John didn't see a spot on the floor* vs. *John didn't see spots on the floor*). A second, perhaps empirically superior, approach might consist in adopting Carlson's hypothesis that BPs are in fact names of kinds. The fact that they are interpretable as free variables in contexts such as (43a) would depend on the application of a type-shifting operation mapping names into propositional functions of the form *Px*, on a par with the type-shifting operation which projects indefinites (interpreted as generalized quantifiers in the framework of Dynamic Intensional Logic) into propositional functions (Chierchia 1995b: 192). More explicitly, we may propose that BPs are shifted into propositional functions when the presence of an (implicit) Q-adverb requires the introduction of a free variable (in order to avoid vacuous quantification). There are, however, at least two problems with such a view. First of all, consider the pair in (44):

(44) a.   Lions have manes.
      b.   Mice hate cats.

The object BP is interpreted existentially in (44a) and generically in (44b). The question is whether the existential reading found in (44a) follows from the interpretation of the object BP as a name or from the application of the type-shifting procedure that turns names of kinds into propositional functions. The first solution immediately raises the issue concerning the status of the predicates
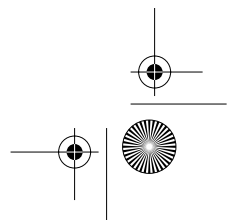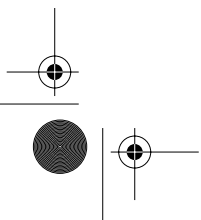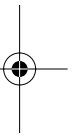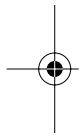
involved in (44): which properties of the predicate can be taken to be responsible for the different interpretation of the object in the two cases exemplified in (44)? On the other hand, the second solution is likely to represent an important difficulty for both versions of MH considered above: the fact that the propositional function corresponding to the object BP is mapped into the scope of *Gen* in (44a) (undergoing existential closure) and into the restrictor of *Gen* in (44b) (giving rise to the universal/generic reading) is certainly in need of a principled explanation.

There is, anyway, a second and more important difficulty. If the application of the type-shifting operation that converts names into free variables depends on the presence of *Gen*, the prediction is that singular indefinites and BPs should pattern uniformly in contexts such as (45) below, as was the case in (43):

(45) a. Madrigals are polyphonic.
      b. Madrigals are popular.

Both sentences exhibit the nomic force proper to generic contexts, with the subject BP interpreted generically. The trouble is that replacing the subject BP with a singular indefinite is acceptable only in the case of (45a), as shown in (46):

(46) a. A madrigal is polyphonic.
      b. ??A madrigal is popular.

The issue is thus to understand why the type-shifting operation that applies to the BP in (45b) is apparently blocked in the case of the singular indefinite in (46b).[25]

The analysis of BPs as *propositional functions* leaves other problems unsolved. Here are some of them:

(i) According to this analysis, BPs are variables bound by an (implicit) Q-adverb. It is further proposed that generic sentences derive their "nomic" force from the inherent modal semantics of the implicit *Gen* or some overt Q-adverb provided with modal force. However, the same intensional/modal interpretation is found in the variants of (43a) containing "extensional" Q-adverbs, exemplified in (47), casting serious doubts on the feasibility of this "quantificational" analysis of genericity:[26]

(47) Dogs are often/sometimes easy to train.

(ii) It is proposed that the existential interpretation of the subject BP in (38a), repeated here as (48), depends on the s-level interpretation of the predicate involved: the episodic reading intuitively assigned to (48) is incompatible with the presence of *Gen* in the corresponding logical representation:

(48) Firemen are available.
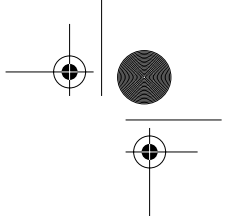
However, in section 3.3 we have already emphasized that many other predicates that seem to express a transient property, and are thus arguably s-level, are *not* compatible with the existential reading of the subject BP, as shown by (49) (= (29) above):

(49)   People are sad/at work/rich. (*only generic*)

It is not obvious how the inherent genericity hypothesis might handle the difference between (48) and (49). It has been proposed (cf. Higginbotham and Ramchand 1996; Delfitto 2004) that the existential reading depends on the presence of an implicit spatio-temporal argument involving proximity to the speaker. Assuming that this is correct, it remains to be established what implications this observation has for the familiar distinction between s-level and i-level predicates and the presence of *Gen*.

   (iii)   Many of the comparative facts reviewed in section 1 (concerning for instance the constraints on the existential and generic interpretation of (subject) BPs) are still in need of a principled explanation. In the next section, we will examine some proposals that point to the possible relevance of the internal syntactic structure of BPs (and DPs in general) for a better understanding of the comparative issue.

5   The internal syntax of BPs

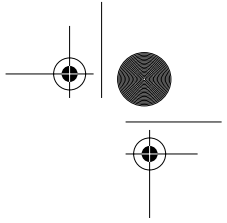The distribution of BPs in Romance languages has given rise to new and stimulating comparative perspectives in the study of the syntax and semantics of BPs. Empirically, the research has mainly concentrated on the subject-object asymmetry that characterizes the distribution of existential BPs in Spanish and Italian: BPs are arguably licensed in governed positions in these languages, but are generally ruled out (unless some additional syntactic and/or prosodic requirements are satified) in the preverbal and (at least as far as Spanish is concerned) postverbal subject position. The proposals that have been formulated in the literature deal with a number of genuine syntactic issues and are relatively independent of the complex interpretive issues that characterize the literature on BPs in English (with some significant exceptions, such as Longobardi 1994). This does not really come as a surprise if we consider that the issue of genericity, which has long constituted the core of the reflections around BPs in English (starting from the canonical proposal in Carlson 1977a), essentially lies outside the scope of the empirical issues that have been debated in the analyses of Romance BPs. The fact is that determinerless nouns can be interpreted only existentially in Romance (with some potential exceptions, to be discussed later). The generic interpretation that is assigned to BPs in English (depending on factors whose nature has been investigated in the previous two sections) is normally realized, in Romance, by resorting to definite DPs (that is, noun phrases introduced by a definite article). The relevant contrast is instantiated in the examples below:

(50) a. Lions have manes.
      b. I   leoni hanno la   criniera (Italian)
   the lions have   the mane

In Spanish, the literature on BPs in the framework of formal grammar includes at least Suñer (1982), Contreras (1986), Lois (1989), and Torrego 1984. As for Italian, the nature of the constraints affecting the distribution of BPs has been mainly investigated in Benincà (1980), Delfitto and Schroten (1991), Longobardi (1994, 1996, 2001), Chierchia (1998), Delfitto (2002), Zamparelli and Heycock (2003).

The constrained distribution of BPs in Spanish has been analyzed by Contreras (1986) in terms of an effect induced by the Empty Category Principle (ECP): BPs in direct object or prepositional object position can be assumed to be licensed by V or P under lexical government (51), whereas subjects and indirect objects yield a violation of the lexical government requirement (52):

(51) a. Quiero tortillas.
          '(I) want tortillas.'
      b. Ayer   salí   con amigos
          yesterday went-(I) with friends
          'Yesterday, I went out with friends.'

(52) a. *Esclavos construyeron las pirámides.
          'Slaves built the pyramids.'
      b. *El director ha devuelto los documentos a empleados.
          'The director has returned the documents to employees.'

If BPs are analyzed as introduced by an empty determiner or quantifier (cf. the discussion in Carlson 1977a), the syntactic constraints on BPs can be arguably reduced to the requirement that empty categories, and especially empty functional heads, be lexically governed (cf. the licensing conditions for empty complementizers in Stowell 1981). On the other hand, Lois (1989) explains the acceptability of BPs in governed positions (as in (51) above) in terms of the requirement that the BP incorporate into its governor (a verb or a preposition). The nature of this incorporation requirement (hopefully related to case-theoretical considerations) remains however essentially unclarified (for the semantic side of incorporation processes, see especially van Geenhoven 1996).

The proposals by Contreras and Lois have been largely influential on the subsequent literature on BPs. In particular, Contreras' hypothesis that the distribution of existential BPs depends on their internal syntax (that is, the conditions on licensing of DPs whose head is empty) has been essentially adopted, within a larger framework of assumptions concerning the syntax and the semantics of DPs, by Longobardi (1994). Longobardi observes that the relevance of the lexical government requirement is apparently confirmed by the exclusion of BPs from
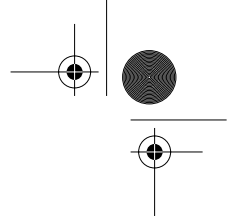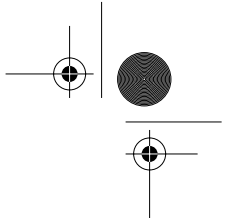
other arguably non-lexically governed positions, such as the postcopular argu-
ment of "inverted" copular constructions (see Higgins 1979; Moro 1993c):

(53)   La causa delle rivolte sono spesso marocchini. (Italian)
       'The cause of the riots are often Moroccans.'

The main interest of Longobardi's approach lies in the fact that he tries to account
for the comparative differences between English and Italian (and, more generally,
between Romance and Germanic) in the distribution of BPs: the fact that BPs
cannot be interpreted generically in Romance and the fact that English, contrary
to Romance and, arguably, the rest of Germanic, does not seem to impose con-
straints on the occurrence of existential BPs in the subject position. The source
of this comparative contrast is essentially reduced to an important parameter on
N-to-D raising: Longobardi convincingly argues, on the grounds of a large set of
facts concerning the relative order of several categories of proper names and
other DP-internal elements such as adjectives and possessives, that proper nouns
overtly move from the N- to the D-position in Italian, whereas this kind of move-
ment, which is assumed to be necessary in order for a name to be interpreted
referentially, that is, as a *rigid designator,*[27] *takes place covertly* in English (i.e., at the
more abstract level of syntactic representation (often referred to as LF) which
represents the syntactic input to interpretation, as already pointed out, in section
4, in the course of our discussion of the Mapping Hypothesis). The relevant
contrast between Italian and English is exemplified by the paradigm found in
(54–55): the fact that the adjective must occur postnominally in Italian but
prenominally in English is derived from the requirement that names overtly
move to D in the former language but not in the latter:

(54)   a.   Old John came in.
       b.   *John old came in.

(55)   a.   E' venuto Cameresi vecchio.
            has come Cameresi old
       b.   *E' venuto vecchio Cameresi.
            has come old Cameresi

Longobardi 1994 essentially interprets the requirement that names fill the D-
position overtly in Italian as the manifestation of a more general parametric
difference between Italian and English, according to which the syntactic and
interpretive conditions which are responsible for the licensing of DPs (including
BPs) as well-formed interpretable objects necessarily apply in *overt* syntax in
Italian (probably as a consequence of some Earliness Principle of the kind
proposed in Pesetsky 1989), but can wait until LF in English.[28] These abstract
conditions are identified with the requirement that an empty D, as every other
empty (functional) head, be lexically governed (much in the spirit of Contreras
1986), and with a universal interpretive principle which establishes that empty

Ds be assigned a default *existential* reading at the interpretive interface (arguably corresponding with the semantic option that leads, in most cases, to the least easily falsifiable statements, to be related to criteria of interface economy). Given these conditions and their parametric application at different levels of syntactic representation, the contrast between Italian and English with respect to the interpretation and the distribution of BPs follows rather straightforwardly. A sentence like (56) in English not only has a BP in a non-lexically governed position, but also involves a generic interpretation of this BP:

(56)   Beavers build dams.

In Longobardi's framework, the two facts are obviously related: since the syntactic licensing condition on empty Ds applies at LF in English, the presence of an empty D in overt syntax will not suffice to rule out the syntactic derivation; at LF, the noun can be assumed to substitute for the empty D, preventing a lexical government violation and ruling out the existential reading which would be associated with the empty D. As emphasized above, proper nouns are assumed to move to D (in syntax or at LF) as a consequence of their referential status. Common nouns are normally interpreted, in contexts where the D-position is filled by lexical determiners interpreted as variable-taking operators, as providing the range of quantification of these operators: in other words, common nouns refer to the *kinds* that provide the domains of restricted quantification in natural language.[29] On these grounds, it is quite natural to propose that abstract movement of a common noun to D assigns this noun the status of a kind-referring expression, that is, common nouns in D will be interpreted as names for *kinds*, essentially along the lines of Carlson's analysis.

In Italian, on the contrary, the sentence corresponding to (56) can be interpreted neither generically nor existentially:

(57)   *Castori costruiscono dighe.

The reason arguably lies in the fact that the empty D must be licensed and interpreted in overt syntax in this language. Obliteration of the empty D by means of substitution of N into D (which leads to well-formedness and to a generic reading in English) comes too late in Italian, that is, after the relevant syntactic and interpretive conditions have already applied, ruling out the syntactic representation associated with (57) as ill-formed.

An important consequence of Longobardi's analysis is that generic DPs (or, better to say, *kind-referring* DPs) cannot be syntactically realized as determinerless nouns in Romance. In fact, the grammatical counterpart of (57) in Italian is a sentence containing a definite DP in subject position:

(58)   I castori costruiscono dighe.
       'The beavers build dams.'
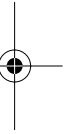
A uniform analysis of genericity, that is, the hypothesis that the generic reading of BPs is produced by the application of a universal interpretive procedure to a uniform syntactic input, seems to require that the definite determiner found in (58) be accurately distinguished from the definite determiner which heads definite DPs that are not interpreted generically. Namely, remember that the kind-referring interpretation of BPs has been associated with a syntactic structure in which the common noun substitutes for D: (58) is compatible with this hypothesis only if the definite article is assigned the status of an *expletive* element, blocking the existential interpretation of the empty D in overt syntax and being replaced with N at the level of representation that constitutes the input to semantic interpretation. In other words, what is essential to the kind-referring interpretation of BPs is the requirement that a syntactic dependency be established between N and D: this abstract dependency is realized in the form of an LF-chain in English and in the form of an expletive-headed chain in Italian (cf. the notion CHAIN in Chomsky 1986b).[30] According to this analysis, *expletive* determiners are not a lexical peculiarity of Romance. In fact, they are attested also in English, in the context where the kind-referring interpretation is expressed by a singular count noun, as shown in (59) below, even though the derivation of these facts from abstract selection properties of the empty determiner requires a very intriguing line of argumentation (cf. Longobardi 1994, n. 45):

(59)   a.   *Lion has four legs.
        b.   The lion has four legs.

As we will see in section 6, the analysis put forward in Longobardi (1994) leaves a number of issues still unsettled. However, it represents a far-reaching attempt to derive the comparative differences noticed at the onset from the hypothesis that *the same* set of syntactic and interpretive conditions applies at *different levels* of syntactic representation. This analysis assigns a crucial role to the hypothesis that noun phrases (including BPs) are uniformly analyzed as DPs, with the NP coinciding with a complement of the head D (cf. especially Abney 1987), and to the head-movement processes which have been claimed to take place, on independent empirical grounds, within DPs, accounting for important aspects of the syntax of noun phrases.[31] It is worth noticing, in this respect, that the abstract operation of N-to-D movement may be interpreted as providing a convenient syntactic input, on compositional grounds, for the reading of BPs as kind-referring expressions (that is, names for kinds) and therefore represents a sort of *syntactic* implementation of Carlson's original proposal (or, if one wants to assume that BPs may also be interpreted as free variables, on a par with the other indefinites, of the type-shifting operation necessary to map predicative expressions into names).[32] Of course, some of the typical problems raised by a uniform analysis of genericity and bare plurals can be easily restated in Longobardi's framework. There is a clear sense, however, that the comparative dimension taken into account by Longobardi's approach has enriched the formal theorizing about bare plurals with a strong syntactic component which cannot be eluded by
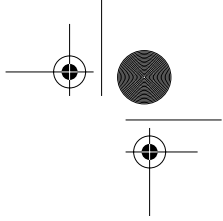
any analysis which wants to meet acceptable standards of descriptive and explanatory adequacy.

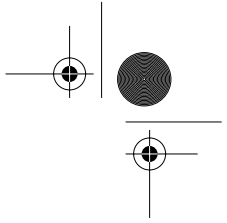# 6   Open issues and topics for future research

At the end of our discussion of the issues which are typically related to the syntax and semantics of BPs, it seems convenient to present a brief survey of the topics that have emerged as still in need of further investigation. We will also refer the reader to recent contributions that might be relevant for a better assessment of these problems and for possible suggestions towards their resolution.

6.1   The issue of reconstruction

As already mentioned in the course of our discussion in sections 4 and 5, the existential reading that may be associated to subject BPs in English is still something of a puzzling phenomenon. Diesing (1992b) proposes reconstruction into spec-VP as a solution, and this proposal is essentially adopted in Longobardi (1994). However, the question arises why reconstruction is generally excluded in Germanic, as revealed by the absence of an existential reading in Dutch examples such as (36) above. Diesing's answer consists in the hypothesis that clause-splitting applies to overt syntax representations in languages such as German and Dutch, to the effect that reconstruction is irrelevant. This claim certainly requires further qualification, since the spec-CP position, often moved into by subjects as a consequence of verb-second, is quite compatible with the existential reading across Germanic, suggesting an obvious parallelism with topicalization in Romance (cf. Longobardi 1994, n. 10 and n. 39):

(60) a. Studenten hebben gisteren het Academisch Gebouw bezet. (Dutch)
          yesterday, (some) students have occupied the University building
      b. ACQUA, ho preso dalla sorgente! (Italian)
          WATER I took from the spring!

The whole issue is made even more complex by the observation that the existential reading of subject BPs in English is sensitive to a number of constraints whose precise nature is still poorly understood. The contrast between (48) and (49), discussed at the end of section 4, seems to indicate that the s-level/i-level distinction, interpreted as a primitive lexical distinction between two classes of predicates, is not sufficient to derive the facts. As far as verbal predicates are concerned, it has been suggested that subjects of unaccusatives and focused subjects are more easily assigned the existential reading (cf. (39) and (40) above, respectively). The aspectual distinction between perfective and imperfective contexts is also arguably relevant, as shown by the fact that sentences in the present tense (which exclusively admits an habitual, hence imperfective, reading in English) cannot be interpreted existentially, whereas sentences in the past tense

(which is clearly compatible with an episodic, hence perfective, interpretation) are essentially ambiguous between the existential and the generic reading.[33] This is shown by the minimal pair in (61):

(61) a. Firemen extinguish the fire. (only generic)
      b. Firemen extinguished the fire. (ambiguous)

As for non-verbal predicates, it has been suggested that those compatible with the existential reading of the subject BP, as *available* in the canonical (48) above, crucially involve a notion of spatio-temporal location in their interpretation, in the form of spatio-temporal proximity to the speaker. This hypothesis seems to be confirmed by the subtle contrast exhibited by the minimal pair (62), under the plausible assumption that the proximity requirement is violated in (62b) (cf. Higginbotham and Ramchand 1996; Delfitto 2004):

(62) a. (Guess whether) firemen are nearby/at hand.
      b. ?(Guess whether) firemen are far away/a mile up the road.

It is worth noting that the relevance of a lexical government requirement of the sort argued for by Longobardi (1994) is apparently corroborated by the observation, found in Higginbotham and Ramchand (1996), that the existential interpretation is *never* available in contexts without copular support, as shown by the contrast in (63) below:

(63) a. I consider firemen available/on strike. (only generic)
      b. I consider firemen to be available/on strike. (ambiguous)

6.2   Bare plurals, indefinites, and genericity

As already observed in section 4, and confirmed by the paradigm in (12–13) above, singular indefinites and BPs are not interchangeable in generic contexts. Another case in point (cf. Dobrovie-Sorin and Laca 1996) is offered in (64) below:

(64) a. Americans are taller than Italians. (generic)
      b. #An American is taller than an Italian. (awkward with the generic reading)

It has been noticed that (64b) substantially improves when an adverb of quantification is overtly realized, as shown by the fact that (65) is more acceptable than (64b) as a generic sentence:

(65)   An American is always taller than an Italian.

These facts may be taken to indicate that generic sentences containing BPs, on a par with generic sentences containing other individual-referring expressions, are
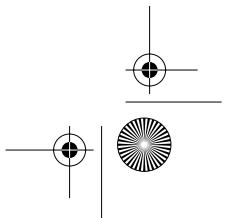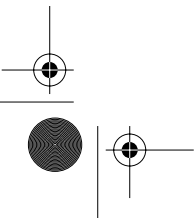
not dependent, for the realization of the generic reading, on the presence of an implicit Q-adverb with an inherent modal semantics (i.e., *Gen*). When the "normative" force associated with *Gen* is uncontroversially present, as in (66), generic sentences are in fact acceptable even with singular indefinites (cf. Dobrovie-Sorin and Laca 1996). For example, notice that *being polyphonic* is just a necessary condition that *every* madrigal must satisfy in order to count as a madrigal:

(66)   A madrigal is polyphonic.

This state of affairs is compatible, in principle, with two different approaches. One might argue that the quantificational analysis of genericity (according to which generic sentences contain an implicit Q-adverb, *Gen*, endowed with modal force) cannot be empirically correct, given the contrast between singular indefinites and BPs exemplified above (cf. Delfitto 19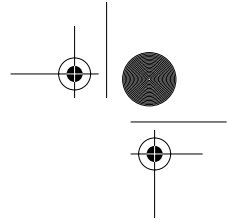98, 2002). Genericity must thus follow from the semantics of subject-predicate structures, much in the spirit of Carlson's original proposal. This neo-Carlsonian analysis has been implemented in Delfitto (2002), in terms of a general proposal concerning the semantics of grammatical aspect and predication. Alternatively, one might try to explain the contrast between (singular) indefinites and BPs by adopting Carlson's hypothesis that BPs are names for kinds (possibly undergoing type-shifting operations that explain their behavior as free variables in certain contexts), while still sticking to the insight that genericity is an essentially quantificational phenomenon (cf. Chierchia 1995b, 1997b, 1998).

6.3   Bare nouns in French and Chinese

A third class of problems concerns the presence of languages in which BPs in argument position are uniformly ruled in (Chinese, Japanese) or uniformly ruled out (Modern French).

As for the first group of languages, an interesting proposal for a principled approach is found in Chierchia (1997b), where the interpretation of NPs as argumental or predicative categories is essentially considered a matter of primitive parameter setting. In Chinese, for example, NPs are uniformly interpreted as arguments, a property to be put in relation with the absence of the mass/count distinction in the morphological system and with the presence of a generalized classifier system. In French, NPs would always be "predicative" (and hence uniformly excluded from argument positions), whereas in other languages the setting depends on the mass/count distinction (for instance, argument bare NPs are mass in English) and shifting operations from the predicative to the argument type are allowed under certain conditions.

A specific proposal for French (which incorporates many insights of Longobardi's analysis) is found in Delfitto and Schroten (1991), where the comparative contrast between Spanish/Italian and English with respect to the licensing of existential BPs is argued to follow from the hypothesis that the empty D heading the BP is subject to an extra identification requirement. The latter is argued to be

satisfied under a local relation with a number agreement morpheme, via the independently motivated assumption that the number morpheme realized on the noun may have a different syntactic status crosslinguistically (cf. also Longobardi 1994, fn. 11).[34] This proposal can be further implemented in terms of an identification condition on the licensing of empty Ds as variable-taking operators. More specifically, it has been proposed that the interpretation of an empty D as an existential operator with the abstract form "Ox" requires an event predicate for the identification of the operator type as existential, and abstract raising of the number morpheme to the D-position for the identification of the "sort" of objects which constitute the range of quantification of the operator (see Delfitto 2002: ch. 3, section 2.1). According to this line of analysis, the lack of argument BPs in French depends on the absence of number agreement morphemes on the noun; namely, it can be argued that in these conditions the range of quantification of the existential operator cannot be defined and BPs are ruled out since they cannot be interpreted as quantificational structures at the interpretive interface (see Delfitto and Schroten 1991 for a detailed discussion of the morphological issues involved). There seems to be evidence that what has to be *identified* is not only the variable (by determining its "sort") but also the operator (by determining its "semantic content"). In fact, only *event* predicates are able to license existential BPs under government: object BPs lead to ungrammaticality in Italian in contexts such as (67) (notice that only the generic reading is available in its English counterpart):

(67)   *Mario odia cani.
       'Mario hates dogs.'

Here two issues arise. The first consists in establishing what counts as an event predicate. At first sight (as noticed by Dobrovie-Sorin and Chierchia) there seem to be stative (that is, non-eventive) predicates which are perfectly able to license object BPs with an existential reading, as shown by the Italian sentence in (68) (notice that its English counterpart also admits the existential reading besides the generic one, contrary to what happens in (67)):

(68)   Mario possiede case. (existential)
       'Mario owns houses.'

As noticed by Dobrovie-Sorin, verbs like *own* and *hate* appear to differ as to their capacity of licensing locative phrases, in that only *own* is compatible with a reading according to which the locative phrase modifies the predicate (cf. Kratzer 1995 for similar observations concerning the individual/stage level distinction). This seems to suggest that event predicates have to be identified with those which admit spatio-temporal modification: the predicate in (68), but not the predicate in (67) would thus qualify as eventive, as confirmed by the contrast detected in (69) in the acceptability of *where*-questions (see also Delfitto 2002, 2004):
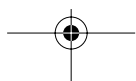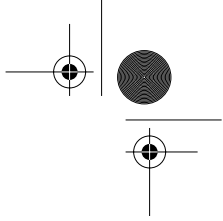
(69) a. *Where does John hate dogs?
      b. Where does John own houses?

Assuming this much to be on the right track, what remains to be established is the precise mechanism by means of which event predicates (and only event predicates) are able to *identify* an empty D as an existential operator under a government relation. For proposals somehow related to this important issue see Higginbotham and Ramchand 1996, Delfitto (1998, 2002).[35]

6.4   *Non-existential readings*

Finally, the set of non-existential interpretations found with BPs gives rise to rather intricate paradigms, leading to different idealizations and (thus) to different theories. A good example of this situation is the hypothesis, put forward in Chierchia (1998), that BPs in Italian admit a kind-referring interpretation, to the effect that Italian and English would pattern together in allowing type-shifting from predicative categories (logical type <e, t>) to object-referring categories (logical type <e>). As empirical evidence for his claim, Chierchia adduces the kind-referring reading found in Italian examples such as (70) below:[36]

(70) a. Cani di grandi dimensioni sono (spesso) aggressivi.
          'Dogs of big size are (often) aggressive.'
      b. Da queste parti, ragazze in minigonna sono rare/diffuse/scarse/
          abbondano.
          'In this area, girls in miniskirts are rare/widespread/scarce/abundant.'

However, it has been noticed that the sentence-types exemplified in (70) arguably involve some form of *unselective binding*, turning the predicative BP into a generalized quantifier: *adverbial* quantification (by means of a possibly implicit frequency adverb) in (70a) and *lexical* quantification (by means of predicates that inherently express quantification over events) in (70b) (see Carlson and Pelletier 1995; Longobardi 2001; Delfitto 2002 for a detailed discussion of the issues involved).[37] The evidence points rather uncontroversially to the conclusion that unambiguous individual-level predicates cannot be assigned kind-reference in Italian (*contra* Chierchia's suggestion). It is a fact that kind-reference is marginally possible with the predicates that can easily be understood as involving event reference (*to be intelligent* can be easily reinterpreted as *to exhibit intelligent behavior*), whereas it is excluded with predicates that are less easily prone to this reinterpretation process (*to be dark* or *to be big*, for instance). Italian speakers have serious trouble interpreting/producing sentences like those in (71a) with the meaning proper to those in (71b), where the definite DP is clearly assigned kind-reference (see Longobardi 2001; Delfitto 2002):

(71) a. *Uccelli di zone paludose sono scuri/grandi.
          'Birds from marshy areas are dark/big.'
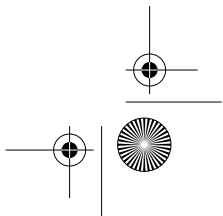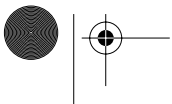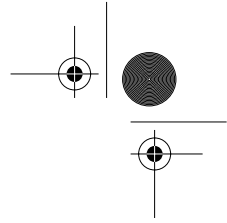
  b. Gli uccelli di zone paludose sono scuri/grandi.
    'The birds from marshy areas are dark/big.'

Moreover, Longobardi (2001) discusses at least three other important pieces of
evidence in favor of the view that kind-reference is not available to BPs in Italian.

 First of all, there is the behavior of predicates for which the property ascribed
to the kind cannot be ascribed to individual members of the kind. A case in point
is the contrast between (72a) in English, that readily admits kind-reference for the
subject BP, and its Italian counterpart in (72b), where the subject BP can be inter-
preted only existentially, in spite of pragmatic awkwardness:

(72) a. Tomatoes of big size taste nicer if one drives South.
   b. Pomodori di grandi dimensioni diventano sempre più saporiti man
    mano che si va a Sud.

Second, it has been observed that Italian BPs pattern exactly like Italian singular
indefinites. Since singular indefinites cannot be interpreted as kind-referring
expressions (witness the well-known contrast between singular indefinites and
BPs in English), this arguably constitutes an independent argument against
kind-reference for Italian BPs. Third, the hypothesis according to which the non-
existential reading of Italian BPs depends on the licensing of a non-existential
unselective binder in the relevant linguistic structure makes the prediction that
contexts that do not involve lexical quantification or frequency adverbs will not
be able to license a non-existential interpretation of BPs, so that kind-reference
effects will be excluded in these contexts. A case in point is aspectually perfective
sentences, where non-existential quantification can be induced only by an overt
frequency adverb (cf. the discussion in Delfitto 2002: ch. 2, section 3.3). The min-
imal pair in (73) exemplifies the clear contrast arising here between Italian and
English: the Italian BP in (73a) admits only the existential interpretation, whereas
the subject BP in its English counterpart (73b) freely allows kind-reference. In
order to express the kind-reference effect proper to (73b), Italian has to resort to
(73c), where the BP has been replaced by a definite DP:

(73) a. Elefanti di colore bianco passeranno il Giudizio Universale alle 5.
   b. White coloured elephants will pass the Final Judgment at 5 o'clock.
   c. Gli elefanti di colore bianco passeranno il Giudizio Universale alle 5.

On the grounds of these facts, it is fair to conclude that English and Italian bare
nouns differ radically, in that the kind-referring reading proper to the former is
precluded to the latter. This conclusion arguably supports Longobardi's hypo-
thesis that the range of interpretive variation concerning kind-reference is linked
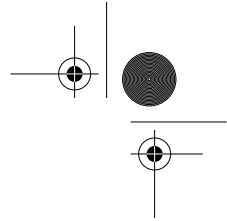to the range of morphosyntactic variation concerning N-to-D raising.
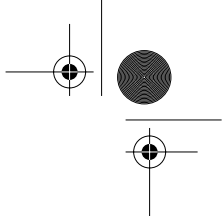
7 Conclusion: summary

Let us try to recapitulate. There seems to be some consensus on the fact that Carlson's analysis of BPs as names for kinds still represents, in many respects, the most adequate theoretical foundation of the semantics of BPs. To put it in different terms, the assimilation of BPs to other sorts of indefinites (and in particular to singular indefinites), as in Kratzer/Diesing's approach, leaves the important asymmetries noticed by Carlson essentially unexplained. In a similar vein, it may be argued that the *quantificational* approach to genericity (at least in the variant according to which generic BPs are free variables bound by an implicit Q-adverb with modal force) does not score better, on empirical and conceptual grounds, than Carlson's original analysis, according to which genericity corresponds to the semantics of subject-predicate structures whereby subjects combine with individual-level predicates. One of the most promising lines of analysis of the syntax–semantics interface in this domain tries to combine Carlson's insights with more adequate assumptions on the internal syntax of BPs and the role of DP-internal syntactic processes such as the licensing of empty determiners and N-to-D raising. On the other hand, these analyses seem to indicate that one of Carlson's essential proposals, namely the idea of reducing the existential reading of BPs to the semantics of the predicate with which they combine, is in fact not correct, at least in the radical version proposed by Carlson. The existential reading of BPs arguably has its roots in the semantics associated with DPs headed by an empty determiner, even though the semantics of the predicate might well be crucial in order to recover the lexical content of this empty position. However, as we have seen, the precise interaction between syntax and semantics is still a matter of debate. According to a first class of proposals (cf. Longobardi 1994), BPs are uniformly DPs and the cross-linguistic variation is crucially limited to *syntactic* parameters. According to another class of proposals (cf. Chierchia 1997b), variability extends to the setting of semantic parameters. Future research will have to decide on this important issue.

NOTES

1 In Chierchia (1996, 1998), the fact that bare nouns are freely allowed in Chinese/Japanese is derived from the hypothesis that bare nouns are generally set to type e in this group of languages, whereas they are set to type e depending on the mass/count distinction in languages such as English, where bare singulars of count nouns, contrary to BPs, have a *predicative* nature (type $<e,t>$).

2 Quite often in the text we will adopt the standard terminology (essentially dating back to Chomsky 1975b), which has the term 'bare plural' (properly referring to noun phrases that merely consist of a plural head noun) as covering all instances of noun phrases which are *not* introduced by a quantifier, a determiner or more generally a

specifier or functional head of some sort. In this use, the term "bare plural" (BP) "improperly" extends to all instances of determinerless noun phrases, including modified head nouns and "bare singulars" of mass (and in certain languages count) nouns.

3 Many Romance varieties seem to exhibit the behavior exemplified in the paradigm below for Italian, showing that BPs with an existential interpretation (that is, roughly interpreted as 'some N') are generally ruled out from the subject position (abstracting away from the cases where the subject is assigned narrow focus, corresponding to the application of a marked focus assignment procedure), but freely allowed in internal argument positions:

(i)   ??Ieri, pompieri hanno spento l'incendio. (BP = subject)
        'Yesterday, firemen have estinguished the fire.'
(ii)   Non ho visto macchie sul pavimento. (BP = direct object)
        'I have not seen spots on the floor.'
(iii)   Sono uscito spesso con amici. (BP = indirect object)
        'I have often gone out with friends.'

Determinerless subjects are quite acceptable, however, as far as the head noun is modified (by a relative clause, an adjective or a PP) or coordinated, as shown below:

(iv)   Ieri, pompieri con equipaggiamento speciale hanno spento l'incendio.
        'Yesterday, firemen with special equipment have estinguished the fire.'
(v)   Ieri, pompieri efficientissimi hanno spento l'incendio.
        'Yesterday, very efficient firemen have estinguished the fire.'
(vi)   Ieri, pompieri che non avevo mai visto hanno spento l'incendio.
        'Yesterday, firemen that I had not seen before have estinguished the fire.'
(vii)   Ieri, pompieri e volontari hanno spento l'incendio.
        'Yesterday, firemen and volunteers have estinguished the fire.'

As is well known, the availability of subject BPs (with the limitations mentioned above) does not extend in Romance to the contexts in which the BP is interpreted "generically," that is, roughly corresponds to a universal quantifier (see sections 2 and 3 for a more adequate characterization of the *generic reading* of BPs).

The constraints on the occurrence of BPs in the standard subject position (spec-of-IP under current versions of X-bar theory) are not a prerogative of Romance, being also found in Germanic SOV languages such as Dutch (see especially the discussion in Reuland 1988; and Diesing 1992a, b), as exemplified below:

(viii) *Fred zag dat branweerlieden het vuur aan blussen waren.
        'Fred saw that firemen were estinguishing the fire.'

However, it should be emphasized that Dutch appears to behave like English (allowing the existential reading of subject BPs) in main clauses, where verb-second applies and the subject occupies the spec-of-CP position under current analyses:

(ix)   Brandweerlieden waren het vuur aan het blussen.
   'Firemen were estinguishing the fire.'
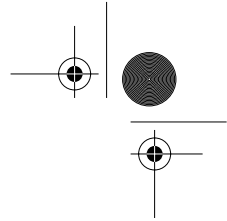
It seems we have clear evidence that different subject positions behave differently in licensing BPs with an existential interpretation. If we adopt the position that Dutch is like Romance with respect to the distribution of existential BPs, we have to account for the different status of the spec-of-CP position. Conversely, if we take Dutch to be like English, in that it freely allows subject BPs, it is the special status of the spec-of-IP position that has to be accounted for.

4 Carlson discusses examples such as *John notices plumbers in Jersey City*, which cannot mean that *all* plumbers were noticed in Jersey City, even though one might easily think of contexts which would clearly favor such a reading, for instance if there is a plumbers convention there attended by all, or most, plumbers.

5 See especially Diesing (1992a, b), Kratzer (1995) and Chierchia (1995b).

6 We are presupposing a model of syntax in which covert operations may apply to surface structures. This possibility is clearly linked to the existence of a level of syntactic representations (traditionally referred to as LF) which may or may not be distinct with respect to the syntactic representations associated with surface structures (that is, the structure in which the elements of the syntactic elements have undergone phonological realization). In Chomsky (1995c) this idea is implemented by assuming that syntax corresponds to a computational system performing derivations, and that mapping to PF (that is, phonological realization) may take place at an arbitrary step of the derivation.

7 See Chomsky (1965), Gough (1969), Dowty (1972), Delorme and Dougherty (1972), Kroch (1974), Bartsch (1972).

8 See Stockwell et al. (1973), Perlmutter (1970a).

9 An important qualification is in order here. Strictly speking, proper names are not individual-referring expression (type *e*) in the formal semantics framework in which Carlson embeds his analysis. In the Montague tradition proper names are in fact assigned a quantificational analysis (type <<e,t>, t>): they represent sets of properties (*Bill* is identified with the set of properties that hold of Bill), on a par with standard generalized quantifiers such as *most dogs*, *every man*, etc.

10 For the relevance of the notion of "well-established kind" in the analysis of other sorts of generics, like singular definite generics, see especially Krifka (1987), Zwarts (1992).

11 The following examples clearly differ as to the quantificational import associated with the definite subject. If (i) tends to get interpreted as involving universal quantification over the members of the battalion, (ii) is better understood with an implicit quantifier of the kind of *most*, and (iii) can arguably be true even if a minority of the members of the battalion is involved in handling ammunition. As for cases like (iv), it is clear that the the predicate true of the battalion is completely false for any of its members:

(i)   The battalion was wiped out.
(ii)   The battalion is quite tired now.
(iii) The first battalion handles ammunition.
(iv)   The first battalion has served its country for 200 years.

This kind of interpretive variation represents an important correlate of the sort of ambiguity that has been detected with BPs. Since the different readings cannot be consistently analyzed in terms of hidden quantification over the members of the relevant plurality, the claim that BPs are not quantified expressions gains further support.
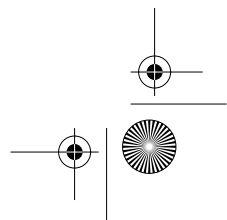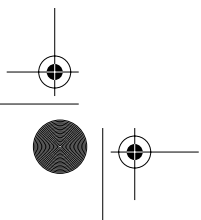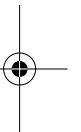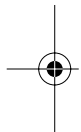
12 A related consequence of Carlson's proposal is that natural language contains only expressions referring to ordinary objects and kinds, and not expressions referring to "stages." The presence of objects corresponding to spatio-temporal slices of things and of stage-referring expressions can be detected only by means of the explicit logical representations which express the semantic interpretation of the relevant sentences.

13 These amendments essentially consist in the assumption that in the case of predicates ambiguous between an s-level and an i-level interpretation, the i-level reading is derived by applying the "generic" operator *G* to the s-level predicates. It is further assumed that a distinct operator *G'* maps predicates of individuals into predicates of kinds. These modifications certainly have some conceptual significance: in particular, the claim that the interpretive ambiguity detected with BPs extends in principle to sentences involving pronouns or proper names (an essential claim of Carlson's original proposal) can hardly be restated in the new framework, where predicates of kinds are derived from predicates of individuals by means of the operator *G'*. However, the motivation for these changes is essentially technical: the introduction of the new operators permits us, according to Carlson, to account for cases where a *generic* BP is assigned wide scope with respect to other scopal elements (as in *Beavers have a tail*). Given the role that hidden generic operators have played in successive analyses, it is worth emphasizing that Carlson's *G* neither corresponds to an implicit Q-adverb quantifying over events/situations nor can be identified with the empty determiner position postulated in the pre-Carlsonian quantificational analyses of BPs. Rather, *G* is an operator mapping predicates into predicates (technically, intensions into intensions).

14 Here, it should be noticed that not all speakers agree about the full acceptability of (25) and, to the extent they tend to accept it, they also tend to rule in the opaque reading of (24) besides the transparent one. There are also theoretical problems with Carlson's approach. He claims that *him* in (24) is a bound pronoun, and that the indefinite is raised to a position from which it has scope over both conjuncts (hence also over the conjuncts containing the pronoun). Both assumptions are problematic. Even if the raising operation is performed at an abstract level of representation (LF), it provides the wrong result with non-indefinites, as revealed by the ungrammaticality of **John is trying to find every policeman, and Kate tried to find him*, *too* (this observation has in fact provided important motivation for the analysis of the cases under discussion as involving E-type anaphora, cf. Evans 1980). Moreover, raising the indefinite to a position from which it takes scope over both conjuncts is likely to violate a well-known condition on movement (ATB-violation), as shown by the ungrammaticality of the cases where movement is overt (**Which book is John trying to find and Kate is trying to find it*, *too*).

15 Cf. Gerstner and Krifka (1993), Wilkinson (1986, 1989), Carlson (1989).

16 Cf. Dobrovie-Sorin (1996), Higginbotham and Ramchand (1996) for a detailed discussion of this issue and some articulated proposals for a principled derivation of the existential reading of subject BPs in English. For a recent analysis based on aspectual considerations and arument structure properties, see Delfitto (2004).

17 According to Carlson's formalism, verbs such as *arise*, which are aspectually ambiguous between an s-level and an i-level interpretation, are considered either as radically homophonous forms, corresponding in fact to two distinct lexical items, or as lexically related forms, the second of which derives from the application of the intensional operator *G* to the form that corresponds to the s-level predicate. According to the latter approach, the form of "arise" present in (28a) results from the application
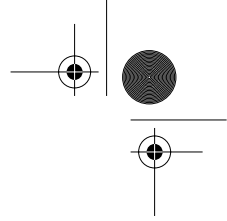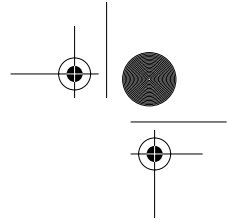
of *G* to the original form of the verb, which is intuitively s-level. Empirically, there can be no doubt about the fact that the predicate in (28a) is i-level: if it were s-level, we should expect an episodic interpretation roughly paraphrasable as "some hurricanes are arising in this part of the Pacific." This is not, however, an admissible reading of (28a), at least in English.

18 In Carlson's model, the nomic force of generic sentences is a function of the intensional interpretation of the subject-predicate structures that constitute the syntactic input to genericity, whereby the predicate expresses a property (that is, a function from possible worlds to sets) and the subject expresses a set of properties.

19 The operation of existential closure is actually not limited to nuclear scopes of quantificational structures in Kamp/Heim's original framework, but extends in fact to a more general sort of existential closure affecting texts. The original view is in many ways problematic, see Kratzer (1995) for an interesting discussion of this issue.

20 As the reader will remember, the terminology we have adopted for expository purposes is in fact partially misleading: for Carlson, all BPs are kind-referring, and the existential quantification on stages associated with certain BPs depends on the formal definition of the predicate with which the BP combines (it is this predicate which is formally characterized as containing an existential quantifier on stages).

21 For a radical criticism of the Mapping Hypothesis on empirical and conceptual grounds, based on the distribution and interpretation of postverbal subjects in languages such as Italian, see Longobardi (2000a).

22 The reader is referred to Kratzer (1995) for a detailed presentation of the empirical arguments in favor of the hypothesis that only s-level predicates are endowed with either a Davidsonian event argument, or a distinct spatio-temporal argument, arguably responsible for the spatio-temporal proximity to the speaker involved by the reading associated to sentences such as (38a) (*there are firemen available around here*, cf. Higginbotham and Ramchand 1996) and for the awkwardness of locative modification with i-level predicates (cf. the contrast between *??John is always a linguist in his car* and *John is always sick in France* especially discussed in Carlson 1982; Dobrovie-Sorin and Laca 1996; and Chierchia 1995b). One of the most intriguing arguments presented in Kratzer (1995) concerns the contrast between (i) and (ii), arguably derivable from the hypothesis that the implicit Q-adverb has a variable to quantify over (that is, the event variable) in (ii) but not in (i):

(i)   *When Mary knows French, she knows it well.

(ii)   When Mary speaks French, she speaks it well.

23 Chierchia argues that his analysis is neutral with respect to the choice among the most influential approaches to BPs, that is, the view that BPs are names for kinds and the view that BPs are indefinites translated into propositional functions of the form *Px* at the interpretive interface (Chierchia 1995b: 192). In fact, Chierchia emphasizes that Carlson's arguments in favor of a non-quantificational analysis of BPs cannot be conveniently addressed within the Discourse Representation Theory (DRT) approach. The question, however, is whether this is sufficient to really differentiate Chierchia's approach from the view that BPs may be indefinites. Chierchia acknowledges that sentences such as *Dogs are usually easy to train* can be naturally assigned the interpretation *Most dogs are easy to train*, involving the analysis of BPs as indefinites. However, he proposes that the status of variables attributed to BPs can be derived from the

application of a type-shifting operation to BPs as names of kinds, on strict parallelism with the type-shifting operations generally applied to indefinites in the framework of Dynamic Intensional Logic, which map generalized quantifiers into propositional functions. The availability of these type-shifting operations raises important issues concerning possible constraints on their application and the derivation, within this enlarged framework, of the properties of BPs reviewed by Carlson and discussed in section 3.

24 Technically, however, matters are less straightforward. Chierchia acknowledges that the explicative power of his proposal crucially depends on the possibility of ruling out movement of *Gen* to a higher position after *Gen* has licensed the polarity feature encoded on the predicate. Chierchia interprets this prohibition as a general fact about polarity licensing items. He claims that sentences like *Every student didn't come to the party* are acceptable with scope of the negation over the subject (a fact on which many speakers do not agree). On the contrary, he observes, negation cannot license a polarity word in subject position (**Anyone didn't come*), which suggests that the trace of the licenser is generally too weak to license polarity features. Even if we accept this analysis, some problems remain. Namely, notice that the local licensing requirement is also operative with those generic predicates for which it holds that the polarity feature is aspectually encoded. In this case, however, subjects *can* be interpreted existentially, as shown by (40) and the corresponding LF-representation in (41). Chierchia seems to suggest that the possibility that *Gen* be scoped out at LF depends on the fact that the polarity feature encoded in the aspectual projection is displaced to a higher position as a consequence of verb movement (the verb moves higher up combining with tense and aspectual morphology). One might assume, for instance, that once the polarity feature finds itself in Agr, *Gen* can simply be inserted as adjoined to AgrP, still satisfying the local licensing requirement. However, notice that the same reasoning might apply to "inherently generic" predicates: at least in some languages, the verb moves higher up and the possibility arises for the licensing requirement to be satisfied in a syntactic configuration which has the subject BP in the scope of *Gen*, predicting the availability of the existential interpretation in cases such as (42), contrary to the facts. The conclusion is that Chierchia's hypothesis gives rise to non-trivial syntactic issues as for its precise technical implementation.

25 If singular indefinites are interpreted as inherent free variables, as in DRT, the issue boils down to consideration of how type-shifting can apply to yield a free variable in contexts where an inherent free variable is apparently excluded.

26 Notice that this problem does not arise within Carlson's original framework, according to which the intensional/nomic interpretations of generic sentences depends on the intensional semantics associated with subject-predicate structures. For a detailed defence of the advantages of a (neo-)Carlsonian analysis that explicitly links genericity to predication, see Delfitto (2002).

27 For a philosophical discussion on proper names as rigid designators, the canonical reading is Kripke (1980).

28 See Longobardi (1996) for technical and conceptual refinements of this analysis, related to the fact that the most recent trends in theoretical syntax admit only *one* interface level at which interpretation applies (cf. Chomsky 1995c), to the effect that earliness principles lose their conceptual foundation. For a different (though conceptually related) analysis, see Delfitto (2002). For a radically different view of the comparative difference between English and Italian BPs in terms of semantic parameters regulating type-shifting, see Chierchia (1998).
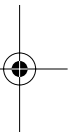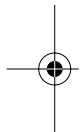
29   It is essential to Longobardi's analysis that *predicative* expressions referring to kinds and providing the domain of quantification of variable-taking operators be in N in surface structure. The assumption is that for an expression to be interpreted as *kind-referring*, this expression must be in the N-position at some level of syntactic representation. More generally, one could say that the D-position encodes reference/ quantification and that the N-position encodes *predication*, in the sense that it hosts *predicative*, i.e., set-referring, elements.

30   The view that certain instances of the definite article are actually interpreted as expletives is apparently confirmed by the behavior of some Romance and Germanic varieties in which the form of the article used with proper nouns is different with respect to the form used in all other contexts (including the generic ones). These varieties include at least Catalan and the Frisian dialect studied in Ebert (1971; cf. Longobardi 1994). The presence of expletive determiners in the lexicon of Romance languages has also been advocated, on different empirical grounds (that is, the analysis of constructions of inalienable possession), by Vergnaud and Zubizarreta (1992).

31   For a recent overview of the syntax of noun phrases, see especially Longobardi (2000b).

32   It is important to emphasize that Longobardi's approach to existential BPs in terms of a lexical/proper government requirement on the empty D which is assumed to head these BPs provides a general alternative to the approaches inspired to Diesing's Mapping Hypothesis, according to which BPs are uniformly interpreted as free variables bound either by an existential or by a generic operator, depending on the syntactic position of the BP at the relevant level of syntactic representation.

33   As already discussed in section 4, the role of aspectual morphology in encoding a habitual or episodic reading of verbal predicates is explicitly acknowledged within the approach to genericity developed in Chierchia (1995b). In this way, the systematic ambiguity of event predicates such as *extinguish* between an s-level and an i-level interpretation receives a morphosyntactic explanation instead of being made dependent on the presence of two homophonous lexical items (as in Carlson's original proposal) or on the presence of an implicit operator *Gen* mapping s-level predicates into i-level ones.

34   Delfitto and Schroten (1991) argue that the D-position cannot be identified as a variable-taking operator by means of abstract Num(ber)-to-D movement in languages such as Italian and Spanish. The reason is that covert head-movement of the number affix to D gives rise to a Minimality violation in these languages (contrary to what happens in English). This idea is technically implemented in the following way. The N + Num complex is analyzed in terms of a X^{-1} affix (Num) that morphologically selects the incorporee (that is, the noun). The incorporee can be a X^0-level category (as in English, where stems qualify as independent words) or a X^{-1}-level category (as in Italian and Spanish, where nouns arguably qualify as bound morphemes). As a consequence, the noun counts as a potential antecedent for the number affix in Italian and Spanish (blocking excorporation of Num to the D-position), but not in English, given the categorial asymmetry between Num and N (excorporation of Num will therefore be possible, explaining why the existential reading is legitimate with subject BPs; see however section 6 for the constraints on the existential reading of subject BPs in English). For a detailed discussion of the issues involved, see Delfitto and Schroten (1991).

35   A problem which clearly deserves further investigation is the set of syntactic conditions which interacts with the possibility of the existential reading of subject BPs in
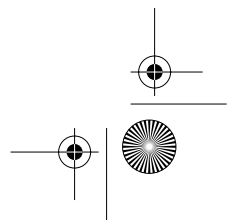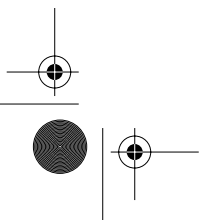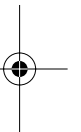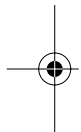
languages such as Italian and Spanish. As for (adjectival) modification, Longobardi (1994) suggests that the presence of a modifier seems to suffice in order to license an empty D as an existential operator (presumably under some form of spec–head agreement which induces the required feature in D). However, the real issue is the mysterious nature of the features involved, especially under the view that licensing requires recovering the semantic content of the empty position as an operator of the form ∃x (cf. Delfitto 1998 for detailed discussion). For a radically different approach to the existential interpretation of modified determinerless nouns in Romance, based on the insights offered by Kayne's theory of antisymmetry, see Delfitto (2002: ch. 3, section 2.2). It is worth emphasizing that modification seems able to rescue the existential interpretation of BPs governed by a non-eventive predicate (cf. the ungrammatical (67) in the main text), as shown by the acceptability of (i) below:

(i)   Mario odia cani piccolissimi.
      'Mario hates some very small dogs.'

36   All these examples concern modified BPs. According to Chierchia, this is a consequence of a formal licensing requirement on empty Ds that does not hold for English: bare nouns are excluded in Italian on purely formal syntactic grounds, independently of issues of interpretation. In this way, Chierchia seems to enrich his semantic framework with some of the results of the most recent syntactic investigations, according to which noun phrases (crucially including BPs) are DPs. However, it is fair to say that Chierchia's style of explanation is essentially Montagovian, in that syntactic choices (BPs as NPs or DPs, existence of a formal licensing requirement on empty Ds) are not independently motivated but rather made totally parasitic on the requirements of semantic analysis, and in particular on the model of semantic parameterization proposed by Chierchia. For a critical discussion of these and related matters, see Delfitto (2002: ch. 3, section 3).

37   As a confirmation of this line of analysis, notice that kind-reference is completely excluded in Italian with kind-level predicates such as *to be extinct* (contrary to what happens in English), as shown by (i) below:

(i)   *Da queste parti, ragazze in minigonna sono estinte.
      'In this area, girls in miniskirts are extinct.'

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