Redefining Indefinites
Redefining indefinites is a new, updated and thoroughly revised version of Définir les indéfinis, published by CNRS Editions in 2004. The general structure of the initial book, divided into eight chapters, has been preserved but each one of the chapters has been revised for two main reasons.

On the one hand, a large body of new data and accounts has emerged in the years that followed the publication of Définir les indéfinis. Since we aim at providing a state-of-the-art treatment of each of the main issues discussed in the book, we were led to incorporate these recent developments. On the other hand, our own account has developed and we no longer defend the property-based analysis of indefinites we assumed in 2004. Since then a large body of empirical and theoretical studies on the distribution and interpretation of nominal expressions and bare nouns has been published in a wide range of languages, with and without articles, which have drawn our attention to previously unnoticed facts and differences between bare singulars and bare plurals, which led us to revise our analysis. We now hold that weak indefinites are not property-denoting elements but rather generalized quantifiers over amounts.

This change of perspective and evolution of our line of thinking has led us to revise all the chapters of the book, which have been affected to various degrees. Chapter 2 has been entirely rewritten in order to incorporate two novel empirical domains: (i) the comparison between argumental DPs and predicative DPs and (ii) the contrast between bare plurals and bare singulars in Romance languages like Spanish and Romanian. It is precisely these data that led us to abandon the property-denoting analysis and move to an account in terms of generalized quantifiers over amounts. Chapter 3, which in the 2004 version served to illustrate the property-analysis of weak indefinites, as well as Chapters 4 and 5, which deal with the ambiguity of indefinites, were thoroughly revised, in line with our new proposal. The analysis of generic plural indefinites proposed in Chapter 7 has been revised in order to integrate an Individuation Constraint on Quantification. We have also revised the Introduction and Chapter 1: in the interest of coherence, we found it necessary to put forward our main hypothesis, according to which indefinites are existential generalized
quantifiers over amounts. Finally, Chapters 6 and 8 have not undergone any major conceptual modification.

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There are two types of studies that can be found in the rich literature on the syntax and semantics of nominal phrases (DPs). On the one hand, we have a large number of empirical studies, which identify, describe and analyze in detail language specific facts, such as the expression of quantity, bare nouns or DPs headed by *de* in French. On the other hand, we have more theoretical studies that seek to isolate the formal properties characterizing the syntactico-semantic behavior of DPs (such as the availability of generic readings, or the licensing of discourse anaphora). The theoretical work deserves credit for bringing methodological rigor into an empirical area that is particularly hard to grasp in view of the diversity of attested interpretations. However, such studies have the problem of narrowing down the area of investigation to a fragment of a given language, leaving for future research many other attested data, which although well described, still resist formalization.

Our investigation of indefinites attempts to bring together empirical and theoretical approaches: we develop a formal analysis of DPs in context, on the basis of language facts. The examples we provide come mainly from English and Romance (especially French and Romanian, although we also include data from Spanish and Italian). We have systematically confronted our proposal to other existing theories. We have attempted to observe the principle of compositionality and to reduce as much as possible the postulation of ambiguity.

For each one of the phenomena under consideration, we offer an overview of the recent literature and lay out our own hypotheses and the remaining open questions. Our analysis is formal insofar as it relies on formal representations but it is not technical. We have made use of the core assumptions underlying the Discourse Representation Theory (indefinites are represented as variables and their quantificational force is due to the operators in their context of occurrence), without however getting into the details of an implementation, in a specific framework. We favored conceptual clarity, argumentation and empirical generalizations over the technicalities of formal details. The data and the analyses pursued here can be formalized in different theoretical frameworks.

The typology of nominal phrases is one of our main interests in this book. The research carried out in the 1980s, in the semantics of discourse (Kamp 1981;
Heim 1982) and in the theory of generalized quantifiers (Barwise and Cooper 1981; Keenan and Stavi 1986; Westersthal 1989), brought new insights into the study of DPs and made it clear that the traditional split between definite and indefinite DPs, as well as the logicians’ distinction between quantified and referential expressions, could not capture the complexity of the empirical facts. We aim to provide an appropriate characterization of the class of so-called indefinite DPs, which are to be distinguished from both referential and quantificational expressions.

The issues we explore and the questions we raise are extremely diverse and are situated at the interface of morphology, syntax, semantics and pragmatics. For example, we wonder whether there are syntactic positions that force or preclude the occurrence of certain DPs and whether these restrictions are related to any specific semantic property. In other words, we want to find out whether there are any correlations between syntactic position, semantic type and interpretive effects of DPs. The most influential line of thinking in the literature, in the spirit of Montague, posits the existence of a homomorphism between syntax and semantics: argumental syntactic positions can only be occupied by elements which have an argument-type of denotation, i.e., either entity (type e) or quantificational type (<<e,t>,t>). This principle automatically rules out property-denoting elements from argument positions. Higginbotham (1985, 1987) challenged this widely assumed homomorphism and proposed to analyze certain indefinite DPs as property-denoting elements (of type <e,t>). This hypothesis was taken up in the 1990s, in particular by McNally (1995), van Geenhoven (1996) or Dobrovie-Sorin (1996), who exploit the hypothesis that indefinite DPs denote properties in order to shed new light on existential ‘there’ sentences or on existential bare NPs. Van Geenhoven’s work on West Greenlandic brought in novel empirical facts, which were shown to be typologically related to data in a wide variety of languages, with and without articles. These highly significant data further supported the reconsideration of the syntax/semantics homomorphism and led to an increasing number of studies relying on what came to be labeled ‘semantic incorporation’, i.e., the semantic composition of property-denoting arguments.

One of the recurrent questions in our study concerns the existence of property-denoting DPs in non-predicative positions. We will provide a negative answer and propose instead that weak indefinites in argument positions need to be analyzed as existential generalized quantifiers over amounts.

A different set of questions concerns the distinction between so-called strong and weak determiners and DPs. Is this a semantic or a pragmatic distinction? Does it overlap with the difference between existential and partitive readings of indefinite DPs?

A third set of questions relates to scope phenomena. Although there are cases where the co-occurrence of two DPs gives rise to ambiguous sentences, with different readings arising from different scope configurations, this does not always happen. We seek to predict instances of ambiguity on the basis of the semantic type of DPs, as well as the distributivity effects induced by certain determiners but not by others.

Most of the answers we provide rely on the distinction between two types of entities that we take to be central for the analysis of DP denotations: individualized
objects, i.e., entities that are distinct from each other, and amounts, i.e., non-individuated entities, which share the property of verifying a certain measure. This measure can be precise or vague, e.g., 300 g of butter and three books refer to amounts consisting in a determined quantity (300 g and three) of butter and of books, respectively, whereas butter and books refer to any amount/quantity, i.e., an indeterminate quantity of butter and books, respectively. Assuming the distinction between individualized objects and amounts, we develop a new account of weak indefinites, as existential generalized quantifiers over amounts. We argue that this hypothesis solves a large number of problems faced by other analyses and offers interesting novel research perspectives.

The book is divided into eight chapters. We first introduce the reasons why we need to postulate the existence of a third type of DP, in addition to referential and quantificational ones and provide a summary of the main results of the theory of generalized quantifiers (Chap. 1).

The next two chapters study in detail the denotation of bare NPs (Chap. 2) and the properties of existential constructions (Chap. 3). We point out the problems of analyses of indefinites as property-denoting elements and instead defend an account that relies on the distinction between two types of entities, individuals and amounts and treats weak indefinites as existential generalized quantifiers over amounts, which combine with existential predicates identifying an amount with an individual. In Chaps. 4 and 5, we focus on the distinction between strong and weak DPs, due to Milsark (1977). On the basis of a detailed analysis of indefinite DPs in context, we show that their interpretation is not a mere instance of underdetermination but rather a genuine ambiguity, each reading being assigned a distinct type of representation at the level of Logical Form.

Chapter 6 deals with the scope of indefinites. If we are right in claiming that indefinite DPs are non-quantificational, the issue of scope should not arise. We show how the notion of dependency captures the relevant facts and how dependency relations are constrained by the denotation of DPs.

Chapter 7 is devoted to generic indefinite DPs. Moving beyond the widely accepted hypothesis that the generic readings of indefinites depend on the occurrence of quantificational adverbs (generally, always, often, rarely), we identify the constraints that govern the genericity of singular and plural des-indefinite DPs in French.

Finally, in Chap. 8, we return to the interpretation of dependent indefinites. In sentences like Every farmer who owns a donkey beats it and If a farmer owns a donkey, he beats it, the indefinite DP a donkey is not to be interpreted as a quantified expression but rather as a referential expression, whose reference is dependent on the quantifier introduced either by a quantified DP (every farmer) or by the conditional operator if. We show that the representation of dependent indefinites as Skolem terms can both capture the interpretive properties of these sentences (such as the asymmetric readings, which were problematic in the framework of the Discourse Representation Theory) and explain why a pronoun coindexed with a dependent indefinite but not c-commanded by it can have a bound variable interpretation.
Chapter 1
Why Indefinites?

In this introductory chapter we will be concerned with the reference, or denotation, of nominal phrases, as well as with the relations between their syntactic properties and their denotation – their semantic type. We wish to know (a) what semantic types of nominal phrases are universally possible, (b) whether there are correlations between syntactic positions and semantic types, (c) whether there are correlations between semantic types and scopal interpretations.

The denotation of nominal phrases depends on the denotation of their parts, namely on lexical items such as nouns, adjectives and on items that are more grammaticalized in nature, such as number inflections, cardinal and ordinal numbers and articles of various sorts, e.g., definite, indefinite or demonstrative. Because they seem to be in complementary distribution with each other, it is currently assumed that the various types of articles occupy the same designated position inside the nominal projection, dubbed Det(erminer). It has also been observed that Determiners are crucial for both the syntax and the semantic composition of nominal projections and therefore nominal phrases are now viewed as Determiner Phrases (DPs), i.e., as maximal projections of the Determiner itself, rather than as NPs (Nominal Phrases), a label that is now used to refer to a lower syntactic constituent, which comprises the noun together with its modifiers, e.g., adjectives.

The logical tradition, which distinguishes between referential DPs (proper names, definite expressions) and quantified1 DPs (every man, each man), groups indefinite DPs together with quantified DPs, since they can be said to involve existential quantification. Relatively recent work (Heim 1982; Kamp 1981), which developed rapidly in the framework of the Discourse Representation Theory (DRT), has established that indefinites do not behave like quantified DPs. The need to distinguish between indefinites and quantified DPs arises when we address questions

1 We will not differentiate between the terms quantified and quantificational.
(b) and (c) above. There are indeed syntactic positions that are accessible to indefinites but not to quantified DPs:

(1)  
   a. John is a nice man.  
   b. *John is each man I’ve loved.  
   c. *John is every man I’ve loved.

   The above contrast shows that indefinites can function as nominal predicates whereas quantified DPs cannot do so. Moreover, there are also argument positions that allow only indefinites (see (2a), (2b) and (2c)), to the exclusion of quantified DPs (see (2d), (2e)):

(2)  
   a. There was (a/one) book on the table.  
   b. There were (three/sm) books on the table.  
   c. There arrived (a/three/sm) student(s) last night.  
   d. *There was each book on the table.  
   e. *There arrived each student last night.

   It has also been observed that indefinites and quantified DPs do not generate the same scopal interpretations:

(3)  
   a. Someone believes that Mary read a (certain) book.  
   b. Someone believes that Mary read every book.

   In (3a), there are two interpretations, (3a') and (3a'"), whereas in (3b), every book cannot have wide scope; (3b'") is not a paraphrase of (3b).

(3)  
   a'. Someone believes that Mary read a book.  
   a". There is a book that someone believes Mary read.  
   b'. Someone believes that Mary read every book.  
   b". For every book, there’s someone who believes that Mary read it.

1.1 Typology of DPs

Since indefinites can be assimilated neither to referential DPs nor to quantificational DPs, we are led to assume that there are three distinct semantic types of DPs: referential, quantified and indefinite. We must now propose definitions and formal representations for each of the three classes and establish the criteria that will allow us to place a particular DP in one or another class.

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2 It is currently assumed that DPs associated with the copular verb be function as predicates. This issue will be examined in detail in Chap. 2.

3 sm is the weak (i.e., unaccented) form of some.
1.1 Typology of DPs

1.1.1 Referential DPs

Proper names and definite expressions constitute the simplest type of DP with respect to denotation: they refer to an individual, an element of type e, where e is an abbreviation for entity. Demonstrative DPs may also be analyzed as denoting individuals, even though, in this case, the reference is not “rigid” – that is to say, stable across different contexts (possible worlds or situations) – but rather variable according to the utterance context.

In examples (4), \textit{John} denotes the individual who carries this name and the predicates respectively denote the properties of singing, being a doctor or being handsome, or extensionally, the sets of individuals who are characterized by these properties. The truth-value of the sentence is calculated by checking whether the individual denoted by \textit{John} is a member of the set of individuals that are singing in (a), that are doctors in (b), or that are handsome in (c). The sentence is true or false depending on whether or not membership is confirmed.

(4) a. John is singing.
    b. John is a doctor.
    c. John is handsome.

Formally then, a sentence such as (4c) is represented as in (4′c), where \( j \) is an individual constant referring to \textit{John} and \textit{Handsome} is a one-place predicate that denotes the set of all that is handsome.

(4′) c. Handsome (j)

According to (4′c), the denotation of \textit{John is handsome}, which is a syntactically complex constituent, is calculated from the denotations of its parts, \textit{handsome} and \textit{John}, by applying the rule of functional application\(^4\): \textit{handsome} is a function that takes \textit{John} as an argument and yields the truth value ‘true’ if the denotation of \textit{John} belongs to the denotation of \textit{handsome} and ‘false’ if the denotation of \textit{John} does not belong to the denotation of \textit{handsome}.

Following the current use in formal semantics, we assume two primitive denotation types, individuals (type e) and truth-values (type t), which respectively correspond to referential DPs and propositions. All the other syntactic constituents denote functions. Leaving aside intensionality, a one-place predicate such as \textit{handsome} denotes a function of type \(<\text{e},\text{t}>\), i.e., a function that applies to the domain of individuals (\( D_e \)) and returns values in the domain of truth-values (\( D_t = \{0,1\} \)).\(^5\) In set-theoretical terms, a function of type \(<\text{e},\text{t}>\) denotes a set of individuals.

\(^4\) Most semantic models assume at least one additional rule, predicate modification. But it is primarily for reasons of simplicity of exposition that this choice is made, since technically, one can limit oneself to functional application (cf. Heim and Kratzer 1998: 61ff).

\(^5\) The domain of truth values, notated \( D_t \), is composed of two elements, true and false, notated 1 and 0 respectively.
The same type of analysis is often assumed for definite descriptions, e.g., (5) can be represented as in (5’):

(5)  The student is crying.
(5’)  Cry (the student)

It remains to be shown how we can get from a noun phrase with internal structure (determiner + noun) to a simple type, e, while obeying the principle of compositionality. According to Russell’s analysis of definite descriptions, the noun N denotes the set of individuals that have the property of being N and the definite article is represented as the iota operator, whose function is to extract from this set the only element that it contains. The iota operator is thus a function of type <<e,t>,e>, i.e., a function that applies to a property or a set of individuals (of type<e,t>) – such as student in (6) – and returns an individual – here, the student in question, of type e.

(6)  the student
(6’)  \( \iota x \text{ student } (x) \)

Proper names as well as definite or demonstrative DPs display remarkable semantic properties. Semantics, which deals with the truth-values of sentences, or, to be more precise, with their truth-conditions, can predict the type of logical relations, e.g., equivalence, entailment or contradiction, that hold between propositions. Certain laws of logic apply to natural language sentences. We mention two of these here:

– the law of contradiction, according to which “P and not P” is a contradictory proposition, i.e., a proposition that is always false (cf. (7a));
– the law of the excluded middle, according to which “P or not P” is a tautological proposition, i.e., a proposition that is always true (cf. (7b)).

(7)  a.  The neighbor’s son is more than 30 years old and the neighbor’s son is not more than 30 years old.
    b.  Either the neighbor’s son is more than 30 years old or the neighbor’s son is not more than 30 years old.

It should be observed that these laws are verified for sentences built with referential DPs (e.g., proper names, definite or demonstrative DPs) but not with indefinite or quantified DPs in subject positions. Indeed, contrary to (7a), (7c) is not a contradictory sentence. As for (7d), it is not tautological and thus illustrates the case of a sentence that does not verify the law of the excluded middle.

(7)  c.  Two children came and two children did not come.
    d.  Each student is present or each student isn’t present.

We conclude that DPs such as two children or each student must denote something other than an individual, something other than an element of type e.
1.1 Typology of DPs

1.1.2 Quantified DPs

First-order logic makes use of two quantifiers, $\forall$ and $\exists$, which allow us to formalize expressions such as every, each, a and even cardinals\(^6\) as well as modified cardinals such as two, exactly two, at least two...:

(8) a. All men are mortal.
   a’. $\forall x (H(x) \rightarrow M(x))$
   b. A man came.
   b’. $\exists x (H(x) \land C(x))$
   c. At least two men came.
   c’. $\exists x \exists y (H(x) \land H(y) \land x \neq y \land C(x) \land C(y))$

In (8), the natural language sentences a, b and c are paired with their representations in predicate calculus, a’, b’ and c’. The $\land$ sign marks conjunction and the $\rightarrow$ sign marks entailment. $H(x)$ signifies ‘x is human’, $M(x)$ ‘x is mortal’ and $C(x)$ ‘x came’.

The two quantifiers of predicate calculus do not allow us to account for all the quantifiers found in natural languages. Indeed, proportional expressions such as most or more than half, which cannot be reduced to Boolean combinations of existentials and universals, cannot be represented in first-order logic. The study of natural language quantifiers has led to the development of representations that are designed for natural language quantifiers. In what follows we will present the tripartite structure representations inspired by the work of Lewis (1975) and the theory of generalized quantifiers, stemming from the work of Montague.

1.1.2.1 Tripartite Structures

Tripartite structures were introduced by Lewis (1975), who observed that adverbs of quantification (sometimes, often, always, never, etc.) can quantify not only over times and events but also over individuals. Thus, sentence (9a) has the same interpretation as (9b), which may be represented as in (9’), where never and no are translated in the same way as NO:

(9) a. A student is never stupid.
   b. No student is stupid.
(9’) NO x (x a student) [x is stupid]

We are interested here not in the interpretative flexibility of adverbs (known as “unselective binding”), nor in the algorithms that allow the derivation of (9’) from

---

\(^6\)The formal representation of cardinals (see (8c’)) requires first-order logic with identity.
(9a) but rather in the tripartite representation proposed by Lewis, which was extended to quantified DPs (cf. Heim 1982). Tripartite representations make clear an important property of natural language quantifiers: independently of its syntactic status (adverb or determiner), a quantifier has scope over the minimal sentence to which it belongs. The quantifier thus appears, in Logical Form, in the initial position of the tripartite structure.\(^7\) The second part of the structure (often called the ‘restriction’) indicates the domain of quantification, which depends on the syntactic context in the case of adverbs but is fixed for determiners: the nominal constituent that is the sister of the determiner appears in the restriction.\(^8\) The third part of the tripartite structure (often called the ‘(nuclear) scope’) is filled with the predicate obtained by abstracting over the position of the quantified DP.

Tripartite representations can be obtained by assuming two rules that map syntactic configurations onto LF representations: (i) the quantified DP is adjoined to the sentential node that immediately dominates it and its original position is filled by an empty category interpreted as a variable\(^9\); (ii) the determiner of the moved quantified DP raises out of the DP and adjoins to the sentential node. By applying these two rules the examples in (10) can be represented as shown in (10\'):  

\[(10)\] 
\[\begin{array}{ll}
\text{a.} & \text{Each professor came.} \\
\text{b.} & \text{Some students are sad.}
\end{array}\]

\[(10')\] 
\[\begin{array}{lll}
\text{Quantifier} & \text{Restriction} & \text{Scope} \\
\text{a.} & \text{each} & (\text{professor (x)}) & [x \text{ came}] \\
\text{b.} & \text{some} & (\text{student (x)}) & [x \text{ is sad}]
\end{array}\]

(10\') reads as follows: ‘for each individual x, if x is a professor, then x came.

1.1.2.2 Generalized Quantifiers

Determiners can also be analyzed as denoting the relation between the two sets corresponding to the restriction (the NP that is the sister of Det) and the scope (the predicate obtained by abstracting over the position of the quantified DP). The determiner each, for example, denotes the relation of inclusion between two sets: (10a) is true if and only if the set of professors is a subset of the set of individuals who came. Some denotes the relation of intersection: (10b) is true if and only if the intersection of the set of students and the set of sad individuals is not empty.

---

\(^7\) If the same sentence contains more than one quantified DP, their relative scope may vary (see Chap. 6).

\(^8\) This mapping may be affected by contrastive stress.

\(^9\) The need for such a rule is generally assumed in models of the syntax-semantics interface: see Montague’s rule of “Quantifying in” or May’s (1985) “Quantifier Raising”. However, it is not clear whether this rule obeys general constraints on syntactic movement, as claimed by May (1985). Cf. Chap. 6.
This analysis of determiners, called the relational analysis, involves a relaxation of semantic composition, since it assumes operations of semantic composition other than functional application. However, as pointed out by Heim and Kratzer (1998: 149–150), the relational analysis of determiners is translatable into a functional analysis. The relational analysis can thus be used as a convenient abbreviation of the functional analysis (the details of which will be given below), which relies solely on functional application.

The work of Montague has shown that the semantic composition of quantificational DPs may rely on functional application provided that we invert its orientation, that is, we need to invert the relation between subject and predicate. Thus, in sentences with referential subjects, the predicate denotes a function that takes as its argument the denotation of the subject DP (cf. (11a)). In sentences with quantificational subjects (see (11b)), it is the subject DP that denotes a function, which takes as its argument the denotation of the main predicate (type \(<e,t>\)) and returns a truth value (type t): given this orientation of functional application, the predicate remains of type \(<e,t>\) but the subject DP is analyzed as an expression of type \(<<e,t>,t>\). In (11), • notates functional composition.

(11)  
\[a.\] The functional analysis of referential DPs, e.g., definite expressions or proper names:
- a predicate of type \(<e,t>\) applies to an individual of type e
  \(<e,t> \cdot e\) returns t by functional application

\[b.\] The functional analysis of quantificational DPs:
- the DP takes as its argument the predicate:
  an element of type \(<<e,t>,t>\) applies to a predicate of type \(<e,t>\)
  \(<<e,t>,t> \cdot <e,t>\) returns t by functional application

Quantificational DPs thus denote functions of type \(<<e,t>,t>\). Put in set-theoretical terms, quantificational DPs denote sets of properties or, equivalently, sets of sets of individuals. Thus, the quantified DP *all children* in (12) denotes the set of properties that all children have. Sentence (12) is true if and only if this set contains the property of singing.

(12)  
\[a.\] All children sing.
\[b.\] \(\forall x \ (\text{child}(x)) \ [\text{sing}(x)]\)

Given that quantified DPs have a denotation of type \(<<e,t>,t>\) and that NP constituents (N or N + Adj) denote a property (type \(<e,t>\)), determiners denote a function of type \(<<e,t>,<e,t>,t>\>). However, we can avoid dealing with relatively complex functions of this type by resorting to the relational analysis of determiners (according to which determiners denote relations between two sets of individuals, one denoted by the noun and the other by the verb phrase), briefly presented at the beginning of this section.

Barwise and Cooper (1981) have extended Montague’s analysis of quantificational DPs to all DPs: they use the formal theory of generalized quantifiers (a part of
mathematical logic due to Mostowski 1957) as a framework for the investigation on quantification in natural language. According to the theory of generalized quantifiers, all DPs can be treated as generalized quantifiers, i.e., as denoting sets of sets. Thus, even referential DPs, e.g., proper names, can be analyzed as generalized quantifiers: *John*, for example, denotes the set of sets containing John and can thus be interpreted as the set of properties that John has. There exist then at least two distinct formal ways of representing proper names: as constants, or as sets of properties, that is, as abstractions over properties:

(i) \( j \)
(ii) \( \lambda P (P(j)) \)

These two representations can be related to each other by Partee’s (1987) rules of semantic type-shifting: a referential DP, which originally denotes an individual (type e), can be analyzed as a generalized quantifier, therefore as an expression of type \(<<e,t>,t>\) by applying a type raising rule.

A terminological point must be made here: it is usual to analyze DPs as made up of a determiner followed by a noun. The class of determiners is defined distributionally, grouping together those expressions situated to the left of the common noun (leaving aside adjectives modifying the noun): definite and indefinite articles and other indefinite determiners, demonstratives and possessives. Within the class of determiners, there is a subclass of expressions called quantifiers, such as *each*, *all* and *most*. This use of the term ‘quantifier’ differs from Barwise and Cooper’s (1981) ‘quantifier’, which is synonymous to ‘generalized quantifier’ and constitutes the denotation of the DP as a whole. So, in the vocabulary of the generalized quantifier theory, determiners and quantifiers are distinct, whereas in standard terminology, quantifiers are a subclass of determiners.

The use of generalized quantifiers has the advantage of capturing the syntactic parallelism found in natural languages between referential DPs and quantified DPs. Thus, although the syntactic structures of the sentences in (13) are identical (DP VP), their first-order logic formalizations in (13‘) differ from one another. Individual constants and variables are notated with lower case letters and predicates are notated with capitals (S and H respectively correspond to the predicates *sleep* and *be human*).

(13)  
   a. John sleeps.
   b. A person sleeps.
   c. Everyone sleeps.

(13‘)  
   a. \( S(j) \)
   b. \( \exists x (H(x) \land S(x)) \)
   c. \( \forall x (H(x) \rightarrow S(x)) \)

The structural parallelism between (13b) and (13c) is maintained in the formalizations (13″b–c), which use generalized quantifiers. In these formulae, the DP is analyzed as a function that takes a property as its argument, whence the notation \( \lambda P \).
In (13″b–c), the DPs denote generalized quantifiers that are applied to the property denoted by the predicate *sleep*.

\[
\begin{align*}
(13″) & \quad \text{b. a person (sleeps)} \quad \lambda P (\exists x (H(x) \land P(x))) \ S \\
& \quad \text{c. everyone (sleeps)} \quad \lambda P (\forall x (H(x) \rightarrow P(x))) \ S
\end{align*}
\]

If we assume that *John* can also denote a generalized quantifier, the analysis of (13a) becomes parallel to that of (13b–c):

\[
(13″) \quad \text{a. John (sleeps)} \quad \lambda P (P(j)) \ S
\]

An important advantage of the generalized quantifier theory is that it allows us to represent natural language quantifiers such as *most*, which cannot be formalized in first-order logic.

A further advantage of the generalized quantifier theory is that of unifying the treatment of DPs, while at the same time allowing us to distinguish between different types of DPs, depending on the nature of their determiners (see Barwise and Cooper 1981), who rely on the properties of generalized quantifiers in order to redefine the distinction between definites and indefinites and Milsark’s (1977) distinction between weak and strong determiners.

### 1.1.3 Indefinite DPs

At the beginning of the 1980s, Kamp (1981) and Heim (1982) departed from the logical tradition, according to which indefinite expressions are quantificational and proposed instead that the quantificational force of indefinites is not intrinsic to these expressions but rather is contributed by certain elements of their context, e.g., adverbs of quantification, analyzed as unselective quantifiers by Lewis (1975).

This analysis of indefinites was meant to solve the problems raised by the so-called donkey sentences (see (14)), in which indefinites take universal readings and therefore cannot be represented as existential quantifiers.\(^\text{10}\)

\[
\begin{align*}
(14) & \quad \text{a. If Pedro owns a donkey, he beats it.} \\
& \quad \text{b. Every farmer who owns a donkey beats it.}
\end{align*}
\]

\[
\begin{align*}
(15) & \quad \text{a. } \forall x [(\text{donkey}(x) \land \text{own}(p,x)) \rightarrow \text{beat}(p,x)] \\
& \quad \text{b. } \forall y \forall x [(\text{farmer}(y) \land \text{donkey}(x) \land \text{own}(y,x)) \rightarrow \text{beat}(y,x)]
\end{align*}
\]

In order to account for this type of example, one needs to choose between two possible analyses of indefinites: (i) they are ambiguous, sometimes translating as

\(^{10}\) A detailed analysis of donkey sentences will be provided in Chap. 8.
existential quantifiers and sometimes as universal quantifiers; (ii) they are not quantificational. Although their implementations differ, both Kamp and Heim chose the latter option. According to Heim’s LF implementation, indefinites supply a free variable and a condition on the domain of the variable.\footnote{In Kamp’s discourse representation structures, an indefinite DP contributes a discourse referent and a condition on that discourse referent. Although technically different, free variables and discourse referents are comparable at the stage of evaluation.}

Thus, an indefinite DP such as a donkey is analyzed as supplying an individual variable \(x\) and a condition on that variable, ‘donkey\((x)\)’, its quantificational force being contributed by some element of the context. Thus, the universal force that can be observed in (14b) comes from the quantified DP every farmer, which binds both a donkey and the anaphoric pronoun it, which is coindexed with a donkey. In other contexts, the quantificational force of indefinites is supplied by adverbs of quantification. In those if-clauses that lack overt adverbs of quantification, a GEN operator (viewed as a covert adverb of quantification and paraphrasable by generally) is supplied by default (Farkas and Sugioka 1983). Indeed, (14a) can be roughly paraphrased as (16):

(16) Generally, if Pedro owns a donkey, he beats it.

Turning now to the existential readings of indefinites, they appear in those contexts in which the indefinite appears in a matrix clause (as in (17a)) or in the nuclear scope of a tripartite quantification (but crucially not in the restriction) (see (17b)).

(17) a. A man entered the room.
   b. When Pedro is alone, he often buys a cat.

According to the analysis proposed by Kamp and Heim, indefinite DPs are not quantificational expressions and may be viewed instead as referential terms. They nevertheless differ from other referential terms such as proper names, which refer rigidly: whereas proper names can be treated as constants, indefinites supply variables.

Summarizing, three classes of DPs can be distinguished from the point of view of their denotation: referential DPs, which are entity-denoting expressions (type e), quantificational DPs (type \(<e,t,t>\)) and indefinite DPs. The semantic type of indefinites is an open question (Table 1.1).

<table>
<thead>
<tr>
<th>Type of DP</th>
<th>Referential</th>
<th>Quantificational</th>
<th>Indefinite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of denotation</td>
<td>e</td>
<td>(&lt;e,t,t&gt;)</td>
<td>??</td>
</tr>
</tbody>
</table>

\footnote{In Kamp’s discourse representation structures, an indefinite DP contributes a discourse referent and a condition on that discourse referent. Although technically different, free variables and discourse referents are comparable at the stage of evaluation.}
1.2 The Representation of Indefinite DPs

In this section we will briefly present the various analyses of indefinites that can be found in the literature. It should be observed right from the start that indefinite DPs are ambiguous, allowing both ‘strong’ and ‘weak’ readings in the sense of Milsark (1977), an issue to which Chaps. 4 and 5 are dedicated. Although most authors did not mention it explicitly, it is the strong readings of indefinites that were covered by the traditional analysis in terms of existential quantifiers, as well as by the more recent analyses originating from Kamp (1981), Heim (1982, 1979a) and Winter (1997) or Skolem terms (Steedman (2003, 2006)). These accounts cannot be extended to cover weak indefinites, which came into focus when bare NPs (i.e., nominal constituents lacking a Determiner) started to be seriously investigated (Diesing 1992; McNally 1995a; van Geenhoven 2006). Diesing’s analysis relying on VP-level existential closure and Van Geenhoven’s analysis relying on property denotation are the most influential accounts of weak indefinites, which we will be led to discard in Chaps. 2, 3, 4 and 5. We will instead propose an account relying on generalized quantifiers over amounts, presented in Sect. 1.2.6 below.

1.2.1 Indefinites and Existential Quantification

Predicate calculus makes use of two quantifiers: the existential quantifier notated $\exists$ and the universal quantifier $\forall$. The former is used to represent particular judgments such as *A man is ill* (to be distinguished from singular judgments of the type *Socrates is mortal*) and the latter is used to represent universal judgments such as *Every man is mortal*.

It is currently assumed that in natural languages it is the determiners that express quantity and therefore determiners are assumed to correspond to the logical quantifiers. Thus the determiners *every, each and all*, which are used in universal judgments, are represented as the universal quantifier, whereas the indefinite article translates as the existential quantifier. The existential quantifier can be used to represent not only singular indefinites but also cardinal indefinites such as *two men* or *three men*:

(18)  
  a. A man came.  
  b. Two men came.  

(18’)  
  a. $\exists x (M(x) \land C(x))$  
  b. $\exists x \exists y (\neg(x=y) \land M(x) \land C(x) \land M(y) \land C(y))$
The logical formula ‘∃x P(x)’ can be paraphrased as ‘there is an x that verifies the property P’. As shown in (18’b), for the representation of cardinal indefinites, we need to use predicate calculus with identity, which allows us to distinguish and therefore to count the elements of the domain.

As explained in Sect. 1.1.2.2. above, the generalized quantifier theory treats all DPs as denoting generalized quantifiers, i.e., sets of sets of individuals (type <<e,t>, t>). Within this framework, expressions of the type each N, every N and all N are represented as in (19a) and DPs headed by the indefinite article as in (19b):

(19)  a.  λQ ∀x (N(x) → Q(x))  
      b.  λQ ∃x (N(x) ∧ Q(x))

Indefinite DPs are thus generalized quantifiers that differ from other generalized quantifiers insofar as their representation contains an existential quantifier.

### 1.2.2 Indefinites as Free Variables

As explained in Sect. 1.1.3 above, according to DRT, singular indefinite DPs supply free variables that range over individuals. A DP such as a student in (20a) is associated with the discourse representation structure (20b). The nominal element (student in (20a)) functions as a predicate that restricts the range of the variable: in (20b), the range of x is the set of students.

(20)  a.  a student  
      b.  

<table>
<thead>
<tr>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student (x)</td>
</tr>
</tbody>
</table>

In intuitive terms, (20a) and (20b) say that a DP such as a student refers to any individual having the property of being a student. In other words, a random individual is extracted from the set of students.

According to Heim (1982), indefinite DPs contain no element corresponding to the existential quantifier – in particular, the existential quantifier does not correspond to the indefinite article and is therefore absent from the representations in (20) but is introduced by rules of “existential closure” (see (22) below and Chap. 2).

It is possible to extend Heim’s (1982) analysis from singular indefinites to plural indefinites, by allowing variables to range not only over atomic individuals but also over plural individuals (Link 1983). The two types of variables are represented by lower case and capital letters, respectively.
1.2 The Representation of Indefinite DPs

(21) a. *two students*  
a'. $X \land \text{Students}(X) \land \text{Two}(X)$  
b. *sm students*  
b'. $X \land \text{Students}(X)$

According to this analysis, a plural indefinite refers to a plural individual (made up of several atomic individuals), whose cardinality may or may not be specified. Cardinals (*one*, *two*, etc.) function as predicates indicating the cardinality of the plurality: the determiner denotes the property of being one, or two, etc. The representation in (21b') does not contain a cardinality predicate, because *sm* refers to an indefinite quantity.

According to the original version of DRT, the variables supplied by indefinites become bound by existential closure, by applying one of the two rules stated in (22a–b) (see Heim (1982: 140–152)):

(22) a. Adjoin an existential quantifier to the nuclear scope of every quantifier.  
b. Adjoin an existential quantifier to T(ext).

In later analyses inspired by DRT (Diesing 1992; Kratzer 1988, 1995), these two rules were dispensed with and a different rule of existential closure was introduced, which applies at the level of the VP. It is important to stress that (22)a–b on the one hand and VP-level existential closure on the other hand were not designed for the same type of indefinites: whereas (22)a-b were meant to respectively account for specific indefinites and dependent indefinites, VP-level existential closure was proposed for the analysis of existential bare plurals and more generally for weak indefinites (see Chaps. 4 and 5 for the distinction between strong and weak indefinites).

1.2.3 Indefinites as Choice Functions

Another type of analysis is due to Reinhart (1997a) and Winter (1997), who propose that certain indefinites be represented as existentially quantified choice functions. In the following representations, f is a choice function and [[student]] is a notation for the denotation of *student*, i.e., the set of atomic students. Similarly, *two students* and *sm students* respectively denote the set of sums of two students and the set of sums of students of unknown cardinality:

(23) a. *a student* translates as $f([[\text{student}]]))$  
b. *two students* translates as $f([[\text{two students}]]))$  
c. *sm students* translates as $f([[\text{students}]]))$

---

12 According to Reinhart, a subset of indefinite DPs does not behave like generalized quantifiers and should be represented by means of choice functions. Winter, on the other hand, maintains that all indefinites should be represented by choice functions.
A choice function maps any non-empty set onto an element of that set. It is therefore a function of type \( \langle e, t, e \rangle \), which applies to the property denoted by the nominal predicate (of type \( \langle e, t \rangle \)) and yields an individual (of type \( e \)) that has that property. So the choice function applied to the property \( \text{student} \) returns a student in the case of (23a), a plural individual corresponding to a sum of two students in the case of (23b) and a plural individual of undetermined cardinality in the case of (23c).

In the context of this analysis, the contribution of the indefinite is to introduce a variable over choice functions that gets bound by existential closure, which may apply at various points of the representation. Sentence (24) may be represented as in (24’a), which can be glossed as in (24’b).

\[
(24) \quad \text{A student is absent.} \\
(24’) \begin{align*}
&\text{a. } \exists f (\text{be-absent}(f(\text{student}))) \\
&\text{b. } \text{There exists a choice function and the student that this function chooses is absent}
\end{align*}
\]

One advantage of choice functions is that they can account for the scope ambiguities characteristic of indefinites without resorting to covert movement at the level of Logical Form. Example (25) illustrates this point. (25’a) represents the interpretation of (25) in which the indefinite outscopes the universal quantifier. (25’b) accounts for the interpretation in which the universal quantifier scopes over the indefinite. (25’c) and (25’d) are the tripartite representations that correspond respectively to (25’a) and (25’b).

\[
(25) \quad \text{Every woman read a book.} \\
(25’) \begin{align*}
&\text{a. } \exists f [\forall z (\text{woman}(z) \rightarrow \text{read}(z, f(\text{book})))] \\
&\text{b. } \forall z [\text{woman}(z) \rightarrow \exists f (\text{read}(z, f(\text{book})))] \\
&\text{c. } \exists f \forall z (\text{woman}(z)) [\text{read}(z, f(\text{book}))] \\
&\text{d. } \forall z \exists f (\text{woman}(z)) [\text{read}(z, f(\text{book}))]
\end{align*}
\]

In (25’a) and (25’b), the function \( f \) applies to sets of books. While remaining \textit{in situ}, the DP \textit{a book} outscopes the universal quantifier of \textit{every woman} in (25’a) due to the fact that the choice function variable, \( f \), is bound by an existential quantifier with wide scope. In (25’b), on the other hand, the point of insertion of the existential quantifier is lower.

We may compare this approach to the traditional approach in logic, where the relative position of quantifiers (existential and universal) accounts for the difference in interpretation: (26a–b) correspond respectively to the wide and narrow scope interpretations of the indefinite:

\[
(26) \begin{align*}
&\text{a. } \exists x \forall y (\text{woman}(y) \rightarrow (\text{book}(x) \land \text{read}(y,x))) \\
&\text{b. } \forall y \exists x (\text{woman}(y) \rightarrow (\text{book}(x) \land \text{read}(y,x)))
\end{align*}
\]
1.2 The Representation of Indefinite DPs

The superiority of a choice function analysis becomes clear when the property denoted by the head noun of the DP is empty.\(^{13}\) To illustrate this, take the case of a conditional sentence with an indefinite in the antecedent clause:

\[(27) \quad \text{Max will be furious if I invite a philosopher.}\]

\[(27') \quad \begin{align*}
\text{a. } & \exists f [\text{invite}(I, f(\text{philosopher})) \rightarrow \text{furious}(\text{Max})] \\
\text{b. } & \exists x [(\text{philosopher}(x) \land \text{invite}(I, x)) \rightarrow \text{furious}(\text{Max})]
\end{align*}\]

Let us suppose that there are no philosophers in the world. Then the representation (27'b) is true, since an implication is true when its antecedent is false: \(\text{philosopher}(x)\) is always false, so the antecedent is false and therefore the proposition (27'b) is true, counter to intuition.

In contrast, the choice function analysis makes it possible to account for the intuition that in a world without philosophers, (27) is not true but, at best, undetermined. For, according to Reinhart (1997a), a choice function is only defined if the set denoted by the property that the choice is based on is not empty. As a result, (27'a) is not true: since there is no function \(f\) such that \(f(\text{philosopher})\) is not defined and thus the antecedent of the conditional is not either.

Let us now briefly compare the choice function approach with the DRT account, where an indefinite DP introduces an individual variable that is bound by the existential quantifier. The specificity of the choice function analysis is that the descriptive content of the indefinite DP is not displaced: in both (25'a) and (25'b), the expression \(f(\text{book})\) appears in the second argument position of the predicate \(\text{read}\). Compare the formulas in (28'), corresponding to the DRT-type analysis, where the predicative expression is raised to the same level as the existential quantifier:

\[(28) \quad \text{Every woman read a book.}\]

\[(28') \quad \begin{align*}
\text{a. } & \exists x [\text{book}(x) \land \forall y (\text{woman}(y) \rightarrow \text{read}(y,x))] \\
\text{b. } & \forall y (\text{woman}(y) \rightarrow (\exists x (\text{book}(x) \rightarrow \text{read}(y,x))))
\end{align*}\]

Example (29) shows that this move of the DP from its surface position is necessary. If we did not move the condition \(\text{book}(y)\) from its surface position, we would obtain the representation (29'b), which is not satisfactory:

\[(29) \quad \text{Each professor rewarded every student who read a book he had recommended.}\]

\[(29') \quad \begin{align*}
\text{a. } & \forall x [\text{prof}(x) \rightarrow \exists y (\text{book}(y) \land \text{recom}(x,y) \\
& \quad (\forall z (\text{student}(z) \land \text{read}(z,y)) \rightarrow \text{reward}(x,z)))]
\end{align*}\]

---

\(^{13}\)In the literature, this point is known as the empty restriction problem or the Donald Duck problem.
16 Why Indefinites?

(29') b. \( \forall x [\text{prof}(x) \rightarrow \exists y (\forall z (\text{student}(z) \rightarrow ((\text{book}(y) \land \text{recom}(x,y) \land \text{read}(z,y)) \rightarrow \text{reward}(x,z)))] \)

(29'b) is not adequate, since it is verified in a world where the professors have not rewarded any students, not even those who read recommended books. Indeed, \( y \) can be instantiated with anything other than a book in order for (29'b) to be verified. In (29'a) this problem is avoided because the predicative condition \( \text{book}(y) \) has been moved out of the antecedent of the conditional.

In the case of (29), this movement is not problematic. But moving the descriptive content of the DP may pose a problem in the case of plural indefinites. This is illustrated in example (30), due to Ruys (1992):

(30) If three relatives of mine die, I will inherit a house.
(30') a. \( \exists f ((\text{die}(f(\text{relatives})) \land |f(\text{relatives})|= 3) \rightarrow \exists y (\text{inherit}(I, y) \land \text{house}(y)) \)
   b. \( \exists X (\text{relatives}(X) \land |X|= 3 \land (\forall x \in X (\text{die}(x) \rightarrow \exists y (\text{inherit}(I, y) \land \text{house}(y)))))) \)

Sentence (30) may receive an interpretation where the indefinite *three relatives of mine* takes narrow scope with respect to *if*: I will inherit a house once any group made up of three of my relatives passes away. But (30) can also mean that there is a group of three of my relatives such that if all three die, then I will inherit a house. This second interpretation, where the indefinite takes wide scope, is well captured by (30'a), which uses choice functions, but poses a problem for the DRT-type analysis as (30'b): (30'b) is not able to dissociate wide scope and a distributive interpretation of the plural indefinite. The advantage of (30'a) is that it can account for the collective reading, even if the predicate *die* is a distributive predicate, ultimately applying to individuals.

1.2.4 Indefinites as Skolem Terms

Building on Farkas (1997a, b, 2001) and Steedman (2003, 2006) proposed that indefinites should not be represented as variables but rather as referential expressions (type e) modeled as Skolem terms, which can be either (a) dependent terms obtained by applying a Skolem function, e.g., ‘the mother of’ or ‘the daughter of’ to all the variables bound by a universal quantifier in whose scope the indefinite occurs or (b) constant terms (whenever there are no universal quantifiers C-commanding the indefinite). Steedman’s proposal resembles the choice function analysis insofar as it assumes that indefinites are analyzed *in situ.*
1.2 The Representation of Indefinite DPs

In (31a), the indefinite in the object position is represented as a dependent Skolem term notated sk53(x), referring to the entity\textsuperscript{14} that is obtained by applying the constant Skolem function sk53 to each variable x bound by the universal quantifier. In other words, the individual referred to by some\textit{body} is not picked up randomly but instead its referent depends on the variable bound by the universal quantifier. The difference between (31a) and (31b) is that in the latter, some\textit{body} translates as a constant, notated sk95, without x. This notation is meant to account for ‘widest scope’ indefinites, which according to Steedman refer to ‘specific individuals’, which ‘have scope everywhere’ (pp. 14, 37)\textsuperscript{15}:

\begin{align*}
(31) & \quad \text{Everybody loves somebody.} \\
& \quad \text{a. } \forall x[\text{person}(x) \rightarrow (\text{person}(sk53(x)) \land \text{loves}(sk53(x), x)] \\
& \quad \text{b. } \forall x[\text{person}(x) \rightarrow (\text{person}(sk95) \land \text{loves}(sk95, x)]
\end{align*}

It should be stressed that the Skolem function proposed by Steedman is a constant (as indicated by the numerical index attached to sk (from Skolem)) in both (31a) and (31b), i.e., regardless of whether the indefinite is interpreted as specific (taking widest scope) or as dependent on another quantifier. Under Steedman’s analysis then, existential closure is dispensed with.

But note that Steedman does not discuss bare nouns. For this type of indefinite expression, Diesing’s (1992) VP-level existential closure might well be needed.

1.2.5 Indefinites and Properties

Nominal expressions lacking a determiner (currently referred to as ‘bare NPs’) can be grouped together with indefinites because in at least part of their distribution they take existential readings. According to a quite influential proposal, existential bare NPs are property-denoting expressions (type \text{<e,t>}) not only when they function as predicates but also when they occur in argument positions (McNally 1995a; van Geenhoven 1996; Dobrovie-Sorin 1997a, b; Ladusaw 1994; Chung and Ladusaw 2003). Property-denoting arguments rely on a particular rule of semantic composition, known as ‘semantic incorporation’ (cf. Chap. 2).

\textsuperscript{14} Steedman insists that Skolem terms do not denote functions (a constant Skolem function is merely part of their representation) but are referential terms (type e) that are assigned structured representations.

\textsuperscript{15} According to Steedman (2006) the scope of indefinites is always assigned \textit{in situ} and depends on ‘generalized Skolem term specification’, which is an “anytime” operation, in the sense that it can apply at any point in a derivation: a Skolem term is specified as a constant if the specification operation applies as soon as the DP constituent has been formed, i.e., before the DP combines with, e.g., some quantified expression; it is specified as a dependent Skolem term if the specification operation applies only after the indefinite DP combines with the main predicate and other arguments of that predicate.
Several authors have proposed that the ‘weak’ readings (in the sense of Milsark (1977)) of indefinites can also be analyzed as relying on property denotation (see Ladusaw 1994; Dobrovie-Sorin 1997a, b; McNally and van Geenhoven 1998 and Chaps. 4 and 5, below). This would explain, among other things, their ability to appear in existential there constructions (see McNally 1998).

### Table 1.2

<table>
<thead>
<tr>
<th>Indefinites analyzed as</th>
<th>Notation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existential generalized quantifiers</td>
<td>( \lambda P \exists x (N(x) \land P(x)) )</td>
<td>Montague (1974)</td>
</tr>
<tr>
<td>Free variables</td>
<td>( x \land N(x) )</td>
<td>Kamp (1981) and Heim (1982)</td>
</tr>
<tr>
<td>Choice functions</td>
<td>( f(N) )</td>
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<td>Skolem terms</td>
<td>( Sk_{53}(x) )</td>
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<td>Property-denoting expressions</td>
<td>( N )</td>
<td>Van Geenhoven (1996), McNally (1998), and Dobrovie-Sorin (1997a, b)</td>
</tr>
</tbody>
</table>

In this book we will show that the property analysis of indefinites, which we had ourselves adopted in Dobrovie-Sorin and Beyssade (2004), is confronted with several problems. We will therefore put forward a new analysis for weak indefinites, which crucially relies on the distinction between two types of entities: individualized entities and amounts, notated \( e_i \) and \( e_a \), respectively. The core proposal to be developed in the various chapters of the book will be that weak indefinites are existential generalized quantifiers over amounts, i.e., expressions of type \( \langle e_a, t \rangle, t \rangle \).

#### 1.2.6 Indefinites as Existential Generalized Quantifiers over Amounts

In this book we will show that the property analysis of indefinites, which we had ourselves adopted in Dobrovie-Sorin and Beyssade (2004), is confronted with several problems. We will therefore put forward a new analysis for weak indefinites, which crucially relies on the distinction between two types of entities: individualized entities and amounts, notated \( e_i \) and \( e_a \), respectively. The core proposal to be developed in the various chapters of the book will be that weak indefinites are existential generalized quantifiers over amounts, i.e., expressions of type \( \langle e_a, t \rangle, t \rangle \).

#### 1.2.7 Conclusion

The following table summarizes the analyses of indefinites that can be found in the literature (Table 1.2). In the various chapters of this book we will present arguments based on lexical, syntactic and contextual criteria, which allow us to choose among the possible representations of indefinites.

#### 1.3 Semantic Properties of Nominal Determiners

Assuming the need to distinguish between referential DPs, quantified DPs and indefinite DPs, we must specify the criteria that enable us to place a random DP into one of these three classes. Referential DPs can be easily spotted, even if their
determiners are not all of the same form. Here we will assume the usual list: proper names, definite and demonstrative DPs (i.e., DPs with definite or demonstrative articles), possessive DPs (i.e., DPs with possessive adjectives).

**Referential DPs**

a. proper names: *Mary, John, Smith*
b. definite DPs: *the book, the girl*
c. demonstrative DPs: *this book, that girl*
d. possessive DPs: *my book, my girl*

The remaining DPs must be classified as either indefinite or quantified DPs. We will place DPs with indefinite articles (*a girl*) among the indefinite DPs and universal DPs (*every girl, each girl, all girls*) among the quantified DPs. But what should we do with the rest: *two girls, three girls, most girls, 20% of the girls, certain girls, a few girls, exactly three girls*, etc.?

Several semantic tests and semantic properties, such as conservativity, intersectivity and symmetry, can be used in order to classify DPs (Barwise and Cooper 1981; Keenan and Stavi 1986). To illustrate these properties, sentences will be represented as tripartite structures of the form Det A B corresponding to the syntactic sequence Det NP VP obtained from a subject – predicate configuration DP VP by shifting DP into Det and NP: A is the set of x’s such that NP(x) is true and B the set of x’s such that VP(x) is true. The determiner relates a noun phrase and a verb phrase.

### 1.3.1 Conservativity

A determiner Det is said to be conservative if and only if (a) and (b) have the same truth conditions:

(a) \( \text{Det A B} \)

(b) \( \text{Det A (A } \cap \text{ B)} \)

This means that in order to determine whether Det A B is true, one need only look at set A and the intersection of A and B, i.e., \( (A \cap B) \); those elements that are neither A nor B, as well as those that are B but not A, are irrelevant.

(32) a. All cats are grey.
   b. All cats are grey cats.

(32’) a. *(Most/Some) children sing.*
   b. *(Most/Some) children are children who sing.*

(32’’) a. No child sings.
   b. No child is a child who sings.
To see whether the proposition *all cats are grey* is true, one does not need to identify non-grey non-cats (e.g., white mice) or grey non-cats (e.g., grey mice).

As shown by Keenan and Stavi (1986), the majority of natural language determiners are conservative. There are however certain elements that might be analyzed as determiners (due to their prenominal position) but that are not conservative (cf. Gamut 1991, vol II, p. 246):

(33)  
\[ \begin{align*}
    \text{a. Only men smoke.}  \\
    \text{b. Only men are men who smoke.}
\end{align*} \]

It seems clear that (33a) and (33b) are not true in the same worlds. To evaluate (33a), it is not sufficient to look at the set of men and the set of men who smoke, we must also consider the set of non-men smokers. The non-conservativity of *only*-DPs is not problematic for Keenan and Stavi’s generalization, since there are reasons to believe that *only* is not a determiner: it never combines with a common noun but only with a maximal nominal projection (a proper name, a common noun preceded by a determiner or a bare plural).

(34)  
\[ \begin{align*}
    \text{a. Only John}  \\
    \text{b. Only the neighbor}  \\
    \text{c. Only girls}  \\
    \text{*Only neighbor}  \\
    \text{*Only girl}
\end{align*} \]

*Many* is another expression that is not conservative and yet it is traditionally analyzed as a determiner:

(35)  
\[ \begin{align*}
    \text{a. Many Scandinavians have won the Nobel prize.}  \\
    \text{b. Many Scandinavians are Scandinavian Nobel prize winners.}
\end{align*} \]

Clearly (35a) and (35b) do not have the same truth conditions: (35a) is evaluated with respect to the number of Nobel prizes and (35b) is evaluated with respect to the number of Scandinavians.

If *many* is assumed to be a determiner, then it must be admitted that conservativity does not characterize all natural language determiners but only the extensional ones (cf. Keenan and Stavi 1986). Extensional determiners are those that do not vary according to context. This is not the case with the relative use of *many.*

\[ \text{[16] An alternative solution is to say that *many* takes a third argument, one that corresponds to the norm. This argument must be contextually instantiated. Once the norm is determined, *many* becomes conservative.} \]

\[ \text{[17] Formally, a determiner Det is said to be extensional if and only if for all A, B, E and E’ such that E’ \supseteq E and Det A B is true in E, then Det A B is also true in E’.} \]
1.3.2 **Intersectivity**

A determiner Det is said to be intersective if and only if (a) and (b) have the same truth conditions:

(a)  Det A B
(b)  Det \((A \cap B) B\)

In other words, to verify a proposition of type (a), we must check whether Det individuals that are A and B are B. To determine the truth value of the sentence, one need only consider individuals that verify both A and B. One need not know the set A in its entirety: specifically, there is no point in considering those A’s that are not B.

Certain determiners, such as cardinals, are intersective:

(36)  a. Two students arrived late.
    b. Two individuals that are students and that arrived late arrived late.

Besides cardinals, the following determiners are also intersective: *a, some, several.*

1.3.3 **Symmetry**

A determiner Det is said to be symmetric if and only if (a) and (b) have the same truth conditions:

(a)  Det A B
(b)  Det B A

It can be demonstrated (cf. Szabolcsi 1997: 21) that, for conservative determiners, symmetry goes hand in hand with intersectivity: if a determiner is conservative and intersective, then it is also symmetrical (if Det A B, Det A \((A \cap B)\) and Det \((A \cap B) B\) have the same truth conditions, then Det B A does so too) and vice versa, if a determiner is conservative and symmetric, then it is also intersective (if Det A B, Det A \((A \cap B)\) and Det B A have the same truth conditions, then Det \((A \cap B) B\) does so too).

This generalization can be illustrated by considering again example (36a): *two*, which is intersective, is also symmetric. (36a) and (36c) have the same truth conditions.
Why Indefinites?

1.3.4 Proportional Determiners

A determiner Det is said to be proportional when the truth conditions of Det A B depend on the relation between the cardinality of (A ∩ B) and that of A. Many, most, 20% of, all are examples of proportional determiners. Such determiners are non-intersective: to verify whether a certain proportion of A is B, it is not enough to compare the elements of (A ∩ B) and those of B. One must also know the cardinality of A, the number of individuals that verify A. Thus, (37a) and (37b) do not have the same truth conditions:

(37) a. Most students arrived late.
   b. Most individuals who are students and who arrived late arrived late.

Imagine that there are six students and that only two arrived late. Two out of six is not much. In this model, (37a) is false. And yet (37b) is true.

Proportional determiners are not symmetric either: (37a) may be true while (37c) is false. This would be the case if, out of six students, five arrived late in addition to 20 other people who are not students.

(37) c. Most individuals who arrived late are students.

Proportional determiners should be distinguished from partitives such as two of the, which are intersective (cf. (38a)) and symmetric (cf. (38b)).

(38) Two of the students arrived late.
   a. Two of the people that are students and that arrived late arrived late.
   b. Two of the people who arrived late are students.

Every can be classified as a proportional determiner, since totality can be viewed as a specific proportion, i.e., 100%.

---

18 Here, we are not taking presuppositions into account.
19 This point is still under debate. Thus, Keenan (1996) notes that, unlike other proportional determiners, every is not necessarily defined as a relation between the cardinality of (A ∩ B) and the cardinality of A. Knowing the cardinality of A is not necessary to verify that Every A is B, since it is enough to check whether the set of A's that do not verify B is empty.
1.3.5 Monotonicity

1.3.5.1 Monotone Increasing with respect to A

Det is monotone increasing with respect to A if, for all A’ greater than A (e.g., A = linguist and A’ = researcher), Det A’ B is true if that Det A B is true:

(39) a. Many linguists are French.
    b. Many researchers are French.

(40) a. Few linguists are French.
    b. Few researchers are French.

(39a) entails (39b), therefore many is monotone increasing with respect to A. Few is not monotone increasing with respect to A: (40a) does not entail (40b); there may be many French researchers but few French linguists.

1.3.5.2 Monotone Increasing with respect to B

Det is monotone increasing with respect to B if, for all B’ greater than B (e.g., B = French and B’ = European), Det A B’ is true if that Det A B is true:

(39) c. Many linguists are European.
    (40) c. Few linguists are European.

(39a) entails (39c), therefore many is monotone increasing with respect to B. Few is not monotone increasing with respect to B: (40a) does not entail (40c); there may be few French linguists but many European linguists.

1.3.5.3 Monotone Decreasing with respect to A

Det is monotone decreasing with respect to A if, for all A’ smaller than A (e.g., A = researcher and A’ = linguist), Det A’ B is true if that Det A B is true:

(41) a. Many researchers are French.
    b. Many linguists are French.

(42) a. Few researchers are French.
    b. Few linguists are French.

(41a) does not entail (41b), therefore many is not monotone decreasing with respect to A. Likewise, few is not monotone decreasing with respect to A: (42a) does not entail (42b); there may be few French researchers but many French linguists, relative to linguists in general.
1.3.5.4 Monotone Decreasing with Respect to B

Det is monotone decreasing with respect to B if, for all B’ smaller than B (e.g., \( B = \text{European} \) and \( B' = \text{French} \)), Det A B’ is true if that Det A B is true:

\[(43) \quad \begin{align*}
    a. & \quad \text{Few researchers are European.} \\
    b. & \quad \text{Few researchers are French.}
\end{align*}\]

\( (43a) \) entails \( (43b) \), therefore \textit{few} is monotone decreasing with respect to B.

1.3.6 The Semantic Characterization of Indefinites

The semantic properties of determiners presented above make it possible to identify indefinite DPs by distinguishing them from both quantificational DPs and referential DPs. Indefinite determiners may be defined as the subclass of determiners that are both symmetric and intersective (cf. Keenan 1987).

All cardinals (two, three, etc.) and modified cardinals (at least two, at most three) are symmetric. They are also conservative and therefore, because of the relationship between conservativity, intersectivity and symmetry mentioned in Sect. 1.3.3., they are intersective as well.

DPs headed by intersective determiners are semantically flexible: depending on the syntactic context and the lexical content of the determiner, they can be analyzed as existential generalized quantifiers over amounts, as Skolem terms, or as quantificational DPs (i.e., existential generalized quantifiers over individuals).

1.4 The Interpretation of Indefinites

1.4.1 The Interpretation of Indefinites and Presupposition

In order to describe the interpretation of indefinite DPs, we need to distinguish between assertion and presupposition.

1.4.1.1 Assertion and Presupposition

Ever since the work of Frege, Russell and Strawson on the meaning and denotation of linguistic expressions, it is common to distinguish between assertion and presupposition: that which is asserted is subject to debate, while that which is presupposed is part of the background information and as such is not included in that which can be questioned. This distinction has an effect upon the denotation of a sentence.
A false presupposition triggers a presupposition failure, which is usually analyzed in terms of truth value gap: the sentence has no truth value, it is neither true nor false. To illustrate this distinction, let us consider the following examples:

(44)  a. Mary is pregnant and John doesn’t know it.
    b. John doesn’t know that Mary is pregnant.

In (44a), it is asserted that Mary is pregnant, whereas in (44b) Mary’s being pregnant is presupposed. So, if Mary is not pregnant, (44a) is false, while (44b) is neither true nor false.

1.4.1.2 Presupposition of Existence and Assertion of Existence

Certain sentences presuppose the existence of individuals corresponding to the DPs that they contain, while other sentences assert their existence. We will respectively talk about presuppositional and existential (non-presuppositional) readings. Definite articles are unanimously assumed to presuppose existence (see (45a), which presupposes the existence of a king of France), whereas indefinite articles and cardinals are often existential and non presuppositional (see (45b)).

(45)  a. John says that the king of France is bald.
    b. John tells that a king of France is bald.

Based on the examples in (46) and (46'), Reinhart (1995) points out that speakers do not hesitate to say that (46'a) and (46'c) express false judgments and that (46'b) is true. On the other hand, she claims that judgments waver for examples (46a–c).

    b. No American king lived in New York.
    c. Two American kings lived in New York.
(46')  a. There was an American king in New York.
    b. There were no American kings in New York.
    c. There were two American kings in New York.

The examples in (46') are there-sentences, which do not presuppose but rather assert the existence (or non existence) of one or more individuals, one or more American kings. Thus they are either true (see (46'b)) or false (see (46'a) and (46'c)).

The examples in (46), on the other hand, are subject-predicate configurations in which indefinites occupy the preverbal subject position. In this position, indefinites can have two different interpretations: the first one is identical to the interpretation found in (46'); the second interpretation is partitive: “one of the American kings”,

etc. In the first case (assertion of existence), the judgments of acceptability for (46a–c) are identical to those for (46′a–c). But in the second case, the indefinites of (46a–c) presuppose that the set of American kings is not empty and since the presupposition contradicts their knowledge of the world, speakers cannot assign truth values to (46a–c). The observed fluctuation in judgments is probably due to the fact that speakers do not analyze these sentences in the same way. Some speakers analyze them as existential sentences and thus judge them to be true or false, the same as they do for the examples in (46′). Others analyze them as presuppositional.

1.4.1.3 Presupposition and Partitivity

Some indefinites, e.g., those introduced by certain, have a partitive interpretation. Attal (1976) points out the contrast in French between certains, which gives rise to a quantificational reading, and des, which cannot do so (except marginally, usually in a contrastive context):

(47) a. Certains enfants étaient tristes.
   ‘Certain children were sad.’
   b. ?? Des enfants étaient tristes.
   ‘Sm (unaccented some) children were sad.’

According to Milsark (1977), there are other indefinites, in particular cardinal indefinites, which are compatible with a partitive reading. In (48), two girls has an interpretation comparable to that of an explicitly partitive indefinite (i.e., two of the girls):

(48) Two girls were blond, all the others had dark hair.

Be they implicit or explicit, partitive indefinites presuppose the existence of a contextually determined set of individuals (whence the term “D(iscourse)-linked” due to Pesetsky 1987) and can be represented as tripartite structures, in the same way as quantificational DPs:

(49) Two x (girl(x)) [x was blond]

1.4.2 Distributive and Collective Readings

Truly quantificational DPs (such as DPs with each in English and chaque in French) are necessarily distributive, whereas definite and indefinite DPs are ambiguous between a collective and a distributive reading.
271.4 The Interpretation of Indefinites

(50) a. My children sang songs.
   b. Three children sang a song.

These sentences can mean that the children sang together, or that they sang individually.

Theoreticians fail to agree on how to represent the distributive reading: should a distributive operator be introduced in Logical Form, or is the difference between the two readings not a true ambiguity but rather a matter of underdetermination, all pluralities being open to different partitionings (cf. the “covers” used by Gillon 1996; Schwarzschild 1992)? A set made up of three individuals \{a,b,c\} could be partitioned in several different ways: (i) as a group (a collective individual) made up of three atomic individuals; (ii) as a set made up of three distinct individuals; (iii) as a set made up of two groups, with three possibilities: \{(a,b),c\}, \{(a,c),b\}, \{(b,c),a\}. Which of these structures is chosen can remain undetermined: besides the collective and strictly distributive readings of (50a–b), corresponding to (i) and (ii), these examples can be used to describe other situations or events, corresponding to the possibilities enumerated in (iii), e.g., two children sang together and one sang individually. That being said, there are syntactic contexts (syntactic position or lexical properties of the predicate) that can impose one or another of the structures (“covers”) that are compatible with a plural DP. For example, a predicate that can only apply to atomic individuals forces a strictly distributive reading:

(51) Three students are strangers.

1.4.3 Scope Ambiguities

Since Fodor and Sag (1982), we know that the scopal properties of indefinite DPs differ from those of quantificational DPs. The latter cannot scope out of the minimal clause to which it belongs, whereas certain indefinites can do so:

(52) Two professors did not know whether every student had read an eighteenth century writer.

In this example, the speaker may have in mind a particular eighteenth century writer. In terms of scope, an eighteenth century writer can be said to have wider scope than two professors, even though the latter is not contained in its minimal clause.

For Fodor and Sag, the wide scope interpretation of indefinites is to be explained as being due to a referential reading, comparable to that of demonstratives; the narrow scope interpretation would be due to a “quantificational” reading.
Fodor and Sag’s analysis cannot account for the so-called ‘intermediate readings’ observed by Farkas (1981) and rediscovered by Abusch (1994). Thus, a sentence such as (53) allows not only the interpretation paraphrased in (54a), which is the only one predicted by Fodor and Sag, but also the ‘intermediate’ reading paraphrased in (54b), according to which the indefinite scopes out of the embedded sentence in which it occurs, but it does not take scope over the quantified DP that occurs in the main sentence:

(53) Every professor rewarded every student who read a novel.

(54) a. There is a novel, such that every professor rewarded every student who read it.
    b. Every professor chose a specific novel and rewarded every student who read that novel.

Moreover, certain indefinites, in particular bare mass nouns and bare plurals, take “extra-narrow” scope (see Carlson’s 1977a observations for English, which extend to Romance languages such as Spanish, Italian and Romanian), which is never found with canonical quantifiers. Yet another scope problem concerns modified cardinals, which, unlike quantificational phrases (cf. (55a) vs (55b)), cannot take scope over the QP in subject position (Liu 1990; Beghelli and Stowell 1997) when they occur in object positions:

(55) a. Every professor will examine at least two students.
    b. Every professor will examine each student.

These various problems will be analyzed in Chaps. 2 and 6.

1.4.4 Specific/Non-specific/Generic Readings

Examples (56)–(58) respectively illustrate specific, non-specific and generic readings of singular indefinites:

(56) John saw a good movie yesterday.
(57) John is looking for a secretary that can speak Russian.
(58) A bird can fly.

These readings have been relatively well described in the literature. One of our goals is to correlate these interpretive differences with the different denotation types of indefinites.
1.5 Conclusion

The aim of this book is to circumscribe the class of indefinite DPs and to propose a unified analysis that may cover the diversity of their context-driven interpretations. Each of the chapters is devoted to a particular empirical domain (bare NPs, existential sentences, ambiguities, scope, dependency relations, genericity) and presents empirical arguments that may help us choose among the various analyses of indefinites to be found in the literature, which we have reviewed above in Sect. 1.2. We will also outline the theoretical challenges associated with treating indefinites as referential, quantificational or property denoting. The latter hypothesis will be carefully examined, as it has played an important role in the recent literature starting with McNally (1995a) and van Geenhoven (1996). Although we had ourselves adopted the property analysis of indefinites in Dobrovie-Sorin and Beyssade (2004), the empirical and theoretical limits of this account have led us to abandon it in this book. We put forward a new hypothesis, based on distinguishing two types of entities: individualized entities and amounts, respectively notated $e_i$ and $e_a$. Given this distinction, we treat weak indefinites as existential generalized quantifiers over amounts ($\text{type} \langle<e_i,t>,t\rangle$). Strong indefinites will be analyzed as either Skolem terms (Steedman (2003, 2006)) or as quantificational. The choice among these possible analyses of indefinites will be shown to depend on the lexical content of verbal and nominal predicates, the syntactic context and information structure (topicalization, focalization).
Bare Noun Phrases (bare NPs henceforth) are nominal constituents that are not preceded by an overt determiner. The analysis of bare NPs is challenging insofar as we need to (i) account for the crosslinguistic variation regarding the use of bare NPs, (ii) propose different analyses for bare plurals and count bare singulars, as they exhibit very different distributions in some languages and (iii) account for the similarities and differences between argumental bare NPs (i.e., bare NPs that occupy argument positions) and predicative bare NPs (i.e., bare NPs occurring as predicates of copular sentences). Moreover, we need to account for the differences and similarities between bare NPs and indefinites headed by overt Determiners, in particular the French *du/de la/des* indefinites.

### 2.1 Bare Noun Phrases across Languages

Given the standard view, according to which it is the determiner that is responsible for referential or quantificational uses of nominal expressions, bare NPs should be assumed to denote properties or, in extensional terms, sets. *Qua* property-denoting expressions, bare NPs are expected to appear in predicate positions and ruled out from argument positions. We will show, however, that there is no clear correlation between absence vs presence of article and predicate vs argument positions, which means that the possibility for some bare NPs to appear in predicate positions should not be taken as evidence in favor of the property analysis of bare NPs occupying argument positions.
2.1.1 An Overview of Crosslinguistic Variation

All Romance languages, including French, allow bare NPs to occur in predicate positions. Note however that bare NPs are allowed in predicate positions only with nouns describing professions, roles, etc. (see Sect. 2.7 below):

(1) a. Jean est médecin.
   Jean is doctor
   ‘Jean is a doctor.’

   b. Jean et Marie sont médecins.
   Jean and Marie are doctors
   ‘Jean and Marie are doctors.’

In examples such as (1a–b), the bare NPs can safely be assumed to denote properties.

In all Romance languages other than French (Spanish, Catalan, Romanian, Italian, as well as continental and Brazilian Portuguese), bare plurals and bare mass nouns can also appear in most of the argument positions:

(2) a. Juan invitó estudiantes.  Spanish
   Juan invited students.

   b. Ion a băut lapte.  Romanian
   Ion has drunk milk
   ‘Ion drank milk.’

In the same contexts, French disallows bare NPs (see (3a–b)) and uses indefinites headed by de la/du/des instead (see (3a’–b’)):

(3) a. *Jean a invité étudiants.
   Jean has invited students
   a’. Jean a invité des étudiants.
   Jean has invited des students
   ‘Jean invited students.’

   b. *Dans la rue jouaient étudiants.
   in the street play.IMPF students
   ‘In the street were playing students.’

   b’. Dans la rue jouaient des étudiants.
   in the street play.IMPF des students
   ‘Students were playing in the street.’

Turning now to bare count singulars (BSs henceforth),1 Romance languages (other than French) differ among each other regarding their use in argument positions:

---

1 The label ‘bare singulars’ used in some of the current literature (Schmitt and Munn 1999; Munn and Schmitt 2005; Farkas and de Swart 2003) and taken up here is somewhat misleading because:
   (i) there is no singular marking on bare count nouns and therefore they can be viewed as
2.1 Bare Noun Phrases across Languages

(4) a. Joao invitou aluno.  
   Brazilian Portuguese
b. *Juan invitó estudiante.  
   Spanish
c. *Ion a invitat student.  
   Romanian
d. *Gianni ha invitato student.  
   Italian
   John has invited student.

These examples show that in Brazilian Portuguese, BSs are freely used in postverbal positions (objects or postverbal subjects), whereas in Spanish, Catalan or Romanian they are severely restricted, being able to appear only in the object position of certain predicates. In Italian, BSs are ruled out even in these restricted contexts:

(5) a. Juan compró apartamento.  
   Spanish
   ‘Juan bought an apartment.’
b. Ion şi-a cumpărat apartament.  
   Romanian
   ‘Ion bought an apartment (for himself).’
c. *Gianni ha comprato apartamento.  
   Italian
   John has bought apartment.

English behaves like Romance languages other than French insofar as it freely allows BPs and bare mass nouns in argument positions but differs from these languages insofar as it rules out BSs not only from all argument positions (the English counterpart of (5)a–c is ruled out) but also from predicate positions.

(6) a. John invited students.
b. John drank wine.
c. *John bought apartment.
d. *John is professor.

The table below summarizes the generalizations illustrated above. The indications ‘yes’ and ‘no’ are straightforward: they mean that bare NPs are allowed and respectively disallowed; the indication ‘yes/no’ means that bare NPs of the relevant type are severely constrained (Table 2.1).

In this chapter we will attempt to explain the quite complex crosslinguistic generalizations summarized in this table. We will leave aside Brazilian Portuguese, for which the reader is referred to Schmitt and Munn (1999), Müller (2002), Munn and Schmitt (2005), Dobrovie-Sorin and Pires de Oliveira (2008, 2010). We will concentrate on Spanish, Catalan and Romanian, because these languages exhibit an interesting contrast between BPs and BMNs, which are quite freely allowed, and BSs, which are severely restricted in argument positions. The data in this group of languages will be compared to those in French on the one hand and English on the

‘non plural’ rather than as ‘singular’; (ii) they are not semantically singular but rather number-neutral. Nevertheless we have decided to adopt this label, in order to bring out the contrast between BPs and these other unmarked count nouns. What we call ‘bare singular’ is called ‘count bare noun’ by some authors (Müller 2002; Dobrovie-Sorin 2010; Espinal and McNally 2011.)
other. French disallows any kind of argumental bare NPs (including BPs and BMNs) but allows bare NPs in predicate positions (more or less in the same contexts as all the other Romance languages), whereas English allows argumental BPs and BMNs but disallows BSs in all positions, including predicate positions.

The contrast between BSs on the one hand and BPs and BMNs on the other can be restated as a generalization regarding indefinite articles. If we distinguish indefinite articles (e.g., un and des in French, a in English, un(a) in Spanish, etc.) from other indefinite determiners such as quelque(s), plusieurs in French or some, certain, several in English, we can say that English, along with Romance languages other than French, has indefinite articles for count singular nouns but lacks them for plurals or mass nouns.

The brief presentation sketched above is sufficient for the reader to become aware of the many questions that arise regarding the analysis of bare NPs: (a) What is the syntactic analysis of bare NPs? Are they full DPs headed by covert Det’s or are they truly bare? (b) Is the syntactic analysis of bare NPs different depending on whether they appear in predicate or in argument positions? (c) Why is it that BPs and bare mass nouns have a larger distribution than count BSs? Is the syntactic analysis of BPs and bare mass nouns different from the syntactic analysis of BSs? (d) What is the semantic analysis of bare NPs? Are they names of kinds (Carlson 1977a, c; Chierchia 1998), property-denoting expressions (McNally 1995a, b, 1998; van Geenhoven 1996; Dobrovie-Sorin 1995, 1997a, b; Dobrovie-Sorin and Laca 1996, 1999; Laca 1996; Dobrovie-Sorin and Beyssade 2004) or do they introduce free variables that get bound by existential closure, like indefinites (Diesing 1992; Kratzer 1988, 1995)?

### 2.1.2 The Distribution of Bare NPs in Romanian, Spanish and Catalan

In this section we show that in Romanian, Spanish and Catalan, the distribution of BSs is much more restricted than the distribution of BPs and bare mass nouns, which indicates that BSs and BPs must be given different analyses (Dobrovie-Sorin et al. 2005, 2006; Espinal and McNally 2011). The generalizations that hold in this group of Romance languages will be illustrated with Romanian, which is less studied than the other Romance languages and therefore, Romanian data are more informative for the reader.
The distribution of bare NPs is more restricted than that of full DPs (nominals with an overt determiner). Thus, bare NPs cannot appear in the preverbal subject position\(^2\) nor as the object of experiencer-subject psych-verbs such as *love, hate, detest, respect*, etc.

(7) a. *Noroi curgea pe stradă.*  
   mud flow.impf on street  
   ‘Mud was flowing in the street.’

b. *Ion respectă profesori.*  
   Ion respects professors

However, if we leave aside these contexts, bare plurals and bare mass nouns can freely appear as direct objects of most verbs, as well as in the post-verbal subject position\(^3\):

(8) a. *Am desenat copaci.*  
   have.1sg drawn trees  
   ‘I drew trees.’

b. *Ion mâinească numai brâncă.*  
   Ion eats only cheese  
   ‘Ion eats only cheese.’

(9) a. *Aici se spală rufe.*  
   here se wash clothes  
   ‘One does the laundry here.’

b. *Pe stradă curgea noroi.*  
   on street flow.impf mud  
   ‘Mud was flowing in the street.’

Count bare singulurs clearly differ from BPs and bare mass nouns insofar as their distribution is much more restricted. Thus, BSs are generally ruled out in the contexts illustrated above:

(10) *Am desenat copac.*  
    have.1sg drawn tree  

The example in (10) becomes grammatical if we add the singular indefinite article:

(11) *Am desenat un copac.*  
    have.1sg drawn a tree

Nevertheless, bare singulurs can appear quite productively in the object position of a reduced number of verbs, e.g., *have* and acquisition verbs, some intensional verbs such as *look for*, some other verbs such as *wear or use*, some light verbs, and also in some idiomatic expressions.

\(^2\) BMNs and BPs can appear in the preverbal subject position provided that they are modified (by an adjective, PP or relative clause), coordinated or contrastively stressed (Longobardi 1994 among others).

\(^3\) We will leave aside the use of bare NPs after prepositions.
(12) a. Ion are casă.
   Ion has house
   ‘Ion has a house.’

 b. Casa asta are lift.
   house-the this has lift
   ‘This house has a lift.’

c. Ne-au pus în sfârșit lift.
   us.DAT-have.3PL put in end lift
   ‘At last they put in a lift (for us).’

d. Ion șii-a cumpărat casă.
   Ion se.DAT-has bought house
   ‘Ion has bought a house (for himself).’

The data reviewed here show the necessity of a three-way distinction: (i) nominal expressions with overt determiners; (ii) bare plurals and bare mass nouns (iii) count bare singulars.

2.1.3 The Syntactic Structure of Bare NPs

The three-way distinction in the distribution of nominal constituents observed above can be correlated with a three-way distinction in syntactic structure, as shown in (13a–c); as an alternative to (13c) we may assume that the indefinite article a is generated under Num and moved from there to Det:

(13) a. Bare singular
   NP
       |
       copil
       child

   b. Bare plural
      NumP
         |
         Num° NP
              |
              Pl      copii
              child.Pl.

   c. Full DP
      DP
         |
         Det NumP
              a      Num° NP
                  |
                  Sg      copil
                  child.SG
Unlike full-fledged DPs, which are headed by a Det(ERMINER), the two types of bare nominals are similar in that they both lack the functional category Det but nonetheless different: bare plurals are NumPs, projections of the functional category of Number, whereas bare (count) singulars are purely lexical projections of the noun, NPs. An NP that lacks Number has in its extension both atomic entities and sums thereof; a NumP constituent headed by Number has only atomic entities or only sums in its extension, depending on whether Number is valued as singular or as plural.\(^4\) The role of Det is to ensure reference to entities or generalized quantifiers.

Problems arise, however, as soon as we take into account the distribution of bare NPs in predicate positions (see Sect. 2.8 below). It will turn out that we cannot treat bare NPs in argument positions on a par with bare NPs in predicate positions and we will therefore be led to distinguish between the two by assuming that bare NPs in predicate positions are genuine bare NPs, whereas bare NPs in argument positions are full DPs headed by a null Det.\(^5\) This hypothesis is welcome insofar as it is in line with a widely assumed correlation: argument positions are occupied by full DPs, which are entity-denoing constituents or generalized quantifiers; predicate positions are occupied by bare NPs, which denote properties.

The hypothesis that bare NPs in argument positions are full DPs rather than mere NPs is supported by a language such as French, which allows bare NPs in predicate positions but not in argument positions, where *des*-phrases are used instead:

\[
(14) \quad a. \text{Jean est professeur.} \\
\text{Jean is a professor} \\
\text{‘Jean is a professor.’} \\
b. \text{Jean et Marie sont professeurs.} \\
\text{Jean and Marie are professors} \\
\text{‘Jean and Marie are professors.’}
\]

\[
(15) \quad a. \text{Jean a une voiture/*voiture.} \\
\text{Jean has a car/*car} \\
\text{‘Jean has a car.’} \\
b. \text{Jean lisait des romans/*romans.} \\
\text{Jean read.IMPF DES novels/*novels} \\
\text{‘Jean was reading novels.’}
\]

The French data can be captured by assuming that (i) argument positions must host full DPs (universal constraint) and (ii) French does not have null Det’s. No

---

\(^4\) Note that this characterization of Number is compatible with the view that Number is not a functional category but rather a feature that attaches to another (functional or lexical) category (Bouchard 1998; Dobrovie-Sorin (to appear b)). Note also that Det does not necessarily subcategorize for Number (see Munn and Schmitt (1999) on BSs in Brazilian Portuguese).

\(^5\) Alternatively, one may assume a type-shifting operation for bare NPs in argument positions. Note however that such a type-shifting operation cannot be assumed to be general across languages.
easy account can be proposed if we assume the alternative view, according to which bare NPs are allowed in argument positions: since French allows bare NPs in predicate positions, we cannot understand why they should not be allowed in argument positions.

### 2.2 Bare Plurals Are not the Plural Counterparts of Singular Indefinites

Carlson (1977a, c) observed several important contrasts between the existential reading of English BPs and the existential reading of singular indefinites and concluded that BPs cannot be analyzed as the plural counterparts of singular indefinites. Dobrovie-Sorin and Laca (2003) showed that Carlson’s observations for English extend to Romance languages such as Spanish, Italian or Romanian.

#### 2.2.1 Opacity

Carlson (1977a, c) noticed that in propositional attitude contexts, English BPs can only take opaque readings, whereas singular indefinites are ambiguous, also allowing transparent readings:

16) a. Minnie wishes to meet a young psychiatrist.
    b. Minnie wishes to meet young psychiatrists.

The opaque reading is possible for both examples but (16b) cannot be interpreted as meaning ‘there is one or more young psychiatrists that Minnie wishes to meet’. This interpretation is possible if we use an indefinite headed by *some* instead of the BP:

17) Minnie wishes to meet some young psychiatrists.

The same observations hold for the Romanian counterparts of these examples, given in (18)–(19):

18) a. Minnie vrea să consulte un tânăr psihiatriu.
    Minnie wants *subj consult* a young psychiatrist
    ‘Minnie wants to consult a young psychiatrist.’
    b. Minnie vrea să consulte tineri psihiatri.
    Minnie wants *subj consult* young psychiatrists
    ‘Minnie wants to consult young psychiatrists.’

19) Minnie vrea să consulte niște/câțiva tineri psihiatri.
    Minnie wants *subj consult* some/a few young psychiatrists
    ‘Minnie wants to consult some/a few young psychiatrists.’
2.2.2 Scope

Singular indefinites and BPs also differ regarding their scope interpretations:

(20) a. Everyone read a book on caterpillars.
    b. Everyone read books on caterpillars.

(20b) only allows a reading on which books takes narrow scope with respect to everyone whereas (20a), with a singular indefinite, is scopally ambiguous.

Again, the same observation can be made for corresponding examples in Romance languages, e.g., Romanian:

(21) a. Toată lumea a citit o carte despre omizi.
    everyone has read a book about caterpillars
    ‘Everyone read a book on caterpillars.’
    b. Toată lumea a citit cărți despre omizi.
    everyone has read books about caterpillars
    ‘Everyone read books on caterpillars.’

BPs also take obligatory narrow scope with respect to negation, an issue that is particularly important for BSs and as such will be discussed in Sect. 2.3.3 below.

2.2.3 Aspect

Dowty (1979) and Carlson (1977a, c) have noticed some other interesting properties of bare nouns, concerning their aspectual effects on verbs. Unlike indefinites headed by overt determiners, BPs cannot supply the boundedness that is required by telicity. Therefore, those predicates that qualify as achievements or accomplishments when their object is headed by an indefinite determiner⁶ yield activities when followed by a BNP object. Examples (22a–b), from English and Spanish, thus show that the alternation between culminative adverbs indicating duration (in X time) and

---

⁶Note that French and Italian indefinite plurals headed by des and dei, respectively, are exceptional in this respect, i.e., they resemble BPs insofar as they can induce atelicity effects. Cf. Dobrovie-Sorin and Laca (2003):

(i) Jean a écrit des articles pendant trois ans/*en trois ans.
    Jean has written des articles during three years/*in three years.
    ‘Jean wrote articles during three years/*in three years.’
non-culminative adverbs (*for X time*) correlates with the alternation between plural indefinites and BPs in object position.

(22) a. Max discovered two rabbits in his yard in two hours/?? for two hours.
   a’. Escribió dos artículos en tres meses/*durante tres meses.
   ‘He wrote two articles in three months/*for three months’
   b. Max discovered rabbits in his yard ??in two hours/for two hours.
   b’. Escribió artículos *en tres meses/durante tres meses.
   ‘He wrote articles *in three months / for three months.’

Similarly, the use of BPs entails a durative interpretation of inherently non-durative predicates such as *kill* or *discover*. Hence the possibility of embedding these kinds of predicates under the aspectual verb *continue*:

(23) a. ?? Harvey continued to kill a rabbit.
   a’. *El zorro siguió matando unas gallinas.
   ‘The fox continued killing some hens’.
   b. Harvey continued to kill rabbits.
   b’. *El zorro siguió matando gallinas.
   ‘The fox continued killing hens.’

The same remarks apply to postverbal subjects in Romance languages, in particular when they appear with intransitive verbs denoting a change of state:

(24) Seguían llegando invitados/*unos invitados.
   ‘There continued to arrive guests /*some guests.’

2.2.4 Anaphoric Relations

BPs cannot function as antecedents of pronouns such as *altii* ‘others’ or *celalți* ‘the others’. The unacceptability judgments illustrated in (25b) and (26b) can be attributed to the non-individualizable type of reference that characterizes BPs. The Romanian examples in (25a) and (26a) show that plural indefinites headed by overt determiners behave on a par with singular indefinites insofar as they are legitimate as antecedents of alternative pronouns.
2.3 Count Bare Singulars Are not the Singular Counterparts of Bare Plurals

(25) a. Ion a recomandat un/trei/niște romane, iar Maria a recomandat altele.  
Ion has recommended a/three/some novels and Maria has recommended others  
‘Ion recommended a/three/some novels and Maria recommended others.

b. # Ion a recomandat romane, iar Maria a recomandat altele.  
Ion has recommended novels and Maria has recommended others

(26) a. Azi a/au venit un/niște/trei studenți străini.  
today has/have arrived a/some/three students foreign  
Mâine vor ajunge ceilalți.  
tomorrow will arrive the-others  
‘A/some/three foreign student(s) arrived today. The others will arrive tomorrow.’

b. # Azi au venit studenți străini. Mâine vor ajunge ceilalți.  
today have arrived students foreign tomorrow will arrive the others.

Note that restrictions of this type do not indicate that BPs are non-referential. Indeed, they allow appositive relatives, which are typical of referential DPs:

(27) Maria aducea de la bibliotecă cărți, pe care Ion le citea.  
Mary brought. IMPF from library books PE which Ion CL.ACC read.IMPF  
‘Maria used to bring books from the library, which Ion read.’

Recent work has shown that count bare singulars\(^7\) are allowed to occur in argument positions not only in languages without articles (e.g., Russian or Hindi) but also in languages with articles (e.g., Albanian, Norwegian, Hungarian and Romance languages). We will leave aside Brazilian Portuguese, a language in which BSs have a distribution that is comparable to the distribution of BPs in the other Romance languages (see Sect. 2.1.1 above). The presentation below will concentrate on Romanian but the core generalizations also hold for Spanish and Catalan, as described in Bosque (1996), Laca (1999), Dobrovie-Sorin et al. (2005, 2006), Espinal and

\(^7\)Count bare singulars, which are not allowed in English (see Sect. 2.3.2 below), were neglected in the post-carlsonian literature (with the notable exception of Kallulli’s (1999) analysis of Albanian) and came to the foreground only recently, since 2003, due to work on Hungarian (Farkas and de Swart 2003), Hindi (Dayal 2003, 2004), Norwegian (Borthen 2003) and Romance languages (Dobrovie-Sorin et al. 2005, 2006).
McNally (2011). All these authors agree that the distribution of count bare singulars is much more constrained than that of bare plurals. Italian BSs, which will not be examined here, show an even more restricted distribution than the BSs of Romanian, Spanish and Catalan.

### 2.3.1 Distribution

With most classes of verbs, count bare singulars are disallowed in object positions, in clear contrast with bare plurals:

(28) a. Am văzut două/niște/câteva păsări
   have.1sg seen two some several birds
   ‘I saw two/some/several birds’

   b. Am văzut *(o) pasăre
   have.1sg seen a bird
   ‘I saw a bird’

Certain predicates do, however, allow BSs in their object positions. Such predicates can be grouped into three lexical classes: (i) a avea ‘to have’ and acquisition verbs; (ii) verbs such as a purta or a folosi ‘to wear, to use’, which can be viewed as implying the verb ‘have’ itself; (iii) intensional verbs such as a căuta ‘look for’, which can also be viewed as implying some kind of prospective possession:

(i) a avea ‘to have’ and acquisition verbs

(29) a. Ion are casă/ mașină/ copil /carte de credit/ pașaport/ bucătăreasă.
   Ion has house car child card of credit passport cook
   ‘Ion has a house/car/child/credit card/passport/cook’

   b. Casa asta are lift/ scară de serviciu/grădină.
   house-the this has lift staircase of service garden
   ‘This house has a lift/staircase/garden.’

   c. Ne-au pus în sfârșit lift.
   us.DAT-have put finally lift
   ‘At last they put in a lift.’

   d. Ion și-a cumpărat casă.
   Ion SE.DAT-has bought house
   ‘Ion bought a house (for himself).’
(ii) a purta ‘to wear’, a folosi ‘to use’, a conduce ‘to drive’

(30) a. Maria poartă pantalon/ pălărie/ uniformă/ poșetă/ cravată/ 
    Maria wears pant hat uniform purse tie 
    cămașă/ rochie scurtă. 
    shirt dress short 
    ‘Maria wears pants/hats/a uniform/a purse/ties/shirts/short dresses’

b. Ion folosește stilou/creion. 
   Ion uses pen pencil 
   ‘Ion uses a pen/pencil’

c. Ion conduce camion. 
   Ion drives truck 
   ‘Ion drives a truck’

(iii) prospective possession: a căuta ‘to seek’, a găsi ‘to find’, a vrea ‘to want’, a 

dori ‘to wish’

(31) a. Ion caută secretară/nevastă/femeie/profesor/bucătar. 
    Ion seeks secretary wife woman professor/cook 
    ‘Ion is looking for a secretary/wife/woman/teacher/cook’

b. Ion dorește nevastă tânără. 
   Ion wishes wife young 
   ‘John wants a young wife.’

The examples in (32a–b) show that the choice of the noun itself is constrained. 
What seems to matter is that the verb together with the BS refers to a conventional- 
ized type of possession:

(32) a. Ion are / a cumpărat (un) apartament/(o) casă /(o) mașină / 
    Ion has has bought an apartment a house a car 
    (un) calculator. 
    a computer 
    ‘Ion has/bought an apartment/a house/a car/a computer’

b. *Ion a cumpărat castel/bloc /fabrică. 
   Ion has bought castle block factory 

As the examples under (i)–(iii) show, the verbs that allow BSs describe actual or 
prospective possession. However, no clear explanation can be found in the current 
literature for the correlation between possession and the possibility of BSs in object 
positions.

In the impersonal passive SE constructions illustrated in (33), the postver- 
bal BSs occupy the object position of exactly the same verbs as those listed in
(i)–(iii) above but they qualify as subjects insofar as they agree with the main verb:

(33)  a.  Ni s- a pus în sfârşit lift.
    us.DAT se-has put finally lift
    ‘At last they put in a lift (for us).’

    b.  Anul ăsta s-a cumpărat cuptor, anul viitor se va
    year-the this se-has bought oven year-the next se will
    cumpăra masină de spălat
    buy machine of washing
    ‘An oven was bought this year, a washing machine will be bought
    next year.’

    c.  De anul trecut se poartă pantalon/pălărie/uniformă/cravată
    since year-the last se wears pant hat uniform tie
    cămașă rochie scurtă.
    shirt dress short
    ‘Since last year it is fashionable to wear pants/hats/a uniform/a tie /shirts/
    short dresses.’

    d.  Se caută secretară/ profesor de matematică/ bucătar.
    se seeks secretary professor of mathematics cook
    ‘A secretary/mathematics professor/cook is needed.’

The only other predicate that allows postverbal subject BSs is the verb a fi ‘to be’. Note that the examples below are paraphrasable by sentences with a avea ‘to have’:

(34)  a.  La facultate e secretară.
    at faculty is secretary
    ‘The faculty has a secretary.’

    b.  În bloc nu e portar.
    in building not is doorman
    ‘The building has no doorman.’

There are two other contexts in which bare singulars are allowed, namely with light verbs and with idioms:

(35)  a.  a lua loc /parte/ ființă/ notă de
    to take place part being note of
    ‘to take place/ to take part/ to come into being/ to take note of’

    b.  a da loc /exemplu / dovadă
    to give place example proof
    ‘to give rise to/to give an example/to show’

    c.  a ține loc de
    to keep place of
    ‘to be a substitute for’
Idiomatic structures are characterized by the repetition of the same BS, occurring as a subject and as the argument of a preposition:

(36)  
  a.  Cui pe cui se scoate.
      nail pe nail se pulls-out
      ‘One nail drives out another’
  b.  Ban la ban trage.
      money to money draws
      ‘Money attracts money’
  c.  Deal cu deal se întâlnește, dar om cu om?
      hill with hill se meets but man with man
      ‘Even hills meet, let alone men’

We may wonder whether the BSs in the latter two contexts should be analyzed in the same way as those appearing in the previous contexts. A differentiating analysis is suggested by the fact that in certain languages, e.g., French, bare singulars (as well as bare plurals) are allowed with certain light verbs and in certain idiomatic expressions but consistently banned with the verbs listed in (i)–(iii), including avoir ‘have’.

Summarizing, BSs can only be internal arguments, not external ones, and are allowed only with a limited number of verbs. BPs have a larger distribution, which suggests that the two types of bare NPs should not be analyzed in the same way.

### 2.3.2 Crosslinguistic Variation

An important argument in favor of treating bare singulars separately from bare plurals is related to crosslinguistic variation: English is like Romance languages (other than French) in allowing existential bare plurals but differs from them insofar as it does not allow bare singulars, except in some idioms, as illustrated with (37).  

(37)  
  a.  call (the) roll
  b.  take heart
  c.  suck face

---

8 There is a use of count bare singulars where they are interpreted as masses, in which case they are allowed freely, as are other mass nouns (John was eating apple/meat/goulash).

9 It should also be noted that English allows bare singulars to appear productively inside N-V compounds (or synthetic compounds of the form N-V+er).

(i)  
  a.  window washing, truck driving, deer hunting, pie baking
  b.  truck driver, deer hunter, pie baker
Most of the examples given in (29)–(31) can only be translated in English with an indefinite singular DP:\(^{10}\):

(38)  
\begin{align*}
\text{a.} & \quad \*\text{John has house/car/child/credit card/passport/cook.} \\
\text{a'} & \quad \text{John has a house.}
\end{align*}

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</thead>
<tbody>
<tr>
<td>b.</td>
<td>*John bought house.</td>
</tr>
<tr>
<td>b'</td>
<td>John bought a house.</td>
</tr>
</tbody>
</table>

(39)  
\begin{align*}
\text{a.} & \quad \*\text{Mary wears hat/uniform/handbag/tie/shirt/dress.} \\
\text{a'} & \quad \text{Mary wears a hat.}
\end{align*}

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>b.</td>
<td>*John put on tie yesterday.</td>
</tr>
<tr>
<td>b'</td>
<td>John put on a tie yesterday.</td>
</tr>
</tbody>
</table>

(40)  
\begin{align*}
\text{a.} & \quad \*\text{John is looking for secretary wife/woman/teacher/cook.} \\
\text{a'} & \quad \text{John is looking for a secretary.}
\end{align*}

<p>| | |</p>
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<tr>
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</thead>
<tbody>
<tr>
<td>b.</td>
<td>*John wants young wife.</td>
</tr>
<tr>
<td>b'</td>
<td>John wants a young wife.</td>
</tr>
</tbody>
</table>

The crosslinguistic variation regarding the (im)possibility of bare singulars in object positions can be correlated with the variation regarding their (im)possibility in predicate positions (Munn and Schmitt 2005).\(^{11}\)

(41)  
\begin{align*}
\text{a.} & \quad \*\text{John is professor/student.} \quad \text{English} \\
\text{b.} & \quad \text{Ion e profesor/student.} \quad \text{Romanian}
\end{align*}

On the basis of these observations, Dobrovie-Sorin et al. (2005, 2006) suggest the following generalization:

(42)  
If a language allows bare singulars in argument (more precisely in object) position, then it also allows bare singulars in predicate position (Spanish and Romanian vs. English).

\(^{10}\)See Munn and Schmitt (2005) for further data and discussion. In addition to argument and predicate positions, Munn and Schmitt examine BSs that occur as modifiers.

\(^{11}\)In English, the predicative construction typically involves a nominal preceded by an indefinite article, whereas in Spanish and Romanian, among other Romance languages, there is a syntactic and a semantic distinction between (i) and (ii). See also De Swart et al. (2005) for an analysis of
2.3 Count Bare Singulars Are not the Singular Counterparts of Bare Plurals

Note that the reverse does not hold: as already pointed out above, French allows bare singulars (and bare plurals) in predicate positions but not in argument positions.

2.3.3 Interpretation: Narrow Scope with respect to Negation

The interpretive restrictions regarding opacity, scope, aspect and anaphoric relations, described for BPs in Sect. 2.2 above, also characterize BSs. We will however not illustrate all of these constraints, since they do not bring any new insight into the phenomenon. Rather, we will concentrate on the obligatory narrow scope wrt negation, which can be observed in (43a–c) for BPs, bare mass nouns and BSs, respectively:

(43) a. N-am citit romane.
    \[\text{NEG-have.ISG read novels}\]
    ‘I haven’t read novels’

b. De doi ani n-am băut vin.
    \[\text{of two years NEG-have.ISG drunk wine}\]
    ‘I haven’t drunk wine for two years (now)’

c. Ion nu are/nu și-a cumpărat apartament/mașină/calculator.
    \[\text{Ion NEG has/NEG SE.DAT-has bought apartment car computer}\]
    ‘John didn’t buy himself an apartment/car/computer.’

Note that in examples such as (44a–b), built with run-of-the-mill verbs, narrow scope with respect to negation cannot be indicated by using a BS:

(44) a. *N-am citit roman.
    \[\text{NEG-have.ISG read novel}\]

b. *De doi ani n-am întâlnit prieten.
    \[\text{of two years NEG-have.ISG met friend}\]

This ungrammaticality is expected, given that BSs can only be used with certain verbs, call them ‘incorporating’ verbs. For non-incorporating verbs, there are two

---

b. *De doi ani n-am întâlnit prieten.
    \[\text{of two years NEG-have.ISG met friend}\]

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    \[\text{NEG-have.ISG read novel}\]

b. *De doi ani n-am întâlnit prieten.
    \[\text{of two years NEG-have.ISG met friend}\]

This ungrammaticality is expected, given that BSs can only be used with certain verbs, call them ‘incorporating’ verbs. For non-incorporating verbs, there are two
ways of indicating narrow scope wrt negation. One possibility is to use a negative word:\footnote{12}{The use of niciun ‘neither.one.masc’ with verbs allowing BSs is marked:}

\begin{enumerate}[a.]
\item N-am citit niciun roman.
\begin{itemize}
\item [\texttt{NEG-have.1SG read neither.one novel}]
\end{itemize}
‘I haven’t read any novel/I’ve read no novel.’
\item Dedoi ani n-am întâlnit niciun prieten drag.
\begin{itemize}
\item [\texttt{NEG-have.1SG met neither.one friend dear}]
\end{itemize}
‘I haven’t met any dear friend for two years (now).’
\end{enumerate}

The second possibility is to use bare plurals, which are allowed with a much larger class of predicates than BSs:

\begin{enumerate}[a.]
\item N-am citit romane.
\begin{itemize}
\item [\texttt{NEG-have.1SG read novels}]
\end{itemize}
‘I haven’t read novels.’
\item Dedoi ani n-am întâlnit prieteni.
\begin{itemize}
\item [\texttt{NEG-have.1SG met friends}]
\end{itemize}
‘I haven’t met friends for two years (now)’
\end{enumerate}

These examples indicate that the difference between incorporating and non-incorporating verbs is maintained under negation.

Note now that in examples uttered without any special stress,\footnote{13}{Parts of the indefinite can be interpreted in the scope of the negation provided that they are contrastively stressed. The alternative must usually be explicitly asserted. When it is the indefinite article that is contrastively stressed, it is interpreted as the numeral ‘one’.} DPs headed by overt Determiners and in particular singular count indefinites, show a clear preference for the wide scope interpretation:

\begin{enumerate}[a.]
\item N-am citit un roman.
\begin{itemize}
\item [\texttt{NEG-have.1SG read a novel}]
\end{itemize}
Only possible reading: ‘There is a novel which I haven’t read.’
\end{enumerate}

\begin{enumerate}[i]
\item N-am nicio maşină.
\begin{itemize}
\item [\texttt{NEG-have.1SG neither.one car.}]
\end{itemize}
‘I don’t have any car.’
\item Nu caut nicio secretară.
\begin{itemize}
\item [\texttt{NEG seek.1SG neither.one secretary}]
\end{itemize}
‘I don’t look for any secretary.’
\end{enumerate}

Examples like (i)–(ii) are used when the speaker negates an explicit or implicit assertion, e.g., ‘You have a car/you look for a secretary’.
b. N-am citit un ROMAN \(^{14}\)
   neg-have.1sg read a novel
   ‘I haven’t read a single novel.’

Turning now to incorporating verbs, the use of BSs becomes quasi-obligatory in a negative context.

(48) a. ?? Ion nu și-a cumpărat un apartament.
    Ion neg se.dat- has bought a apartment
   a’. Ion nu și- a cumpărat apartament.
    Ion neg se.dat- has bought apartment
   ‘Ion didn’t buy an apartment.’

b. * Azi Ion nu poartă un pantalon
    today Ion neg wears a pant
   b’. Azi Ion nu poartă pantalon.
    today Ion neg wears pant

   c. * Ion nu caută o secretară.
      Ion neg seeks a secretary
   c’. Ion nu caută secretară.
      Ion neg seeks secretary

Whenever a specific or a partitive reading is intended, the indefinite article must be used. Thus, for houses that are closed with more than one key, one may say:

(49) Nu pot intra fiindcă nu am o cheie.
    neg can.1sg enter because neg have.1sg a key
   ‘I cannot enter because I do not have a key’

2.3.4 Conclusions

In sum, using a bare noun, either singular or plural, is a way of indicating the narrowest possible scope, in particular narrow scope with respect to negation. As we will see in Chaps. 6 and 8 the obligatory narrow scope interpretation of bare NPs is due to the fact that they are necessarily ‘weak’ (in the sense of Milsark 1977).

The difference in distribution between BSs and BPs indicates that BSs cannot be viewed as the singular counterparts of BPs, a conclusion that is supported by the observation that BSs have a number-neutral interpretation, i.e., they do not necessarily refer to atomic entities but allow both atoms and sums in their denotation (in other words, BSs are true of either atomic or plural entities, depending on the context).

\(^{14}\)Capitals indicate contrastive stress.
The number-neutral interpretation of BSs can be assumed to derive from the fact that their syntactic representation lacks Number (Farkas and de Swart 2003; Dobrovie-Sorin et al. 2005, 2006).

### 2.4 The Semantics of Bare Plurals

Recognizing that a distinction in distribution calls for a distinction in semantic type and/or LF representation, we need to assign distinct analyses to singular indefinites, existential\(^{15}\) bare plurals (BPs) and count bare singulars (BSs). Granting that singular indefinites are entity-referring expressions (type e), we need to propose a differentiating analysis for the two types of bare NPs. Since BPs have been investigated more than BSs, we will concentrate on BPs. Although most of the current analyses were intended to account only for BPs, we will check whether they can also account for BSs. We will first show that Carlson’s (1977a, c) analysis based on the hypothesis that BPs are names of kinds cannot be extended to Romance languages, because in these languages bare NPs, regardless of their number-marking, cannot have generic readings (Dobrovie-Sorin and Laca 1996, 2003). Turning next to the hypothesis that bare NPs denote properties,\(^{16}\) we show that property-denotation is a plausible analysis for BSs but not for BPs. We will therefore be led to revive the more traditional view that BPs are the plural counterparts of non-specific singular indefinites. Both types of DPs (i.e., singular indefinites and BPs viewed as plural indefinites) can be analyzed as entity-referring expressions, which nevertheless differ as to whether they refer to individuated entities, i.e., entities that are distinct from each other or to amounts/quantities, i.e., non-individuated entities that are ordered by the part-whole relation. Building on this denotational difference (Dobrovie-Sorin 2007), our proposal will be that BPs should be analyzed as generalized quantifiers over amounts. In sum, we assume a distinction between two types of entities (i.e., individuals and amounts) and correlated to it a difference between two types of generalized quantifiers, over individuals and over amounts.

---

\(^{15}\) We are not interested here in kind-referring BPs, which are found in English but not in Romance languages (other than Brazilian Portuguese). As argued in Sect. 2.4.1, the existential readings of Romance BPs cannot be derived from kind-reference.

\(^{16}\) This hypothesis is adopted by most of the theoreticians that have examined both types of bare nouns (see in particular van Geenhoven 1996; Kallulli 1999; Carlson 2003; Chung and Ladusaw 2003; Dobrovie-Sorin et al. 2005, 2006). Dayal (2003) is one of the few authors who assumes a type distinction between bare singulars and bare plurals: existential bare singulars denote properties, whereas bare plurals (both existential and generic) rely on kind-reference (as in Carlson 1977a, c; Chierchia 1998). This analysis cannot be adopted here, given that bare plurals in Romance languages cannot denote kinds.
2.4.1  *Bare Plurals and Reference to Kinds*

2.4.1.1  The Carlsonian Analysis

In addition to existential readings, illustrated in (50), English BPs can also have generic readings, illustrated in (51).

(50)  a.  Students are dancing in the street.
     b.  John is eating apples.

(51)  a.  Gorillas are on the verge of extinction.
     b.  Cats are intelligent.
     c.  John loves cats.

Carlson (1977a, c) proposed a unified analysis of English BPs, according to which they are to be analyzed as names of kinds. On this view, the generic and existential readings of BPs are in complementary distribution, the choice between one or the other reading depending on the context: generic readings arise when BPs combine with individual-level predicates, whereas existential readings are triggered by stage-level predicates.

The generic readings of BPs are directly explained by Carlson’s hypothesis according to which BPs denote kinds, i.e., entities (type e expressions) whose reference is not fixed with respect to a time and a place.

In contrast, the existential reading of BPs depends on stages of kinds, resulting from the use of kind denoting expressions in contexts that make reference to particular events. According to Chierchia’s (1998) revised version of Carlson’s analysis, the existential readings of BPs result from the application of a type-shifting operation dubbed ‘Derived Kind Predication’ defined as in (52):

(52)  Derived Kind Predication (DKP): (Chierchia 1998)

\[
P(k) = \exists x [ x \in k \land P(x)]
\]

As stated in (52), the DKP applies when bare plurals (which by assumption denote kinds) appear as arguments of s-level predicates that apply to ordinary objects, rather than kinds. The DKP introduces an existential quantifier over instances of the kind. The DKP applies in an example such as (53), since *barking* is a property of ordinary objects, not kinds. In (53), (*)dogs* notates ‘the kind dogs’, obtained by applying the Down operator to the property *dogs*:

(53)  Dogs are barking.

\[
barking(*)\text{dogs} \iff (\text{via DKP}) \exists x [ x \leq \text{dogs} \land barking(x)]
\]

A Carlsonian analysis adequately captures the generic reading of BPs (cf. Chap. 7) but is problematic for the existential reading of BPs. This is particularly clear if we try to give a unified analysis of the existential reading of bare nouns in English and Romance languages.
2.4.1.2 Bare Plurals in Romance Languages Are Not Kind-Referring

Carlson’s (1977a, c) analysis cannot extend to Romance languages. Indeed, BPs in Spanish, Italian and Romanian are not compatible with kind predicates such as *be on the verge of extinction* 17:

(54)  a.  În România sunt pe cale de dispariţie urşii /*urşi.
    in Romania are on way to disappearance bears-the bears
    ‘In Romania bears are becoming extinct.’

    b.  O lege din 1950 protejează urşii /*urşi.
    A law from 1950 protects bears-the bears
    ‘A law from 1950 protects bears.’

More generally, BPs do not yield generic readings when they combine with individual-level predicates 18:

(55)  Lui Ion îi plac prăjiturile /*prăjituri
    DAT Ion him.DAT appeal cakes-the cakes
    ‘Ion likes cakes.’

(56)  Ion respectă profesorii /* profesori
    Ion respects professors-the professors
    ‘Ion respects professors.’

In Spanish or Romanian, kind reference cannot be assumed for BSs either. Let us indeed recall that BSs are allowed with a very restricted number of predicates (see Sect. 2.3.1 above). Since kind-predicates and i-level predicates are not among those predicates that can combine with BSs, kind-reference cannot be assumed for this type of bare NP either.

We are thus led to conclude that in Romance languages, the existential readings of bare NPs cannot be assumed to be derived from kind-denoting bare NPs.

2.4.2 Bare Plurals and Property Denotation

Let us now consider an alternative analysis, according to which existential bare nominals denote properties (type <e,t>) even when they occur in argument positions (McNally 1995a, b, 1998; van Geenhoven 1996; Dobrovie-Sorin 1997a, b; Dobrovie-Sorin and Laca 1999; Dobrovie-Sorin and Beyssade 2004). This hypothesis

---

17 Examples with postverbal subjects (see (54)–(55)) or postverbal objects (see (56)) are used here in order to avoid interference with another constraint, according to which unmodified bare nouns cannot appear in preverbal position in Spanish, Italian and Romanian.

18 Chierchia (1998) observed that the generic reading of modified bare NPs is possible in a restricted class of examples and he concluded that bare NPs denote kinds in Italian. This assumption was criticized by Longobardi (2002) and Delfitto (2002).
can be implemented by assuming that verbal predicates can be represented not only in the canonical way, as unsaturated expressions waiting for entity-denoting constituents, but also as expressions that can be saturated by property-denoting constituents.

### 2.4.2.1 Existential Predicates

Let us first illustrate the canonical type of semantic composition, by considering examples such as (57), represented as shown in (57’):

(57)  
   a. John is handsome.
   b. John admires Mary.

(57’)  
   a. \( \lambda x. x \) is handsome (John)
   b. \( \lambda x. \lambda y. x \) admire y (Mary) (John)

This type of predicate cannot apply to properties: the rules of semantic composition do not allow us to derive a truth value by combining two predicates. If we assume that BPs in Romance languages denote properties, the ungrammaticality of examples of the type in (58) is explained as being due to the fact that a property-denoting expression cannot saturate predicates such as \( \text{admire} \), which is represented as in (57’).

(58)  
   * Ion \( \text{admire} \) profesori.

   Ion admires professors

According to van Geenhoven (1996), Dobrovie-Sorin (1997a, b) and McNally (1998), certain predicates, call them ‘existential’, can be represented not only as in (57’) but also as shown in (59), where an existential operator binds some of the verb’s argument variables. This kind of predicate is saturated in the lexicon by existential closure and consequently cannot apply to entity-denoting expressions. Variables bound by existential closure can range over domains that are either non-restricted (cf. the implicit arguments of transitive verbs such as \( \text{wash}, \text{eat}, \text{etc.} \)) or restricted by predicate variables notated P or Q in (59) below. Existential predicates are thus represented by means of lambda abstraction over predicate variables:

(59)  
   a. \( \lambda P. \lambda Q. \exists x \ \exists y \ [x \ \text{wash} \ y \ \land \ Q(x) \ \land \ P(y)] \)
   b. \( \lambda P. \exists x \ [x \ \text{sleep} \ \land \ P(x)] \)
   c. \( \lambda P. \exists x \ [x \ \text{is available} \ \land \ P(x)] \)

According to the representations in (59), the predicates \( \text{wash} \) or \( \text{sleep} \) remain unsaturated: they need to combine with properties that will saturate the predicate positions represented as P and Q, which restrict the domain of argument variables.
Summarizing, predicates can be represented in two different ways, either as ‘entity predicates’, i.e., lambda-abstracts over entities, or as existential predicates, which have an existential quantifier in their lexical representation and function as lambda-abstracts over the properties that restrict the range of their argument variables. All predicates can be represented as entity predicates but only certain predicates, e.g., *wash, dance, sing*, etc. but not *intelligent* or *sad*, can be represented as existential predicates. The empirical criteria that allow us to distinguish between those predicates that necessarily function as entity predicates and those that allow both analyses will be examined in Sect. 2.5.

Given existential predicates of the type in (59), the examples in (60) can be represented as in (60′), which yield the representations in (60″) via lambda-conversion:\(^{19}\):

\[
(60) \quad \begin{array}{ll}
\text{a. Women were washing shirts in the garden.} & \\
\text{b. Children were sleeping on the bed.} & \\
\text{c. Books are available.} & 
\end{array}
\]

\[
(60′) \quad \begin{array}{ll}
\lambda P \lambda Q \exists x \exists y [x \text{ wash } y \land Q(x) \land P(y)] \text{ (shirts) (women)} & \\
\lambda P \exists x [x \text{ sleep } \land P(x)] \text{ (children)} & \\
\lambda P \exists x [x \text{ are available } \land P(x)] \text{ (books)} & 
\end{array}
\]

\[
(60″) \quad \begin{array}{ll}
\exists x \exists y [x \text{ wash } y \land \text{ women (x) } \land \text{ shirts (y)}] & \\
\exists x [x \text{ sleep } \land \text{ children (x)}] & \\
\exists x [x \text{ are available } \land \text{ books (x)}] & 
\end{array}
\]

The BPs *women, children* and *books* in (60′) and (60″) have not been represented as entities (of type $e$) but as properties (of type $<e,t>$). The sentence has an existential interpretation due to the presence of an existential quantifier in the representation of the predicate.

2.4.2.2 Accounting for Carlson’s Observations Regarding Scope

Let us now briefly show that the property analysis of bare NPs can account for the contrasts observed by Carlson between indefinite DPs and BPs regarding scope

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\(^{19}\) On a classical analysis, we distinguish three types of conversion for terms of the lambda calculus.

\[\alpha\text{-conversion : replace } \lambda x A \text{ with } \lambda y A[y/x] \text{ if } y \text{ does not appear in } A.\]

\[\beta\text{-conversion : replace } (\lambda x A) t \text{ with } A[t/x].\]

\[\eta\text{-conversion : replace } A \text{ with } (\lambda x Ax) \text{ if } A \text{ is of type } a \rightarrow b \text{ and } x \text{ is of type } a \text{ and if there is no instance of } x \text{ in } A.\]

These rules are all called lambda-conversion rules and by definition, two terms $t$ and $t′$ are said to be lambda-equivalents if there is a sequence of lambda-conversions that allows reducing $t$ to $t′$ or vice versa.
2.4 The Semantics of Bare Plurals (see Sect. 2.2). Let us consider examples of the type in (14), repeated here as (61), where meet is embedded under a propositional attitude verb:

(61) a. Minnie wishes to meet a young psychiatrist.
    b. Minnie wishes to meet young psychiatrists.

Singular indefinites are analyzable as individual variables bound by an existential quantifier introduced by existential closure. Since existential closure can apply at different levels (Heim (1982) and subsequent literature), (61a) is ambiguous, allowing both an opaque (the existential operator is inserted below wish) and a transparent reading of the indefinite (the existential operator is inserted above wish).

BPs, on the other hand, can only be legitimated by an existential quantifier present in the lexical representation of the predicate with which they combine: in (61b), the existential quantifier is introduced by the verb meet (which is analyzed as an existential predicate, on a par with wash in (60')) and therefore it has narrow scope with respect to the verb wish, thus yielding an opaque reading.

This explanation for the obligatory narrow scope of BPs extends to other scopal elements, e.g., quantified DPs or temporal adverbs, which appear above the main verb that supplies the existential quantifier that legitimates the BP.

As we can see, in examples such as (61a–b) the same predicate (meet) receives two different analyses: in order to account for the transparent reading of (61a), we must assume that meet translates as a lambda-abstract over entities and in order to account for the opaque reading of (61b), meet must be represented as an existential predicate, which combines with an argument of type <e,t> (i.e., the bare plural young psychiatrists).

2.4.2.3 Problems

The property analysis of BPs is confronted with several problems. The first one is related to the observation that those expressions that are clearly property-denoting, e.g., adjectives, cannot occur in argument positions:

(62) a. *Ion mănîncă crud.
    Ion eats raw
    b. *Maria pictează roșu.
    Maria paints red

20 Carlson (1977a, c) translates the singular indefinite article as an existential quantifier. We have reformulated his analysis in the DRT framework because this facilitates the comparison with more recent analyses of the same data.
21 The narrow scope reading of the indefinite DP in (61a) can be analyzed either as (i) relying on the same representation as that of the BP in (61b), i.e., meet translates as an existential predicate and the indefinite DP denotes a property or (ii) the indefinite DP translates as a variable over entities and an existential operator is supplied below wish. The choice between these options is not relevant for the present discussion.
To answer this objection one may invoke a subcategorization constraint (e.g., the syntactic category of adjectives is disallowed in argument positions) correlated with a semantic distinction between two types of properties, those that are allowed in argument positions and those that are not.

The second argument against the hypothesis that BPs denote properties comes from French, which allows bare plurals in predicate positions (see (63) below) but not in argument positions, where des-phrases must be used instead (see (64)):

(63) Jean et Jeanne sont professeurs.
Jean and Jeanne are professors
‘Jean and Jeanne are professors.’

In examples of the type in (63), the BP denotes a property. However, French does not allow BPs in argument positions, as shown in (64a). Examples of this type become grammatical if we replace the BPs by des-indefinites, which are the closest French counterparts of BPs in the other Romance languages:

(64) a. *J’ai rencontré professeurs.
I have met professors
b. J’ai rencontré des professeurs.
I have met des professors
‘I have met professors’

The contrast between predicate and argument positions as to the possibility of BPs in French suggests that property-denoting expressions cannot occur in argument positions.

2.4.2.4 The Property Analysis of Count Bare Singulars

The third argument against analyzing BPs as property-denoting expressions is related to the observation made in Sect. 2.3 above, that in languages such as Spanish or Romanian, count BSs occurring in argument positions are much more constrained than BPs. Such a contrasting distribution calls for two distinct semantic analyses. Property-denotation seems appropriate for count BSs in argument positions, insofar as it might explain their highly constrained distribution: precisely because they are property-denoting, they cannot occur in run-of-the-mill argument positions; even in those contexts in which they do appear, they are not genuine arguments but instead function – at some level of representation – as predicate-modifiers that combine with the verbal predicate and yield complex predicates.

Dayal’s (2003) rule of Pseudo-incorporation, shown in (65), is a rule of predicate modification based on the idea that certain transitive verbs can be represented as ‘incorporating predicates’:

Farkas and de Swart’s (2003) rule of Unification of thematic arguments and Chung and Ladusaw’s (2004) rule of Restrict are different implementations of the same type of analysis.
2.4 The Semantics of Bare Plurals

(65) a. $\lambda x \lambda y \lambda e \ [V(e) \land Ag(e)=y \land Th(e)=x]$

b. $\lambda P \lambda y \lambda e \ [P-V(e) \land Ag(e)=y \land Appropriately\ Classificatory\ (e)]$

(65a) represents a transitive verb and (65b) represents the incorporating version of the same verb, which is obtained by replacing the Theme argument with a placeholder for a predicate-modifier notated P. (65a) denotes a relation between individuals, whereas (65b) denotes a relation between individuals and properties, since according to Dayal “the property argument does not correspond to a Theme but is instead interpreted as a modification of the verb”. Given (65b), the object position can be filled by property-denoting nominals and in particular by a bare singular. The restriction to ‘appropriately classificatory’ events (cf. Dowty 1979) is meant to account for the fact that V + bare singular sequences must refer to types of events that are culturally stable.23

What (65b) does not make clear is the sort of relationship held between the verbal predicate V and the property P. Because of this, we adopt the slightly different predicate modification rule given in (65c), proposed in Dobrovie-Sorin et al. (2006), which differs from Dayal’s rule in that the property denoted by the bare nominal is predicated of the Theme of the verb:24

(65) c. $\lambda P \lambda y \lambda e \ [V(e) \land Ag(e)=y \land Th(e) \ has\ P \land Approp.\ Classificatory\ (e)]$

We assume that the rule of predicate modification applies only when two lexical constituents, with no functional category intervening between them: the verb, which is a lexical head ($V^o$), combines with a bare singular, which can be either a lexical head ($N^o$) or a phrasal constituent (NP). Compare bare plurals, which have (at least) the functional category of Number and as such – given the constraint suggested here – cannot combine with the predicate by predicate modification. In sum, property denotation seems appropriate for BSs in argument positions. But then, if we want to keep BPs distinct from BSs, we need another semantic analysis for BPs.

The contrast described here between BPs and BSs in Romance languages is paradigmatic of similar contrasts found in other languages (see the contrast described by Dayal (2003) between pseudo-incorporated and non incorporated bare NPs in Hindi) or crosslinguistically. Thus, according to Chung and Ladusaw’s (2003) description, the Maori indefinites headed by te are full DPs,25 whereas the Chamorro

23 See also Carlson (2003), according to whom the semantic composition of weak bare nominals deals with types of things and types of events (rather than tokens): ‘there are no times, no possible worlds, no truth, only types’.

24 For a more precise definition of predicate-modification the reader is referred to Espinal and McNally (2011), where a refined characterization of the predicates that allow it can also be found.

25 Although they occupy different argument positions, both te-indefinites in Maori and incorporated objects in Chamorro are weak (in the sense of Milsark (1977)), in particular they take obligatory narrow scope with respect to negation.
incorporated objects are bare NPs that can only appear with have and with existential predicates. Because the Chamorro incorporated objects can be doubled by an independent nominal expression (Gāi-ga’ yu’ kātu ‘have-pet I cat’ “I have a cat”) they cannot be assumed to combine with a main predicate with a built-in existential quantifier (as in Carlson (1977a, b) or van Geenhoven (1996)). Chung and Ladusaw (2003) therefore propose a semantic analysis in which the rule of predicate-modification (labelled Restrict) is factored out from the rule of existential closure, which applies after Restrict and is parametrized: whereas the rule of existential closure is optional in Chamorro, it is obligatory in Maori, and therefore the argument position is saturated, thus rendering impossible the doubling of te-indefinites.

Although Romance BSs cannot be doubled, they resemble Chamorro incorporated objects insofar as they are genuinely bare NPs with a highly restricted distribution, which led us to assume that they are property-denoting expressions that compose with the main predicate via Dayal’s (2003) rule of Pseudo-incorporation, which is a rule of predicate-modification comparable to Restrict. We can use the parametrization of existential closure proposed by Chung and Ladusaw (2003) in order to explain why, unlike Chamorro incorporated objects, BSs in Romance languages cannot be doubled by a DP with the same theta-role.

Turning now to Maori te-indefinites, we would like to suggest that their semantic composition is radically different from that of Chamorro incorporated objects: they are not property-denoting expressions (recall that they are DPs rather than genuine bare NPs) and correlative they cannot compose with the main verb via predicate modification. We may instead assume that the semantic composition of Maori te-indefinites is comparable to the semantic composition of Romance BPs, which we are going to clarify in the following sections.

2.4.3 Bare Plurals and VP-level Existential Closure

2.4.3.1 VP-Level Existential Closure and Scope

Diesing’s (1992) analysis of BPs in terms of VP-level existential closure preserves Carlson’s (1977a, c) insight that the existential readings of BPs crucially depend on an existential quantifier that is supplied by their context. But instead of assuming that the existential quantifier appears in the lexical representation of the predicate (as proposed by Carlson (1977a) and later by van Geenhoven (1998)), Diesing proposes a syntactic implementation based on a rule of VP-level existential closure:

(66) Attach an existential quantifier at the left edge of the VP-domain.26

The variables supplied by BPs can only be legitimated by VP level existential closure, which explains their obligatory narrow scope: since the variables supplied by BPs are bound by VP-level existential closure and since at LF any quantifier takes scope over the VP (as a result of Quantifier Raising or of Quantifying in), BPs will take narrow scope relative to any co-occurring quantifier.

Note also that the Carlsonian analysis cannot easily explain why, in those languages that allow postverbal subjects (e.g., all Romance languages other than French), the existential readings of BPs are blocked in the preverbal subject position. Under Diesing’s proposal this generalization is accounted for: preverbal subjects are above the VP and as such they are out of the reach of existential closure.

### 2.4.3.2 VP-Level Existential Closure and Aspect

Another important observation made by Carlson (1977a, c) was that the existential reading of bare plurals is allowed – even forced – by certain predicates and blocked by others:

(67) a. Children were dancing in the street. (OK existential, * generic)
    b. Doctors are intelligent. (* existential, OK generic)

Within Carlson’s own analysis, the grammaticality or the ungrammaticality of (67) is explained as depending on the possibility or impossibility of introducing an existential quantifier in the lexical representations of the predicates appearing in these examples.

This type of account is not sufficient, because the existential readings of BPs cannot be fully explained on the basis of the lexical properties of the predicates with which they combine. Thus, most of – maybe all – those predicates that allow existential readings for BPs also allow generic readings, depending on the tense and aspect of the predicate:

(68) a. Students were dancing in the street.
    b. Students dance rock’n roll.

Given pairs of this type, the existential quantifier cannot be introduced in the lexical representation of the predicate but rather at some later stage in the derivation of a given sentence, after Tense and/or Aspect have attached to the predicate. Under Diesing’s analysis, one can assume that VP-level existential closure is allowed or blocked by certain choices of Tense or Aspect.

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27 Note that the relevant lexical classes of predicates are difficult to characterize (see Sect. 2.5 below).
2.4.3.3 Problems with Generic Objects

Generic objects, illustrated in (69), are problematic for Diesing:

(69)  a. Maria loves coffee.
       b. Juan hates lawyers.

In these examples, the BPs take generic reading despite the fact that they occur in object positions and as such they should be caught by VP-level existential closure. Diesing’s proposal is that emotional predicates such as *hate, love*, etc. force their objects to scramble out of the VP at Logical Form, which puts them outside the reach of existential closure.

It should be clear that Diesing’s analysis in terms of scrambling may be an adequate explanation for why the existential readings of the objects of *love/hate* verbs are blocked but it does not explain why their generic readings are allowed. Indeed, Diesing’s analysis incorrectly predicts that bare mass NPs and BPs take generic readings in Romance languages other than French:

(70)  a. *María adora café
       Maria loves coffee
       b. *Juan detesta manzanas
       Juan hates apples

The contrast between (69a–b) and (70a–b) can be explained as being due to the fact that bare NPs in Romance languages (other than Brazilian Portuguese) are necessarily ‘weak indefinites’, which as such must be legitimated by VP-level existential closure, whereas English bare NPs may also function as names of kinds.

To conclude, Diesing’s account is confronted with various problems, the most important in the present context being that the rule of VP-level existential closure is not compositional: the existential quantifier is neither introduced at the lexical level of representation, nor is it strictly correlated with the application of a particular syntactic rule. Also, in order for the rule of VP-level existential closure to do the work it is needed for, Diesing must assume lowering rules, which we would like to avoid.

2.4.4 Bare Plurals as Amount-Referring Expressions

In this section we will present our own view regarding the semantic analysis of BPs. Building on the denotational difference between count singular predicates on the one hand and plural and mass predicates on the other hand, we will propose that bare BPs (and bare mass NPs) can be analyzed neither as e-type expressions nor as properties but rather as generalized quantifiers over amounts. This proposal preserves Carlson’s intuition that BPs are legitimate only if an existential quantifier can be supplied by the context.
2.4.4.1 Individuals vs. Amounts

The difference between count singular nouns (*cat*) on the one hand and plural nouns (*cats*) and mass nouns (*coffee*) on the other hand can be characterized as follows: count singular nouns describe individualized objects, viewed as ‘integrated wholes’ (Simons 1987; Moltmann 1997, 1998) whereas count plural predicates refer to amounts/quantities of objects, on a par with mass nouns, which refer to amounts/quantities of substance. Predicates that denote sets of integrated wholes are neither cumulative nor divisive whereas predicates that denote sets of amounts are cumulative and divisive.

In somewhat more technical terms, the denotation of a count singular noun is a set of individuals, i.e., objects that cannot be ordered by the part-whole relation. All the elements of this set are distinct from each other and do not overlap. The denotation of plural and mass nouns, on the other hand, is a set of objects that has the algebraic structure of a join semi-lattice: the objects of this set are amounts, which overlap and are ordered by the part-whole relation.

Summarizing, we distinguish between two types of entities: individualized entities (for which we will use the label ‘individuals’ henceforth) and amounts.

The domain of denotation of amounts (of substance or of objects) is a set that is structured by the part-whole relation, which explains why mass predicates, as well as plural predicates, are both cumulative (if A is coffee and B is coffee, then the sum of A and B is coffee; if A is books and B is books, then the sum of A and B is books) and divisive (if A is part of an amount of coffee B, then A is an amount of coffee; if A is part of an amount B of dogs, then A is an amount of dogs).

It should be clear that some indefinites, e.g., singular indefinites such as *a boy*, or cardinal indefinites, e.g., *two students*, are ambiguous: they can refer either to an (singular or plural) individual or to an amount of objects (an amount of cardinality 1 for *a boy* and an amount of cardinality 2 for *two boys*). When they refer to individuals, such indefinites are interpreted as specific indefinites.

2.4.4.2 Bare Plurals as Existential Generalized Quantifiers over Amounts

Following Carlson (1977a, c) and all subsequent proposals, we will assume that the existential readings of BPs depend on an existential predicate. According to us, an existential predicate is necessary because existential BPs (as well as bare mass NPs) refer to non specific amounts and the existence of non specific amounts cannot be presupposed; their existence must be asserted, hence the necessity to combine with an existential predicate.

We depart from previous proposals regarding the denotation of existential BPs: they are neither names of kinds (as proposed by Carlson (1977a, c)) nor properties (as proposed by van Geenhoven (1996) among many others) but rather generalized
quantifiers over amounts. To illustrate our analysis, let us consider the following examples:

(71)  a. Children were sleeping.
    b. Smoke is coming out of the chimney.

The representation in (72g) resembles previous proposals insofar as it assumes an existential quantifier in the representation of main predicates (see the representation of sleep in (72b)) but is nevertheless different insofar as the BP is represented as a generalized quantifier of the type shown in (72a), which itself contains an existential quantifier:

(72)  a. children = \( \lambda P \exists x_a (\text{children}(x_a) \land P(x_a)) \)
    b. be sleeping = \( \lambda x_a \exists x_i (\text{be-sleeping}(x_i) \land \text{Ind}(x_i, x_a)) \)
    c. Children are sleeping = children (be-sleeping)
    d. \( \lambda P \exists x_a (\text{children}(x_a) \land P(x_a)) \) \( \lambda x_a \exists x_i (\text{be-sleeping}(x_i) \land \text{Ind}(x_i, x_a)) \)
    e. \( \exists x_a (\text{children}(x_a) \land \left[ \lambda x_i \exists x_i (\text{be-sleeping}(x_i) \land \text{Ind}(x_i, x_a)) \right](x_i)) \)
    f. \( \exists x_a (\text{children}(x_a) \land \exists x_i (\text{be-sleeping}(x_i) \land \text{Ind}(x_i, x_a))) \)
    g. \( \exists x_a \exists x_i (\text{children}(x_a) \land \text{be-sleeping}(x_i) \land \text{Ind}(x_i, x_a)) \)

In (72c), the two constituents are semantically composed by applying children (viewed as denoting the generalized quantifier in (72a)) to be-sleeping. In (72d) we have replaced the two constituents by their representations in (72a) and (72b). In (72e) and (72f) we have applied lambda-conversion twice. In (72g) we have proposed the existential quantifier that binds the individual variable.

Let us stress that according to this proposal, examples built with existential BPs rely on LFs that contain two (rather than just one) existential quantifiers, which respectively appear in the representation of the BP and of the main predicate: the existential quantifier inside the generalized quantifier asserts the existence of an amount that instantiates the property denoted by the noun (children), whereas the existential quantifier in the representation of the main predicate asserts the existence of a participant to the event (of sleeping); the variable over amounts of children and the variable over participants to the event of sleeping are related by a relation of individuation notated Ind, by virtue of which amounts of objects (in this case children) are specified as being identified with the individuals that are the Theme participants to the sleeping event.

Note that the contrasts between bare plurals and singular indefinites observed by Carlson (1977a, c) and reviewed in Sect. 2.2 above can be explained as a consequence of the fact that BPs must combine with existential predicates. And since existential predicates are ingredients of all of the accounts of BPs reviewed here, these accounts cannot be differentiated on the basis of the contrast between

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28 Let us stress that Ind is not an identity relation (in which case the two terms of the identity should be interchangeable) but rather an oriented identification relation, which allows an amount, i.e., a not yet individualized entity, to be identified with an individual.
BPs and singular indefinites. The competing analyses of BPs can nevertheless be evaluated based on other considerations. Carlson’s account in terms of kind-referring BPs cannot be extended to Romance languages. Diesing’s account is not compositional. Finally, the property analysis of BPs is both conceptually problematic insofar as it runs against a fundamental homomorphism principle, according to which argumental DPs denote either entities (type e) or generalized quantifiers (type $\ll e, t, t \rr$) and empirically problematic insofar as it does not explain why adjectives, which are property-denoting expressions, cannot appear in argument positions. The generalized quantifier analysis of BPs proposed here obeys the homomorphism principle and is moreover able to capture the constraint against adjectives: qua property denoting expressions, adjectives cannot occur in argument positions; bare NPs occurring in argument positions do not denote properties but rather generalized quantifiers over amounts, i.e., quantifiers that assert the existence of an instantiaton of a property.

### 2.5 Existential Predicates and Entity Predicates

We have previously argued (see Sects. 2.4.2 and 2.4.4) that the existential reading of BPs is allowed only with certain predicates, dubbed ‘existential’, which contain an existential quantifier in their representation. Let us now try to define the empirical criterion that allows us to distinguish between existential predicates and entity predicates, which can only translate as lambda-abstracts over entities. In what follows, we will first show that the relevant distinction cannot be the one between stage-level and individual-level predicates (Carlson 1977a, c; Kratzer 1988). We will then suggest a different criterion, which relies on spatial localization.

#### 2.5.1 Individual-Level and Stage-Level Predicates

On Carlson’s (1977a, c) approach, English bare nouns are analyzable as names of kinds and the predicates responsible for their existential interpretation play a double role: on the one hand, they introduce an existential quantifier and on the other hand, they allow the denotation of the BNP to be shifted from a kind to the stages that instantiate the kind. Given this analysis, the relevant predicates have to be both “existential” and “transitory”, hence the hypothesis that the existential quantifier is related to the transitory property of the predicate. This hypothesis is crucial for Carlson but not for us: on the analysis adopted here, the existential interpretation of bare nouns does not depend on “stages of individuals” or “stages of kinds”. The only property of the predicate that is crucial for our analysis is the fact that it allows one of its argument positions to be bound by an existential quantifier.
The correlation between transitory predication and existential quantification is therefore not necessary and hence we do not expect to find it in all contexts. Some authors (Kiss 1994; Dobrovie-Sorin 1995) have observed that English has transitory predicates, e.g., *tired* or *sad*, which do not allow existential readings of bare nouns in argument position (cf (73)). Example (74), from Kiss (1994), shows that *line* is a non transitory predicate that nevertheless allows an existential interpretation of a bare NP in subject position.

(73)  * Students were tired.
(74)  Volcanoes line both sides of the river.

The same observations hold in Spanish, Italian and Romanian. Bare nouns, which in these languages only allow an existential reading, are not always possible as arguments of transitory predicates, nor are they always excluded as arguments of permanent predicates. To give an example, the adjectives built with the copula *estar* in Spanish express transitory predications but most of these predicates cannot combine with bare nouns (cf. (75)).

(75)  ?? Estaban tristes/ inquietos/ enfermos medicos.  Spanish
     were sad worried sick doctors
     ‘Doctors were sad/worried/ sick.’

Only a subset of the adjectives that require *estar*, namely those that do not express qualities of the subject but rather existence at a certain location, allow bare nouns as arguments:

(76)  Estaban presentes/ disponibles médicos.  Spanish
     were present available doctors
     ‘Doctors were present/ available.’

Conversely, even if the predicates in examples (77a–b) express stable situations, they are compatible with bare nouns in argument position:

(77)  a.  Bordeaban cipreses el camino.  Spanish
     line.IMPF cypresses the road
     ‘Cypresses were lining the road.’
     b.  Este manuscrito contiene errores.
     this manuscript contains errors
     ‘This manuscript contains errors.’

The correlation between transitory predication and existential readings is not observed in French either. Kleiber (2001:55) argues that the temporal criterion cannot explain data of the type in (78):

(78)  a.  ? Un avion est gris.
     ‘A plane is grey.’
     b.  ? Un médecin est disponible/triste.
     ‘A doctor is available/sad.’
These examples exhibit the same grammaticality judgments, despite the fact that their main predicates differ regarding the temporal criterion: example (78a) is built with an individual-level predicate (which expresses a permanent or stable property) and (78b) is built with an s-level predicate (which expresses a transitory property).

In sum, there is no perfect correlation between transitory predicates and the so-called existential predicates, which legitimate the existential reading of BNPs (as well as the weak existential reading of indefinite DPs). We therefore need another empirical criterion to identify this class of predicates.

### 2.5.2 Space Localization

According to Dobrovie-Sorin (1997a, b), what makes a predicate existential is the possibility of localizing its arguments in space.²⁹ It can indeed be observed that those predicates that allow the existential reading of bare nouns (see (76)) also allow space adverbials (see (79b)), whereas those that exclude existential bare nouns (see (75a–b)) also exclude space adverbials (see (79a)):

(79)  a. ¿Dónde estaba triste/ inquieto/ enfermo Juan? Spanish
   where was sad worried sick Juan
   ‘Where was Juan present?’
   b. ¿ Dónde estaba presente Juan?
       where was present Juan

The same kind of correlation can be observed in French:

(80)  a. * Du beurre était rance.
       du butter was rancid
   b. Du beurre était en train de fondre dans une assiette.
       du butter was PROG to melt in a plate
       ‘There was butter melting on a plate.’

According to the space location criterion, most i-level predicates qualify as non-existential (as in (81)), because these predicates disallow not only the temporal but also the spatial localization of their argument. For these predicates, the spatial location criterion does just as well as an analysis in terms of a contrast between permanent and episodic properties.

²⁹The use of spatial location as a criterion of identifying predicates that allow existential or weak readings of indefinites was independently proposed by McNally (1995a, b, 1998), Glasbey (1998) and Kleiber (2001).
But the spatial location criterion can also account for those cases that are problematic for the criterion based on the i-level versus s-level distinction. We may thus suggest that permanent predicates such as line in (74) are compatible with an existential reading because the direct object acts as the spatial localizer of the subject. Being located in space, the subject can have an existential reading.

The spatial location hypothesis also accounts for those predicates that do not allow existential readings of BPs, although expressing a transitory property:

(82) a. ??Contrabassoonists were cheerful.
    b. ??Peasants were angry.
    c. ??During Chomsky’s lecture, students were asleep/drunk/hungry/tired.
    d. ??When we arrived, students were asleep/drunk/hungry.
    e. ??Look! students are drunk/ hungry in the street.

(83) *Du beurre était frais/ liquide/ mou

The examples in (82) and (83) contain s-level predicates and yet they do not allow existential readings. Applying the spatial location criterion, we again obtain the correct result: the predicates in (82) and (83) do not locate their subject argument in space.

Finally, Dobrovie-Sorin (1997a, b) proposed that the spatial location criterion explains the ungrammaticality of examples such as (84) pointed out by Laca (1990), which show that bare nouns in Spanish, Italian and Romanian cannot appear in the object position of verbs such as love, hate, etc. As expected, French de NPs behave on a par with bare nouns in the other Romance languages:

(84) a. *María adora café. Spanish
    a’. *Marie adore du café French
    b. *Juan detesta manzanas. Spanish
    b’. *Jean déteste des pommes French

Some of these examples are acceptable for certain speakers but only with a “quasi-universal” reading (or “functional” reading in Condoravdi’s (1992, 1994) terminology).
The ungrammaticality of examples of the type in (84a–b) correlates with the ungrammaticality of examples such as (84c–d), which show that their predicates do not allow for space adverbials:

\[(84)\]
\[c. \quad * \text{María adora Juan en la cafetería.} \quad \text{Spanish}\]
\[c'. \quad * \text{Marie adore Juan dans la cafétéria} \quad \text{French}\]
\[d. \quad * \text{Juan detesta María en la cocina.} \quad \text{Spanish}\]
\[d'. \quad * \text{Jean déteste Maria dans la cuisine.} \quad \text{French}\]

2.5.3 Some Apparent Problems

The space localization criterion must be refined in view of three types of data that seem to be problematic.

Let us first observe that space adverbs are possible with any kind of predicate when the subject is kind-referring. Thus, predicates such as *expensive* or *sacred*, which disallow space adverbs when the subject DP is a proper name, allow them when the subject is a name of kind:

\[(85)\]
\[a. \quad \text{Les livres sont chers en France.} \quad \text{the books are expensive in France.}\]
\[a'. \quad \text{Books are expensive in France.}\]
\[b. \quad \text{Les vaches sont sacrées en Inde.} \quad \text{the cows are sacred in India}\]
\[b'. \quad \text{Cows are sacred in India.}\]

In examples of this type, space adverbials do not function as modifiers of the main predicates but rather as modifiers of the subject DP, as suggested by glosses such as ‘The books sold in France are expensive’ or ‘Cows in India are sacred’. Kind-referring DPs can be easily modified by space localizers, because kinds refer to entities that are spatially scattered; the role of the modifier is to restrict reference to the realization of the kind at a certain location. Since individuals occupy one location at a time, an individual-referring argument cannot be modified by a space localizer. With those predicates that cannot be modified by space adverbs, examples such as (86) are either unacceptable or else the space localizer is interpreted as a time adverbial:

\[(86)\]
\[a. \quad ?? \text{Jean est fatigué dans sa chambre.} \quad \text{Jean is tired in his room}\]
\[b. \quad \text{Jean est heureux dans sa chambre.} \quad \text{Jean is happy in his room}\]
(86b) is acceptable because it is easily interpretable as ‘whenever John is in his room, he is happy’; (86b) is less acceptable because this type of interpretation is more difficult with a predicate such as \textit{tired}.

The sentences in (87) seem to provide another type of problem for the spatial location hypothesis:

(87) a. * De la fumée était dans la pièce/ dans le four.
   
\begin{tabular}{l}
\textit{de la smoke} \textit{was in the room in the oven} \\
\end{tabular}

b. * Du beurre était sur la table.
   
\begin{tabular}{l}
\textit{du butter} \textit{was on the table} \\
\end{tabular}

* Du linge était dans la salle de bain.
   
\begin{tabular}{l}
\textit{du laundry} \textit{was in the bathroom} \\
\end{tabular}

Despite the presence of a space adverbial, these examples are unacceptable. But note that in these examples the adverbial is not a modifier of the predicate but rather it functions as the main predicate itself, the copula being semantically empty. If we replace the copula with a verb, these sentences become acceptable.

(88) a. De la fumée s’élevait du four.
   
\begin{tabular}{l}
\textit{de la smoke} \textit{refl-rise.impf from the oven} \\
\end{tabular}

‘Smoke was rising up from the oven.’

b. Du beurre traînait sur la table.
   
\begin{tabular}{l}
\textit{du butter} \textit{lie.impf on the table} \\
\end{tabular}

‘There was butter lying on the table.’

c. Du linge séchait dans la salle de bain.
   
\begin{tabular}{l}
\textit{du laundry} \textit{dry.impf in the bathroom} \\
\end{tabular}

‘There was laundry drying in the bathroom.’

To take care of this type of example, we may say that a predicate can be represented as existential if it allows space modifiers. Space predicates themselves cannot function as existential predicates.

To sum up, we can distinguish two classes of predicates that allow for the existential reading of one of their arguments. The first class includes non-stative predicates, all of which allow space modifiers, as in (89):

   
\begin{tabular}{l}
\textit{des children} \textit{sleep.impf at the corner of the fire} \\
\end{tabular}

‘There were children sleeping by the fire.’

b. Des enfants étaient en train d’écrire sur la table du séjour.
   
\begin{tabular}{l}
\textit{des children} \textit{were prog to write on the table of the dining room} \\
\end{tabular}

‘There were children writing on the table of the dining room.’
Non-stative predicates describe events, which have to be localized in space and time. The localization of an event indirectly locates the participants in the event, i.e., the arguments of the predicate, hence the existential reading of the subject in (89). See also examples (88).

Stative predicates do not refer to events and therefore they do not allow space adverbials. However, certain stative verbs are such that one of their arguments is located with respect to another argument. One such predicate is *surround*, whose subject is located with respect to the object. Although these predicates do not assert the existence of an event, they allow an existential reading (cf. (77)) because they locate their arguments with respect to each other.

The following generalizations summarize the previous discussion: (i) the arguments of statives can only be located with respect to another argument of the same predicate; (ii) the arguments of non-statives can be located by means of the locative expression that anchors the event in space (and time) and thus indirectly anchors the participants in the event.

2.6 French Indefinites Headed by *du/de la/des*

In this section we show that French indefinites headed by *du/de la/des* are the closest French counterparts of bare NPs. We start by illustrating the parallel distribution and interpretive properties of BPs and bare mass NPs, which are echoed by the parallelism between plural *des* indefinites and mass indefinites headed by *de la* or *du*. Nevertheless, the latter are more constrained than the former, which is a particular case of a general crosslinguistic difference between mass and plural indefinites.

2.6.1 Bare Plurals and Bare Mass NPs

We have pointed out at several points in this chapter that mass nouns pattern with plural nouns in English as well as in Romance languages other than French: both types of nouns are allowed to occur without an article in argument positions (see (90)–(91)), in clear contrast with singular count nouns, which need an indefinite article in most contexts.

(90) a. John stole books from the library 
   b. Juan robó libros de la biblioteca 
   c. Ion a furat cărți de la bibliotecă  

(91) a. John stole wood. 
   b. Juan robó leña 
   c. Ion a furat lemn.
In Romance languages other than French, bare mass nouns also resemble BPs in that they cannot combine with entity predicates, as illustrated in (92)–(93)\(^{31}\):

(92) a. *Juan adora café.  Spanish
    John loves coffee.
  b. * Maria adoră cafea.  Romanian

(93) a. *Juan respecta profesores  Spanish
    b. *Ion respectă profesori.  Romanian

Moreover, bare mass nouns exhibit the interpretive effects that we have discussed for BPs: they always take narrow scope (94) and induce atelicity effects. Examples of the type in (94) are ungrammatical because the atelicity triggered by the BN *fruta is incompatible with the telicity induced by *se comió:

(94)  *Maria se comió fruta  Spanish
    Mary *se ate fruit

2.6.2   Parallelisms between du/de la/des French Indefinites and Bare NPs in the Other Romance Languages

In French, NPs are not allowed to appear bare in argument positions. But Dobrovie-Sorin and Laca (2003) have shown that French DPs of the form *de + definite article + N\(^{32}\) represent the closest counterparts of existential bare NPs in other Romance languages.

Like bare NPs in the other Romance languages, *de + definite article NPs can be used with plural and mass nouns but not with count singulars\(^{33}\):

\(^{31}\)The corresponding English examples are grammatical because English BPs and BMNs can refer to kinds. The Spanish and Romanian examples become grammatical if we use a definite mass Ns instead of bare mass nouns:

(i)  Juan adora el café.  Spanish
     Juan loves the coffee
(ii) Maria adoră cafea.  Romanian

\(^{32}\)De-expressions followed by a definite article (du/de la/des) are different from de-expressions directly followed by a noun, which are required in negative contexts or when related to certain adverbs such as beaucoup ‘many’ or peu ‘few’ (je n’ai pas vu de fille(s) ‘I haven’t seen de girl(s)’, j’ai vu beaucoup / peu de filles ‘I have seen many / few de girls’). Here, we will leave aside this other kind of expression.

\(^{33}\)In French, certain nouns, i.e., tomate ‘tomato’ can be interpreted, depending on the context, either as a mass or as a countable expression. We can thus have des tomates (countable plural) as well as de la tomate (mass, e.g., J’ai mangé de la tomate, or number neutral, e.g., Il y avait de la tomate sur le marché).
Furthermore, *du/de la/des NPs can combine with existential but not with entity predicates:

(96) a. De la fumée s’élevait du four.
    De la smoke SE rise.IMPF from-the oven
    ‘Smoke was rising up from the oven.’

b. 300 g de beurre étaient en train de fondre sur la table.
    300 g of butter were PROG to-melt on the table
    ‘300 g of butter were melting on the table.’

c. *Du beurre était savoureux.
    Du butter was delicious

d. *Du beurre était mou.
    Du butter was soft

*De + definite article NPs are incompatible with a generic reading, just like Spanish or Romanian bare plurals.

Given these similarities with existential BNs, French *de + def art NPs can be analyzed as weak indefinites, which in our implementation denote generalized quantifiers over amounts.

### 2.6.3 On the Strong Reading of des Indefinites

It should nevertheless be mentioned that in addition to the unmarked use described above, French plural des NPs may take strong readings in certain environments (Attal 1976, Chap. 4 below). Under their strong reading, des indefinites can combine with

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34 Attal’s distinction is based on the observation that these plural des NPs can escape the scope of negation, have specific readings in intensional contexts, or occupy argument positions of certain verbs. Attal (1976: 142) leaves open the question of whether there is “one or two des”. More recent studies (for an overview, see Bosveld-de Smet 1997: 5–54) show that there are good reasons to assume the existence of the marked use of des.
entity predicates (96a), can escape the scope of negation (97b) and can appear in contrastive contexts, where they supply an antecedent for the anaphoric expression d’autres (97c):

(97) a. Des élèves étaient malades.
    des students were sick
    ‘Sm students were sick.’

b. Des élèves ne m’ont pas rendu leurs devoirs.
    des students NEG me-have NEG returned their assignments
    ‘Sm students didn’t hand in their assignments.’

c. Des enfants tambourinaient sur leurs tables, tandis que d’autres
    des children drum.IMPF on their tables while others
    criaient à tue-tête.
    scream.IMPF out loud
    ‘Sm children were drumming on their tables, while others were
    screaming out loud.’

The possibility of strong readings distinguishes French des indefinites from the BPs of other Romance languages:

(98) a. *Ieri erau bolnavi elevi.
    yesterday were sick students
    ‘Some students were sick yesterday.’

b. *Nu mi-au adus lecțiile elevi.
    NEG me-have brought lessons-the students
    ‘Three students didn’t bring me their lessons.’

This indicates that the presence of an overt determiner (e.g., a numeral or des in French) is mandatory for a strong reading (leaving aside the generic reading). The possibility of strong readings is indeed a general crosslinguistical property of plural indefinites headed by overt determiners (see Chaps. 4 and 5):

(99) a. Ieri erau bolnavi niște elevi.
    yesterday were sick some students
    ‘Some students were sick yesterday.’

b. Nu mi-au adus lecțiile trei elevi.
    NEG me-have brought lessons-the three students
    ‘Three students didn’t bring me their lessons.’

In Sect. 2.4.4 above we have proposed that plural nouns denote sets of amounts. Since both BPs and des indefinites refer to a random element in a set of amounts, the default interpretation of both types of expressions is the weak reading. The possibility of strong readings of des indefinites can be attributed to the fact that the presence of the determiner signals the choice of a particular plurality, which is isolated from the other pluralities in the domain and as such it acquires the status of a plural individual, i.e., a plural entity that is distinct from any other plural entity.
2.6.4 Mass Nouns and the Impossibility of Individuation

The examples in (100) below show that mass indefinites headed by du/de la cannot take strong readings:

(100) a. *De la fumée était épaisse.
    *De la smoke was thick

b. *De l’eau n’était pas sale.
    *DE L water NEG was NEG dirty

The contrast between the acceptability of plural des indefinites in (97) and the unacceptability of mass de la/du indefinites in (100) is a particular case of a general contrast between plural and mass indefinite DPs. Indeed, the examples in (100) contrast with those in (101) below, in which the mass DP is built with an overt determiner:

(101) a. *Ieri era limpede niște apă.
    yesterday was clear some water.

b. *200g de apă nu era murdară.
    200g of water NEG was dirty

Moreover, the examples below show that whereas plural indefinite DPs can be used as arguments of love or hate, mass indefinites cannot appear in this context even when preceded by a determiner:

(102) a. Maria urăște doi băieți.
    ‘Maria hates two boys.’

b. *Maria adoră 200g de cafea.
    Maria adores 200g of coffee

In sum, mass indefinites headed by overt determiners, in particular by du/de la, differ from plural indefinites headed by overt determiners, in particular by des, insofar as they cannot take strong readings. We are thus led to conclude that the use of an overt indefinite determiner is not sufficient for isolating a particular amount of substance from the other amounts that satisfy the same property. This difference between mass and plural indefinites can be attributed to the properties of their respective domains of denotation: the plural domain is generated from a set of individuals (i.e., entities that are distinct, non overlapping), whereas the mass domain is generated from a set of amounts (i.e., overlapping entities). Reference to individualized amounts is possible for demonstratives (this water, these 200 g of butter) and for definites (the water in the tub, the butter on the table) because these determiners correspond to operations (deixis and maximalization, respectively) that yield individualized entities.
2.7 Bare NPs in Predicate Positions

Let us now examine bare NPs in predicate positions. French shows that the use of bare NPs in predicate positions is disconnected from the use of bare NPs in argument positions. More precisely, French allows BNPs in predicate positions (with certain nouns), although it does not allow them in argument positions:

(103)  a. *Jean était en train de lire livre.
  Jean was prog to read book
  
  b. Jean et Marie sont étudiants.
  Jean and Marie are students
  
  c. Jean est étudiant.
  Jean is student

The absence of correlation between the use of bare NPs in argument and predicate positions is also visible in the other Romance languages, where the use of BSs in argument positions is much more restricted than that of BPs (see Sect. 2.1.2 above), whereas in predicate positions, BSs can be used in all the contexts in which a BP can be used.

Given that predicate positions presumably require property-denotation, we might expect bare nouns in predicate positions to be possible (at least for a certain lexical class of nouns) in all languages. English is a counterexample to this generalization:

(104)  a. *John is student.
  b. John is a student.
  c. John and Mary are students.

The impossibility of using BSs in predicate (as well as in argument) positions is to be analyzed as being due to some syntactic constraint that operates in English as opposed to all the other Romance languages, including French.

In the rest of this chapter we will concentrate on the contrast between BSs and indefinite singulars (ISs henceforth) in predicate positions, which is exhibited by all

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35 English does allow BSs in predicate positions but only if they have unique reference, e.g., with some functional nouns:

(i) Mary is chairwoman.

36 According to Dobrovie-Sorin (to appear b), Number is a feature that attaches to little n in English and as such it is necessarily realized (as –s in the plural and as the indefinite article a in the singular) on nouns, even in predicate positions. In Romance languages, on the other hand, Number would attach to Det, which would allow nouns to show up without any Number marking.
Romance languages. In French, this contrast is paralleled by the contrast between
BPs and *des* indefinites:

(105) a. Minou est un chat.
     Minou is a cat
a’. Minou et Minette sont des chats.
     Minou and Minette are des cats
     ‘Minou and Minette are cats.’
b. Jean est étudiant.
     Jean is student
b’. Jean et Marie sont étudiants.
     Jean and Marie are students

Due to lack of space, the contrast between BPs and *des* indefinites will not be
illustrated with examples in the rest of this chapter but readers may check on their
own that *modulo* the singular/plural difference, the proposed analyses cover
the corresponding contrasts between BPs and plural *des* indefinites. Similar con-
trasts between BPs and plural indefinites can be found in the other Romance
languages.

Our generalizations will be illustrated with French examples. This choice is
motivated by several reasons: (i) as explained above, this language shows clearly
that the use of bare NPs, in particular BSs, in predicate positions is a phenomenon
that is distinct from the use of bare NPs in argument positions; (ii) the contrast
between BSs and ISs is paralleled by the contrast between BPs and *des* indefinites;
(iii) French has constructions of the type Marie, c’est une belle femme ‘Mary, this is
a good-looking woman’, which are crucial for the analysis of the contrast between
BSs and ISs.

Both the generalizations and the proposed analyses are assumed to cover the
other Romance languages but not English, as in English copular sentences ISs do
not alternate with BSs and thus what we say about ISs in Romance languages is not
expected to hold for English ISs.

In order to compare ISs and BSs in predicate positions in French, we will
consider only unmodified nouns, for which the contrast between ISs and BSs is
clear cut.

### 2.7.1 A Subclass of Nouns

A restricted class of common nouns may appear bare in the predicate positions of
copular sentences. Such predicates refer to professions (*professeur* ‘professor’,
*avocat* ‘lawyer’), titles (*prince*), hobbies (*alpiniste* ‘climber’), functions (*secrétaire*
‘secretary’), occupations (*étudiant* ‘student’) or social status (*chomeur* ‘unemp-
ployed’) (cf Laca and Tasmowski 1994; Matushansky and Spector 2004; de Swart
et al. 2007; Roy 2006).
Several authors have tried to characterize these nouns. According to Roy (2001, 2006), those nouns that can be used bare in the postcopular position are event nouns, i.e., nouns that have an event-variable in their argument structure. Thus, profession nouns such as teacher, dancer or professor would refer to activities when used bare in predicate positions: Jean est enseignant means that John teaches, which refers to an activity. According to Roy, all nouns can be used bare when they are predicated of human individuals, provided that they allow an eventive reading. Roy’s characterization seems problematic for nouns such as père ‘father’ or fille unique ‘only daughter’:

(106) a. Jean est père (de trois enfants)  
Jean is father (of three children)  
‘Jean is the father of three children.’

b. Marie est fille unique.  
Mary is daughter unique  
‘Marie is an only daughter.’

Matushansky and Spector (2004) claimed that nouns that can appear bare in predicate positions share the property of being non-scalar. These authors distinguish nouns like génie ‘genius’, which can never be bare, from nouns like professeur ‘professor’, by pointing out that only the former are compatible with degree modification: one can be a real or an absolute genius but cannot be more or less of a professor. However, this description is not entirely adequate, given the uncertain boundary between scalar and non scalar predicates and the fact that non scalar predicates can be easily coerced into acquiring scalar readings (cf Kennedy 1999). A non-scalar adjective like français ‘French’ can be used in the comparative (Jean n’est pas plus français que Pierre ‘John is not more French than Peter’), thus acquiring a scalar interpretation.

Beyssade and Dobrovie-Sorin (2005) argue that nouns that can be bare in predicate positions are non sortal (cf Gupta 1980), i.e., nouns that are not inherently associated with an individuation principle. Sortal and non-sortal nouns can be distinguished on the basis of the counting test. Imagine a situation where I face a group formed by two men (a math teacher and a physics teacher) and a woman teaching both literature and English. If I am asked how many women there are in the group in question, I can easily answer ‘only one’. However, if I am asked how many teachers there are, the answer is less straightforward, depending on whether I am supposed to count the woman once or twice (once as a literature teacher and once as an English teacher). Professeur ‘teacher’ is a non-sortal noun, without any inherent individuation principle: when counting teachers, we can either count the actual individuals or the disciplines they teach. The situation is even clearer for nouns like passager ‘passenger’, which refers to individuals who take part in an event. In order to count passengers we count either individuals (and if one individual travels twice, he counts as one passenger), or trips (and therefore if one individual travels more than once, he gets counted several times). Beyssade and Dobrovie-Sorin claim that in French, bare nouns in predicate positions are non sortal, a notion
that covers nouns referring to professions, titles, hobbies, as well as relational nouns, functional nouns and event nouns:

(107) a. Jean est père.
    Jean is father
    ‘Jean is a father.’

b. Jean est ami avec Marie.
    Jean is friend with Marie
    ‘Jean is friends with Marie.’

c. Jean est passager sur le vol n° 345.
    Jean is passenger on the flight n° 345
    ‘Jean is a passenger on flight nº 345.’

2.7.2 Distributional Differences between Singular Indefinites and Bare Singulars

There are several syntactic and semantic differences between ISs and BSs in predicate position in Romance languages. Here we will present two of these differences.

First, singular indefinites cannot appear as predicates of small clauses, in clear contrast with bare singulars.

    Marie imagines Paul a minister
    Marie imagines Paul minister

With respect to this context, BSs behave on a par with adjectives and PPs, which can also appear in small clauses, and differ from DPs headed by determiners, which cannot appear in small clauses, regardless of whether they are indefinite (as in (109c) or definite as in (109d)).

(109) a. Marie croit Paul coupable.
    Marie believes Paul guilty
    ‘Marie believes Paul guilty.’

b. Marie croyait Jean en difficulté.
    Marie believe.IMPF Jean in trouble
    ‘Marie believed John was in trouble.’

c. *Marie croyait Jean un avocat.
    Marie believe.IMPF Jean a lawyer

d. *Marie croyait Jean le meilleur avocat.
    Marie believe.IMPF Jean the best lawyer
Secondly, an interesting correlation holds in French copular sentences (a.o., Kupferman 1979) between the type of subject pronoun, namely *il/elle vs. ce ‘this, that’* and the type of predicate, namely ISs vs. BSs:

\[(110)\]  
\[a.\]  Marie, elle est professeur.  
  Marie she is professor  
\[b.\]  ?Marie, elle est une belle femme.  
  Marie she is a beautiful woman
\[(111)\]  
\[a.\]  *Marie, c’est professeur.  
  Marie that is professor  
\[b’.\]  Marie, c’est une belle femme.  
  Marie that is a beautiful woman

### 2.7.3 Higgins’ Typology Revisited

According to Higgins (1979), four types of copular sentences need to be distinguished:

\[(112)\]  
\[a.\]  John is a doctor.  
  predicational  
\[b.\]  Clark Kent is Superman.  
  equative  
\[c.\]  That’s John.  
  identificational  
\[d.\]  The problem is John.  
  specificational

Roy (2006) and Beyssade and Dobrovie-Sorin (2005) have shown that the contrasts between BSs and ISs cannot be explained on the basis of Higgins’s typology. Roy postulates a three-way distinction among predicational copular sentences\(^{37}\) and Beyssade and Dobrovie-Sorin assume two distinct rules of predication, called attributive predication and classifying predication. According to both proposals, Higgins’ class of predicational sentences is split into two types, corresponding to ISs and BSs, respectively.

Both of these analyses are problematic insofar as they do not take into account important similarities between copular constructions built with ISs and the three types of non-predicational sentences defined by Higgins. Indeed, copular sentences built with ISs pattern with the non-predicational copular sentences wrt to the two tests used above, i.e., the compatibility with small-clauses (see (113)) and the alternation between *ce / il* pronouns (see (114)).

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\(^{37}\) The notions of ‘defining’, ‘characterizing’ and ‘situation-descriptive’ predicates, which are defined in semantic terms, are assumed to entertain a one-to-one relation with distinct grammatical categories:

(i) Defining predicates are expressed by ISs.
(ii) Characterizing predicates are expressed by BSs.
(iii) Situation-descriptive predicates are expressed by adjectives.
2.7 Bare NPs in Predicate Positions

(113) a. *Mary croit John un médecin. predicational
Mary believes John a doctor
b. *Mary croit Clark Kent Superman. equative
Mary believes Clark Kent Superman
c. *Mary croit ce John. identificational
Mary believes that John
d. *Mary croit le problème John. specificational
Mary believes the problem John

(114) a. Jean, c’ est un médecin. predicational
Jean that is a doctor
b. Clark Kent, c’est Superman. equative
Clark Kent that is Superman
c. Ca, c’est John. identificational
that that is John
d. Le problème, c’est John. specificational
the problem that is John

The parallelisms between copular sentences built with ISs and the non predicational types of copular sentences led Beyssade and Dobrovie-Sorin (2009) to propose that copular sentences built with ISs are not predicational but instead should be grouped together with the three classes of non-predicational sentences. Higgins’ four-way typology can thus be reduced to a binary distinction between predicational sentences and identity sentences (equative, identificational and specificational sentences can be viewed as subtypes of identity sentences). 38 As we will see in Sect. 2.7.4 below, predicational sentences are defined in a more constrained way that allows us to split Higgins’s predicational sentences into predicational (in this more restricted sense) and identity sentences. This binary distinction correlates with a difference in syntactic categories:

(115) a. Identity sentences require full DPs in the post-copular position.
b. Bare singulars can only appear in predicational sentences, on a par with adjectives.

2.7.4 Semantic Composition

According to Beyssade and Dobrovie-Sorin (2009), predicational copular sentences rely on attributive predication, whereas identity copular sentences rely on

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38 Beyssade and Dobrovie-Sorin’s hypothesis that equatives, identificationals and specificationals are all identity sentences builds on Heycock and Kroch’s (1999) view that specificationals are base-generated as equatives rather than derived via Predicate Inversion from a predicational configuration (Moro 1997; den Dikken 2006).
identity predication. Below we present the definitions of these two types of predications and we make explicit the semantic composition for each of them.

\[(116) \text{Attributive predication} \]
\[
[[\text{DP is Adj/BS}]] = 1 \quad \text{iff} \quad [[\text{DP}]] \text{ has } P_{\text{Adj}} / P_{\text{BS}} \\
\quad \text{or in other terms} \\
\quad \text{iff} \quad P_{\text{Adj}} / P_{\text{BS}} \in [[\text{DP}]]
\]

In words, a sentence of the form DP is Adj/BS is true iff the property denoted by the Adj or BS belongs to the set of properties denoted by the DP.

Crucial for our present purposes are the semantic types assumed for the two expressions around the copula: the subject must be analyzed as denoting a set of properties (i.e., as a generalized quantifier) and the predicate as a property-denoting expression. The copula plays no role, it is empty and can be represented by the identity function \(l_{PP}\). The compositional analysis of a sentence based on attributive predication is given in (117); \(j\) is a constant that refers to John and \(H\) is a unary predicate corresponding to handsome.

\[(117) \quad a. \text{John is handsome} \\
\quad b. S\lambda PP(j)\lambda xH(x) \quad \text{which reduces first to } \lambda xH(x)(j) \\
\quad \quad \text{and then to } H(j)\]

Turning now to identity sentences, Beyssade and Dobrovie-Sorin (2009) analyze them as relying on an identity predicate, which relates two arguments of the same kind (two entities, two properties, etc.). In these sentences, the copula is interpreted as an identity predicate. This does not mean that we assume identity sentences to be symmetric. Indeed, even equatives can be shown to be asymmetric, as observed by Groenendijk et al. (1996). The asymmetry that characterizes identity sentences can be captured by assuming that they do not rely on the symmetric identity relation, as in (118a) but rather on a one-place predicate derived from an identity relation by saturating the postcopular argument. The asymmetry between the two arguments is due to information structure.

\[(118) \quad a. \text{identity relation:} \quad \lambda x \lambda y (x = y) \\
\quad b. \text{identificational predicate, e.g., BE a } \lambda x (x = a)\]

Equative sentences can thus be represented as in (119c), which is obtained by applying an identificational predicate of the form shown in (118b) to the individual denoted by the subject DP, as in (119b), which reduces to (119c) by lambda-conversion. The two constants \(ck\) and \(s\) correspond to the individuals respectively denoted by Clark Kent and Superman.
Higgins’ three classes of non-predicational sentences illustrated in (112)b–d can all be viewed as relying on a predicate of the type in (118b) and as such all of them can be called ‘identity sentences’. They differ from each other by the type of the subject: (i) equative sentences are those identity sentences built with proper names or definite descriptions; (ii) identificational sentences are identity sentences built with presentational pronouns; (iii) specificational sentences are identity sentences built with attributive subjects:

(120) Types of identity sentences
   a. Clark Kent is Superman.
      Equative: the subject DP = proper name
   b. That’s John.
      Identificational: the subject DP = presentational pronoun
   c. The problem is John.
      Specificational: the subject DP = attributive use

Beyond their differences, all of the three types of subjects enumerated here are entity-denoting expressions. Specificational sentences are special insofar as they are known to be built with DPs used attributively.\(^{39}\) Note however that the subjects of equatives themselves have been argued to be used attributively (Groenendijk et al. 1996), in which case they would mean ‘the individual referred to by the name of Clark Kent’ rather than ‘the individual Clark Kent’. Finally, the presentational pronouns that appear in identificational sentences are also entity-denoting expressions that might be viewed as involving a particular type of attributive use: ‘the individual referred to by using ce ‘this/that’ (whom you don’t know)’. These observations suggest that the subjects of our three types of identity sentences are much more similar than one would believe: all of them rely on e-type expressions that are used attributively.

### 2.7.5 Copular Sentences Built with Singular Indefinites as Equatives

Turning now to the postcopular expressions, identificational and specificational sentences allow not only proper names but also indefinite DPs, as illustrated below:

(121) a. That is a woman. Identificational
    b. What John saw is a woman. Specificational

\(^{39}\) Comorovski (2007) proposes to represent the attributive use of specificational subjects as intensional expressions of type \(<s,e>\).
Let us now assume that the third type of identity sentence, equatives, may also be built with a postcopular indefinite. Such a hypothetical equative would be a copular sentence of the form in (122b), which is obtained from the canonical equative given in (122a) by replacing the proper name in the postcopular position with an indefinite DP. Analyzed in this way, the sentence in (122b) says that there is an actor to which Clark Kent is identified:

(122) a. Clark Kent is Superman.
   b. Clark Kent is an actor.

This analysis of copular sentences of the type in (122b) fills a gap in the paradigm of identity sentences, insofar as postcopular indefinite DPs appear not only in specificational sentences and identificational sentences but also in equatives. We are thus led to conclude that copular sentences built with postcopular singular indefinites are not to be analyzed as predicational sentences – as currently assumed – but rather as equatives: a singular indefinite in the postcopular position denotes an individual to which the entity denoted by the subject is identified. Under our proposal, a strong dividing line separates copular sentences built with bare singulars from those built with singular indefinites: only the former are predicational sentences (and as such group with copular sentences built with adjectives), whereas the latter constitute a particular type of identity sentence, namely equatives built with ISs in the predicate position.

Predicational sentences rely on a rule of attributive predication, which establishes a relation between a property-denoting predicate and a subject DP that denotes a generalized quantifier (i.e., a set of properties). Identity sentences, on the other hand, rely on an identity predicate, which establishes a relation between a subject DP that denotes an entity (since it is used attributively, the subject DP cannot be shifted to denote a generalized quantifier) and another entity. We thus postulate the existence of two distinct copulas. In predicational sentences, the copula is semantically empty and as such can be represented as the identity function (see (123a)), which applies to a formula and yields the same formula. In identity sentences, on the other hand, the copula denotes the identity relation (see (123b)):

\[ \text{(123a)} \]

The distinction between the identity and the predicational copula is a standard one. Less standard is the view that specificational, identificational as well as copular sentences built with ISs all rely on an identity copula. Although den Dikken’s (2006) account of copular sentences differs from ours insofar as it crucially relies on Predicate Inversion for the analysis of specificational and refutes the existence of base-generated equatives, it is nevertheless similar to ours insofar as it recognizes only two types of copular sentences, Moro’s (1997) canonical and inverse predication. Correspondingly, den Dikken’s copulas are either ‘relators’ or ‘linkers’. Our approach in terms of identity predication (rather than Inverted Predication) is well motivated on semantic grounds (an identity predicate is needed for the semantic composition), whereas under den Dikken’s account, the ‘linker’-type of copula has nothing to do with identity, being syntactically triggered by the movement underlying Predicate Inversion. According to den Dikken, the Predicate Inversion analysis of specifications and equatives has the advantage of explaining the ban on A’-extraction of the postcopular expression, e.g., *whose opinion of Smith do you think your opinion of Jones is? We leave it open for further research the objective of showing that this constraint can be explained as an effect of identity predication (as opposed to attributive prédication).
(123) a. $\lambda P \lambda x P(x)$  copula in predicational sentences  
b. $\lambda x \lambda y (x = y)$  copula in identity sentences

Beyssade and Dobrovie-Sorin’s (2009) analysis presented above can be summarized as follows:

(124) a. Predicational copular sentences are built with a predicate that denotes a property and a subject that denotes a generalized quantifier. The copula is semantically empty.

b. Identity copular sentences are built with an identity predicate that establishes an identification relation between the entity denoted by the subject and the entity denoted by the postcopular DP. The copula denotes the identity relation.

2.7.6  **Explaining the Contrasts between Bare Singulars and Indefinite Singulars**

In what follows we will show that Beyssade and Dobrovie-Sorin’s (2009) proposal is able to explain the contrasts between ISs and BSs in postcopular positions. We begin with the two contrasts presented in Sect. 2.7.2 above and continue with some others.

2.7.6.1  **Small Clauses and Secondary Predication**

Small clauses are characterized by the absence of the copula. This absence is legitimate with BSs because BSs are property-denoting expressions and correspondingly the copula preceding them is semantically empty, which explains why it can be dropped. ISs, on the other hand, are entity-denoting expressions that must combine with a copula that denotes the identity relation. Being semantically non empty, the copula cannot be dropped, which explains why ISs cannot appear as predicates of small clauses.

The hypothesis that BSs can denote properties, whereas ISs cannot do so, also explains why BSs can function as secondary predicates, whereas ISs cannot do so:

(125) Jean est né (*un) prince et est mort (*un) mendiant.

‘John was born a prince and died a beggar.’

In sum, both small clauses and secondary predications are instances of attributive predication (as opposed to identity predication) and therefore ISs are ruled out in these environments.
2.7.6.2 Alternation Between ce ‘that’ and il/elle ‘he/she’

Turning now to the alternation between ce ‘that’ and il ‘he’ (see (110–111)), these pronouns differ with respect to their denotation: only the former can be analyzed as a generalized quantifier (type $<e,t>,t>$).\(^{41}\) Since the pronoun ce necessarily refers to an entity of type $<e>$, it is ruled out from predicational sentences.\(^{42}\)

The examples in (126) show that only ISs can provide an answer to questions of the type qui est…? ‘who is’, whereas only BSs can be the antecedent of an anaphor like ce que ‘which’ or l’est aussi ‘also’.

(126) a. Qui est Jean? Jean est *(un) chanteur
   ‘Who is Jean? Jean is a singer’

   b. Jean est *(un) docteur, ce que je ne serai jamais.
      ‘John is a doctor, (that) which I’ll never be.’

   c. Marie est *(une) institutrice, et sa sœur l’est aussi.
      ‘Marie is a primary school teacher and her sister is also
      ‘Marie is a primary school teacher, and her sister is that too.’

This behavior is expected, given that qui ‘who’ refers to entities of type $<e>$, whereas the antecedent of ce que ‘which’ and l’est aussi ‘also’ is property-denoting.

2.7.6.3 Modifying PPs for Names of Role

It is also expected that only bare nouns are compatible with expressions like de profession ‘by profession’, de nationalité ‘by nationality’ and with qua phrases (en tant que ‘as’), which select a property-denoting argument:

\(^{41}\) Partee (1987) showed that a DP could be associated to several semantic types, which are related to each other by type-shifting rules. According to Beyssade and Dobrovie-Sorin, ce ‘that’ is special in that it is necessarily of type e, i.e., it can only denote an entity. Ad-hoc as it may seem, this characterization of ce seems natural: languages may resort to special lexical items in order to make reference to objects that are viewed as having no property at all, which means that they cannot be viewed as denoting sets of properties.

\(^{42}\) Note however that when it refers to either a kind or a proposition (finite or not), ce can be the subject of attributive predication:

(i) La soupe, c’est bon.
   ‘Soup, that’s good.’

(ii) Que Jean fasse du jogging, c’est surprenant.
    ‘That Jean do of jogging, that’s surprising.’

(iii) Faire du jogging, c’est sain.
     ‘Jogging is healthy.’
(127) a. Pierre est (*un) avocat de profession.  
   Pierre is a lawyer of profession  
   ‘Pierre is a lawyer by profession’

   b. Pierre est (*un) chrétien de religion.  
   Pierre is a Christian of religion  
   ‘Pierre is a Christian by religion’

   c. Pierre est (*un) français de nationalité.  
   Pierre is a Frenchman of nationality  
   ‘Pierre is French by nationality’

(128) En tant que (*un) médecin, Pierre n’a pas voulu prendre  
   position sur ce sujet.  
   ‘As a doctor, Pierre didn’t want to take a position on this matter.’

2.7.6.4 Quantified Subjects

Bare nouns can appear in the predicate position of copular sentences built with a quantified subject, whereas singular indefinites cannot do so:

(129) a. Parmi ses amis, personne n’est (*un) acteur.  
   Among his friends nobody is a actor  
   ‘Among his friends, nobody is an actor.’

   b. Dans sa famille, tout le monde est (*un) médecin de père en fils.  
   In his family everybody is a doctor from father to son  
   ‘In his family, everybody is a doctor from father to son.’

Sentences like (129a–b) have the Logical Form in (130), in which the quantifier denotes a relation between two sets:

(130) a. \( \text{NOx} \; (\text{person} \; (x)) \; \text{actor} \; (x) \)

   b. \( \forall x \; (\text{person} \; (x)) \; \text{doctor} \; (x) \)

The ungrammaticality of (129a–b) is expected under the hypothesis that ISs cannot denote properties and as such they cannot supply one of the two sets related by the quantifier. Combined with the copula, ISs necessarily form identity predicates and therefore can only take entity-denoting subjects.

2.7.6.5 Lifetime Effects

As observed by Roy (2006) and Matushansky and Spector (2004), a.o., ISs and BSs contrast with respect to the so-called ‘lifetime effects’, which can be analyzed
in terms of implicature. Thus, the sentence in (131a), built with an indefinite, is both true and appropriate, although Balzac is actually dead, whereas the sentence in (131b), with a bare noun, is odd, because it carries the implicature that Balzac is alive:

(131)  a. Balzac est un écrivain.
   Balzac is a writer
   ‘Balzac is a writer’
   b. ?Balzac est écrivain.
   Balzac is writer

The contrast between ISs and BSs regarding lifetime effects can be explained in terms of the distinction between predicational and identity sentences if we assume that identity is an existent-independent predicate (the notion of existence-independent predicate is borrowed from Musan (1997)). Identity expresses an atemporal relation: an identity sentence imposes no requirement concerning the times of existence of the referents of DP_1 and DP_2. Indeed, as shown in (132), it is possible to establish an identity relation between two DPs that are associated to two disjoint time intervals corresponding to the past and future times with which the referents of Jean and Marie are associated:

(132)  Ce que Jean a ressenti hier est exactement ce que Marie ressentira demain.
   ‘What John felt yesterday is exactly what Mary will feel tomorrow.’

Attributive predication, on the other hand, requires that the time of existence of the subject must cover the situation time \( t_s \):

(133)  In predicational sentences, \( t_e \supseteq t_s \)

The present tense on the copular verb conveys the same meaning as an explicit adverb such as today. Therefore, because \( t_e = \) today, the requirement in (133) amounts to the requirement \( t_e \supseteq \) today, which implies that the referent of DP_1 is alive. This explains why copular sentences built with the present tense and BSs, which are to be interpreted as relying on attributive predication, exhibit lifetime effects. No such effect arises with ISs, because they rely on identity predication.

According to Roy, among others, the lifetime effect also characterizes copular sentences such as (134a), built with a past tense and a bare singular in predicate position. Note however that in the past sentence, the implicature ‘no longer alive’ is easily cancelable by adding a time adverbial, as in (134b). The only inference of (134b) is that Paul is no longer a doctor, hence (134b) is true if Paul has retired or changed his job. This inference is itself easily cancelable, as shown in (134c):
(134)  a. Paul était médecin.
   Paul was doctor
   ‘Paul was a doctor’

b. Paul était médecin avant d’émigrer aux États-Unis.
   Paul was doctor before to emigrate to the US
   ‘Paul was a doctor before he emigrated to the US’

c. Paul était médecin avant d’émigrer aux États-Unis,
   Paul was doctor before to emigrate to the US
   et il l’est resté.
   and he that is remained
   ‘Paul was a doctor before he emigrated to the US and he remained a doctor.’

2.7.6.6 Spatial and Temporal Modification

Let us finally consider the examples in (135), which show that spatial and temporal modifiers are allowed in predicational sentences but not in identity sentences:

   Paul is a doctor in Paris
   ‘Paul is a doctor in Paris’

b. Paul a été (*un) professeur à trois occasions dans sa vie.
   Paul has been a professor at three times in his life
   ‘Paul has been a professor three times in his life’

c. Marie est de temps en temps (*une) ouvreuse à l’Odéon.
   Marie is from time to time a usher to the Odéon
   ‘Marie is occasionally an usher at the Odéon’

   Jean has been a student from 1995 to 1998
   ‘Jean was a student from 1995 to 1998.’

In the non starred versions of the examples above, the locative or temporal phrase is a sentential complement, whose semantic role is that of a property modifier: it turns a given property into a new one. If *be doctor* is a property, *be doctor in Paris,* or *be doctor during the day* are two other properties. The ungrammaticality of the starred versions is due to the fact that in identity sentences, the postcopular expression does not denote a property and as such it cannot be modified. DP–internal modifiers are allowed, as in (136b):
(136) a. Paul est un médecin de jour/le jour.
   Paul is a doctor of day the day
   ‘Paul is a doctor during the day.’
   b. Jean est un médecin de la faculté de Paris.
   Jean is a doctor of the faculty of Paris
   ‘Jean is a doctor from the university of Paris.’

2.7.6.7 Attributive Uses of Indefinite Singulars

Note finally that copular sentences convey different meanings depending on whether they are built with or without an indefinite article, as illustrated by (137):

(137) a. Jean est clown.
   Jean is clown
   ‘Jean is a clown’
   b. Jean est un clown.
   Jean is a clown
   ‘Jean is a clown’

According to Laca and Tasmowski (1994), the IS has a metaphoric meaning. This is an appropriate description of the contrast given in (137) since être clown ‘(to be [a] clown)’ in (137a) means to be a professional clown, whereas être un clown ‘(to be a clown)’ in (137b) is less precise: the noun clown in (137b) does not necessarily refer to John’s profession but rather says something about John’s character, e.g., he likes to fool around or he is a funny guy.

Although they are built with ISs, copular sentences of the type in (137b) are predicational rather than identity sentences. Indeed, in these examples, the subject DP does not have an attributive use, as in identity sentences but rather a referential use, as in predicational configurations. Correspondingly, the postcopular IS is not interpreted as referring to an individual belonging to the class of (professional) clowns but rather as an attributive predicate roughly paraphrasable by ‘have the qualities of a clown’ or ‘behave as a clown’.

The predicational use of ISs can also explain a number of examples that are problematic for Beyssade and Dobrovie-Sorin’s (2009), as correctly pointed out by a reviewer of this book:

(138) a. Chaque langue est un art.
   every language is an art
   ‘Every language is a work of art.’
   b. Chaque maison est un royaume.
   every house is a kingdom
   ‘Every house is a kingdom.’
   c. Chaque homme est un orateur.
   every man is an orator
   ‘Every man is an orator.’
In all of these examples, the postcopular IS is not interpreted as denoting an individual but rather as denoting properties associated to prototypical entities such as a work of art, a kingdom or an orator: ‘every language has the status/ (some of) the qualities of a work of art’, ‘each house has the status/ (some of) the qualities of a kingdom’, ‘every house has (some of) the status/ (some of) the qualities of a kingdom’, ‘every man has (some of) the qualities/status of an orator’. The example in (138d) can be explained along the same lines:

(138)  d. Chaque ouvrage est un tout.
       every work is a whole
       ‘Every piece of work is a whole.’

This example is to be analyzed as relying on attributive predication rather than on an identity relation because be a whole means ‘form a whole’.

The explanation proposed above seems correct but we should acknowledge that it weakens Beyssade and Dobrovie-Sorin’s (2009) assumption that unmodified ISs necessarily form an identity predicate. They do so in those contexts in which ISs denote an individual belonging to the class denoted by the noun. But there are contexts in which ISs seem to be able to function as attributive predicates.

2.7.7 Modified Bare Nouns

Unlike singular indefinites, which are compatible with any kind of modifier, bare noun modification is much more constrained:

(139)  a. Jean est (un) médecin généraliste.
       Jean is a doctor generalist
       ‘Jean is a general practitioner.’

   b. Jean est *(un) médecin honnête.
       Jean is a doctor honest
       ‘Jean is a honest doctor’.

Modified bare nouns denote complex predicates, built from the simple properties denoted by the unmodified bare nouns. There are at least three different ways of building complex properties by modification.

First, a noun of profession N may be modified by a postnominal adjective or by another noun preceded by a functional preposition, yielding a hyponym of N: médecin généraliste ‘general practitioner’ in (140a) designates a type of doctor and chanteur de jazz ‘jazz singer’ in (140b) a type of singer. The only constraint on these constructions is a purely lexical one: the resulting NP must denote a subtype of the unmodified N.
Let us now consider BSs preceded by adjectives of the type bon ‘good’ or mauvais ‘bad’:

(141) a. Jean est bon / mauvais médecin.
   Jean is good bad doctor
   ‘Jean is a good/bad doctor’
   
   In cases of this type, we may assume that the head of the postcopular phrase is the adjective itself rather than the noun. A complex property is built by modifying an adjective by a name of role. Therefore, names of roles can be taken to denote, depending on the context, either a property or a property modifier. In (141), the name of role médecin is analyzed as a property modifier rather than as a property: the property attributed to Jean is not the property of being a doctor but the property of being bad or good, as a doctor.

   This analysis presents two advantages compared to some other recent proposals (Matushansky and Spector 2004; de Swart et al. 2007). First, we can explain why danseur in (142) does not have the restricted meaning of professional dancer (compare unmodified BSs, which have only the restricted meaning). (142) can be understood as meaning ‘John is bad when he dances’ and not necessarily as ‘John is a professional dancer who dances badly’.

(142) Jean est bon danseur.
   Jean is good dancer
   ‘Jean is a good dancer.’
   
   The examples in (143) corroborate our analysis:

(143) a. *Pierre trouve Jean danseur / génie.
   Pierre finds Jean dancer / genius
   
   b. Pierre trouve Jean bon danseur.
   Pierre finds Jean good dancer
   ‘Pierre finds Jean [to be a] good dancer.’
   
   c. Pierre trouve Jean bon (comme danseur).
   Pierre finds Jean good as dancer
   ‘Pierre finds Jean [to be] good (as a dancer).’
   
   The acceptability of (143b) is unexpected if bon danseur ‘good dancer’ is analyzed as a BS, i.e., a bare noun modified by an adjective. This acceptability can be explained under the proposal made above: bon danseur ‘good dancer’ is an AdjP
headed by *bon* ‘good’, which is modified by *danseur* ‘dancer’. Under this analysis, (143b) is acceptable on a par with (143c), because adjectives (unlike nouns) satisfy the selectional restrictions of *trouver* ‘find, consider’.

Our proposal can be extended to cover examples of the type shown in (144), which are usually analyzed as lexicalizations or idioms. Within our account, they can instead be analyzed in terms of property modification:

(144)  
- a. Jean est beau/ gentil garçon.  
  Jean is handsome/kind boy  
  ‘Jean is a handsome/kind boy.’
- b. Marie est vieille fille/ jeune grand-mère.  
  Marie is old girl young grand-mother  
  ‘Mary is a spinster/a young grand-mother’
- c. Jean est simple soldat / petit commerçant.  
  Jean is simple soldier/ small shopkeeper  
  ‘Jean is a simple soldier/small shopkeeper.’

2.7.8 *The Argument Structure of Relational Nouns*

Turning now to relational nouns such as *ami*, the presence or the absence of the indefinite article depends in this case on the type of preposition that heads the complement of the relational noun. With PPs such as *avec DP* ‘with DP’ or *à DP* ‘to DP’, which are headed by lexical prepositions, the indefinite article is ungrammatical (as shown in (145a–b)). With PPs such as *de DP*, built with a semantically empty preposition, functioning as a marker of Genitive Case, the indefinite article is obligatory:

(145)  
  Jean is a friend with Pierre  
  ‘Jean is friends with Pierre.’
- b. *Jean est *(un) ami de Pierre.  
  Jean is a friend of Pierre  
  ‘Jean is friends with Pierre.’

Kinship nouns are a sub-class of relational nouns, which are special in that their complement can itself be a bare noun:

(146)  
- a. Jean est (un) fils d’avocat  
  Jean is a son of lawyer  
  ‘Jean is a son of lawyer.’
- b. Jean est *(le) fils d’un avocat.  
  Jean is the son of a lawyer  
  ‘Jean is the son of a lawyer.’
Granting that bare nouns denote properties, examples of the type in (146a) indicate that contrary to current assumptions, the second argument of kinship nouns need not be saturated by an individual but may also be saturated by a property. In other words, kinship nouns may denote a relation between an individual and a property referring to a role. In (142b), *fils de diplomate* denotes a complex property, obtained by applying a function (*fils* ‘son’) to a property (*diplomate* ‘diplomat’):

\[
(147) \begin{align*}
\text{a. } & \lambda x \lambda P \text{son}(x, P) \text{ (lawyer)} j \\
\text{b. } & \lambda x \text{son}(x, \text{lawyer}) j
\end{align*}
\]

(147) shows how the complex predicate *être fils d’avocat* ‘be son of lawyer’ is built. The kinship noun *son* is analyzed as a binary predicate, which denotes a relation between an individual and a property (rather than a relation between two individuals, as currently assumed). This is indicated by the two lambda abstractions \(\lambda x \lambda P\) in (147a). This binary predicate is applied to the property denoted by *lawyer* and to the constant ‘j’ referring to John. (147b) is obtained by reduction from (147a), the name of role *lawyer* instanciating the value of P. In (147b) the complex property *être fils d’avocat* represented by ‘\(\lambda x \text{son}(x, \text{lawyer})\)’ is applied to j.

### 2.7.9 Comparison with Other Approaches

Let us now compare the analysis adopted above with the proposal in de Swart et al. (2007). Both approaches share the assumption that bare nouns and singular indefinitives have different denotations. However, the distinctions they make are not the same. On our proposal, bare nouns in predicate position are property-denoting expressions, just like adjectives, which can be directly attributed to individuals, whereas singular indefinites refer to entities. Accordingly, we posit the existence of two types of copular sentences, predicational and identity sentences, with two distinct copulas. In contrast to this, de Swart et al. make no distinction concerning the copulas and assume the existence of two operators (REL and QUAL) that map kinds to individual entities. Following Carlson, they assume that nouns lexically denote kinds of type \(k\) and they use a *realization* operator REL in order to map a kind to the set of entities realizing it. Copular sentences built with a singular indefinite would establish a relation between the entity denoted by *John* and the kind denoted by *teacher* via the use of the realization operator, which mandatorily applies at the NumP level. In the case of copular sentences built with bare nouns, they assume the existence of capacity qualifiers, of the type *by profession, by nationality*, which may be overt or covert. Capacity qualifiers are analyzed as operators that map the kind \(k\) denoted by the noun to the set of entities realizing the kind as a particular role in society, often associated with its typical activities. Capacity qualifiers, noted QUAL, are more restrictive than REL: only entities that realize the kind \(k\) in the way that is expressed by the qualifier are in the set QUAL(\(k\)).

The two accounts cover different empirical domains. De Swart et al. restrict their attention to role names and therefore nothing is said regarding other types of nouns
that can appear bare in predicate positions, e.g., relational or kinship nouns. Note furthermore that their account, which builds on the lexical properties of role names, does not seem able to explain the use of role names modified by adjectives such as *bon*. Claiming that *mauvais médecin* ‘bad doctor’ is a role name like *médecin* ‘doctor’ and that this information is lexically encoded would be an *ad hoc* and counter-intuitive solution. The same observation holds for kinship nouns like *fils de diplomate* ‘son of diplomat, diplomat’s son’, *fils d’avocat* ‘son of lawyer, lawyer’s son’, which are unlike to be stored as such in the lexicon, a proposal that would obscure their compositional and productive character.

### 2.8 Conclusions

In this chapter we were led to challenge several widely assumed generalizations and hypotheses regarding the analysis of bare NPs. The most important observation is that the use of bare NPs in argument positions should not be viewed as being related to the use of bare NPs in predicate positions. These are two separate phenomena, for which separate analyses are needed. This observation strongly suggests that the property analysis of argumental BPs is misguided. We remain open to the possibility of analyzing count BSs in Spanish, Romanian or Catalan as property-denoting. Carlson’s (1977a, c) observations regarding the differences between BPs and singular indefinites can be attributed to the fact that, due to the absence of an overt Det, BPs are necessarily weak (in the sense of Milsark 1977), whereas singular indefinites are both weak and strong. In Sect. 2.4.4 we have suggested that the lack of indefinite article is related to the denotation: mass and plural nouns refer to amounts (of substance or of objects), i.e., entities that are ordered by the part-whole relation, whereas singular count nouns refer to individuals, i.e., entities that are not ordered by the part-whole relation.

The main theoretical proposal of this chapter is that argumental BPs (as well as bare mass NPs) should be analyzed as generalized existential quantifiers over amounts, which are defined in such a way that they need to combine with existential predicates. In Chaps. 3, 4 and 5 we will show that this analysis extends to non-bare weak indefinites.

Turning now to bare NPs in predicate positions, let us insist that the interesting phenomenon concerns only a limited class of nouns: names of roles, professions and relational nouns. All other nouns occurring in postcopular positions require the indefinite article. The differences between copular sentences built with BSs as opposed to ISs point to a necessary distinction between two types of copular sentences (and two types of copulas), which we have labeled attributive and identity sentences. In identity sentences, the postcopular indefinite denotes an individual, just as it does in argumental positions. In attributive sentences, the postcopular noun denotes a property, which explains why ISs are disallowed and BSs allowed, on a par with adjectives.
Chapter 3
Existential Sentences

It is usually assumed that existential sentences are subject to an “indefiniteness restriction”: only indefinite DPs can follow sequences such as *There is* in English or *Il y a* in French; definite and quantificational DPs (cf (2)) are excluded from such contexts. In this chapter, those French examples that are not glossed are the counterparts of the immediately preceding English examples:

(1)  
\begin{align*}
\text{a. } & \text{There was a man in front of the door.} \\
\text{a’. } & \text{Il y avait un homme devant la porte.} \\
\text{b. } & \text{There is a knife on the table.} \\
\text{b’. } & \text{Il y a un couteau sur la table.}
\end{align*}

(2)  
\begin{align*}
\text{a. } & \text{?There is Fred outside.} \\
\text{a’. } & \text{?Il y a Fred dehors.} \\
\text{b. } & \text{?There was the table in the garden.} \\
\text{b’. } & \text{?Il y avait la table dans le jardin.} \\
\text{c. } & \text{*There was each table in the garden.} \\
\text{c’. } & \text{*Il y avait chaque table dans le jardin.}
\end{align*}

\footnote{In this chapter we will present recent analyses of English existential sentences and see how they can be refined in order to account for the French data. Beyond the similarities between *there be* sentences in English and *il y a sentences in French, these constructions also differ in interesting ways. In addition to the difference in verbs (avoir ‘to have’ in French and to be in English) and the presence of two pronouns il and y in French, the two constructions differ with regard to agreement: in French, the verb avoir is always found in the third person singular, regardless of the number (singular or plural) of the DP argument, whereas in English, BE agrees with the DP argument. We will not attempt to explain these syntactic differences here. Nor are we going to examine Landman’s (2003) observation that a definite DP is more easily accepted following *il y a* in French than following *there be* in English.}

McNally (1998) restates the indefiniteness constraint as a selectional restriction according to which existential sentences select property-denoting arguments. In this chapter we will show that McNally’s proposal is problematic and we will adopt Heim’s (1987) negative constraint: a variable that ranges over individuals cannot occur in the LF representation of existential constructions. Basing our analysis on French, we will distinguish three types of existential sentences, a locative existential construction, an eventive construction and an enumerative construction, which can be distinguished by their respective codas. Locative existentials are built with a locative PrepP (note that the examples in (1a–c) are all of the locative type), in eventive existentials the coda is an eventive relative clause in French and an eventive gerund in English and finally, in enumerative existentials the coda is absent or implicit. These three constructions all obey Heim’s constraint but they nevertheless differ from each other regarding the type of argument that they allow. The most restrictive constraint holds for locative existentials, which can only take non specific amounts as arguments. The argument of eventive existentials is an event participant, which can be an individual or an amount. Finally, the argument of enumerative existentials is a list. At the end of the chapter we will examine two types of existential sentences that seem to constitute counterexamples to Heim’s generalization: existential sentences built with quantificational arguments and existential sentences that allow for the relativization of their argument. We will explain why and how such sentences obey Heim’s constraint.

3.1 Constraints on Existential Sentences

3.1.1 Existential Sentences Have Property-Denoting Arguments

3.1.1.1 The Semantic Composition of Existential Sentences according to McNally (1998)

McNally’s (1998) analysis builds on a remark due to Strawson (1959: 241), who says that existential sentences can be construed as propositions of the form subject-predicate “in which the subject is a property or concept and in which the predicate declares, or denies, its instantiation.” Accordingly, McNally proposes that there-sentences are built with a predicate of instantiation that applies to a property. Thus the sentence in (3) is true if and only if the property snow, represented in (4) as λy snow(y), is instantiated.

(3) There is snow.
(4) to be instantiated (λy snow(y))

As McNally points out, a property is instantiated if and only if there is a particular of which it is true. To be instantiated is reformulated in (5a) so as to show that it
is this predicate that introduces existential quantification: *to be instantiated* translates as \( \lambda P \exists x P(x) \), i.e., the set of properties P such that there is a particular x for which P is true. We go from (5a) to (5b) and then to (5c) via two applications of the rule of \( \lambda \)-reduction. In (5a), \( \lambda y \) snow(y) represents the set of amounts of matter that are snow. (5b) is obtained by substituting the value \( \lambda y \) snow(y) for P in \( \exists x P(x) \) in (5a). And finally (5c) is obtained from (5b) after reduction of \( \lambda y \) snow(y) (x), which yields snow(x).

(5)  
\[
\begin{align*}
(5a) & \quad \lambda P \exists x P(x) \, (\lambda y \text{snow}(y)) \\
(5b) & \quad \exists x \, (\lambda y \text{snow}(y)) \, (x) \\
(5c) & \quad \exists x \text{snow}(x)
\end{align*}
\]

According to this analysis, *there is snow* is true if and only if a particular, namely a certain quantity of snow, exists. It is the logical counterpart of *there is* that is responsible for introducing existential quantification, not the postverbal DP *snow*.

This representation of *there* sentences should be distinguished from the traditional formalization (6b), which is still often used, according to which (3) contains a predicate of existence (*there is*) and an existential quantification over particulars (corresponding to *snow*). In (6a), the unary predicate \( \lambda x \text{exist}(x) \) is the logical counterpart of *there is* and the generalized quantifier \( \lambda P \exists y \, [\text{snow}(y) \land P(y)] \) translates the expression *snow*. The existential quantifier \( \exists \), which quantifies over a particular, is part of the representation of *snow*. This is particularly clear in (6b), which is the reduction of (6a).\(^2\) Note that (6b) is somewhat redundant, as the predicate *exist* duplicates information given by the existential quantifier \( \exists \).

(6)  
\[
\begin{align*}
(6a) & \quad \lambda P \, [\exists y \, [\text{snow}(y) \land P(y)]] \, (\lambda x \text{exist}(x)) \\
(6b) & \quad \exists y \, [\text{snow}(y) \land \text{exist}(y)]
\end{align*}
\]

Going back to McNally’s (1998) analysis, it explains the restrictions on the distribution of postverbal DPs in existential constructions by means of a constraint on the semantic type of the DP\(^3\):

\(^2\)To reduce (6a), \( P \) in \( \exists y \, [\text{snow}(y) \land P(y)] \) is replaced by the predicate \( \lambda x \text{exist}(x) \). We thus obtain (i). y is then substituted for x in [exist(x)], yielding (6b).

(\(i\) \quad [\exists y \, [\text{snow}(y) \land (\lambda x \text{exist}(x)) \, (y)]

\(^3\)McNally views the constraint in (7) as a selectional restriction comparable to the requirement of plural referents imposed by predicates such as *gather*, which can be satisfied by morphological plurals (ii) but also by singular DPs that denote groups (iii). Example (i) is excluded, not because the subject is singular but rather because it denotes an atomic individual:

(\(i\) \quad *A girl is gathering around the table.  
(ii) \quad The girls are gathering around the table.  
(iii) \quad The dense crowd is gathering around the building.
(7) McNally’s (1998) constraint

Sentences of the form *There be DP W* are well-formed only if DP denotes a property (in other words, DP is of type <e,t>).

It follows from the formulation in (7) that *There be DP W* and *Il y a DP W* are ungrammatical when DP denotes an individual or a generalized quantifier.\(^4\)

Summarizing, according to McNally (1998), the DP in an existential construction does not introduce a discourse referent but rather a property. It is the predicate *there be / il y a* that introduces existential quantification, as well as an individual variable. To assert existence is to predicate a property of another property, i.e., to assert that a property is instantiated. Such an assertion is about a property and only indirectly about the individuals of which that property is true.

3.1.1.2 Negative Existential Sentences

We have already noticed that McNally’s formalization of *There is / Il y a* sentences should be distinguished from the traditional formalization of existential sentences, given in (6b) and repeated here in (8), which involves a predicate of existence (*there is / il y a*) and existential quantification over particulars (corresponding to *snow / de la neige*).

(8) \( \exists y \ [\text{snow}(y) \land \text{exist}(y)] \)

This traditional analysis is problematic for negative sentences: the DP *snow* introduces existential quantification in the logical form, which contradicts the negation of the predicate *exist*, which translates *there is no*. In sum, the Logical Form (9b) conveys a contradiction:

(9) a. There is no snow.
    b. \( \exists y \ [\text{snow}(y) \land \neg \text{exist}(y)] \)\(^5\)

McNally’s analysis avoids the paradox of negative existential sentences because in both positive and negative existentials, *snow* is analyzed as denoting a property and does not introduce any existential quantification.

\(^4\)Apparent exceptions will be examined later in this chapter: the case of definite descriptions in Sect. 3.3 and the case of quantified expressions in Sect. 3.4.

\(^5\)If negation took scope over the entire sentence, we would have the following representation:

(i) \( \neg \exists y \ [\text{snow}(y) \land \text{exist}(y)] \)

This representation is also somewhat paradoxical due to the simultaneous presence of the negated existential quantifier and the predicate *exist*. It could be paraphrased as: *it is false that there exists snow that exists*. 
(10) a. There is snow.
   b. $\lambda P \exists x P(x) (\lambda y \text{snow}(y))$

(11) a. There is no snow.
   b. $\lambda P \neg \exists x P(x) (\lambda y \text{snow}(y))$

### 3.1.2 Problems with the Property Analysis

#### 3.1.2.1 Definite DPs

On McNally’s account, definite DPs are expected to be ruled out of existential constructions as a consequence of the fact that they are of type e, rather than $<$e,t$. However, McNally acknowledges the occurrence of definite DPs in existential sentences. This can be seen in the English example in (12), due to Lambrecht (2002), and its French equivalent in (13). Furthermore, she notes that in languages like Catalan, definite DPs are always acceptable in existential constructions (cf. (14))

(12) There is the mailman coming.
(13) Il y a le facteur qui arrive.
   ‘There is the mailman coming.’

(14) Hi havia la Joana a la festa.
   ‘Joan was at the party.’

To account for these examples, McNally resorts to type-shifting. Ever since Montague, it is well established that a proper name can denote either something of type e (a constant), or a set of properties, of type $<$e,t$>$. Jean translates either as the constant j in (15a), or as the set of properties that Jean has in (15b). Partee and Rooth (1983) and Partee (1987) have furthermore shown that it is possible to multiply type-shifting rules and thus go from a type e denotation to one of type $<$e,t$. Jean may be represented as the set of individuals that are identical to Jean, as shown in (15c).

(15) a. j
   b. $\lambda P (P(j))$
   c. $\lambda x (x=j)$

Accordingly, for McNally, any referential expression of type e can type-shift to an expression of type $<$e,t$. This would account for the occurrence of definite descriptions in existential sentences, by simply assuming that they are subject to the above-mentioned type-shifting rule.
According to McNally, the marginal acceptability, viz. the unacceptability, of definite DPs and proper names is not due to the selectional constraint (which allows them, due to type-shifting) but rather to a pragmatic novelty condition on the referent denoted by the postverbal argument: *There be* can only be used in a context C if the DP serving as its argument introduces a novel discourse referent. This pragmatic constraint adds up to the semantic selectional constraint according to which the DP argument of existential sentences denotes a property. The pragmatic condition accounts for the contrast between (16) and (17):

(16)  a. *There was the table in the garden.
     a'. *Il y avait la table dans le jardin.

(17)  a.  There was a table in the garden.
     a'.  Il y avait une table dans le jardin.
     b.  There were several tables in the garden.
     b'.  Il y avait plusieurs tables dans le jardin.

Indefinite DPs are frequent in existential sentences because, as shown by Heim (1982), they always introduce a new discourse referent. Definite DPs, on the other hand, do not usually meet the novelty condition. Instead, they refer back to a discourse referent that has already been introduced or is part of the common ground.

McNally claims that definite DPs are excluded of existential sentences because they never introduce new entities. But this is not exact. The difference between definiteness and indefiniteness does not perfectly correlate with that between familiarity and novelty. Indeed, there are instances of definite DPs that introduce new discourse referents, in particular, what Prince (1981: 235) calls an ‘unused’ new entity. An unused entity is a referent that the addressee is assumed to be acquainted with (e.g., a contextually salient referent) but which she has not used yet. This is illustrated with the definite descriptions *le chat / the cat* and the proper name *John* in (18) and (19), which can be uttered out of the blue:

(18)  a.  Have you seen the cat in the yard?
     a'.  As-tu vu le chat dans la cour ?

(19)  a.  Peter went to Paris. He saw John over there.
     a'.  Peter est allé à Paris. Il a vu John là-bas.

---

Prince distinguishes between two kinds of new discourse referents: one kind is “brand new” discourse referents, corresponding to cases where the addressee must create a new entity and introduce it into the universe of discourse; the other kind is “unused” discourse referents, corresponding to cases where the addressee already has a discourse referent in his/her own model and only needs to introduce or copy it into the discourse-model. The referent does not need to be created but merely activated, as it were.
The examples in (20)–(21) show that despite their being definite, DPs that refer to ‘unused new’ entities may be used in existential sentences:

(20) a. There is the cat in the yard.
   a’. Il y a le chat dans la cour.
(21) a. There is John over there.
   a’. Il y a John là-bas.

Another case in point, observed by Comorovski (1995), involves examples relying on the mechanism known as ‘cross-reference’. This can be observed with certain definite DPs, e.g., *its author / son auteur* in (22), or *the son of the neighbor / le fils de la voisine* in (23):

(22) a. John read [a book on Schubert] and wrote to [its author].
   a’. John a lu [un livre sur Schubert] et a écrit à [son auteur].
(23) a. Jean has [a neighbor who plays the piano]. As for [the neighbor’s son], he plays the violin.
   a’. Jean a [une voisine qui joue du piano]. Quant au [fils de la voisine], il joue du violon.

In (22), *its author/son auteur* introduces a novel discourse referent but this referent is dependent on the DP *a book on Schubert/un livre sur Schubert*. Similarly in (23), *the son of the neighbor/le fils de la voisine* introduces a discourse referent not yet present in the context but the referent depends on another referent that has already been mentioned (i.e., the neighbor).


(24) a. There was the son of a neighbor at the party.
   a’. Il y avait le fils d’une voisine à la fête.

In sum, the study of existential sentences calls attention to definite DPs that refer to new entities: although they refer to new discourse-referents, these DPs are definite either because their referents are salient or ‘active’ in the extralinguistic context, or because they are introduced by means of cross-reference (see Chap. 8 on dependent DPs).

McNally’s account relies on two constraints: a semantic one, on the (semantic) type of the DP argument in existential sentences, and a pragmatic one, on the novelty of the discourse referent associated with the DP. The two constraints are of a very different nature: the former rules out quantified expressions from existential sentences, the latter explains why definite DPs are often less acceptable than indefinite DPs. We will not pursue this analysis, which makes use of type-shifting.
rules without restricting the range of application of these rules. Rather, we seek to avoid type-shifting rules as much as possible. We consider it is always possible to have a type-lifting operation that applies to a constant, i.e., an expression referring to an individual and returns an expression of type $\langle e, t \rangle$. To put it differently, in our view, a constant can either refer to an individual, or to a set of properties. But we do not allow for any other type-shifting operations and we think that type-shifting can only result from the application of a covert semantic operator.

Let us now observe that the presence of definite DPs in existential sentences is problematic not only for McNally’s analysis but also for Milsark’s (1977) view according to which the arguments of *there*-sentences are necessarily weak indefinite DPs (see Chaps. 4 and 5 below). This problem can be avoided by extending the typology of French existential sentences to English. As shown in Sect. 3.2.2 below, definite DPs can freely occur in eventive existentials (i.e., those existentials that have an eventive relative (in French) or gerund (in English) as a coda) but not in locative existentials (i.e., those existentials that have a locative coda).

### 3.1.2.2 Adjectives

A simple and yet compelling argument against the property analysis of the argument of existential sentences (and more precisely locative existentials) comes from the fact that adjectives, which are typically property-denoting expressions and which are always felicitous in predicate positions, are excluded from existential sentences. This generalization holds cross-linguistically and in particular in both English and French:

(25)  
\begin{align*}
\text{a. } & \star \text{ There is } \lbrace \text{happy/red} \rbrace. \\
\text{a'. } & \star \text{ Il y a } \lbrace \text{heureux/rouge} \rbrace.
\end{align*}

(26)  
\begin{align*}
\text{a. } & \text{ She was } \lbrace \text{happy/red} \rbrace. \\
\text{a'. } & \text{ Elle était } \lbrace \text{heureuse/rouge} \rbrace.
\end{align*}

The clear contrast illustrated in (25)–(26) is unexpected under McNally’s property analysis. In fact, McNally’s analysis of existential sentences is a particular case of a more general hypothesis according to which weak DPs are property-denoting expressions (McNally (1995a, b, 1998), van Geenhoven (1996), McNally and van Geenhoven (1998), Dobrovie-Sorin (1995, 1997a, b), Ladusaw (1994), a.o.), which we have shown to be problematic in section 4.2 of Chap. 2 above. Note that McNally might have argued that the arguments of existential sentences are weak DPs of a special, more constrained sort. However, the hypothesis of property-denotation does not seem to be adequate and the simplest view is to go back to Milsark’s (1977) observation that the arguments of existentials must be weak DPs (see Chaps. 4 and 5 of this book).

In order to further understand Milsark’s generalization we need to define weak DPs and explain why only weak DPs are allowed as arguments of existential sentences (as we will see below, this requirement holds for locative existentials but not for the other two types of existentials discussed in Sect. 3.2 below).
3.2 Existential Sentences in French

3.1.3 Our Proposal in a Nutshell

The conclusions in (27a) and (27b) can be respectively drawn from our examination of existential sentences built with definite DPs and adjectives:

(27)  
   a. The property analysis cannot be a constraint on all types of existential sentences.  
   b. The property analysis cannot be a constraint on locative existential sentences.

In the remainder of this chapter we will attempt to show that existential sentences are of different types and that there is a correlation between the type of DP and the type of existential sentence:

(28)  
   a. Locative existentials have weak DPs as arguments.  
   b. Definite DPs are allowed in eventive and enumerative existentials.

We will also make explicit the semantic composition of locative existentials based on the hypothesis stated in (29), proposed in Chap. 2 and further motivated in Chaps. 4 and 5:

(29)  Weak DPs refer to non specific amounts.

3.2 Existential Sentences in French

In this section, we will concentrate on French *il y a* existentials and propose, following Giry-Schneider (1988), Comorovski (1995) and Lambrecht (2002), that three types of existential sentences must be distinguished: a locative existential construction, an eventive construction and an enumerative construction,\(^7\) which can be distinguished by their respective codas. Locative existentials are built with a locative

\(^7\)We do not adopt Comorovski’s (1995) distinction between the existential and the presentational readings of *there is* sentences. For Comorovski, the existential reading corresponds to an assertion of existence, as in (i), and the presentational reading, to the introduction of a new referent, as in (ii):

(i)  Il y a peu de neige dehors.  
   ‘There is little snow outside.’  
(ii) Il y a beaucoup de gens qui meurent de froid dehors.  
   ‘There are many people freezing to death outside.’  

According to Comorovski, these two readings correspond to different ways of calculating the semantic value of the sentence. Under the existential reading, the denotation of the predicate structure is calculated and combined with the meaning of *there be*. Under the presentational reading, the denotations of *be* and the coda XP combine with each other before combining with the denotation of the DP. The expletive “there” contributes nothing to the meaning of the sentence.
coda. Eventive existentials are built with an eventive coda, more precisely an eventive relative clause or an eventive present participle in French (the English counterparts of this type of existential are generally built with a gerund). Finally, enumerative existentials do not need a coda and when a coda is present, it does not introduce new information; enumerative constructions are characterized by the fact that their argument is an enumeration.

### 3.2.1 The Locative Existential Construction

Locative existential constructions are of the type shown in (30):

(30)  
| (a) | Il y avait autrefois une belle princesse qui vivait dans un grand château. |
|---------------------------------|
| There has.IMPF once a beautiful princess who live.IMPF in a big castle. |
| ‘Once there was a beautiful princess who lived in a great castle.’ |
| (b) | Il y a de la neige sur les toits. |
| There has DE LA snow on the roofs. |
| ‘There is snow on the roofs.’ |

Here, the existential construction is used to introduce a new discourse referent that will be the theme of the discourse that follows. Often, the discourse referent is linked to worlds and times that are also unidentifiable (an imaginary world, an unanchored time like *un jour* ‘one day’ or *autrefois* ‘once’). This type of sentence is often found in narratives.

Locative existential constructions are incompatible with definite DPs, as can be seen by comparing the judgments in (30) with those in (31):

(31)  
| (a) | * Il y avait autrefois la belle princesse qui vivait dans un grand château. |
|---------------------------------|
| There has.IMPF once the beautiful princess who live.IMPF in a big castle. |
| ‘Once there was the beautiful princess who lived in a great castle.’ |
| (b) | * Il y a de la neige sur les toits. |
| There has the snow on the roofs. |
| ‘There is the snow on the roofs.’ |
The sentence asserts the existence of an entity at a certain location. When the coda is empty, as in (32), an implicit locative may be reconstructed: ici ‘here’ in (32a) or sur la terre ‘on earth’ in (32b–c). This can be explained if we assume that the instantiation predicate, there be or il y a, is an episodic predicate that contains a situation or a location in its argument structure (Kratzer 1988). If this argument is not expressed, then it must be recoverable from the context.

(32) a. Il y a un problème.
   there has a problem
   ‘There is a problem.’

   b. Il y a un Dieu.
      there has a God
      ‘There is a God.’

   c. Il n’y a pas de justice.
      there NEG has NEG DE justice
      ‘There is no justice.’

On our analysis, the existential predicate is a localization predicate, which can only combine with an amount-referring expression. Such a predicate asserts the existence of an entity at a certain location; the localized entity individualizes the amount-referring DP with which the existential predicate combines.

Our proposal for the semantic composition of existential sentences is given below. Consider sentence (33). It will be associated with the Logical Form (34), which is obtained by combining the locative existential predicate ‘il y a x sur la table’ with the weak DP ‘de l’eau’. The detail of the semantic composition is given in (35): as indicated in (35c), the generalized quantifier denoted by ‘de l’eau’ (see (35a)) applies to the property denoted by il y a x sur la table (see (35b)). In (34) and (35), Ind is an individuating relation by which an amount (which instantiates a certain property) is individuated by identification to a localized entity. (34) is equivalent to (35c) and is obtained by applying to (35c) two lambda-conversions, which are detailed in (35d) and (35e).

(33) Il y a de l’eau sur la table.
   there has DE water on the table
   ‘There is water on the table.’

(34) \[ \exists x_1 \exists x_2 (\text{Water}(x_2) \land \text{Ind}(x_1, x_2) \land (x_1 \text{ is at Loc})) \]

(35) a. de l’eau = \( \lambda P \exists x_1 (\text{water}(x_1) \land P(x_1)) \)

b. il y a x sur la table = \( \lambda x_2 \exists x_1 (\text{Ind}(x_1,x_2) \land (x_1 \text{ est sur la table})) \)

c. \( \lambda P \exists x_1 (\text{water}(x_1) \land P(x_1)) \bullet \lambda x_2 \exists x_1 (\text{Ind}(x_1,x_2) \land (x_1 \text{ est sur la table})) \)

d. \( \exists x_1 (\text{water}(x_1) \land \lambda x_2 \exists x_1 (\text{Ind}(x_1,x_2) \land (x_1 \text{ est sur la table}))) (x_2) \)

e. \( \exists x_1 (\text{water}(x_1) \land \exists x_1 (\text{Ind}(x_1,x_2) \land (x_1 \text{ est sur la table}))) \)
According to this analysis, existential sentences are not built by saturating a predicate with an argument. Instead, the argument of an existential sentence is necessarily treated as a generalized quantifier that applies to an existential predicate.

### 3.2.2 The Eventive Construction

In addition to locative existentials, we can identify a construction that we will refer to as an eventive existential:

(36)  

<table>
<thead>
<tr>
<th>Example</th>
<th>French Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Il y a le téléphone qui sonne.</td>
<td>‘There is the phone ringing.’</td>
</tr>
<tr>
<td>b. Il y a le chat qui meurt de froid dehors.</td>
<td>‘There is the cat freezing to death outside.’</td>
</tr>
<tr>
<td>c. Il y a la fille de la voisine qui cueille des fleurs dehors.</td>
<td>‘There is the neighbor’s daughter out picking flowers.’</td>
</tr>
</tbody>
</table>

This construction does not assert the existence of a new entity but rather of a new event; a new entity may nevertheless be introduced in an argument position as a participant to the event. In French, this kind of existential sentence may constitute an answer to the question *Qu’est-ce qu’il y a ?* (‘what is the matter?’) and *il y a* can sometimes be paraphrased by *il y a que*, as in (37), which corresponds to (36)a:

(37)  

<table>
<thead>
<tr>
<th>Example</th>
<th>French Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Il y a que le téléphone sonne.</td>
<td>‘It’s that the phone is ringing.’</td>
</tr>
</tbody>
</table>

As noted by Lambrecht, the utterances in (36) are not used to inform the addressee about the existence of a telephone, a cat or a neighbor’s daughter, nor do they call attention to these referents but instead they are meant to inform the addressee...

---

*For this reason, it can be said that it is the proposition associated with DP W that is the focus in the eventive construction, as opposed to the proper existential construction, where the DP is the focus. Lambrecht (2002) claims that in the locative existential construction, W counts as a secondary predicate.*
And it is only insofar as they are participants in the event that the telephone, cat and neighbor’s daughter are mentioned. No semantic constraint bears on these event participants; they may refer to individuals or amounts and they may be new or familiar.

In eventive constructions, the coda is obligatorily overtly expressed. This is easy to understand, since it is the coda itself that supplies an event variable and a restriction on its range:

(38)  a.  ? Il y a le téléphone.  
    there has the phone  
    ‘There is the phone.’

  b.  ? Il y a le chat.  
    there has the cat  
    ‘There is the cat.’

  c.  ? Il y a la fille de la voisine.  
    there has the daughter of the neighbor  
    ‘There is the neighbor’s daughter.’

According to Lambrecht, the coda in this type of existential sentence is a “presentational relative construction”.

Note furthermore that the eventive reading can also be obtained by replacing the expletive *il* and the clitic *y* with a personal pronoun:

(i)  J’ai eu mon beau-frère qui a fait Paris-Nice.  
    I have had my brother-in-law who has done Paris-Nice  
    ‘I had my brother-in-law who competed in Paris-Nice’

(ii)  Il y a eu mon beau-frère qui a fait Paris-Nice  
    There has had my brother-in-law who has done Paris-Nice  
    ‘There was my brother-in-law competing in Paris-Nice.’

9It may be noted that the eventive reading can also be obtained by replacing the expletive *il* and the clitic *y* with a personal pronoun:

(i)  J’ai eu mon beau-frère qui a fait Paris-Nice.  
    I have had my brother-in-law who has done Paris-Nice  
    ‘I had my brother-in-law who competed in Paris-Nice’

(ii)  Il y a eu mon beau-frère qui a fait Paris-Nice  
    There has had my brother-in-law who has done Paris-Nice  
    ‘There was my brother-in-law competing in Paris-Nice.’

10Presentational relative constructions are not restricted to *il y a* sentences but are also present in example (i) given in the preceding footnote and in (i)–(ii) below. All these examples are from Lambrecht (2002):

(i)  Je vois le facteur qui arrive  
    I see the mailman who arrives  
    ‘I see the mailman coming.’

(ii)  Voilà le facteur qui arrive.  
    Look the mailman who arrives  
    ‘Here comes the mailman.’
Eventive existentials clearly differ from locative existentials in that their argument need not be a weak DP; individual-referring expressions (type e) such as proper names, as well as definite or demonstrative DPs are also allowed:

(40)  a.  Il y a {un/le} téléphone qui sonne.
    There has a/the phone that rings
    ‘There is {a/the} telephone ringing.’

b.  Il y a Jean qui sonne.
    There has Jean that rings
    ‘There is Jean ringing.’

The possibility of eventive existentials taking both weak and strong DPs in their argument position is due to the fact that their coda contains an eventive predicate, which is ambiguous, translating either as an existential predicate or as an entity-predicate and correlative being able to combine with both weak and strong DPs. To illustrate this point, let us consider the two eventive existential sentences below and their Logical Forms:

(41)  a.  Il y a Jean qui dort.
    ‘There is Jean sleeping’

b.  \( \exists e \ (\text{sleep} (e) \land \text{Subject} (e, j)) \)

(42)  a.  Il y a des enfants qui dorment.
    ‘There are children sleeping’

b.  \( \exists e \exists x_i \ (\text{sleep} (e) \land \text{Subject} (e, x_i) \land \text{Ind} (x_i, x_j) \land \text{des enfants} (x_j)) \)

The eventive existential predicate \textit{il y a} is used to assert the existence of the event described in the proposition to which it applies. In the case of (41), the predicate \textit{sleep} is analyzed as an entity-predicate that combines with the proper name \textit{Jean}, whereas in (42), the predicate \textit{sleep} is analyzed as an existential predicate that introduces an existential quantifier on one of the participants in the event, as shown in (42b).

It is interesting to compare existential sentences and thetic sentences with preverbal subjects. Ulrich (1985) and Sasse (1987) propose that there are two types of thetic sentences, labeled entity-central and event-central, which are illustrated in (43a) and (43b) respectively:
3.2 Existential Sentences in French

(43)  
   a.  Un gros nuage apparaît à l’horizon.
      a large cloud appears at the horizon
      ‘A large cloud is appearing on the horizon.’
   b.  Il fait froid.
      it makes cold
      ‘It is cold.’

In the thetic sentence in (43a), a novel entity is introduced as a participant to the event denoted by the main predicate: the verb *apparaître* ‘to appear’, which is an eventive verb, cannot be replaced by a stative verb, such as *être* ‘to be’ or *se trouver* ‘to be situated’, as illustrated by (44a–b):

(44)  
   a.  * Un gros nuage se trouve à l’horizon.
      a large cloud refl situate at the horizon
      ‘A large cloud is situated on the horizon.’
   b.  * Un gros nuage est à l’horizon.
      a large cloud is at the horizon
      ‘A large cloud is on the horizon.’

Existential sentences are of two types, eventive and locative. Eventive existential sentences correspond to the acceptable entity-central thetic sentences (see (45a) and (43a)), whereas locative existential sentences correspond to the unacceptable ones (see (45b) and (44a–b)):

(45)  
   a.  Il y a un gros nuage qui apparaît à l’horizon.
      There has a large cloud that appears at the horizon
      ‘There is a large cloud appearing on the horizon.’
   b.  Il y a un gros nuage à l’horizon.
      There has a large cloud at the horizon
      ‘There is a large cloud on the horizon.’

(45a) can be said to be eventive, whereas (45b) is a locative existential sentence.

In sum, at this point, we can distinguish between two types of existential constructions in French, locative existentials and eventive constructions. In the following table, we present their respective properties (Table 3.1):

<table>
<thead>
<tr>
<th></th>
<th>Locative existential sentences</th>
<th>Eventive sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coda</td>
<td>Can be implicit</td>
<td>Necessarily explicit</td>
</tr>
<tr>
<td></td>
<td>Locative</td>
<td>Eventive</td>
</tr>
<tr>
<td>DP</td>
<td>Weak DP</td>
<td>No restriction</td>
</tr>
<tr>
<td></td>
<td>Novel</td>
<td>Type e</td>
</tr>
</tbody>
</table>
Unlike McNally, who analyzes existentials with definite DPs as cases of locative existential constructions with type-raising of the definite DP (from $e$ to $<e,t>$), we believe that such sentences are eventive existentials, a type of construction that does not constrain the postverbal DP, which can be not only indefinite but also definite (see Sect. 3.3.2 on the use of certain quantified DPs).

Giry-Schneider (1988) and Comorovski (1995) both maintain that existential sentences built with locative codas are ambiguous, invoking, respectively, the following examples:

(46) a. Il y a un lion sur le canapé.  
    there has a lion on the couch  
    ‘There is a lion on the couch.’

b. There is a woman in the house.

(46a) is ambiguous between an eventive reading, e.g., as an answer to the question *Qu’est-ce qu’il y a ?* ‘What is the matter?’ and a purely existential reading; correlativey, the locative PP serves to localize an event or an entity. Comorovski claims that (46b) is ambiguous in the same way. There seem to be two different stress patterns, noted by Rando and Napoli (1978), which correspond to the two different readings: when only *woman* is stressed, the sentence has an existential reading; when stress is placed on both *woman* and *house*, it has an eventive reading. A study of French prosody might give similar results. We believe that this kind of ambiguity is in fact quite rare. When the coda is a locative, an eventive reading (i.e., as an answer to the question ‘What is happening?’) is only possible if it is truly exceptional for the referent denoted by the DP to be in the place described in the coda.

### 3.2.3 The Enumerative Construction

The enumerative construction is found in both French and English but it is more frequent in French:

(47) a. Il y a Marie qui viendra, il y a Jean aussi, un copain de Jean et sans doute toi aussi.
   a’. Marie is going to come, and there’s also Jean, a friend of John’s and probably you.

b. Je crois qu’on a appelé tout le monde. Non, il y a encore Marie et Jean.
   b’. I guess we’ve called everybody. No, there is still Mary and John.

Enumerative constructions are usually used as answers to questions and their coda takes up the question itself, e.g., (47a) can be an answer to *Qui viendra* ‘Who will come?’. Generally speaking, in enumerative constructions, the coda does not convey new information: it is not included in the focus, its content corresponds to the discourse topic. Consequently, even if enumerative sentences without a coda
can be found (see (47b)), in fact the coda is not empty but elliptic: it can easily be recovered from the context. Thus, in (47b), an elliptic coda takes up the discourse topic, which in this context can be ‘Whom do we have to call?’ The argument of enumerative existentials is a list that can contain any type of DP, in particular proper names or definite DPs.

3.2.4 Conclusions

To sum up, we have distinguished three types of existential constructions in French, which can be characterized by their respective codas: locative existentials have locative codas, eventive existentials have eventive codas and enumeratives have a coda that corresponds to a discourse topic. Concerning the constraints on the DPs occurring in these constructions, Milsark’s generalization seems adequate for locative existentials but not for eventives or enumeratives. Unlike locative existentials, which can only combine with weak DPs, eventives and enumeratives are compatible with entity-denoting DPs, e.g., definite DPs, as well as proper names.

3.3 Existential Sentences Cannot Have Individual Variables as Arguments

3.3.1 Heim’s (1987) Constraint

Heim (1987) observed that personal pronouns cannot appear in English existential constructions. This generalization extends to *il y a*-sentences in French. The examples in (49) are the French counterparts of the immediately preceding English examples:

(48) a. Few people admitted that they had been at the party.
   b. *Few people admitted that there had been them at the party.

(49) a. Peu de gens ont reconnu qu’ils étaient venus à la fête.
   b. *Peu de gens ont reconnu qu’il y avait eu eux à la fête.

Based on examples of the type in (48b) and (49b) and assuming that personal pronouns typically translate as individual variables, Heim (1987:23) proposed the constraint in (50):

(50) Heim’s constraint

*There be x* is ungrammatical where x is an individual variable.

In what follows we will provide further evidence for this constraint by examining existential sentences built with quantificational DPs on the one hand and existential sentences inside relatives on the other hand.
3.3.2 Quantified DPs in Existential Sentences

3.3.2.1 Quantification over Types Rather Than Tokens

Given Heim’s constraint, quantified DPs are predicted to be excluded from existential sentences: at LF, quantified DPs are moved (via Quantifier Raising) out of their argument position, leaving behind an individual variable, which yields a violation of Heim’s constraint. However, existential sentences built with quantified DPs can be found, as observed by Lumsden (1988), who gave the following examples:

(51) a. There was every kind of doctor at the convention.
   b. There were most sorts of books in his library.
   c. There were both varieties of wine for sale.
   d. There was each kind of question on the exam.

In all of these examples, the postverbal DP contains a noun like kind, sort or variety.11 The examples become ungrammatical when the terms kind, variety, type… are removed:

(52) a. *There was every doctor at the convention.
   b. *There were most books in his library.
   c. *There was each question on the exam.

These data show that quantified DPs are not ruled out as such from appearing in the argument position of an existential construction. Rather, their acceptability depends on the descriptive content of the noun, which must refer to subkinds. DPs such as a kind of doctor, a sort of book and a kind of question do not denote individuals but classes of individuals. In (51a), quantification is not over the set of individuals that are doctors but over the set of medical specializations (general practitioners, surgeons, dentists…); in (51b), the domain of quantification is not the set of books but rather the set of literary genres; and in (51c), the domain of quantification is not the set of actual questions, but rather the set of types of questions.

Similar observations hold in French. It is possible to construct minimal pairs similar to Lumsden’s by replacing the postverbal N with toutes sortes de N (‘every sort of N’) or toute espèce de N (‘every kind of N’) or tout type de N

11For a more detailed analysis of the word kind and for more details on the differences between every kind of N and an N of every kind, cf. Wilkinson (1991, 1995). The differences seem to disappear in existential sentences. This seems to be true as well for the expressions Det genre de N and (un/Des) N de Det genre in French:

(i) Il y avait ce genre de médecins à la réunion.
   ‘There was that sort of doctor at the convention.’
(ii) Il y avait des médecins de ce genre à la réunion.
    ‘There were doctors of that sort at the convention.’
Note that these expressions convey indefiniteness. *Toutes sortes de médecins* (‘every sort of doctor’) is equivalent to *des médecins de toutes sortes* (‘doctors of every sort’), *tous les types de questions* (‘every type of question’) can be replaced by *des questions de tous les types* (‘questions of every type’) and *toute espèce de gens* (‘all kinds of people’) means the same as *des gens de toutes espèces* (‘people of all kinds’).

(53) a. Il y avait toutes sortes de médecins à la réunion.
   There have IMPF all sorts of doctors at the convention
   ‘There was every sort of doctor at the convention.’

   b. Il y avait des médecins de toutes sortes à la réunion.
   There have IMPF DES doctors of all sorts at the convention
   ‘There were doctors of every sort at the convention.’

   c. ? Il y avait tous les médecins à la réunion.
   There have IMPF all the doctors at the convention
   ‘There were all the doctors at the convention.’

(54) a. Il peut y avoir tous les types de questions à l’examen.
   There may have all the types of questions at the exam
   ‘There may be any type of question on the exam.’

   b. Il peut y avoir des questions de tous les types à l’examen.
   There may have DES questions of all the types at the exam
   ‘There may be questions of any type on the exam.’

   c. ? Il peut y avoir toutes les questions à l’examen.
   There may have all the questions at the exam
   ‘There may be all the questions on the exam.’

---

12 According to Vaugelas, with *toute sorte de* ‘all sorts of’, followed by a complement, the singular is used if the noun is singular and the plural is used if the noun is plural:

(i) Je vous souhaite toute sorte de bonheur.
   ‘I wish you all sorts of happiness.’

(ii) Dieu vous préserve de toutes sortes de maux.
   ‘May God protect you from all sorts of evil.’

But this is not always the case: thus, for example, we may find *toutes sortes de gibier* ‘all sorts of game’ in the writings of R. Bazin, or *toute sorte de charges* ‘every sort of charges’ in the writings of A. Suarès.
(55) a. On rencontre toute espèce de gens dans ces pays. (H. Bosco)

3sg meets every kind of people in these countries

‘One meets all kinds of people in these countries.’

b. On rencontre des gens de toutes espèces dans ce pays.

3sg meets des people of all kinds in this country

‘One meets people of all kinds in this country.’

c. ? On rencontre tous les gens dans ce pays.

3sg meets all the people in this country

‘One meets all people in this country.’

More interestingly, French exhibits grammatical examples such as (56a), where the postverbal argument is quantified and nouns such as type, sort or kind do not appear.\textsuperscript{13}

(56) a. Il y avait \{la plupart des/tous les\} livres de Beckett dans cette librairie.

there have.impf the majority of the/all the books of Beckett in this bookstore

‘There were \{most/all of\} Beckett’s books in that bookstore.’

b. * Il y avait \{la plupart des/tous les\} livres dans cette librairie.

there have.impf the majority of the/all the books in this bookstore

‘There were \{most/all of\} books in that bookstore.’

c. * Il y avait \{la plupart des/tous les\} livres reliés dans cette librairie.

there have.impf the majority of the/all the books bound in this bookstore

‘There were \{most/all of\} bound books in that bookstore.’

The contrast between (56a) vs. (56b–c) deserves an explanation. In (56a), the nominal predicate livre de Beckett ‘book by Beckett’ applies to book titles and not to copies of books. (56a), with la plupart / most, does not mean that most copies of Beckett’s books were in the bookstore but rather that for most books by Beckett, at least one copy can be found in the bookstore. Livre de Beckett does not refer to an

\textsuperscript{13}Note however an interesting contrast between tous les (‘all the’) and tout (‘every’) or chaque (‘each’) in French. Tout and chaque cannot easily appear in existential constructions, even when they are followed by a noun that denotes a kind instead of a token.

(i) * Il y avait tout livre de Beckett dans cette librairie.

there have.impf every book of Beckett in this bookstore

‘There was every book by Beckett in that bookstore.’

(ii) ?? Il y avait chaque livre de Beckett dans cette librairie.

there have.impf each book of Beckett in this bookstore

‘There was each book by Beckett in that bookstore.’
object, a token but to a title, a type. *Livre de Beckett* is used in this sentence as a predicate of kinds, not as a predicate of objects. *Beckett’s books* refers to a kind, divided into subkinds corresponding to each title. *Livre de Beckett* refers to a set of subkinds: the set of titles of texts written by Beckett, with each title corresponding to a subkind, whose members are copies of that title. (56a) means that for most titles of Beckett, there is at least one copy of this title (i.e., one instantiation of the subkind corresponding to the title) in the bookstore.

The contrast between (56a) on the one hand and (56b) and (56c) on the other hand shows that reference to book-types rather than to book-tokens requires a restriction on the noun *livre* and not just any restriction will do.

In sum, quantified DPs are not entirely excluded from existential constructions. They are acceptable, provided that they do not quantify over individuals but over subkinds, types or sorts.

### 3.3.2.2 Representation

To account for the grammaticality of examples such as (51), McNally proposes to identify kinds with property-denoting DPs. According to her, the contrast in (57) is predictable, if one considers the Logical Forms (58a) and (58b), respectively associated with (57a) and (57b). Tripartite representations – of the form Quantifier (restriction) [scope] – allow us to call attention to the type of the variable bound by the quantifier, which occurs both in the restriction and in the scope. Individual variables are represented by lowercase letters (x, y, z…) and uppercase letters (P, Q…) represent predicate variables.

(57)  
   a.  There was every kind of doctor at the convention.  
   b.  *There was every doctor at the convention.

(58)   
   a.  ∀P (kind-of-doctor (P)) [there was P at the convention]  
   b.  ∀x (doctor (x)) [there was x at the convention]

According to McNally, the Logical Form in (58b) is ill-formed because it violates the constraint on the semantic type of the argument of *there be*, which has to be a property (type <e,t>) and not an individual of type e. The Logical Form in (58a) on the other hand is well-formed, because P ranges over properties. The restrictor ‘(kind-of-doctor (P))’ means that P is a medical specialization.

McNally observes that the contrast between ‘every N’ and ‘every kind of N’ is also found in copular constructions:

(59)   
   a.  *Martha has been every doctor.  
   b.  Martha has been every kind of doctor.

(59a) is ungrammatical because a predicative position, which needs to be filled by a property-denoting DP, is occupied by an essentially quantified expression, *every doctor*, which is of type <<e,t>,t> and cannot be type-shifted to <e,t>. *Every doctor* cannot denote a property. (60a), the tripartite representation associated with (59a), is ill-formed since the variable x ranges over atomic individuals and not over properties.
(60) a. $\forall x \ (\text{doctor} (x)) \ [\text{Martha has been } x]$

In contrast, (59b) is grammatical and associated with the Logical Form (60b). The quantifier binds the variable $P$, which does not refer to an individual but to a property. $P$ takes its value in the set of medical specializations. Consequently the Logical Form (60b) is well-formed.

(60) b. $\forall P \ (\text{kind-of-doctor} (P)) \ [\text{Martha has been } P]$

McNally’s analysis crucially relies on the idea that kind-reference is identical to properties, which we will not endorse. Thus, McNally’s attempt to account for the grammaticality of examples of the type in (51) is problematic, which sheds further doubt on McNally’s hypothesis that the argument of existential sentences is property-denoting, which we have already rejected in Sect. 3.2 above, on the basis of independent evidence.

Let us repeat that McNally’s hypothesis is not needed in order to explain the ungrammaticality of quantificational DPs in existential sentences: Heim’s constraint is sufficient. But we still need to understand why the Lumsden-type of example is allowed. We will assume, following Carlson (1977a), that kinds are entities of type $e$, which are nevertheless distinct from individual entities: “kinds are a little different from more normal individuals in that kinds can be here and there, whereas normal individuals are generally confined to one location, at a given time” (Carlson 1977a: 442). To capture this difference between the two types of entities we will use indices $o$ and $k$ to notate variables that range over objects and kinds respectively. The Logical Forms associated with (57) are given below:

(61) a. $\forall x_k \ (\text{kind-of-doctor} (x_k)) \ [\text{there was } x_k \text{ at the convention}]$
   
   b. $\forall x_o \ (\text{doctor} (x_o)) \ [\text{there was } x_o \text{ at the convention}]$

Because (61a) contains a variable over kinds rather than a variable over individuals, this LF does not violate Heim’s constraint.

The analysis we have proposed for the existential predicate (il y a / there is) in Sect. 3.2.1 predicts the paraphrase relation between (62a) and (62b).

(62) a. Il y a toutes les sortes de docteurs à la réunion.
   ‘There are all the sorts of doctors at the convention.’

b. Il y a des docteurs de toutes les sortes à la réunion.
   ‘There are doctors of every sort at the convention.’

Thus, the LF associated with the nuclear scope of (61a) is developed in (63a) below. The tripartite formula in (61a), repeated in (63b), can be translated into the logical formula in (63c), which conveys that for every subkind of doctor, there is at least one individual entity that belongs to this subkind and is at the convention. Accordingly, the logical form in (63c) can represent the semantic content of both (62a) and (62b). This follows from the fact that the instantiation of a subkind amounts to the consideration of instances of the subkind in question (see (63d)). $x_a$ is used to
represent a variable over amounts, \( M(x) \) means that \( x \) is a doctor and \( D(x) \) that \( x \) is a dentist. If we consider a specific subkind of doctors (dentists for example) and we associate it with a constant \( D \), then the DPs ‘the dentists’ and ‘the doctors of subkind \( D \)’ have the same denotation and correspond to the existential generalized quantifiers given in (63e). (63f) is equivalent to (63e), since \( D \) is a subkind of doctors.

\[
(63) \quad \begin{align*}
\text{a.} & \quad \exists x_k \ (\text{Ind}(x_k) \land (x_k \text{ is at the convention})) \\
\text{b.} & \quad \forall x_k \ (\text{kind-of-doctor}(x_k)) \land (\text{there was } x_k \text{ at the convention}) \\
\text{c.} & \quad \forall x_k \ (\text{kind-of-doctor}(x_k)) \rightarrow \exists x_i \ (\text{Ind}(x_i, x_k) \land (x_i \text{ is at the convention})) \\
\text{d.} & \quad \text{Ind}(x_i, x_k) \iff \exists x_a \ (\text{Real}(x_a, x_k) \land \text{Ind}(x_i, x_a)) \\
\text{e.} & \quad \text{Des dentistes ‘dentists’: } \lambda P \exists x_a \ [D(x_a) \land P(x_a)] \\
\text{f.} & \quad \text{Des médecins de la classe des dentistes ‘doctors from the kind of dentists’: } \\
& \quad \lambda P \exists x_a \ (M(x_a) \land \text{Real}(x_a, D) \land P(x_a)) \\
& \quad \lambda P \exists x_a \ (D(x_a) \land P(x_a)) \\
\text{g.} & \quad (M(x) \land \text{Real}(x, D)) \iff D(x)
\end{align*}
\]

Returning to the French example in (56a), repeated in (64), it will have the Logical Form in (65):

\[
(64) \quad \text{Il y avait la plupart des livres de Beckett dans cette librairie.} \\
\text{there have the majority of the books of Beckett in this bookstore} \\
\text{‘There were all of Beckett’s books in that bookstore.’} \\
(65) \quad \text{MOST} x_k \ (\text{book-by-Beckett}(x_k)) \ [\text{there is } x_k \text{ in that bookstore}]
\]

\( \text{Livre-de-Beckett} \) in (64) is analyzed as a property of (sub) kinds. Thus, the quantifier does not bind an individual variable but a kind variable.

To sum up, in all these examples, the quantifier raises out of the scope of the predicate of existence, leaving a variable behind. For the sentence to be grammatical, the variable has to obey Heim’s constraint, according to which, in existential sentences, the argument cannot be an individual variable. The presence of words like \emph{kind}, \emph{sort}, \emph{type} is crucial for the examples in (51) and (53)–(55), because they guarantee that the variable ranges over subkinds and not over individual entities.

### 3.3.3 Existential Sentences Inside Relative Clauses

This section focuses on existential sentences inside relative clauses. Carlson (1997b) identified a subtype of relative clause, labeled ‘amount relatives’, and he observed that these relatives are the only type of relative clause that admits existential constructions:

\[
(66) \quad \begin{align*}
\text{a.} & \quad \text{Every man there was on the life-raft died.} \\
\text{b.} & \quad \ast \text{Some man there was on the life-raft died.}
\end{align*}
\]
In what follows we will show that this type of relative clause obeys Heim’s constraint. The presentation below is based on French and English examples. Most English examples come from either Carlson (1977b) or Heim (1987). Most of the French examples come from Frantext, a corpus of French novels.

### 3.3.3.1 Amount Relatives

Carlson (1977b) showed that relative clauses of the type shown in (67c) are neither non restrictive (like (67a)) nor restrictive (see (67b)).

(67) a. Les étudiants, qui ont le droit à une réduction, passeront après tout le monde.
   the students, who have the right to a discount pass.fut after everybody
   ‘Students, who get a discount, will go after everyone else has.’

b. Les étudiants qui ont réussi l’examen peuvent s’inscrire pour le second semestre.
   the students who have passed the exam may refl register for the second semester
   ‘Students who passed the exam may register for second semester.’

c. Every man there was on the life-raft died.

Although amount relatives are superficially very much like restrictive relatives, they differ from canonical restrictive relatives by certain syntactic and semantic properties: (i) while restrictive relatives can be introduced by *wh*- pronouns, amount relatives are only compatible with *that* and the null complementizer; (ii) unlike the other types of relative clauses, amount relatives allow the constituent that follows *there be* to be relativized. The latter observation is important to our discussion. It corroborates the idea that there is a selectional restriction on the semantic type of the argument of existential constructions.

To properly understand the data, let us take a closer look at Carlson’s observations. Drawing a parallel between amount relative clauses and comparative clauses, Carlson observes that in a comparative clause, the compared DP may appear inside an existential sentence:

(68) a. There are more women in high school than there are in college.

b. There aren’t as many women in college as there are in high school.

These comparative clauses are assumed to be formed by a deletion transformation applied to underlying configurations of the type shown in (69), corresponding to (68a): in (69); the deleted element is *X women*, where *X* notates a quantity phrase that may be paraphrased by *AN AMOUNT X*.

(69) There are more women in high school than there are *X* women in college.
Two numbers or quantities are compared: the quantity or number of women in high school and the quantity or number of women in college. The variable $X$ in (69) does not refer to a variable over individuals but rather to a variable over quantities. The nature of the comparison is clear when paraphrased as in (70):

(70) The amount of women in high school is greater than the amount of women in college.

Carlson suggests that amount relatives resemble comparatives. He considers the two following sentences, which respectively involve an amount relative clause and a restrictive relative clause.

(71) a. Marv put everything ($\emptyset$ / that / $^*$which) he could in his pocket.
   b. Huet put everything which was red in his crib.

(71b) can be represented as in (72b). But (71a) and (72a) do not have the same truth conditions.

(72) a. $\forall x$ (Marv can put $x$ in his pocket) $\rightarrow$ (Marv put $x$ in his pocket)
   b. $\forall x$ (x is red) $\rightarrow$ (Huet put $x$ in his crib)

(71a) is understood to mean that once Marv’s pocket is full, no further object may be placed in it, even an object that would otherwise easily fit in the pocket. According to (72a), Marv would have to put in his pocket any object that would normally fit and continue to add such objects even beyond the point when his pocket becomes full. So, (72a) is not a proper formalization of (71a). Instead, it is interesting to compare (71a) to a comparative of equality such as (73):

(73) Marv put as many things as he could in his pocket.

Carlson proposes that amount relatives differ from restrictive relatives in that the relativized element is filled by an amount expression rather than by an individual denoting expression. Consequently, the underlying structure associated with (71a), repeated in (74a), is (74b):

(74) a. Marv put everything that he could in his pocket.
   b. Marv put everything [that he could put [NP that amount] of things in his pocket]

In French, where the data are somewhat different, this analysis in terms of amount is even more obvious. In the French sentences corresponding to (74a), either there is ellipsis of the entire VP (Il y a plus de femmes au lycée qu’à l’université ‘There are more women in high-school than at the university’), or the existential construction is retained and the pronoun en (corresponding to the phrase de femmes) is obligatory (il y a plus de femmes au lycée qu’il n’y en a à l’université ‘there are more women in high-school than there are at the university’). In the latter case, it is clear that only the amount element in the DP is relativized, because the nominal element remains in the relative clause in the form of the pronoun en.
Let us now return to the example in (67c), repeated here as (75a) and contrast it with (75b).

(75)  a. Every man there was on the life-raft died.
    b. *Some man there was on the life-raft died.

The difference in acceptability between the two examples can be attributed to their not having the same structure. (75a) is an amount relative and therefore the relativization of the position following there was is possible. (75b), on the other hand, is a restrictive relative and the relativized element denotes an individual. The wh-trace is therefore a variable that ranges over individuals, which is ruled out by Heim’s constraint, hence the ungrammaticality of (75b). According to Carlson, the structures associated with these two sentences are as follows:

(76)  a. Every man [there was [that amount] of men on the life-raft] died
    b. Some man [there was [that man] on the life-raft] died

Heim (1987) proposes a slightly different notation for amount relatives. She replaces the trace of the relativized element with a phrase having the structure x-many N or x-much N, which expresses the idea of quantity. If the relativized expression is of the individual-type, then its trace is an individual-type variable x. (75a,b) are accordingly represented as (77a, b):

(77)  a. Every man [there was [x-many] men on the life-raft] died
    b. *Some man [there was [x] on the life-raft] died

The advantage of Heim’s notation in (77) is that it allows the same analysis to be used to account for both the contrast between (75a) and (75b) and the contrast between (78a) and (78b).

(78)  a. There were that many horses in the pasture.
    b. *There was that horse in the pasture.

We still need to explain why every man is compatible with amount relatives, whereas some man is not. Carlson (1977b) observes that it is only those determiners that can precede an amount expression that can head an amount relative. Determiners meeting this condition appear in the first list in (79) and those that do not appear in the second:

(79)  THE 40 men  *TEN many people
    THESE few insects  *FEW several incidents
    EVERY ten minutes  *LOTS of many boys
    ANY five cigars  *MANY twelve pounds
    ALL fifty Vikings  *A several clods
    WHAT few remarks  *SOME eight mammals
    THESE two answers  *SEVERAL many ladies
    THESE five criminals  *MOST nine squids
    MY many dreams  *EACH fifty minutes
Since the quantifier of the relativized DP of an amount relative is an amount expression, one would not expect that singular nouns could head amount relatives. This is indeed true for count nouns, which accounts for the ungrammaticality of (80b).

\[(80)\]

\begin{enumerate}
\item a. The men that there were in Austria like Bob.
\item b. *The man that there was in Austria likes Bob.
\end{enumerate}

Since mass nouns refer to amounts of substance, we expect them to be allowed to head amount relatives:

\[(81)\] The meat there was soon eaten by the cougar.

The acceptability of (81) is explained by analyzing the mass DP as having a determiner of the type *that much* in the underlying structure.

Carlson’s analysis of amount relatives accounts for most of the data. For instance, it accounts for the constraint on complementizers that may introduce amount relatives. Carlson (1977b), Safir (1982) and Heim (1987), among others, observe that amount relatives are never introduced by *wh- relative pronouns (cf. (67)). The difference between a *wh- element and the complementizer that* can be analyzed in terms of type. A *wh- pronoun is analyzed as a variable that ranges over individuals, whereas the relativized element of an amount relative denotes an amount and not an individual. The complementizer *that is compatible with the relativization of amounts:

\[(82)\]

\begin{enumerate}
\item a. *The few men who there were at the party were awfully boring.
\item b. The few men that there were at the party were awfully boring.
\end{enumerate}

Under the assumption that *there be* selects an amount-denoting argument, it is clear why existential constructions can appear in amount relatives but never in relatives introduced by a *wh- word:

\[(83)\]

\begin{enumerate}
\item a. Every man there was on the life-raft died.
\item b. *Every man who there was on the life-raft died.
\end{enumerate}

Note finally that Carlson’s observations concerning whether a determiner is or is not compatible with amount expressions are able to account for the contrasts illustrated in (84) and (85):

\[(84)\]

\begin{enumerate}
\item a. The people there were at that time only lived a few decades.
\item b. {What/That} light there is in this painting is quite diffuse.
\item c. Any beer there may be left in that cooler is mine.
\end{enumerate}

\[(85)\]

\begin{enumerate}
\item a. {* Five/*Most/*Several/*Many/} men there were here disagreed.
\item b. {* Some/*Each/* A} man there was disagreed.
\end{enumerate}

So, although it may often be impossible to see a difference in interpretation between a restrictive relative and an amount relative, example (71a) clearly demonstrates that in certain cases the notion of quantity is necessary.
3.3.3.2 Existential Sentences in French Relative Clauses

In French, observations regarding amount relatives are not as easy to make as in English, because in French there is no equivalent of the who/that alternation in relative clauses. However, an interesting difference exists between que ‘that’ and ce que in non restrictive relative clauses. The examples below show that ce que ‘that which’ must be used when the relativized DP is not a referential DP but an attributive one.\textsuperscript{14}

(86) a. Elles s’habillaient comme des femmes excentriques, {ce qu’/\textit{\textsuperscript{*}}qu’} elles étaient.

‘They dressed like eccentric women, which is what they were.’

b. Je doute que Terry soit un génie, {ce qu’/\textit{\textsuperscript{*}}qu’} ils considèrent tous qu’elle est.

‘I doubt that Terry is a genius, which is what they all consider her to be.’

Nevertheless, it is easy to observe that existential constructions do not appear frequently in French relative clauses. A search of the Frantext database only turned up some 30-odd hits. Let us consider some of them.

\textsuperscript{14}These examples correspond to the French translation of English examples borrowed from McNally (1998), who uses them in order to illustrate the difference between individual- and property-denoting expressions:

(i) a. *They dressed like the eccentric women who they were.
   a’. They dressed like the eccentric women that they were.
   b. *I doubt that Terry is the genius who they consider her to be.
   b’. I doubt that Terry is the genius that they consider her to be.

For reasons not directly related to the topic under discussion here, there are no minimal pairs with definite DPs in French: both (iiia) and (iib) are acceptable.

(i) a. Elles s’habillaient comme les femmes excentriques, ce qu’elles étaient.
   b. Elles s’habillaient comme les femmes excentriques qu’elles étaient.
(87)  a.  Il faisait chaud, ça sentait bon, et cela venait des odeurs qu’il y avait sur sa table de toilette.
   ‘It was warm, there was a pleasant smell, and this was coming from the fragrances that were on her bathroom table.’

b.  Il régnait à la façon des tyrans qu’il y avait alors dans la plupart des villes grecques.
   ‘He ruled in the manner of the tyrants that were in most Greek cities at the time.’

c.  Un jour, l’insuffisance cardiaque, alliée à la surcharge de poids qu’elle prenait parce qu’elle mangeait pour toutes les femmes qu’il y avait en elle, l’attendit au coin d’un couloir de l’hôpital.
   ‘One day, her heart condition, combined with the weight she had put on because she ate for all the women that there were inside her, caught up with her in the corner of a hospital corridor.’

d.  Je ne l’aime pas comme un individu, mais comme le fond religieux de ma race, comme quelque chose qu’il y a chez tous et chez moi.
   ‘I do not love her as an individual, but as the religious foundation of my race, as something there is in everyone and in me.’

In (87a) and (87b), relative clauses are headed by indefinites DPs (des odeurs ‘[des] fragrances’, des tyrans ‘[des] tyrants’) that do not refer to specific entities. These DPs translate at Logical Form as existential generalized quantifiers that combine with the existential predicate ‘il y avait’ exactly as in (35), Sect. 3.2.1. In (87c), toutes les femmes qu’il y avait en elle (‘all the women that there were inside her’) does not denote several particular women, unlike the analogous complex DP in Toutes les femmes qui sont parties ont eu raison (‘All the women that left were right’). The common noun femme (‘woman’) does not refer to a property of objects (a woman as an individual) but rather to a property of kinds (a woman as a type of woman). Consequently the universal quantifier binds a kind variable, not an individual variable. In a more explicit paraphrase of the example, the different types of women could be listed: elle mangeait pour toutes les femmes qu’il y avait en elle : la nerveuse, la travailleuse, la paresseuse… (‘she ate for all the women that there were inside her: the nervous one, the hard-working one, the lazy one…’). So Heim’s constraint is verified: in none of the acceptable examples does the variable range over individuals. Finally, (87d) illustrates a relatively frequent type of example involving the expression quelque chose qu’il y a… (‘something there is…’). The use of this indefinite corroborates the idea that the relativized DP cannot refer to an individual variable.

To the database examples above, we can add similar cases found on the Internet (see (88)) or constructed examples, as in (89).
(88) a. Que faire de tout ce qu’il y a dans mon placard ?
What to do with all that there is in my wardrobe?
b. C’est tout ce qu’il y a de plus réussi/ de sérieux.
‘There couldn’t be anything more successful/serious.’
c. Je vous souhaite tout ce qu’il y a de meilleur pour 2011.
‘I wish you all the best for 2011.’
d. On ne voit vraiment rien de ce qu’il y a autour.
‘One can’t see anything of what is around’

(89) a. Tous les livres qu’il y avait dans la bibliothèque de ma grand-mère ont brûlé.
‘All the books that there were in my grandmother’s library have burnt.’

b. Les livres qu’il y avait dans la bibliothèque de ma grand-mère ont brûlé.
‘The books that there were in my grandmother’s library have burnt.’

All of these examples involve amount relatives. Note that the sentences in (88)
involve *ce que* ‘that which’, only possible after *tous* ‘all’ or *rien* ‘nothing’. The
examples in (89) are similar to those provided by Carlson, repeated in (90). Carlson
has pointed out that singular nouns cannot be modified by amount relatives. The
same restriction holds in French, as attested by (92).

(90) a. Every man there was on the life-raft died.

b. The men that there were in Austria like Bob.

(91) *The man that there was in Austria likes Bob

(92) *Le livre qu’il y avait dans la bibliothèque de ma grand-mère a brûlé.
‘The book that there was in my grandmother’s library has burnt.’

Summarizing, Carlson’s amount relatives obey Heim’s constraint, because in this
type of relative, the variable does not range over individuals but rather over
quantities.
It should be observed that in the French examples examined above, the existential sentences inside the relatives are all of the locative type. Turning now to the other types of existentials, it seems very difficult, if not impossible, to relativize the enumerative constructions (cf. (93)). This is even clearer for eventive existential sentences, which cannot appear in relative clauses, as illustrated by (94):

(93) a. Il y a Jean, Marie et un ami.
   ‘There are Jean, Marie and a friend.’

   *Jean, Marie et un ami qu’il y a....
   ‘Jean, Marie and a friend that there is’

(94) a. Il y a le téléphone qui sonne dans la pièce du fond.
   ‘There’s the phone ringing in the back room.’

   *Le téléphone qu’il y a qui sonne dans la pièce du fond...
   ‘The telephone that there was ringing in the back room…’

3.4 Conclusion

Contrary to what is usually assumed, existentials are not subject to Milsark’s constraint, according to which only weak indefinite DPs may be arguments of there-sentences, definite and quantified DPs being excluded from this position. No determiner is completely excluded from these constructions: provided they quantify over non individual entities, quantified DPs are allowed in existential sentences; as for definite DPs or proper names, they are licensed in eventives (as event participants) and in enumeratives (as members of a list). We have shown that Heim’s constraint is relevant for all the data we have examined, in English as well as in French: existential sentences are incompatible with individual variables in their argument position.

We have distinguished three types of existential constructions (locatives, eventives and enumeratives), which can be characterized by their respective codas.

Locative existential sentences are built with weak DPs (analyzed as generalized existential quantifiers over amounts), which combine with the instantiation predicate il y a. They are also compatible with quantified DPs, when the quantification is not over individuals but over other types of entities such as kinds, types, sorts as well as amounts. The analysis of amount relatives provides an argument in favor of Heim’s constraint.
Eventive existential sentences are built by an application of the instantiation predicate to an event, described by a constituent made up of the DP and the coda.

Enumerative existential sentences take a list in their argument position.

In all of these cases, the instantiation predicate *il y a*/*there be* can be seen as a particular type of existential predicate. Its semantic contribution reduces to asserting the instantiation of its argument.

In terms of formalization, our contribution is the representation of weak DPs as generalized existential quantifiers. These generalized quantifiers differ from other generalized quantifiers on two points: (i) they quantify over amounts and not over individuals; (ii) they can only apply to existential predicates.
Chapter 4
The Ambiguity of Indefinites: Towards a Denotational Definition of the Weak/Strong Distinction

According to Milsark (1977), certain indefinites have two readings, a “weak” and a “strong” reading. In this chapter we will show that this two-way distinction should be replaced by a three-way distinction: in addition to the weak reading, we will distinguish two types of strong readings, a quantificational and a non-quantificational one. Three distinct representations will be proposed for each of these three readings and correlations between the denotations of indefinites and presuppositionality or partitivity will be highlighted.

4.1 Weak and Strong Indefinites

Although it plays a central role in the study of indefinites as well as the study of the semantics of DPs in general, the definition of the weak/strong distinction remains problematic,\(^1\) despite efforts to formalize it within the generalized quantifier framework (see especially Barwise and Cooper 1981). In what follows, we present those contexts in which the difference between weak and strong indefinites can be discerned (Sect. 4.1).

Milsark (1977) observed that only indefinite DPs can appear in existential sentences introduced by *il y a / there is*; quantificational or definite DPs are unacceptable\(^2\):

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\(^1\) For a clear presentation of the problems raised by current analyses of the weak/strong distinction, the reader is referred to McNally and van Geenhoven (1998).

\(^2\) See Chap. 3 above for refinements of this generalization.
Milsark’s distinction between weak and strong DPs was meant to capture this differential behavior: weak DPs can occur in existential sentences, whereas strong DPs cannot.

Milsark further observed that indefinite DPs are not always weak. They may also have a strong construal, which corresponds to a partitive meaning. The crucial point is that indefinites such as two students, which are not overtly partitive (they do not have a partitive complement), are necessarily interpreted as partitive in certain contexts. Consider the examples in (2) and (3):

(2) a. Deux filles étaient en train de jouer dans la cour.
   ‘Two girls were playing in the courtyard.’
b. Deux filles étaient blondes, toutes les autres avaient des cheveux foncés.
   ‘Two girls were blond, all the others had dark hair.’

(3) a. Two girls were playing in the courtyard.
   a’. Sm students were reading a poem. (*sm = unaccented form of some)
   b. Two students were blond.
   b’. (Some/*Sm) students are intelligent / handsome / blond.

In (2a), deux filles ‘two girls’ is ambiguous allowing two interpretations: “There were two girls who were playing in the courtyard” and “Two of the girls were playing in the courtyard”. Note however that the weak reading (i.e., “there were two girls …’) is more salient. In (2b), on the other hand, the partitive reading (i.e., “two of the girls”) is the only possible one; the group denoted by deux filles is construed as belonging to a larger group of girls in the common ground (hence Pesetsky’s (1987) label “D(iscourse)-linked”). The same observations hold for English, as illustrated in (3). Only the partitive reading is available in (3b–b’), as in (2b), due to the use of predicates like intelligent, handsome, blond (see Sect. 4.2.2).

Let us warn the reader that the correlations between strong vs. weak readings and partitivity or non partitivity should be carefully formulated. Milsark does not say anything about overtly partitive indefinites, e.g., two of your students, and it can be
quite easily shown that such indefinites are not necessarily strong, as indicated by examples such as there were two of your students in the street yesterday (see section 1.2 of Chap. 5). To repeat the main point, Milsark’s observation regarding partitivity is that in certain contexts, namely in the subject position of certain predicates, indefinites necessarily take a partitive reading, although they are not overtly partitive.

Milsark’s generalizations regarding weak and strong interpretations can be summarized as in (4):

(4) Milsark’s (1977) generalizations
   a. Indefinites occurring in existential sentences are necessarily weak.
   b. Indefinites occurring in the subject position of a certain class of predicates (individual-level) are necessarily strong.
   c. Strong indefinites have partitive interpretations.

In what follows we will provide further evidence in favor of (4a–b) but we will depart from (4c), by showing that strong indefinites are not always partitive/ (“D-linked”) (see Sect. 4.3.2), which will lead us to distinguish two types of strong indefinites.

4.2 Weak Indefinites

In this section we point out some disadvantages of the current analyses of weak indefinites and we make a new proposal, namely the one already introduced in Chap. 3 above, according to which weak indefinites refer to amounts and should be represented as generalized existential quantifiers over amounts.

4.2.1 Weak Indefinites as Individual Variables Bound by Existential Closure

Following Kamp (1981) and Heim (1982), most theoreticians assume that indefinites are to be represented as individual variables (see especially Kratzer 1988, 1995; Diesing 1992, a.o.).

In the framework of Heim (1982), individual variables are bound by existential closure, which may apply in two contexts:

(i) in the nuclear scope of every quantifier, or
(ii) at the highest level, the level of text.  

Heim (1981:139) explains that in order to take care of indefinites occurring in unembedded sentences, we have to ‘make reference to expressions larger than sentences, namely texts, which are sequences of sentences of unlimited length’. Heim assumes a rule of construal called Text Formation, which attaches a sequence of sentences under a T(ext)-node. Text-level existential closure consists in adjoining the existential quantifier to T.
These two possibilities are illustrated in (5a) and (5b), respectively:

(5)  a. Chaque élève écrira un poème.
    Each student will write a poem.
    ‘Each student will write a poem.’

   b. Un élève m’a annoncé une mauvaise nouvelle.
    A student me-has announced a bad news
    ‘A student gave me a bad piece of news.’

(5’) a. ∀x ∃y (student (x) ∧ poem (y)) [x will write y]
    b. ∃x ∃y (student (x) ∧ bad piece of news(y)) [x told me y]

Diesing (1992) observed that Heim’s rules cannot account for the weak readings of indefinites and proposed instead the following rule:

(6) Existential closure applies at the VP level.

Besides this definition of existential closure, Diesing’s analysis relies on certain other hypotheses:

(7)  a. Subjects of individual-level (permanent or stable) predicates must occupy
    the (Spec, IP) position (which is external to the VP constituent).

   b. Subjects of stage-level (transitory) predicates can be either in (Spec, IP) or
      in a VP-internal subject position.

   c. Subjects of stage-level predicates may be affected by a lowering rule,
      which moves them from (Spec, IP) back to their initial VP-internal subject
      position.

Taken together, these hypotheses account for the data in (2). The predicates in (2b) are individual-level and therefore their subjects must occupy a preverbal position (technically referred to as (Spec, IP)), which is above VP and thus outside the scope of existential closure (see (6)). As a result, a weak (or existential) reading of (2b) is blocked; only the strong reading (the presuppositional reading, in Diesing’s terms) is available. Sentence (2a) is built with a stage-level predicate and therefore the subject can be lowered to a position inside VP, where it is in the scope of existential closure, as defined in (6). Thus, a weak reading is available in (2a).

Although one may disagree with some parts of Diesing’s analysis (in particular the lowering of the subject from Spec, IP back into VP), it seems necessary – granting that indefinites translate as variables – to constrain their weak readings by using rules of existential closure that are stricter than those of Heim (1982).

The hypothesis that an existential quantifier is present in the lexical representation of certain predicates goes back to Carlson (1977a, c), according to whom the relevant class can be identified with s(tage)-level predicates, as opposed to i(ndividual)-level predicates. In Sect. 2.5 of Chap. 2 we have proposed a different distinction, between entity-predicates and existential predicates, which cuts across the i-level/s-level predicate distinction. Furthermore, the lexical nature of the predicate
is not a sufficient condition for an indefinite to be able to take a weak reading: the possibility of weak readings of indefinites depends not only on the lexical properties of the predicates with which indefinites combine but also on the position occupied by the indefinite. Thus, the pair in (8a) vs. (8b) shows that in Romanian, bare plurals are allowed in the postverbal subject position with a verb such as *a veni ‘to come’ but disallowed in the preverbal subject position of the same verb:

(8) a. Ieri au venit studenţii să-mi spună..
    ‘Yesterday there came students to tell me …’

b. *Studenţii au venit ieri să-mi spună
    students have come yesterday subj-me say
    ‘Students came yesterday to tell me …’

Diesing’s (1992) rule of VP-level existential closure is an attempt to capture this additional constraint on weak indefinites. According to Diesing, the contrast in (8a) vs (8b) can be explained as follows: (i) existential BPs are weak indefinites; (ii) weak indefinites must be bound by existential closure; (iii) existential closure applies to the VP. The example in (8a) is grammatical because the subject is VP-internal and as such the BP can be legitimated by existential closure; the example in (8b) is ungrammatical because the subject is VP-external and as such the BP cannot be legitimated by existential closure; and since existential BPs can only be weak indefinites, (8b) is ungrammatical.

Note that this explanation relies on the assumption that in Romance languages other than French (as well as in German) subjects sitting in Spec, IP cannot be lowered to a VP-internal position. Compare English and French, where this type of lowering rule must be assumed in order to account for the acceptability of (2a) and (3a, a’). Lowering seems to be blocked by the Theme/Topic status of preverbal subjects (see Sect. 5.2 of Chap. 5).

Let us finally observe that in order to account for both weak and strong readings of indefinites we need to assume both Heim’s (1982) rules of existential closure (for strong and dependent readings) and Diesing’s rule of VP-level existential closure (for weak readings). Because this is not a desirable set up, Kratzer (1988, 1995) and Diesing (1992) suggest that it is possible to dispense with Heim’s rules.

4.2.2 Weak Indefinites as Property-Denoting Expressions

Another possibility is to analyze weak indefinites as property-denoting expressions (Heim 1987; Ladusaw 1994; Dobrovie-Sorin 1997a, b; McNally 1998; McNally

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*Diesing’s own data concern the postverbal and preverbal positions of subject bare plurals in German.*
and van Geenhoven 1998). This analysis relies on the hypothesis that certain predicates are not necessarily represented as in (9a) but may also be represented as in (9b):

\begin{align}
(9) & \quad \lambda x \ P(x) \\
& \quad \lambda Q \exists x \ (P(x) \land Q(x))
\end{align}

(9a) is the canonical representation of one-place predicates: they denote sets of individuals (type <e,t>) and as such can only apply to individual-denoting DPs (type e). The representation in (9b) is designed in such a way that certain predicates, e.g., dormir ‘sleep’, laver ‘wash’ and disponible ‘available’ have argument positions that are already saturated by existential closure in the lexicon. But they are not fully saturated, as they still require a property to specify the domain of variation of their argument variable. In (9b), this is represented by the property variable Q restricting the argument variable.\(^5\)

Granting (i) that sentential predicates can be represented as in (9b) and (ii) that weak indefinites denote properties, we can analyze sentences such as (10) as shown in (10\(’\)):\(^6\)

\begin{align}
(10) & \quad \text{Des enfants sont en train de dormir.} \\
& \quad \text{des children are prog to sleep} \\
& \quad \text{‘Children are sleeping.’} \\
& \quad \lambda Q \exists x \ (dormir(x) \land Q(x)) (\text{des enfants}) \\
& \quad \lambda \exists x (dormir(x) \land \text{des enfants}(x))
\end{align}

\(^5\) Sometimes, the domain of variation of the existentially bound variable is not restricted. Such is the case of implicit arguments, which appear in the thematic structure of a predicate but are not lexically projected, as in sentences like Jean a mangé ‘Jean ate’ or Marie lit beaucoup ‘Marie reads a lot’.

\(^6\) The weak reading of indefinites is sometimes analyzed as predicate modification (Farkas 2001). And yet, rules of modification of the sort proposed in Chung and Ladusaw (2003), for example, are technically different from the type of representation used here. At this point in the investigation of weak indefinites, there are two possibilities. The first one is that weak indefinite readings are all of a kind, in which case the different representations proposed in the recent literature are notational variants of the same phenomenon. Alternatively, it may be that there are several distinct types of weak indefinites (for example, bare plurals and bare count singulars in Spanish or Romanian would belong to distinct types), licensed by different syntactic contexts and assigned different semantic representations.
All predicates can be represented as in (9a) but only a subclass of predicates (albeit a large one), call them existential,\(^7\) can be represented as in (9b). This amounts to saying that in the lexicon existential predicates are systematically ambiguous between the two kinds of representation, (9a) and (9b).

The hypothesis that weak indefinites are not represented as individual variables correlates with their not introducing discourse referents. It is nevertheless possible for a weak indefinite to be the antecedent of an anaphor, because a discourse referent is introduced indirectly as a participant to the event denoted by the VP.

The property analysis of weak indefinites is problematic insofar as it cannot explain why prototypical property-denoting expressions such as adjectives may occur in those argument positions that allow weak indefinites:

(11) a. John reads novels.
    b. *John reads romantic.

4.2.3 Weak Indefinites as Amount-Referring Expressions

We have so far discarded two analyses of weak indefinites, one in terms of individual variables bound by VP-level existential closure, the other in terms of properties. We will nevertheless preserve the common ingredient of these analyses, namely the hypothesis that weak indefinites are legitimate only if an existential quantifier can be supplied by the predicate with which the indefinite combines.

In Chap. 3 above we have already proposed that weak indefinites occurring in existential sentences are to be analyzed as amount variables bound by the existential quantifier introduced by *il y a*. We repeat below our proposal for the semantic composition of existential sentences:

(12) \[ \text{de l’eau} =\lambda P \exists x_a (\text{water}(x_a) \land P(x_a)) \]
(13) \[ \text{il y a} = \lambda x_i \exists x_i (\text{Ind}(x_i,x_a)) \]
(14) a. il y a de l’eau = de l’eau (il y a)
    b. \( \lambda P \exists x_a (\text{water}(x_a) \land P(x_a)) \land \lambda x_i \exists x_i \text{Ind}(x_i,x_a) \)
    c. \( \exists x_a (\text{water}(x_a) \land \lambda x_i \exists x_i \text{Ind}(x_i,x_a)(x_a)) \)
    d. \( \exists x_a (\text{water}(x_a) \land \exists x_i \text{Ind}(x_i,x_a)) \)
    e. \( \exists x_i \exists x_a (\text{water}(x_a) \land \text{Ind}(x_i,x_a)) \)

\(^7\)“Existential predicate” is an ambiguous term, in that it can refer either to lexical classes or to representations of verbs, in a given context. Under the latter meaning, “existential predicate” refers to (9b).
In (14a), the two constituents are semantically composed by applying the generalized quantifier denoted by \( de\ l’eau \) to the property denoted by \( il\ y\ a \). In (14b) we have replaced the two constituents by their representations in (12) and (13). In (14c) and (14d) we have applied lambda-conversion twice. In (14e) we have preposed the existential quantifier that binds the individual variable.

Let us now turn to the representation of examples of the type in (10a–b), repeated under (15a–b). Both examples can be analyzed in the same way, so that it is sufficient to give the semantic composition of one of the two examples:

\[(15)\]

\[\begin{align*}
\text{a. } & \text{Des enfants sont en train de dormir.} \\
& \text{Des children are PROG to sleep} \\
& \text{‘Children are sleeping.’} \\
\text{b. } & \text{De la fumée s’échappe de la cheminée.} \\
& \text{DE LA smoke escapes of the chimney} \\
& \text{‘Smoke is coming out of the chimney.’}
\end{align*}\]

Granting that \textit{des enfants} ‘[des] children’ in (15a) is a weak indefinite and granting that weak indefinites are to be represented as generalized quantifiers of the type shown in (12) above, \textit{des enfants} is to be represented as in (16a). Following Carlson, we will assume an existential quantifier in the lexical representation of predicates such as \textit{sleep}:

\[(16)\]

\[\begin{align*}
\text{a. } & \text{des enfants} = \lambda P \exists x_a (children (x_a) \land P(x_a)) \\
\text{b. } & \text{sont en train de dormir} = \lambda x_a \exists x_i (sleeps (x_i) \land \text{Ind} (x_i, x_a)) \\
\text{c. } & \text{Des enfants sont en train de dormir} = \text{children (be sleeping)} \\
\text{d. } & \lambda P \exists x_a (children (x_a) \land P(x_a)) \cdot \lambda x_a \exists x_i (sleeps (x_i) \land \text{Ind} (x_i, x_a)) \\
\text{e. } & \exists x_a (children (x_a) \land [\lambda x_a \exists x_i (sleeps (x_i) \land \text{Ind} (x_i, x_a))] (x_a)) \\
\text{f. } & \exists x_a (children (x_a) \land \exists x_i (sleeps (x_i) \land \text{Ind} (x_i, x_a))) \\
\text{g. } & \exists x_a \exists x_i (children (x_a) \land sleeps (x_i) \land \text{Ind} (x_i, x_a))
\end{align*}\]

### 4.3 Strong Indefinites

In this section, we will demonstrate the existence of two distinct types of strong readings, a quantificational and a non quantificational one.

#### 4.3.1 Quantificational Strong Indefinites

According to Milsark, strong indefinites have partitive interpretations (note however that partitive indefinites, in particular overt partitives, e.g., \textit{two of my students}, are not necessarily strong (see Sect. 4.4 for further discussion)). In this subsection
we will propose that the partitive interpretations of those indefinites that are not overtly partitive are an effect of their quantificational status, which is triggered by the context. In the next subsection we will argue that strong indefinites are not necessarily partitive and correlative that they are not necessarily to be represented as quantificational.

In order to clarify as much as possible the difference between the weak and strong readings of indefinites, let us consider the example in (17), built with a cardinal and let us further assume that the Logical Forms associated with each reading are as indicated in (18) and (19):

(17) Deux enfants sont en train de jouer dehors.  
   two children are PROG to play outside  
   ‘Two children are playing outside.’

(18) Weak reading ($x_a$ is a variable over amounts)  
   $\exists x_a (\text{child}(x_a) \land \text{two}(x_a) \land \text{playing}(x_a))$\textsuperscript{8}

(19) Strong reading ($x_i$ is a variable over individuals)  
   Two $x_i (\text{child}(x_i)) \ [x_i \text{ is playing}]

As explained above in Sect. 4.2.3, the weak readings of indefinites are associated with logical forms without quantification over individuals, in which an amount variable is bound by an existential quantifier. Indeed, the variable in (18) does not range over individual children but rather over amounts of children of cardinality two, whereas the variable in (19) ranges over individual children. Correlatively two functions as a cardinality predicate (which is a particular type of measure phrase) in (18) but as a quantifier in (19). For the sentence in (17) to be true under the weak reading of two children, we only need to find an amount of two elements for which both predicates are true. To say that a strong indefinite is partitive means that it presupposes the existence of a contextually determined set of individuals. We assume that this presupposed set corresponds to the restriction of a tripartite structure. The tripartite representation in (19) is built on the model of sentences containing quantificational DPs:

(20) a. Each child is blond.  
    b. $\forall x (\text{child}(x)) \ [x \text{ is blond}]

It should be stressed that in the case of quantificational determiners such as tous (‘all’), la plupart (‘most’) or 3%, tripartite representations are due to their lexical properties (proportionality, non-intersectivity). In the case of indefinite DPs, on the other hand, tripartite representations are not due to the lexical properties of indefinite determiners (which are intersective, symmetric and non proportional) but rather to the syntactic context (in particular contexts in which a weak reading is blocked) or to a partitive / D-linked reading that is intended by the speaker.

\textsuperscript{8}The LF representations of examples of this type might be more adequately represented in terms of existential quantification over events. However, this refinement can be disregarded here.
4.3.2 Non-quantificational Strong Indefinites

In this section we show that strong indefinites are not necessarily partitive (which goes against Milsark’s generalization given in (4c)). We propose that strong non-partitive indefinites are not to be represented as quantificational DPs but rather as individual variables or more precisely as Skolem terms (cf. Steedman (2003)).

4.3.2.1 Non-partitive Strong Readings

Let us consider the following examples:

(21) a. Une voiture est dans le garage.
   a car is in the garage
   ‘A car is in the garage.’

b. Un homme était à côté de moi.¹⁰
   a man was next of me
   ‘A man was next to me.’

c. On a dû s’arrêter parce que trois enfants étaient malades/fatigués.
   3SG has had refl-stop because three children were sick tired
   ‘We had to stop because three children were sick.’

The indefinites appearing in (21a–c) are not necessarily interpreted as partitive: these examples do not necessarily presuppose the existence of contextually determined sets of cars, men or children. Indeed, in (21a), a continuation like les autres sont à tel endroit ‘the others are in such-and-such a place’ is neither needed nor expected. There are contexts in which (21a) may be uttered felicitously without causing a potential interlocutor to ask “où sont les autres?” (‘where are the others?’). In short, (21a–c) do not require a partitive reading.

Note now that despite the intuition that the examples in (21) can be paraphrased by existential sentences, the indefinites in (21) cannot be assumed to have weak readings, because these examples are built with entity predicates (see Sect. 2.5 of Chap. 2), which cannot apply to DPs that are necessarily weak, e.g., mass indefinites introduced by du/de la in French:

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¹⁰ For some speakers, examples of the type in (21a–b), borrowed from Kleiber (1981a, b), are highly marginal.
4.3 Strong Indefinites

(22)  
a.  *De la fumée est dans le garage.
   de la  smoke is  in    the garage
   ‘Smoke is in the garage.’

b.  *Du beurre était à côté de la farine.
   du  butter  was  next  of  the flour
   ‘Butter was next to the flour.’

These examples are ungrammatical due to two conflicting requirements: mass indefinites introduced by *du/*de la are necessarily weak, i.e., they supply an amount variable and as such they must be legitimated by existential closure, but copular sentences with a localizing PP predicate block this reading.

We are thus led to conclude that, although they do not have partitive meanings, the indefinites that appear in (21) have strong readings. This type of reading is difficult to obtain; judgments vary and are context-dependent, as shown in (23), built with joyeux ‘joyous’, a stage-level predicate that qualifies as an entity predicate, i.e., a predicate that cannot supply an existential quantifier.

(23)  
a.  ??Deux filles étaient joyeuses.
   two  girls  were  joyous
   ‘Two girls were joyous.’

b.  Deux filles étaient si joyeuses que tout le monde était de bonne humeur.
   two  girls  were  so  joyous  that  everyone  was  of  good  mood
   ‘Two girls were so joyous that everyone was in a good mood.’

Non-partitive strong readings are easy to find with indefinites that are specific, e.g., speaker-specific:  

(24)  
a.  Une femme que je connais est chauve.12
   a woman that I know is  bald
   ‘A woman I know is bald.’

b.  Un collègue à moi est daltonien.
   a colleague of me is  color-blind
   ‘A colleague of mine is color-blind.’

Certain indefinite determiners are specialized for non-partitive strong readings. A clear example of this type of determiner is unos ‘some’ in Spanish (see Villalta 1995; Tasmowski and Laca 2000; Lopez Palma 2007). In the following examples, due to Helena Lopez Palma (p.c.), we see that unos N can be represented neither as a quantificational indefinite, (25a–b), nor as a weak indefinite, (25c).

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11 See Farkas (1994), who distinguished among speaker-specificity, epistemic specificity and scope specificity, by virtue of their descriptive content.

12 Example from Galmiche (1986).
(25) a. Unos estudiantes le han regalado un libro a Carmen.
     some students her have given a book to Carmen
     ‘Some students gave a book to Carmen.’
b. *Unos estudiantes le han regalado sendos libros a Carmen
     some students her have given sendos books to Carmen
     ‘Some students gave sendos books to Carmen.’
c. Los estudiantes han leído unos libros.
     the students have read some books
     ‘The students read some books.’

Unlike quantificational DPs, unos N cannot have a distributive interpretation:
(25a) describes a situation in which a group of students gave a book together; (25b)
is ungrammatical because sendos forces a distributive interpretation (‘some stu-
dents each gave a book to Carmen’) and is therefore incompatible with unos.13
Unlike bare plurals in Spanish, unos N cannot be interpreted as a dependent plural:
(25c) cannot mean that the students each read a book (whereas this meaning is pos-
sible for Spanish bare plurals, as in Los estudiantes han leído libros).14
We can therefore conclude that indefinite DPs headed by unos are strong but not
quantificational.

This third type of reading, although crucial for the theory of indefinites,15 has escaped
notice because – unless it is lexically marked, as is the case for unos – it is only margin-
ally accepted and requires special contexts. This kind of interpretation is facilitated by
indications allowing the discourse referent to be introduced by way of a separate predi-
cation, such as “that I/you (don’t) know)” or “that I met last year”, as in (24).

4.3.2.2 Non-quantificational Strong Indefinites and Wide Scope Effects

Since Fodor and Sag (1982), indefinites are known to allow wide scope interpreta-
tions that cannot be analyzed as relying on mechanisms of quantifier scope:

(26) Each professor knows that a student I’m advising failed the test.

13 Helena Palma Lopez points out that (25b) becomes acceptable if unos estudiantes is replaced
with unos estudiantes mios:‘some students of mine’:

(i) Unos estudiantes mios le han regalado sendos libros a Carmen.
     some students mine her have given sendos books to Carmen

Distributivity here owes to the specificity of the DP (the referent of unos estudiantes mios is acces-
sible to the speaker), which in turn owes to the presence of mios. For more on how the specificity
of indefinites and distributivity are linked, see Sect. 5.1.5 of Chap. 5.

14 This does not mean that, when in object position, unos N will always take wider scope than the
subject. In (25c), for example, the relative scope of the two DPs is ambiguous: each student may
have read the same group of books, or each may have read a different group.

15 Acknowledging the existence of non-quantificational strong indefinites may help resolving a
contradiction between the analyses of Heim (1982) and Heim (1987) (remarked upon but left
unresolved in note 1 of the latter): the analysis of Heim (1987) pertains to weak indefinites, while
the analysis of Heim (1982) is adequate for non-quantificational strong indefinites.
Example (26) allows a specific reading according to which a student that I’m advising is such that each professor knows that he failed the test. This reading cannot be analyzed in terms of quantifier scope because canonical quantifiers cannot scope out of the minimal clause to which they belong, which led Fodor and Sag to propose that the wide-scope interpretation of indefinites derives from a referential interpretation of the indefinite. Within the three-way analysis of indefinites proposed here, wide-scope indefinites can be represented neither as weak indefinites (such indefinites are necessarily narrow-scoped) nor as quantificational strong indefinites (the scope of quantified DPs cannot exceed their minimal clause). This leaves us with the third reading that we have identified here: non-quantificational strong indefinites.

Following Steedman (2003), we propose to represent this type of indefinite, which exhibits wide-scope effects, as a Skolem term (see Chap. 6 below).

4.3.3 The Two Strong Readings of Indefinites and the Denotation of DPs

The two strong readings of indefinites identified above are parallel to two different types of strong DPs, as shown in (27):

(27) Strong DPs Indefinites Other than Indefinites
Type <<e,t>,t> quantificational quantificational
Type e Referential proper names, definites, demonstratives

We have so far suggested that partitive strong indefinites can be analyzed as quantificational DPs, which can be represented by means of tripartite structures. Non-partitive strong indefinites on the other hand are referential DPs, which denote individuals. The similarity between referential DPs and non-partitive strong indefinites appears clearly if the latter are analyzed as Skolem terms (see Steedman 2003 and Chaps. 6 and 8). This analysis has not yet become predominant. In the current literature non-partitive strong indefinites are treated as specific. For a general overview of different semantic approaches to specific indefinites see von Heusinger (2011).

4.4 The Weak/Strong Distinction and Presuppositionality

Following Diesing (1992), we will assume the “presuppositionality hypothesis” (cf. Heim and Kratzer (1998: 163)) according to which quantified DPs are presuppositional. Sentences built with quantified DPs are represented as tripartite structures, in which the restriction may be identified with the presuppositional part of the sentence. Since referential DPs are also presuppositional (cf. Strawson), we can assume the generalization in (28), which establishes a correlation between the denotation of DPs and presuppositionality:

(28) Strong DPs (referential DPs and generalized quantifiers) are presuppositional.
Two types of presuppositionality have to be distinguished, correlating with the two types of strong DPs. Referential DPs, e.g., proper names, presuppose the existence of their referent, whereas quantificational DPs presuppose that the set denoted by the head noun N (or by the noun together with its modifiers) is not empty. In other terms, quantificational DPs presuppose the existence of the non-empty set denoted by their NP constituent.

Since Diesing (1992), the term “presuppositional” is commonly used as a synonym for “partitive”, “D-linked” or “quantificational”. We do not adopt this use: for us, presuppositional is equivalent to “strong” but different from “partitive” and “quantificational”. Indeed, there are both partitive and non-partitive presuppositional indefinites. The distinction between partitive and non-partitive presuppositional indefinites corresponds to the distinction that we have established between the two strong readings of indefinites: quantificational strong indefinites are presuppositional and partitive, whereas non-quantificational strong indefinites are presuppositional but not partitive. Non-quantificational strong indefinites resemble definite and demonstrative DPs by their denotational type (type e) and by their non-partitivity.

“Wide scope” indefinites allow us to illustrate the case of non-partitive presuppositional indefinites:

(29) Each professor knows that a student failed the test.

The so-called “wide scope” interpretation of a student is presuppositional: if the set of students is empty, then the sentence is uninterpretable (neither true nor false). However, the wide-scoped indefinite is not necessarily partitive: there need not be a contextually relevant proper subset of students (except for the singleton containing the student in question).

On the other hand, overtly partitive indefinites are not always presuppositional, as indicated by examples such as (30), which show that indefinites like one/two/three/several of your students/children/friends are acceptable in existential sentences:

(30) Dans la salle il y avait deux de tes étudiants.

‘In the room there were two of your students.’

Examples of this type, in which overtly partitive indefinites occur in existential sentences, can be represented as in (31), where the partitive constituent introduced by de ‘of’ does not map to the restriction of a tripartite configuration but instead is analyzed as a property that restricts the domain of variation of an amount variable:

(31) \( \exists x_a [x_a \text{ belongs to your students} \land |x_a| = \text{two}] \)

Represented as in (31), the example in (30) asserts the existence of an amount that ranges over students of yours and the measure of which is two. Here and elsewhere, the cardinals that modify weak indefinites are to be analyzed as the values obtained by applying a measure function to an amount of objects.
Summarizing, the denotational distinction between weak and strong indefinites correlates with the distinction between non-presuppositional and presuppositional indefinites:

(32) a. Strong indefinites (which denote either individuals or generalized quantifiers) are presuppositional.
    b. Weak indefinites are non-presuppositional.

As indicated in (32a), presuppositional indefinites are not necessarily quantificational. They may also be referential (i.e., individual referring).

4.5 Conclusions

Most theoreticians distinguish only two readings of indefinites, weak and strong. We have shown that indefinites are in fact compatible with three distinct readings (weak, quantificational strong and non-quantificational strong) and we have proposed three possible analyses of indefinites, which can be represented as follows:

a. Weak indefinites refer to non specific amounts and must combine with an existential predicate. They denote generalized existential quantifiers over amounts.

b. Non-quantificational strong indefinites are referential expressions that are represented as Skolem terms.

c. Quantificational indefinites are generalized quantifiers, which we have represented in terms of tripartite configurations.
In the preceding chapter, we established that indefinites are potentially ambiguous, being compatible with three different types of representation. The evidence in favor of this tripartition was mainly based on two contexts that restrict the interpretations of indefinites: *il y a* sentences and a lexical distinction between two classes of predicates. In what follows, we will examine DP-internal properties that help disambiguate indefinites: (a) the lexical properties of determiners; (b) the internal structure of indefinite DPs. We will then consider contextual factors, such as syntactic position and information structure. The main generalizations will be based on French examples, which do not seem to differ from the corresponding English examples, as can be inferred from the glosses. Spanish and Romanian examples will be found in Sect. 5.1.4, where they illustrate the phenomenon known as ‘prepositional accusatives,’ a type of construction that does not exist in French or English.

5.1 Disambiguating Indefinites: DP-Internal Factors

5.1.1 Lexical Specification of Plural Indefinites: Partitivity, Contrastivity and Distributivity

Many languages have more than one plural indefinite determiner. French, for example, has *certains, quelques, des* and *plusieurs* and English has *certain, some, sm* (deaccented *some*) and *several*. They are all indefinite in that they are intersective and symmetrical but they differ with respect to other semantic properties, such as partitivity, contrastivity and distributivity. These features restrict the interpretative possibilities of indefinite DPs.
Attal (1976) notes that there is an important contrast between *certains* ‘some’ and *des* in French: *certains* gives rise to quantificational sentences with distributive interpretations, while *des* does not, except in contrastive contexts:

(1) a. Certains enfants étaient tristes/malades / indisciplinés.
    certain children were sad/ sick / undisciplined
b. ?? Des enfants étaient tristes/ malades/ indisciplinés.
    des/ sm children were sad/ sick / undisciplined
   ‘Some children were sad/sick/undisciplined.’

In unmarked cases, DPs introduced by *certains* are to be analyzed as quantificational, whereas DPs introduced by *des* refer to non-specific amounts. The other plural indefinite determiners (*quelques, plusieurs*) are compatible with all three representations introduced in the previous chapter; the choice of a particular representation is contextually determined.

In what follows, we would like to suggest that the quantificational properties of *certains* derive from its lexical meaning. More precisely, *certains* is intrinsically contrastive and as such it gives rise to the implicature “not all”. The speaker uses *certains* rather than *des* or *quelques* when the individuals characterized by the property denoted by N may be divided into two subsets, the set of those who satisfy the predicate of the sentence and the set of those who do not. The contrastivity that characterizes *certains* thus induces partitivity. In the words of Corblin (2001:105), “*certains N laisse entendre une partie de N mais pas tous les N*”.

(2) Certains étudiants ont rendu leur copie.
    certain students have returned their paper
   ‘Certain students turned their paper in.’

Determiners other than *certains* (such as *des, quelques, plusieurs*, etc.) are lexically non-contrastive. If, from *quelques N VP*, we may conclude that not every N satisfies VP, it is not because of the lexical meaning of *quelques* but rather because of an application of Grice’s conversational maxim of quantity.

The contrastive partitivity of *certains* must be distinguished from the partitivity of explicitly partitive indefinites, as in (3):

(3) Deux de tes étudiants ont rendu leur copie.
    two of your students have returned their paper
   ‘Two of your students handed their paper in.’

---

1 ‘*Certains N suggests some of the Ns but not all of the Ns.*’

This is not a logical implication but only an implicature, because it is possible to cancel it by using *même* ‘even’ and say:

(i) Certains étudiants sont indisciplinés. Tous même, me semble-t-il.
    certain students are undisciplined all even me seems- it
   ‘Certain students are undisciplined. All of them, even, it seems to me.’
For (3) to be true, it is enough that two students of yours handed their paper in. Whether your other students handed theirs in or not does not affect the truth value assigned to the sentence.

Let us now return to Attal’s observation that indefinites introduced by *certain* favor a distributive reading. This interpretation distinguishes *certain* not only from *des* (see (1a–b)) but also from other plural indefinites, which favor a collective reading:

(4) a. Certains étudiants sont passés me dire que…
   certain students are come me tell that
   ‘Certain students came by to tell me that…’

   b. Plusieurs/ des/ quelques étudiants sont passés me dire que…
   several des some students are come me tell that
   ‘Several / sm / a few students came by to tell me that…’

It can be shown that distributivity *per se* is not part of the lexical meaning of *certain*. Indeed, the distributivity of *certain N* can be blocked by predicates that select pluralities:

(5) Certaines filles se ressemblait.
   certain girls refl resembling
   ‘Certain girls looked alike.’

In examples of this kind, *certain* remains contrastive-partitive, which gives rise to the implicature that there are girls that do not look alike. Quantificational DPs, which are necessarily distributive (see Sect. 6.3 of Chap. 6), are unacceptable in the same context:

(6) a. *Chaque fille se ressemblait.
   each girl refl resemble
   ‘Each girl looked alike.’

   b. *Toute fille se ressemblait.
   every girl refl resemble
   ‘Every girl looked alike.’

We may thus conclude that *certain* is not inherently quantificational.

However, some correlation seems to exist between the distributivity and the contrastive meaning of *certain*: *certain* is contrastive and by default distributive (unless the sentential predicate is collective), whereas *des, plusieurs* and *quelques* are non-contrastive and – in unmarked cases – non-distributive.

It seems possible to account for this correlation as follows. The contrastive meaning (‘not all’) that characterizes *certain* must take into account not only the intersection of the nominal predicate with the predicate of the sentence but also other elements belonging to the set described by the nominal predicate. However, *certain* is not a proportional determiner, because we need not check every element in the set denoted by the nominal predicate in order to assign a truth value to a sentence containing *certain*. It is sufficient to find one element in this set that does not have the property denoted by the verb.
The proposal we have just outlined regarding *certains* can be summarized by saying that its (contrastive-partitive) lexical meaning gives rise to a tripartite Logical Form and thus to distributivity. In unmarked cases, distributivity will be “strict”: the quantification domain will contain atomic individuals (see (4’)). If the predicate of the sentence blocks this reading (as with *ressembler* ‘look alike’, which can only apply to groups), the quantification domain will contain groups of individuals (see (5’)):

(4’) *Certains* x (student (x)) [x came by to tell me that …]  
(5’) *Certains* x (x is a group of girls) [x look alike]

This representation says that, given a contextually identifiable group of girls, certain subgroups (but not all) belonging to this group contain girls who look alike.

Indefinites that are neither explicitly partitive nor contrastive are necessarily interpreted as partitive when they appear in a contrastive context or as subjects of negative predicates:

(7) a. Plusieurs enfants ne m’ont pas écrit.  
   several children NEG me have NEG written  
   ‘Several children didn’t write to me.’

b. Quelques enfants sont arrivés à temps, d’autres ne sont venus que
   some children are arrived at time others NEG are come only
   deux heures plus tard.
   2 hours more late
   ‘Some students arrived on time, others did not come until 2 hours later.’

In this case as well, contrast triggers the distributive reading. This correlation between contrast and distributivity suggests again that contrast gives rise to a quantifi cational structure, which correlates with distributivity:

(7’) a. *Plusieurs* x (children (x)) [x did not write to me]

Let us now see how *plusieurs* differs from *quelques*.

(8) a. Plusieurs enfants étaient intelligents/ tristes/ blonds/ fatigués.  
   several children were intelligent/ sad/ blond/ tired
   ‘Several children were intelligent / sad / blond / tired.’

b. ?? Quelques enfants étaient intelligents.
   some children were intelligent
   ‘Some children were intelligent.’

c. ? Quelques enfants étaient tristes / blonds / fatigués.
   some children were sad / blond / tired
   ‘Some children were sad / blond / tired.’

d. *Plusieurs*/ quelques enfants se ressemblaient.
   several/ some children REFL resemble
   ‘Several / some children looked alike.’
Examples (8a–c) have predicates that must apply to atomic individuals. Example (8a) is acceptable because *plusieurs* can be distributive (though it does not have to be, as indicated by (8d). The marginality of (8b–c) is due to *quelques* being marked as collective; it may be distributive only in the presence of a contrastive predicate (as in *Quelques enfants étaient fatigués, les autres étaient en train de jouer dans la cour* ‘Some children were tired, the others were playing in the yard’).

Turning now to *des*-indefinites, on their unmarked use they have a weak reading (see Chap. 2, where parallelisms are drawn between bare plurals in Spanish and Romanian and indefinites with *des* in French), which is incompatible with the quantificational configuration induced by contrast or explicit negation. This accounts for the marginality of (7c), which contrasts with the acceptability of (7a–b).³

(7)  c. ??Des enfants ne m’ont pas écrit.

  Des children neg me have neg written
  ‘Sm children didn’t write to me.’

Let us now consider the examples in (9), due to Galmiche (1986):

(9)  a. Des verres sont vides.

  Des glasses are empty
  ‘Sm glasses are empty.’

  b. Des fauteuils sont bancals.

  Des armchairs are wobbly
  ‘Sm chairs are wobbly.’

  c. Des verres sont ébréchés.

  Des glasses are chipped
  ‘Sm glasses are chipped.’

  d. Des fourchettes sont sales.

  Des forks are dirty
  ‘Sm forks are dirty.’

  e. Des fleurs sont fanées.

  Des flowers are wilted
  ‘Sm flowers are wilted.’

² The collective meaning is even clearer in the case of the Spanish determiner *unos* (Villalta 1995).

³ There is however a partitive *des*, which is interpreted like *certains* (cf. Bosveld de Smet 1997).

(i) Des élèves étaient absents hier.

  Des students were absent yesterday
  ‘Some students were absent yesterday.’
f. Des ampoules sont usagées.
   'Sm bulbs are worn out.'

Des bulbs are worn out

g. Des cendriers sont pleins.
   'Sm ashtrays are full.'

Des ashtrays are full

The acceptability of these examples is surprising: on their unmarked interpretation, *des* indefinites are weak, i.e., amount referring, but the examples in (9) are constructed with entity predicates (see Sect. 2.5 of Chap. 2), which cannot combine with amount-denoting arguments. Note however that the interpretations of the examples in (9) are not partitive: to paraphrase them, one would not use *certains* but rather *quelques*. The lack of a partitive interpretation is expected under the assumption that on their unmarked reading, *des* indefinites cannot be quantificational (cannot be represented by tripartite structures). We are therefore led to assume that in examples such as (9), *des* indefinites function as referential terms that refer to plural individuals. From the perspective proposed here, plural individuals differ from amounts insofar as they carry a referential index that distinguishes them from other plural individuals that satisfy the same description. Examples of the type in (9) can be represented as predicational configurations in which the main predicates apply to referential terms (see (9a)). Note that in (9a), the numerical index on *glasses* does not indicate the number of glasses but instead is a referential index.

(9a) a. empty (glasses_{3})

The referential use of *des* indefinites illustrated in (9) is subject to severe constraints: as pointed out by Galmiche (1986), examples of this kind are acceptable only when both the subject and the predicate of the sentence express directly perceptible objects and properties, respectively. This indicates that direct perception allows referential interpretations even for those indefinites that are not lexically marked as specific. Moreover, examples that trigger a specific reading of *des* indefinites are subject to rules of discourse relevance for which the interaction between the meaning of the verb and the meaning of the noun is a decisive factor. Thus, examples (9a–g) become ungrammatical if we replace the matrix predicates by their antonyms. Note that the type of predicate in (9) and (10) does not differ; entity-predicates are used in both cases:

(10) a. ?? Des verres sont pleins.\(^4\)
   'Sm glasses are full.'

\(^4\)These examples are acceptable with the partitive meaning equivalent to *certains*. This is expected because the partitive *des* is quantificational and entity-predicates allow quantificational readings.
b. ?? Des fauteuils sont confortables.
   Des armchairs are comfortable
   ‘Sm chairs are comfortable.’

c. ?? Des verres sont entiers.
   Des glasses are whole
   ‘Sm glasses are whole.’

d. ?? Des fourchettes sont propres.
   Des forks are clean
   ‘Sm forks are clean.’

e. ?? Des fleurs sont fraîches.
   Des flowers are fresh
   ‘Sm flowers are fresh.’

f. ?? Des ampoules sont neuves.
   Des bulbs are new
   ‘Sm bulbs are new.’

g. ?? Des cendriers sont vides.
   Des ashtrays are empty
   ‘Sm ashtrays are empty.’

According to Galmiche, examples (10a–g) are unacceptable because they are not ‘relevant’, which means that their content is not sufficiently informative. At a feast, glasses are supposed to be full. In this context, an utterance is relevant if it describes the unexpected situation of glasses being empty (see (9a)) and therefore needing to be refilled.

Evidence in favor of the idea that the predicates in (9) above are entity-predicates is provided by examples with mass nouns. Mass indefinites are necessarily weak (compare plural indefinites which may take an entity type denotation as explained in (9’a)) and as such they cannot combine with entity-predicates.

(11)  a. * De la fumée était noire.
   De la smoke was black
   ‘Sm smoke was black.’

b. ?? Du mobilier était abîmé / en mauvais état.
   Du furniture was damaged/ in bad condition
   ‘Some furniture was damaged/ in bad condition.’

To summarize, plural indefinite determiners in French present notable interpretative differences, corresponding to different choices from among the three types of representation proposed in Chap. 4. In unmarked uses, des-indefinites refer to amounts, indefinites headed by quelques have a collective interpretation (they supply variables that range over plural individuals) and certains has a contrastive meaning (and is correlatively to be represented as a quantificational DP). Plusieurs is interpreted as a cardinality predicate meaning ‘more than one, several’; it is compatible with the three types of readings just described. Although they are not
designated as partitives in the lexicon, *quelques* and *plusieurs* can acquire a partitive meaning in the presence of a contrastive predicate. Whether it is due to the lexical specification of the determiner (as is the case for *certains*) or induced by the syntactic context, the contrastive interpretation gives rise to a quantificational Logical Form (tripartite structure) and this representation correlates with a distributive reading.

### 5.1.2 Partitive Indefinite DPs

Partitive indefinites such as *un/deux/*plusieurs des *N* ‘one/two/several of the *N*’ are not necessarily interpreted as distributive, which indicates that they are not necessarily quantificational:

(12) Deux de tes étudiantes se ressemblaient incroyablement.

Two of your students REFLECT.IMPRESÉNASSE.IMPRESSE.INF. IMPERF. incredibly

‘Two of your students looked incredibly alike.’

This example can be represented as in (12’), where the indefinite is referential (more precisely it is to be analyzed as a Skolem term, see Chap. 6), which is indicated by the referential index 35:

(12’) looked incredibly alike (two-of-your-students

Overt partitives can even appear in existential sentences:

(13) Dans la salle, il y avait deux de tes étudiants.

in the room there have.IMPRESSE. IMPERF. two of your students

‘In the room were two of your students.’

We know that existential constructions require amount-denoting DPs and are therefore incompatible with quantificational DPs that quantify over individuals (see Chap. 3). An example like (13) thus constitutes an argument in favor of the idea that explicitly partitive indefinites are not necessarily quantificational.\(^5\) Formally, this means that the *de DP* ‘of DP’ constituent need not always be analyzed as belonging to the restriction of a tripartite structure; it can also be analyzed as a property restricting the range of the variable introduced by the weak indefinite, translated in the Logical Form as an existential generalized quantifier over amounts that combines with the instantiation predicate *il y a*. By applying two successive lambda-conversions to (13’a), we obtain (13’b) and finally (13’c).

\(^5\) There are notable differences between languages regarding this point. For example, explicit partitives in Spanish cannot appear in *hay* ‘there is’ constructions: (i) *había dos de tus estudiantes en la sala* ‘there were two of your students in the room’ vs. (ii) *había dos estudiantes tuyas en la sala* ‘there were two students of yours in the room’ (judgments provided by Helena Lopez de Palma, p.c.).
(13’) a. \( \lambda P \exists x_a (x_a \text{ belongs to your students} \land |x_a| = 2 \land P(x_a)) \cdot \lambda x_a \exists x_i (\text{Ind}(x_i, x_a) \land (x_i \text{ is in the room})) \)

b. \( \exists x_a (x_a \text{ belongs to your students} \land |x_a| = 2 \land \lambda x_a \exists x_i (\text{Ind}(x_i, x_a) \land (x_i \text{ is in the room}))(x_a)) \)

c. \( \exists x_a^2 (\text{Ind}(x_a^1, x_a^2)) \land x_a^1 \text{ belongs to your students} \land x_a^1 \text{ is in the room} \land |x_a^1| = 2) \)

The dissociation between partitivity and quantificational status is worth stressing, for it goes against most of the current analyses of indefinites. It is thus commonly assumed that an indefinite that is partitive (or D-linked, in the sense of Pesetsky (1987)) is also quantificational. We have just observed that indefinites that are explicitly partitive are not necessarily quantificational. On the other hand, it seems plausible that the partitive meaning of those indefinites that are not explicitly partitive is due to a quantificational structure: the quantificational domain (corresponding to the restrictive term of a tripartite structure) is interpreted as a contextually determined subset of the set described by the nominal predicate. The quantificational structure itself is not brought about by the inherent features of the indefinite DP but rather by properties of the context: the type of predicate (see Chap. 4, Sect. 4.3.2), the presence of a contrastive context (see the examples in (7), above), or yet other factors to which we will return below.

In sum, overtly partitive indefinite DPs are ambiguous: they may be amount-referring (more precisely and in our implementation they denote a generalized existential quantifier over amounts) or quantificational (denote a generalized quantifier over individual entities). Contrast induces a tripartite representation, interpreted as a quantificational configuration. This kind of representation is possible but not necessary for partitive DPs.

5.1.3 Modified Cardinals

Westerstähl (1989) and Liu (1990) observed that modified cardinals (au moins n ‘at least n’, exactement n ‘exactly n’, n au plus ‘at most n’) have interesting scopal properties: unlike unmodified cardinals, which allow several readings (wide scope (14a), intermediate scope (14b) and narrow scope (14c)), modified cardinals favor a narrow scope reading (cf. (15)):

(14) Chaque professeur a récompensé chaque élève qui a lu deux romans.

Each professor rewarded each student who has read two novels.

‘Each professor rewarded each student who read two novels.’

a. There are two novels such that each professor rewarded each student who read them.

b. Each professor chose two novels and rewarded each student who read them.

c. Each professor rewarded each student who read any two novels.
Chaque professeur a récompensé chaque élève qui a lu au moins deux romans.

‘Each professor rewarded each student who read at least two novels.’

Kamp and Reyle (1993) showed that modified cardinals behave both like indefinites and like quantifiers. With respect to scope, they behave like quantifiers (in that they cannot scope out of the minimal sentential domain to which they belong) but their anaphoric potential makes them comparable to indefinites. As illustrated by (16b), they introduce a discourse referent that is accessible in “donkey sentences”, on a par with the singular indefinite in (16a) and in contrast with the quantified DP in (16c).

(16) a. Tout fermier qui possède un âne le bat.
   every farmer who owns a donkey it beats
   ‘Every farmer who owns a donkey beats it.’

b. Tout fermier qui possède au moins deux ânes les bat.
   every farmer who owns at least two donkeys them beats
   ‘Every farmer who owns at least two donkeys beats them.’

c. * Tout fermier qui possède chaque âne le/ les bat.
   every farmer who owns every donkey it/ them beats
   ‘Every farmer who owns each donkey beats it/them.’

Corblin (2001) points out additional differences between modified and unmodified cardinals: modified cardinals favor distributive over collective readings and they do not allow generic readings. These two points are illustrated in (17).

(17) a. Cinq étudiants m’ont offert un livre. (distributive or collective)
   five students me have offered a book
   ‘Five students offered me a book.’

b. Au moins cinq étudiants m’ont offert un livre. (distributive)
   at least five students me have offered a book
   ‘At least five students offered me a book.’

c. Deux jumeaux se ressemblent. (generic reading possible)
   two twins refl resemble
   ‘Two twins look alike.’

d. Au moins deux jumeaux se ressemblent. (generic reading impossible)
   at least two twins refl resemble
   ‘At least two twins look alike.’

These observations led Kamp and Reyle (1993) and Corblin (2001) to postulate the existence of an intermediate class between cardinals and quantifiers, labeled ‘cardinal quantifiers’. As the name suggests, these expressions would be a sub-type of quantifiers rather than a sub-type of indefinites.
We will not adopt this analysis: modified cardinals may but need not be quantificational. DPs introduced by modified cardinals acquire quantificational status under the same contextual conditions as other indefinites, in particular in the subject position of entity-predicates (cf. (18a)) or in contrastive contexts (see (18b)):

(18) a. Au moins trois filles étaient blondes.
    at least three girls were blond
    ‘At least three girls were blond.’
b. Même si la plupart des étudiants n’ont pas réussi,
    even if the majority of the students NEG have NEG succeeded
    au moins trois étudiants ont eu 18/20.
    at least three students have had 18/20
    ‘Even if most students did not pass, at least three students received 18 out of 20.’

Like indefinites and unlike quantificational DPs, they may appear in il y a constructions:

(19) a. Dans la salle, il y avait au moins deux étudiants.
    in the room there have.IMPF at least two students
    ‘In the room were at least two students.’
b. *Dans la salle, il y avait chaque étudiant.
    in the room there have.IMPF each student
    ‘In the room was each student.’
c. Il y a au moins trois étudiants qui ont triché.
    there has at least three students who have cheated
    ‘There are at least three students who cheated.’
d. * Il y a chaque étudiant qui a triché.
    there has each student who has cheated
    ‘There is each student who cheated.’

In this context, modified cardinals cannot be analyzed as quantificational but must be analyzed as weak, i.e., as referring to amounts.

Our proposal is that modified cardinals differ from run-of-the-mill indefinites in that they do not allow a non-quantificational strong reading, i.e., a specific referential interpretation; in other words, they cannot be represented as Skolem terms (see the difficulty of a collective reading in the subject position in (17b)⁶). The other

⁶Note that a collective interpretation of modified cardinals is related to an eventive interpretation of the sentence, in which the modified cardinal is a weak indefinite:

(i) Au moins cinq étudiants se sont réunis hier.
    at least five students refl are gathered yesterday
    ‘At least five students have gathered yesterday.’
effects observed by Kamp and Reyle (1993) and Corblin (2001) can be shown to follow from this hypothesis. As we will see in Chaps. 6 and 7, wide and intermediate scope effects (see (14a–b)) on the one hand and generic interpretation (see (17c) vs. (17d)) on the other hand, are possible only if a given indefinite can translate as an individual variable.

In short, modified cardinals are indefinites that cannot be represented as individual variables. We may now wonder whether this impossibility is linked to the form of the DP (i.e., to the modification of the cardinal). A possible hypothesis relies on postulating a homogeneity condition on quantification domains: a plural indefinite can map onto a variable that ranges over pluralities only if the domain of variation is homogeneous. A modified cardinal like *au moins deux N* ‘at least two N’ denotes a set of amounts of varying cardinality: amounts of two N, of three N, etc. However, this constraint could not explain why *exactement un N* ‘exactly one N’ (or more generally *exactement n N* ‘exactly n N’), which defines a homogeneous quantification domain, behaves in the same way as *au moins n N* ‘at least n N’ or *au plus n N* ‘at most n N’.

Another line of explanation was proposed by Krifka (1999), who assumes that modified cardinals are not determiners but rather complex expressions made up of an adverb and a cardinal. *Au moins*, *au plus* and *exactement* have the same semantics when applied to a numeral like *quatre* ‘four’ or when applied to some other linguistic unit, as illustrated in (20). These adverbs affect the truth conditions of the sentence, not the interpretation of the determiners. In other terms, even when they are modified, cardinals are analyzed as cardinals, i.e., as indefinites, which are ambiguous:

(20) a. Jean a vu au moins Marie.
    Jean has seen at least Marie
    ‘Jean saw Mary at least.’

b. Pierre était exactement à l’heure.
    Pierre was exactly at the hour
    ‘Pierre was exactly on time.’

c. Jean demandera au plus une petite somme d’argent.
    Jean ask.fut at most a small sum of money
    ‘Jean will ask for at least a small amount of money.’

Further reasons can be found for not considering modified cardinals to be determiners. In the theory of generalized quantifiers, it was shown that conservativity is a characteristic property of natural language determiners. Accordingly, elements such as *only* in English, which can appear in a prenominal position but are not conservative, are excluded from the set of English determiners. Certain modified cardinals are, at least in certain uses, comparable to *only* in that they are not conservative. Take the case of *exactement trois* ‘exactly three’ and *au plus trois* ‘at most three’.
5.1 Disambiguating Indefinites: DP-Internal Factors

(21)  
\( a. \) Exactement trois filles ont menti.  
\( \text{exactly three girls have lied} \)  
‘Exactly three girls lied.’
\( b. \) Au plus trois filles ont menti.  
\( \text{at most three girls have lied} \)  
‘At most three girls lied.’

In these examples, the modified cardinal is not conservative: in order to determine the truth value of these sentences, one must know not only the set of all girls and the set of girls who lied but also the set of all liars. So for example, (21a) and (21b) can be said to be false in contexts where the set of liars contains boys as well as girls. Assigning a truth value requires examining the set of liars and checking that it is composed of exactly three or at most three girls, respectively. One must make sure that there are no liars that are boys.

A complete analysis of modified cardinals goes far beyond the aims of this book. For our present concerns it is sufficient to assume a negative characterization, according to which DPs headed by modified cardinals cannot be represented as non quantificational strong indefinites. The scopal phenomena examined in Chap. 6 will give further evidence in favor of this hypothesis.

5.1.4 Prepositional Accusatives: Denotation Type and Specificity

Certain languages have two distinct forms for direct objects, one unmarked, the other marked with a morphological case – as in Turkish, cf. Enç (1991) – or with a preposition – like a in Spanish (Jaeggli 1982; Bleam 1999) and pe in Romanian (Dobrovie-Sorin 1990, 1993; Cornilescu 2000). In this section we will examine Romanian and Spanish prepositional Accusatives and we will show that the use of a marked accusative blocks the weak reading; in other words, marked accusatives cannot be analyzed as amount-referring expressions. This constraint leaves room for crosslinguistic variation. Thus, Romanian prepositional Accusatives necessarily take specific and wide-scoped interpretations (Farkas 1978; Dobrovie-Sorin 1987, 1990, 1993, 1995), whereas Spanish prepositional Accusatives may also be interpreted as non specific and narrow scoped indefinites.

5.1.4.1 Romanian

In Romanian, the prepositional marking of the direct object correlates with clitic doubling: in (22b) and in (24b), the direct object is doubled by the clitic l- (accusative

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7 The notion of ‘strong Case’ was used by de Hoop (1992) to refer to prepositional or morphologically marked Accusatives, as opposed to unmarked objects, assumed to be marked with a ‘weak Case’.

8 For a crosslinguistic analysis of specific indefinites, and in particular of prepositional Accusatives, see von Heusinger (2002).
masculine third person singular) and in (23b), the direct object is doubled by the clitic o (accusative feminine third person singular). The clitic doubling of the direct object was optional in earlier stages of Romanian but it has become obligatory in the modern language. Examples (22a) and (23a) show that non-prepositional accusatives cannot be doubled by clitics (this impossibility characterizes all stages of Romanian):

(22)  
   a.  *L-am întâlnit un prieten.  
      him.ACC-have.ISG met a friend  
   b.  L-am întâlnit pe un prieten.  
      him.ACC-have.ISG met PE a friend  
      ‘I have met a friend.’

Turning now to their interpretation, prepositional accusative indefinites receive a specific interpretation and they take obligatory wide scope.9

The specific interpretation of prepositional objects is indicated by the fact that they do not give rise to “weak cross-over” (or “WCO”) effects, whereas unmarked objects yield WCO effects10:

(23)  
   a.  ?* Mama ei îi va ajuta [una din studentele tale].  
      mother her.gen will help one of students yours  
   b.  Mama ei îi va ajuta pe [una din studentele tale].  
      mother her.gen her.acc will help PE one of students yours  
      ‘Her mother will help [one of your students].’

   Note also that a donkey sentence type of reading is blocked by prepositional accusatives:

(24)  
   a.  Toţi profesorii care au cunoscut un student excepţional  
      all professors-the who have met a student exceptional  
      îşi amintesc de el.  
      REFL remember of him  
      ‘All the professors who knew an exceptional student remember him.’
   b.  ?* Toţi profesorii care l-au cunoscut pe un student  
      all professors-the who him-have met PE an student  
      excepţional îşi amintesc de el.  
      exceptional REFL remember of him.

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9 Here, we will not be looking at the distribution of prepositional accusatives with pronouns like nimeni ‘nobody’, cineva ‘someone’, etc.

10 The term cross-over refers to the following generalization (cf. Postal 1971; Wasow 1972, 1979): a relative or interrogative pronoun cannot cross (or move past) a pronoun with which it is coindexed. Weak cross-over violations arise in structures where the coindexed pronoun does not c-command the trace left by the movement of the relative pronoun. For example, in *Who does his, mother love e, the pronoun his is embedded in the DP his mother and thus does not c-command the trace of who in the object position. Weak cross-over effects are also observed where a pronoun is coindexed with a quantified DP to its right (*his, mother loves nobody). This kind of example is parallel to examples with wh-movement (in relatives or interrogatives) if it is assumed that quantified DPs move at the level of Logical Form.
These properties show that prepositional accusative indefinites behave like referential DPs, e.g., definite DPs or proper names. (25) shows that proper names do not give rise to weak cross-over violations and that they can be doubled by clitics (in fact they must be clitic doubled in contemporary Romanian):

(25) Mama lui îl va ajuta pe Ion.

‘His mother will help John.’

Finally, Romanian prepositional-marked indefinite objects cannot take narrow scope:

(26) a. i. Fiecare profesor va examina zece elevi.

‘Each professor will examine ten students.’

ii. Toţi judecătorii cunosc doi avocaţi.

‘All the judges know two lawyers.’

iii. Toţi copii au văzut un actor celebru.

‘All the children saw a famous actor.’

b. i. Fiecare profesor îi va examina pe zece elevi.

‘Each professor them will examine ten students.’

ii. Toţi judecătorii îi cunosc pe doi avocaţi.

‘All the judges them know two lawyers.’

iii. Toţi copii l-au văzut pe un actor celebru.

‘All the children him-have seen a famous actor.’

(27) a. Ieri n-am examinat mulţi elevi.

‘I didn’t examine many students yesterday.’

b. Ieri nu i-am examinat pe mulţi elevi.

‘I didn’t examine many students yesterday.’

In the examples in (26a), each professor, judge or child can examine, know or see different students, lawyers or actors, respectively. The examples in (26b), on the other hand, are concerned with specific groups of ten students, two lawyers or one actor, with which the speaker is acquainted. In other words, the prepositional marked Accusatives in (26b) show speaker-specific readings (Farkas 1978). In (27a), mulţi ‘many’ has to be interpreted in the scope of negation and the sentence therefore means that I examined few children, as opposed to (27b), which must be interpreted as ‘many children are such that I did not examine them’.
A specific indefinite is necessarily presuppositional but not necessarily partitive.\textsuperscript{11} We can see this in (26b)(i), which presupposes the existence of a group of ten students, without necessarily presupposing the existence of another set of students, contextually determined, to which the group of ten belongs. Note that definite DPs, as well as proper names are also presuppositional but non-partitive.

The correlation between specificity and wide-scope observed here for Romanian prepositional-marked indefinite objects constitutes evidence in favor of the analysis of scope adopted in Chap. 6, where we will see that the so-called ‘wide scope’ interpretation of indefinites is in fact not due to a genuine scope mechanism, e.g., Quantifier Raising, but rather to the specific interpretation of indefinites. A specific indefinite refers to a particular individual, which belongs to the world of the speaker (therefore, we can speak about speaker specificity). Their specificity prevents Romanian prepositional indefinite objects from taking narrow scope with respect to other quantifiers.

In sum, Romanian prepositional indefinite objects qualify as strong non-quantificational indefinites: they are necessarily specific (i.e., they carry a referential index that is fixed with respect to a given discourse context or with respect to the world of the speaker) and as such they cannot take narrow scope. However, they do not qualify as quantificational, because they are not necessarily partitive.

5.1.4.2 Spanish

Romanian and Spanish differ regarding the use and interpretation of prepositional accusatives. Thus, there are contexts in which the prepositional accusative is obligatory in Spanish, even if the indefinite in question does not receive a specific interpretation. In (28b) the girl that John loves need not be known by the speaker or assumed to refer to a particular girl in the discourse context:

(28)  a. *Juan ama una chica.
    Juan loves a girl
    ‘Juan loves a girl.’

b.   Juan ama a una chica.
    Juan loves a a girl
    ‘Juan loves a girl.’

Examples (28a–b) are constructed with entity-predicates, which block the weak reading of the DP in the object position, while allowing both a specific and a non-specific reading. The examples in (28a–b) show that in Spanish, prepositional accusatives are obligatory for non-weak indefinite objects, regardless of whether they

\textsuperscript{11} Enç (1991) analyzes morphological accusatives in Turkish as being necessarily partitive. In Romanian as well, prepositional accusatives are partitive in most contexts. However there are examples of Romanian prepositional accusatives that are specific without being partitive.
are specific or not. An indefinite that is not \( a \)-marked is necessarily interpreted as weak.\(^{12}\)

The Romanian examples in (29a–b), which correspond with (28a–b), are both grammatical but differ with respect to speaker-specificity:

(29)  
a.  Ion iubește o studentă.
   Ion loves a student

   ‘Ion loves a student.’

b.  Ion o iubește pe o studentă.
   Ion her loves \( \text{pe} \) o student

In (29a), the object is interpreted as non-specific, more precisely, the student loved by Ion is not known by the speaker and non-partitive, whereas in (29b) it can have either a partitive reading (presupposing a contextually determined set of students) or a specific reading (the student in question can be identified by the speaker).

In the brief presentation of the Romanian data, we showed that the specificity of the prepositional indefinite objects in that language correlates with the impossibility of taking narrow scope. Given that Spanish prepositional accusatives are not necessarily specific, we expect them to allow a narrow scope interpretation.

Examples (30a–c), taken from Bleam (1999:176), show this prediction to be correct:

(30)  
a.  Juan y María buscan (a) una chica que sepa español.
   John and Mary seek \( (\text{a}) \) a girl who know.Subj Spanish

   John and Mary seek \( \text{(a)} \) a girl who knows Spanish

b.  *Juan y María buscan una chica que sabe español.
   John and Mary seek a girl who knows Spanish

   It is known that subjunctive relative clauses force a \( \text{de dicto} \) reading (i.e., a reading in which the indefinite is interpreted as narrow-scoped with respect to an opacity operator, e.g., the verb \text{seek} ), while indicative relatives force a \( \text{de re} \) reading (i.e., readings in which the indefinite is interpreted out of the scope of an opacity operator, e.g., the verb \text{seek} ). Thus, (30a), built with a subjunctive, can only have a \( \text{de dicto} \) interpretation. The fact that the prepositional accusative is optional in (30a) indicates that it does not block the \( \text{de dicto} \) reading, i.e., a narrow-scoped reading with respect to \text{seek}.

   The indicative, on the other hand, forces a \( \text{de re} \) reading, i.e., a reading in which the indefinite is not interpreted in the scope of \text{seek}. Such a reading is allowed in (30b), where the object is marked by \( a \), and impossible in (30c), where the object

\(^{12}\) In the words of Bleam (1999:180), who identifies “weak” and “property denoting”: “non-\( a \)-marked animate DPs [in Spanish] are interpreted as properties”.
is not marked. The example in (30c) is ungrammatical due to the contradictory requirements imposed on the indefinite: the presence of an indicative relative clause forces the indefinite to take a de re reading but the absence of the prepositional marking forces the indefinite to take a weak reading and therefore a de dicto reading.

In sum, an unmarked indefinite object is necessarily interpreted as taking narrow scope in Spanish, whereas a prepositional accusative can take both narrow and wide scope with respect to an opacity creating verb. Granting that the wide-scope (or rather the non-narrow-scoped) interpretation of indefinites is in fact due to a specific reading, prepositional Accusatives in Spanish must be allowed to assume for specific readings. However, the fact that in this language prepositional Accusatives can also take narrow scope indicates that they are not necessarily specific.

According to some theoreticians (see in particular McNally and van Geenhoven (1998)) the narrow scope interpretation of indefinites correlates with a weak reading of the indefinite. The prepositional accusative version of (30a) shows that this correlation cannot be maintained: indeed, the object takes narrow scope, although it is marked by a, which blocks the weak reading. In Chap. 6 it will be proposed that certain narrow-scoped indefinites are to be analyzed as dependent indefinites (rather than as weak indefinites) and that dependent indefinites are to be represented as dependent Skolem terms. This means that narrow-scoped prepositional Accusatives in Spanish can be analyzed as dependent Skolem terms, whereas narrow-scoped unmarked Accusatives are weak indefinites.

Going back to Romanian, unmarked accusatives are ambiguous, allowing both specific and non-specific readings and correlatively allowing both wide and narrow scope (see (31b–c)), whereas the prepositional accusative, which forces specificity, rules out the possibility of a de dicto reading (see (31a)).

(31) a. *Ion și Maria cauta pe o fată care să vorbească spaniola.
   John and Mary seek pe a girl who speak.Spanish
   subj

   b. Ion și Maria cauta o fată care să vorbească spaniola.
   John and Mary seek a girl who speak.Spanish
   subj

   c. Ion și Maria o caută (pe) o fată care să vorbească spaniola.
   John and Mary her seek pe a girl who speak.Spanish

5.1.4.3 Conclusions

The generalizations presented above regarding prepositional Accusatives and unmarked objects in Spanish and Romanian can be summarized as follows:

<table>
<thead>
<tr>
<th></th>
<th>Weak reading</th>
<th>Non-specific</th>
<th>Narrow scope</th>
<th>Specific</th>
<th>Wide scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romanian PrepAccus</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spanish PrepAccus</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Romanian Unmarked Obj</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spanish Unmarked Obj</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
In both Romanian and Spanish, the use of the prepositional Accusative triggers a strong non quantificational reading. But Romanian and Spanish prepositional Accusatives differ regarding specificity and correlatively regarding their scopal interpretations: Romanian prepositional Accusatives are necessarily specific and wide-scoped, whereas Spanish prepositional Accusatives can be both specific and non-specific and correlatively they can allow both wide and narrow scope. It seems reasonable to suggest that the obligatory specificity of Romanian prepositional Accusatives is due to the fact that in this language, prepositional Accusatives are clitic-doubled: it is the presence of the doubling clitic that would trigger the referential indexing of prepositional Accusatives. Since a-marked Accusatives are not clitic-doubled in Spanish, they are not necessarily referentially indexed.

5.2 Information Structure and the Disambiguation of Indefinites

Insofar as the interpretation of indefinites is contextually determined, the best theoretical option would be to assign a unique representation to the indefinite itself and analyze interpretative differences as being induced by a difference in context. Such is the theoretical position adopted by Reinhart (1995), who claims that the different readings of indefinites can be characterized in terms of (the presence or absence of) presuppositionality and depend on the information structure of the sentence. We will follow Reinhart’s view that indefinites in the Topic position are necessarily presuppositional but we will depart from Reinhart by showing that there are indefinites that are presuppositional without occupying the Topic position.

5.2.1 Indefinites in the Topic Position Are Presuppositional

Syntactic structure is underdetermined with respect to Topic-Comment structure, the same syntactic structure being compatible with more than one information structure. Accordingly, a sentence of the form Subject-Verb-Object can be assigned at least two different structures: (i) no Topic, or (ii) the subject is Topic. The Topic may be defined as being the constituent about which something is asserted in a

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13 This generalization holds for many other languages, in particular for Turkish (Enç 1991) and Hebrew (Danon 2002).

14 In Chap. 6 it will be proposed that narrow scoped indefinites that are not weak are to be analyzed as dependent indefinites.
categorical statement. As an answer to a question like ‘What happened?’, an SVO sentence is analyzed as having a thetic structure (i.e., as having no Topic, its whole content belonging to the Comment). In an answer to a *wh*-question like ‘What did Jean do?’, the element corresponding to the *wh*-phrase is mapped onto the Focus and everything else, in particular the subject, goes to the Ground. Since in the general case the Topic belongs to the Ground, the subject in the type of sentence just described is interpreted as a Topic. The choice between options (i) and (ii) is context-dependent and can sometimes be marked into nationally. In what follows we will be concerned with how the Topic-Comment partition bears on the interpretation of indefinites.

Let us examine the difference between existential *il y a* sentences and sentences with preverbal subjects:

(32) a. *Il y avait un roi américain à New York.*
   there have.IMPF a king American in New York
   ‘There was an American king in New York.’

   b. *Il n’y avait pas de roi américain à New York.*
   there NEG have.IMPF neg de king American in New York
   ‘There were no American kings in New York.’

   c. *Il y avait deux rois américains à New York.*
   there have.IMPF two kings American in New York
   ‘There were two American kings in New York.’

(33) a. *Un roi américain vivait à New York.*
   a king American live.IMPF in New York
   ‘An American king lived in New York.’

   b. *Aucun roi américain ne vivait à New York.*
   no king American neg live.IMPF in New York
   ‘No American king lived in New York.’

   c. *Deux rois américains vivaient à New York.*
   two kings American live.IMPF in New York
   ‘Two American kings lived in New York.’

Reinhart (1995) points out that speakers do not hesitate in judging (32a) and (32c) to be false and (32b) to be true. These judgments are consistent with the fact that existential *il y a* sentences are structurally unambiguous: the entire sentence belongs to the Focus and correlativey, the indefinite DP receives a weak reading.

In contrast, speakers are hesitant when judging examples like (33a–c), which are compatible with two distinct information structures, all-Comment and Topic-Comment. Correlated with these two configurations are two different interpretations of indefinites occupying the preverbal subject position: weak (i.e., non-presuppositional) and presuppositional, respectively. In the first case, the judgments of acceptability for (33a–c) are identical to those for (32a–c). But in the second case, the indefinites in (33a–c) presuppose that the set of American kings is not
empty. As this presupposition conflicts with the speakers’ knowledge, they are unable to assign a truth value to (33a–c). The fact that speaker judgments vary for (33) can be understood as being due to the uncertainty regarding the analysis of these examples: some speakers may analyze them as existential sentences (i.e., as conveying the same meaning as (32)) and thus judge them true or false; other speakers may analyze them as Topic-Comment configurations and thus judge them to be indeterminate, i.e., neither true nor false, because of presupposition failure.

While we agree with this analysis, we do not agree with Reinhart’s hypothesis that the (non-)presuppositionality of indefinites is a purely pragmatic effect due to the process by which speakers assign a truth value to a Topic-Comment structure. Contrary to Reinhart, we believe that the differences between presuppositional and non-presuppositional interpretations are not simply pragmatic but that they correlate with differences in denotation type: presuppositional DPs denote either individuals (type e) or generalized quantifiers over individuals (type <<e,t>,t>), whereas non-presuppositional DPs are weak DPs (which denote generalized existential quantifiers over amounts). Information structure partly determines which of these denotations are possible in a given context.

5.2.2 Non-topical Presuppositional Indefinites

Let us consider the following examples:

(34)  Un roi américain était ivre/ malade/ affamé.
   a king American was drunk/ sick/ starving
   ‘An American king was drunk/ sick/ starving.’

These sentences seem to be indeterminate rather than false. In line with Reinhart’s attempt to derive the presuppositionality of indefinites from their topical status, one might assume (35):

(35)  The subject of an entity-predicate is necessarily a Topic.

But this generalization is incorrect, as indicated by the fact that in the context of questions (36) and (37), the subject DPs of the answers given in (36’) and (37’) are not Topics. Indeed, as answers to (36) and (37), the sentences in (36’) and (37’) are all-Focus, and since all-Focus sentences are thetic, they have no Topic and therefore their subject cannot be assumed to be a Topic.

(36)  Pourquoi es-tu sous le choc?
   why are you under the shock
   ‘Why are you in shock?’

(36’) Pendant mon cours, un roi Américain était ivre/ malade
during my class a king American was drunk / sick
   ‘During my class, an American king was drunk / sick.’
And yet, these examples display presuppositional effects comparable to those in (34). These effects are unexpected under Reinhart’s analysis, for which the presuppositionality of indefinites is entirely due to information structure. These facts are accounted for under the alternative analysis proposed here, according to which presuppositionality is due to denotation type: entity-predicates are incompatible with weak (i.e., amount-denoting) DPs, allowing only individual-type or generalized quantifier denotations, which are necessarily associated with presuppositionality.

An even clearer case is provided by examples built with verbs like *aimer* ‘to love’, *hâter* ‘to hate’, *admirer* ‘to admire’, as in (38), which contrast with (39):

(38) Jean aime la musique / les femmes / *de la musique / ?? des femmes.
Jean likes the music the women DE LA music DES women  
‘Jean likes music / women.’

(39) Jean écrit de la poésie / des poèmes / *la poésie / ?? les poèmes.
Jean writes DE LA poetry DES poems the poetry the poems  
‘Jean writes poetry / poems.’

The ungrammaticality of *de la / des* indefinites in the object position of (38) can be attributed to the fact that predicates such as *aimer* ‘love’ are entity-predicates, which block the weak reading of their object. This analysis correctly predicts that these predicates give rise to presuppositionality effects regarding the object. Note now that in these examples, the object DPs are not Topics: the sentences in (38) say something about Jean, not about music or women.

The important point here, which goes against Reinhart’s proposal, is that entity-predicates give rise to strong readings (and thus to presuppositionality) of DPs that are not Topics.

### 5.2.3 Only Indefinites in Topic Positions Are Quantificational

Following Diesing (1992), most theoreticians assume a “semantic partition” mechanism by virtue of which:

(40) a. An indefinite in Spec, IP is quantificational.
    b. An indefinite belonging to the VP is existential.

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15 For further observations regarding this phenomenon see Kanouse (1972), Lawler (1972), Declerck (1987) and Laca (1990).
As an illustration, consider the example in (41), which is ambiguous, as indicated in (42)a–b:

(41) Deux professeurs ont acheté un livre.
    two professors have bought a book
    ‘Two professors bought a book.’

(42) a. ‘Two of the professors bought a book’.
    b. ‘There were two professors who bought a book’

Diesing’s hypothesis can account for the ambiguity of (41) by assuming that the subject DP can either remain in the position it occupies at S-Structure (namely, (Spec, IP)), or it can lower into the VP-internal subject position (namely, (Spec, VP)):

(43) a. [Spec,IP Deux professeurs] [t_I ont] [vp acheté un livre]
    b. [Spec,IP Deux professeurs] [t_I ont] [vp Deux professeurs acheté un livre]

Given these two representations, the two interpretations of (41) follow from hypotheses (40a–b). There is however no independent motivation for postulating the representations in (43a–b) and lowering is a problematic syntactic operation.

We therefore need to revise Diesing’s analysis, by taking out the syntactic implementation, which obscures that which truly disambiguates indefinites, namely information structure. As we already saw in Sect. 5.2.1, in languages such as English or French, a preverbal subject can be a Topic but does not have to be one (see examples (33) above). So (41) can have either of two information structures, which correlate with different representations of the indefinite itself. We will assume the principle stated in (44), according to which Topic status is a necessary condition for an indefinite to be quantificational:

(44) An indefinite DP may be quantificational only if it is a Topic.16

The conceptual motivation for this correlation is that information structure and quantification are both asymmetrical. Absence of symmetry is lexical for quantificational determiners such as tout ‘every’ and chaque ‘each’, whereas for determiners that are intersective and symmetric, a quantificational representation is only possible if the asymmetry that is characteristic of quantification is induced by the syntactic configuration (e.g., the partition between VP-internal and VP-external material) or a Topic-Comment partition.

5.2.4 Indefinites at the Left Periphery

Above, we have shown that indefinites may appear in the Topic position, with notable semantic effects. Yet, this generalization seems problematic in view of the

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16 This is an extension of the generalization proposed by Tasmowski and Laca (2000) for a specific case, that of unos (‘some’, ‘a few’) in Spanish.
following examples, in which an indefinite cannot be left dislocated, although it is currently assumed that dislocated constituents are Topics:

(45) a. *Un étudiant, il m’a aidé à porter la table.
   a student he me has helped to carry the table
   ‘A student, he helped me with carrying the table.’

   b. *Un étudiant, Jean l’a examiné deux fois.
   a student Jean him has examined two times
   ‘A student, Jean examined him twice.’

The examples in (45) differ from those examined in previous sections in that the indefinite DP is a left dislocated constituent, separated from the rest of the sentence by an intonational pause (indicated by a comma) and resumed by a personal pronoun. Such left-dislocated elements are adjoined to a sentence without being a part of it: they are neither constituents belonging to the syntactic structure of the minimal sentence, nor are they elements of the semantic composition of the sentence. Their only link to their host sentence is anaphoric, usually indicated by means of an anaphoric pronoun. In sum, the Topics examined in previous sections are sentence-internal, whereas the Topics in (45a–b) are not part of the minimal sentence to which they attach. Although we cannot pursue this hypothesis here, it seems natural to assume that the structural difference between sentence-internal and sentence-external Topics correlates with the pragmatic difference between sentential and discourse Topics (for the notion of ‘discourse Topic’ see Büring (1997)).

As far as we know, the ungrammaticality of (45) has not yet received a satisfactory explanation. Our tentative suggestion is that a pragmatic constraint on the use of sentence-external Topics may be at work. The ‘common ground’ (to be kept distinct from the notion of Ground used in Sect. 5.2.1) refers to the shared knowledge of the speaker and the hearer:

(46) A sentence-external Topic must belong to the common ground (of the speaker and the hearer).

Because proper names and definite DPs that have unique referents are part of the common ground, such DPs are legitimate sentence external Topics:

(47) a. Jean, il m’a aidé à porter la table.
   Jean he me has helped to carry the table
   ‘John, he helped me with carrying the table.’

   b. Mon frère, Jean l’a examiné deux fois.
   my brother Jean him has examined two times
   ‘My brother, Jean examined him twice.’

17 Regarding the various left peripheral constructions in French see Fradin (1988).
Going back to indefinites, it is important to observe that specificity is not sufficient for an indefinite to belong to the common ground. Indeed, speaker-specific indefinites (which belong to the world of the speaker) are hard to interpret as belonging to the world of the hearer. Therefore the indefinites in (45) do not belong to the common ground and as such they are not legitimate sentence-external Topics. Hence the unacceptability of (45).

Let us now turn to examples of the type in (48), in which the dislocated indefinites refer to kinds, as clearly indicated by the use of the special pronoun ça:\n
(48) a. Un étudiant, ça sait lire et écrire.
   a student this knows read and write
   ‘A student, it knows how to read and write.’

b. Un chat, ça ronronne.
   a cat this purrs
   ‘A cat, it purrs.’

\(^{18}\) Jean-Marie Marandin (2011, personal communication) observes that specificity does play a role in the acceptability of certain examples:

(i) Un étudiant que je n’avais pas vu depuis 30 ans, je l’ai rencontré hier à l’opéra.
   ‘A student that I had not seen for 30 years, I met him yesterday at the opera.’

(ii) Un étudiant à toi, il m’a aidé à porter la table.
    ‘A student of yours, he helped me with carrying the table.’

(iii) Un de tes étudiants, je l’ai examiné deux fois.
    ‘One of your students, I examined him twice.’

According to us, these examples are not fully acceptable (they are clearly degraded compared to (47)). We furthermore believe that the structure of these examples is different from those in (45) and (47). The acceptability of certain examples is ameliorated if the indefinite is modified by a restriction that indicates some relation to the hearer (see (ii) and (iii)). However, these examples are not perfectly acceptable, because the referent of the indefinite itself is not part of the knowledge of the hearer.

\(^{19}\) Besides kinds, ça can refer to propositions, events, or not yet individualized entities but not to individualized or specific entities:

(i) Je ne peux pas croire ça.
   I NEG can NEG believe this
   ‘I cannot believe this.’

(ii) Je ne veux pas que ça m’arrive une nouvelle fois.
    I NEG want NEG that this me-happens a new time
    ‘I don’t want this to happen to me once again’

(iii) *Marie, je ne veux pas que ça vienne me chercher.
     Marie I NEG want NEG that this comes me look for

(iv) *Un étudiant à toi, je ne veux pas que ça vienne me chercher.
     A student of yours I NEG want NEG that this comes me look for
The grammaticality of dislocated kind-referring indefinites is expected under the proposal sketched here. Indeed, the constraint in (46) is satisfied, since kinds belong to the common ground of the speaker and the hearer.

Let us further observe that amount-referring indefinites may also be viewed as belonging to the common ground: the existence of unspecified amounts that instantiate kinds is part of the assumed knowledge of speakers and hearers. We therefore expect amount-referring indefinites to be acceptable in dislocated positions. This is indeed true, as shown in examples (49), built with French indefinites headed by *du/ de la*, which have been analyzed as referring to amounts of substance in Chaps. 2, 3 and 4:

(49)  
(a) Du café, j’en ai acheté e hier. (e = empty category)  
   ‘Sm coffee, I bought some yesterday.’
(b) Du café, je sais qu’il en a acheté e hier.  
   ‘Sm coffee, I know that he has bought yesterday.’
(c) De l’or, je sais qu’il en a été acheté e.  
   ‘Sm gold, I know some was bought.’

Let us finally consider the Romanian examples in (50), which allow direct objects (marked by PE) to occur at the left edge of the sentence:

(50)  
(a) Pe un student Ion îl va examina de două ori.  
   ‘There is a student that Ion will examine twice.’

Although these examples seem to be built in the same way as the French examples in (45), they are in fact different. Note first that there is no perceptible pause between the preposed object and the rest of the sentence and correlatively no comma is used in writing. Furthermore, the relation between the object pronoun and the preposed object DP is not an anaphoric relation but rather the type of relation that underlies clitic-doubling. Indeed, if the indefinite is speaker-specific, the clitic is

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20 The dislocation of mass DPs proves ungrammatical in (i) and (ii) but this is due to syntactic reasons: *en* cannot be linked to an empty category in the preverbal subject position. Example (iii) is grammatical, for *en* is linked to the postverbal position of an impersonal *il* construction.

(i) *Du café, e, s’en, est acheté hier. (e = empty category)  
   ‘Sm coffee was bought yesterday.’
(ii) *Du café, e, en, a été acheté hier.  
   ‘Sm coffee was bought yesterday.’
(iii) *Du café, il s’en, est acheté e hier.  
   ‘Sm coffee, there was some bought yesterday.’
present regardless of whether the object DP is at the left edge of the sentence, as in (50), or inside the sentence, as in (51):

\[(51) \text{Ion îl va examina pe un student de două ori.} \]

\[\text{Ion him will examine pe a student of two times} \]

‘Ion will examine a student twice.’

These observations indicate that preposed direct objects in Romanian examples of the type in (50) are not external to the minimal sentence: they may be analyzed as occupying (Spec, IP), a position that in this language can host not only subjects but also objects (cf. Dobrovie-Sorin 1987). Indefinites occupying this position are not subject to the constraint in (46), which explains why the Romanian examples in (50) are fully grammatical, in clear contrast with the French examples in (45).

In sum, sentence external Topics should be distinguished from sentence internal Topics. Indefinites can occupy the position of sentence internal Topics (in which case they can be either specific or quantificational but not weak) but specific indefinites cannot function as sentence external Topics, whereas weak indefinites (amount-referring) as well as kind-referring indefinites can do so. Because they are outside the minimal sentence, sentence external Topics are not part of the semantic composition of the sentence to which they attach. The semantic composition takes into account the pronoun that has the sentence external Topic as an antecedent. Sentence internal Topics, on the other hand, are part of the semantic composition and they impose a strict constraint on the DP in Topic position: it cannot be weak.

### 5.3 Conclusions

Even though indefinite determiners are unambiguous (they are semantically defined as intersective), indefinite DPs allow three distinct representations: (i) weak indefinites refer to amounts, i.e., to non individualized entities; (ii) entity-referring indefinites (type e); (iii) quantificational indefinites. For certain determiners, cardinals in particular, all three possible analyses can be observed. One or two of these representations may be unavailable due to various factors, such as: (a) the lexical properties of certain determiners (see the differences between certains ‘certain’, quelques ‘some’, plusieurs ‘several’ and des ‘deaccented ‘some’); (b) the internal structure of an indefinite DP (absence of a determiner, partitive structure); (c) the lexical properties of the matrix predicate (entity-predicates, contrastivity); (d) use of object markers; (e) syntactic position; (f) information structure. The first four factors, which are lexical or concern the structure of the indefinite DP, bear on the choice between the weak and strong readings of indefinites, whereas the last two factors, which are contextual, make a quantificational representation possible. Let us stress that according to us, the quantificational interpretation of indefinites is never lexically specified (compare Diesing (1992), who assumes that indefinites are ambiguous
between a quantificational and a weak interpretation) but depends on the context: only indefinites in Topic positions, as well as indefinites in the subject position of contrastive predicates can be assigned a quantificational representation. In sum, we have proposed that certain indefinites, in particular singular indefinites and cardinal indefinites, are ambiguous between a weak and a strong reading. Other indefinites can be only weak or only strong depending on the lexical properties of their determiners and/or their internal structure. The difference between non quantificational strong and quantificational strong indefinites, on the other hand, is not a matter of ambiguity but rather a matter of indeterminacy, the choice between the two options being determined by the context.
Chapter 6
The Scope of Indefinites

In contexts where indefinite DPs co-occur with operators of various sorts (quantificational DPs, intensional predicates, negation, quantificational adverbs), we can observe certain interpretive effects, which have been traditionally analyzed in terms of the relative ‘scope’ of the indefinite DP with respect to these operators. This type of analysis is based on the logical tradition, according to which indefinites are existentially quantified DPs. In more recent theoretical frameworks, mainly following Heim (1982) and Kamp (1981), indefinites are analyzed as individual variables. Scope interactions with other operators are captured by postulating free insertion of an existential quantifier $\exists$, through existential closure. The main problem with this approach is that it predicts more interpretations than the ones attested, in other words, it over-generates.

The analysis we will adopt in this chapter is close to the one in Farkas (1997a, b, 2001) and Steedman (2003), who analyzed ‘scope’ effects in terms of dependency relations. Accordingly, indefinites do not have ‘wide’ or ‘narrow scope’ but are dependent or independent with respect to another operator.

After briefly reviewing existing analyses (Sect. 6.1), we show that interpretive effects usually attributed to scope in fact depend on the denotation of indefinite DPs: weak indefinites take obligatory narrow scope, whereas intermediate and wide scope are associated with individual-denoting indefinites (Sect. 6.2). Since indefinites lack inherent quantificational force, they are not distributive and as such do not induce any referential dependency. We show that distributive construals, which are possible in certain contexts, are due to distributive predication rather than

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1 In this chapter we will only examine the scope of a DP with respect to other DPs.
2 The scope ambiguities triggered by the interaction between tense or modality on the one hand and DPs on the other hand could also be analyzed in terms of dependencies. But in these cases, the DPs would be dependent on times and worlds.
to quantification (Sect. 6.3). In Sect. 6.4, we propose an analysis of the dependent readings of indefinites, analyzed as Skolem terms.

6.1 Scope: Current Analyses

6.1.1 Scope and Quantifier Raising

The two interpretations of the sentence in (1) are generally assumed to correspond to two distinct representations:

(1) Someone insulted everyone.
(1’)

a. (Someone x) (everyone y) (x insulted y)
   b. (Everyone y) (someone x) (x insulted y)

(1’’)

a. $x \forall y$ (human(x) $\land$ human(y)) [x insulted y]
   b. $\forall y \exists x$ (human(x) $\land$ human(y)) [x insulted y]

The representations in (1’a–b) can be derived by the rule of Quantifier Raising (May 1977, 1985), which attaches quantified DPs to the first dominating sentential node; at this level, the relative order of the two quantified DPs is not constrained, thus yielding the two possibilities in (1’a–b). The representations in (1’’) are the result of replacing raised DPs with the corresponding logical quantifiers and adding the restriction on the domain of quantification (here, someone and everyone range over the set of humans).

The rule of Quantifier Raising is motivated by the fact that the rules of semantic composition cannot interpret quantificational DPs in argument positions. The rule of Quantifier Raising solves this problem by pulling the quantified DP out of the argument position:

(2) I examined every student.

(2’)

every x (student(x)) [I examined x]

In this representation, the object position is occupied by an individual variable and the determiner every denotes a relation between the property ‘be a student’ (in extensional terms, the set of x such that x is a student) denoted by the restriction and the property ‘be examined by me’ (in extensional terms, the set of x such that I examined x) denoted by the nuclear scope.

Unlike May (1977, 1985), we do not think that Quantifier Raising is a movement rule that exhibits properties typical of syntactic movement, in particular wh-movement, which occurs in interrogatives and relatives. Wh-movement is subject to locality constraints, as well as constraints related to the target position, but it can avoid locality violations by successive movement:

(3) a. Who do you think [e_i [that Mary forgot [e_i [to call e_i ]]]]?
   b. Who does this student believe [e_i [that Mary admires e_i ]]?
Quantifier Raising, on the other hand, is a strictly local rule, which cannot go beyond the limits of the minimal clause.\(^3\) The sentence in (3c) cannot have an interpretation where \textit{every professor scopes over a student}; the sentence is not an assertion about several students but about a single student, the same for every professor:

\begin{enumerate}
\item[(3) c. ] A student believes that Mary admires every professor.
\end{enumerate}

We may thus conclude that Quantifier Raising cannot be assimilated to other instances of syntactic movement and therefore it is conceptually indistinguishable from Montague’s rule of ‘Quantifying-in’: both implementations rely on a semantic composition where quantified DPs are attached to the immediately dominating clausal node, their interpretation being independent of their surface position. We will use Quantifier Raising for ease of exposition, as this implementation provides a straightforward way of deriving Logical Forms on the basis of corresponding syntactic structures. However, the analyses developed here do not hinge on this specific formalism.

### 6.1.2 Scope Ambiguity or Ambiguous Indefinites?

According to a widely accepted line of thinking (see in particular Farkas (1985) and Corblin (1997)), going back to the logical tradition, the ambiguity between specific and non-specific indefinites is a scope phenomenon:

\begin{enumerate}
\item[(4)] All the students saw a counselor.
\item[(4')] \begin{enumerate}
\item a. \(\forall y \exists x \text{ (student}(x) \land \text{counselor}(y)) \ [x\text{ saw } y]\)
\item b. \(\exists x \forall y \text{ (student}(x) \land \text{counselor}(y)) \ [x\text{ saw } y]\)
\end{enumerate}
\end{enumerate}

According to Farkas (1985) and Corblin (1987), the non-specific reading of the indefinite in (4) is the result of its narrow scope with respect to the subject DP (see (4’a)), whereas its specific reading results from wide scope (see (4’b)).

However, this account cannot be extended to the example in (5a), due to Fodor and Sag (1982):

\begin{enumerate}
\item[(5) a. ] Every professor heard the rumor that a student of mine failed the test.
\end{enumerate}

The sentence in (5a) is ambiguous: either every professor heard that there is a (possibly different from one professor to another) student who failed, or, there is a specific student \(x\) such that every professor heard the rumor that \(x\) failed the test.

\(^3\)Farkas and Giannakidou (1996) challenged the strict locality of Quantifier Raising by pointing out some exceptions:

\begin{enumerate}
\item[(i)] A/some student made sure that each/every invited speaker has a seat.
\end{enumerate}

For further discussion of scope inversions see Sect. 6.2.2.
This second reading is unexpected under the assumption that indefinite DPs are quantificational, since as already mentioned, QPs cannot scope out of the minimal clause to which they belong, which implies that they cannot scope out of syntactic islands as shown in (5b):

(5) b. Some professors heard the rumor that every student of mine failed the test.

The sentence in (5b) can only have a reading where every student has narrow scope: a group of professors heard the rumor that every student of mine failed.

We must therefore conclude, following Fodor and Sag (1982), that the second interpretation of (5a) cannot be analyzed as relying on the wide scope of the indefinite DP. In sum, the ambiguity of (5a) cannot be analyzed as resulting from the relative scope of two quantifiers. Fodor and Sag (1982) derive the two possible readings from the ambiguity of indefinites, between a ‘referential’ and a ‘quantificational’ reading. Referential indefinites have no scope but can receive an apparent wide scope interpretation in virtue of the fact that they refer to a specific individual.

With this in mind, let us now go back to example (4). If some wide-scope indefinites are quantificational, the ambiguity of (4) could be derived in terms of scope, since the indefinite is in the same clause as the quantified subject DP. However, this analysis is not necessary, as we could just as well assume that the apparent wide scope reading results from the referential interpretation of the indefinite.

### 6.1.3 Intermediate Scope or Referential Dependency?

Fodor and Sag’s proposal cannot account for the intermediate scope reading of indefinites, a fact noted in Farkas (1981) and rediscovered by Abusch (1994) and Corblin (1997). Thus, in examples such as (6a), the indefinite scopes out of the minimal clause containing it, without, however, acquiring widest scope.

(6) a. Every professor rewarded every student who read a novel.

The sentence in (6a) has three possible readings. On the first one, the indefinite takes maximal scope: there is a (single) novel, such that every professor rewarded every student who read it. Another option is that the indefinite has narrow scope: every professor rewarded every student who read a novel (whatsoever), the result being that there could be as many novels as students. On the third

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4Let us warn the reader that we do not endorse Fodor and Sag’s view that the narrow scope reading of indefinites depends on their quantificational status. As made clear below, our proposal is that narrow scope indefinites are either weak or dependent indefinites.

5Having no scope means getting wide scope interpretation without giving rise to any kind of dependency.
possible reading, the indefinite takes intermediate scope: every professor chose a specific novel and rewarded every student who read that novel; there can be at most as many different novels as professors but crucially, fewer novels than students. This last reading cannot be easily obtained but becomes more accessible in the presence of a certain type of relative (see Sect. 6.4 below):

(6) b. Every professor rewarded every student who read a novel he had recommended.

This reading is unexpected under Fodor and Sag’s account: a referential indefinite should only be able to take widest scope, or, to put it differently, its reference should not be dependent on that of other quantifiers.

In view of these facts, Fodor and Sag’s proposal needs to be revised, in order to account for both maximal scope and intermediate readings. Using the DRT framework, Abusch (1994) analyzes the scope ambiguities of indefinites (represented as variables) as a consequence of existential closure, which can attach to different syntactic constituents.

Thus, the three readings of the sentence in (6a) would correspond to the different positions occupied by the existential quantifier at Logical Form. This yields the wide scope representation in (7a) (existential closure at text-level), the intermediate scope reading in (7b) (existential closure in-between the two universal quantifiers) and the narrow scope reading in (7c) (in situ existential closure). It is important to note that the condition novel (z) associated with the indefinite DP a novel occupies different positions in (7)a–c. This is due to the fact that in the case of wide and intermediate scope interpretation, the condition supplied by the indefinite DP is inserted in the position in which the existential quantifier is itself inserted. Although this analysis is not stated in terms of movement, it has the same effect as a movement analysis:

(7) a. \( \exists z \ [\text{novel}(z) \land \forall x \ [\text{professor}(x) \rightarrow \forall y \ [(\text{student}(y) \land \text{read}(y, z)) \rightarrow \text{rewarded}(x, y)]]] \)

b. \( \forall x \ [\text{professor}(x) \rightarrow \exists z \ [\text{novel}(z) \land \forall y \ [(\text{student}(y) \land \text{read}(y, z)) \rightarrow \text{rewarded}(x, y)]]] \)

c. \( \forall x \ [\text{professor}(x) \rightarrow \forall y \ [(\text{student}(y) \rightarrow \exists z \ [\text{novel}(z) \land (\text{read}(y, z) \rightarrow \text{rewarded}(x, y))])]] \)

Reinhart (1995) puts forth a similar proposal, the difference being that the indefinite DP is not translated as a free variable but as a choice-function ’f(novel)’. In this framework, the three readings of the sentence in (6a) are associated with the representations in (8a–c):

(8) a. \( \exists f \ \forall x \ [\text{professor}(x) \rightarrow \forall y \ [(\text{student}(y) \land \text{read}(y, f(\text{novel}))) \rightarrow \text{rewarded}(x, y)]]] \)

b. \( \forall x \ [\text{professor}(x) \rightarrow \exists f \ \forall y \ [(\text{student}(y) \land \text{read}(y, f(\text{novel}))) \rightarrow \text{rewarded}(x, y)]]] \)

c. \( \forall x \ [\text{professor}(x) \rightarrow \forall y \ (\text{student}(y) \rightarrow \exists f \ [\text{read}(y, f(\text{novel})) \rightarrow \text{rewarded}(x, y)]])]] \)
The representations in (8) do not rely on movement: in all three formulas in (8a–c), *a novel stays in situ* and occupies the position of the second argument of the predicate *read*, thus yielding ‘read(y, f(novel))’. The absence of movement constitutes an important advantage of the choice function account compared to the one that makes use of free variables.

One may wonder whether we can implement Reinhart’s idea of leaving the indefinite DP *in situ* without using choice functions. One might thus postulate LFs representations such as (7′a-c), where the existential quantifier is separated from the descriptive condition, which occupies the surface position of the indefinite.

\[(7′) \ a. \ \exists z \ \forall x \ \text{professor}(x) \rightarrow \forall y \ [(\text{student}(y) \land \text{novel}(z) \\
\land \text{read}(y,z)) \rightarrow \text{rewarded}(x,y)]\]

\[b. \ \forall x \ [\text{professor}(x) \rightarrow \exists z \ \forall y \ [(\text{student}(y) \land \text{novel}(z) \land \text{read}(y,z)) \\
\rightarrow \text{rewarded}(x,y)]]\]

\[c. \ \forall x \ [\text{professor}(x) \rightarrow \forall y \ (\text{student}(y) \rightarrow \exists z \ [(\text{novel}(z) \\
\land \text{read}(y,z)) \rightarrow \text{rewarded}(x,y)])]\]

Representations of the type in (7′c) are confronted with a well-known problem in situations where there are no novels. Indeed, if there is no novel, ‘novel(z)’ is false and any formula of the type ‘\( \exists z \ [\text{novel}(z) \rightarrow \phi] \)’ is true, thus rendering the sentence in (6a) true. This is in contradiction with the speakers’ intuition, especially in the case of the wide scope interpretation of (6a).

The analysis in terms of choice functions avoids this problem: if there is no novel, there is no choice function that ranges over novels and consequently, formulas (8a–c) are false. Therefore, the analysis in terms of choice functions offers a technical solution to a specific problem but it stays conceptually close to DRT-based approaches. Both accounts rely on the assumption that indefinites are not quantificational expressions but introduce free variables (individual and function variables, respectively). The different possible readings result from free insertion of existential closure operators. It should be observed that although there is no movement of the indefinite DP, the position where the existential quantifier is inserted still plays an important part, which means that these analyses adhere to the traditional view that the ambiguity of indefinites is a scope ambiguity.

A different line of investigation has been pursued in Farkas (1997a, b, 2001), Kratzer (1998) and Steedman (2003), who restate the so-called “scope phenomena” in terms of dependency relations. Under this view, what is crucial is whether a given indefinite DP has a stable denotation, or alternatively, its reference is dependent on some other expression in the sentence with which the indefinite co-varies.

In this chapter we will continue to talk about wide, intermediate or narrow scope to describe the different interpretations, even if we will adopt an analysis inspired by Steedman (2003), which is not formulated in terms of scope. The so-called wide scope reading is now treated as involving indefinites that take constant reference, whereas so-called intermediate and narrow scope readings rely on a dependent indefinite.
6.2 Scope and Type of Denotation

In the previous chapters, we made a three-way distinction regarding the denotation of indefinite DPs, which can be individual-referring, amount-referring or quantificational. In two of these cases (individual-referring and amount-referring), QR is not motivated, because the nominal expression does not contribute a quantifier. Indeed, those indefinites that translate as individual variables have the semantic type that is required for argument positions and consequently, there is no type-mismatch that could force movement. As for weak indefinites, their legitimation depends on the existential quantification introduced by the predicate with which the indefinite combines.

Having argued that individual-denoting and amount-denoting indefinites are not subject to QR, we can now turn to the third type of reading previously identified, namely the 'strong quantificational' one and ask whether an analysis relying on QR is adequate in this case, as is typically assumed in analyses that treat indefinite determiners as ambiguous between a quantificational and a non-quantificational reading (see Diesing 1992). In such a framework, an indefinite DP with a non-quantificational determiner is not visible for QR, whereas an indefinite DP with a quantificational determiner is subject to obligatory QR. In Sect. 6.2.2, we show that this analysis is not appropriate: the inverse scope of indefinites is not derived by QR and should instead be analyzed as a non-dependent reading, which is one of the possible interpretations of individual-denoting indefinites (type e). Distributivity can be derived from plural predication.

6.2.1 On the Obligatory Narrow Scope of Weak Indefinites

6.2.1.1 Bare Nouns

The example in (9) shows that bare nouns like students of mine cannot take wide scope.

(9) Every professor heard the rumor that students of mine failed the test.

This scope restriction is a consequence of the analysis of bare NPs proposed in Chap. 2: they are necessarily weak indefinites (amount-referring expressions), which as such must combine with an existential predicate, which prevents them from being interpreted out of the position in which they appear. The obligatory narrow scope of bare NPs is thus a direct consequence of their denotational type.

6.2.1.2 Modified Cardinals in Object Position

Consider now the sentence in (10), built with a modified cardinal (e.g., at least two, maximum three, exactly two):

(10) Every professor heard the rumor that at least a student of mine failed the test.
The example in (10) shows that the scope of modified cardinals is clause-bound. The DP *at least a student of mine* can acquire neither a wide scope interpretation (this meaning, which is missing, is in (11a)) nor an intermediate scope reading, on which it would outscope the intensional operator *rumor*, but would take scope below the quantified DP *every professor* (cf. (11b)):

(11)  
1. There is at least a student of mine such that every professor heard the rumor that he failed the test.
2. Every professor heard, about at least a student of mine, the rumor that he failed the test.

One way to account for these observations is to assume, following Kamp and Reyle (1993), that modified cardinals are quantificational and as such, their scope is clause-bound.

However, Kamp and Reyle’s analysis cannot account for the scope properties of a modified cardinal within its minimal clause. The facts illustrated in (12a–b) were noticed by Ben-Shalom (1993), Beghelli (1995), Beghelli and Stowell (1997), among many others:

(12)  
1. Every critic panned at least two books by H. Miller. \((S > O, \ast O > S)^6\)
2. A psychologist examined at least 30 students. \((S > O, ??O > S)\)
3. A boy invited at least three girls. \((S > O, \ast O > S)\)

These examples show that modified cardinals cannot take ‘inverse’ scope\(^7\): the object, which is structurally below the subject in surface structure, cannot scope over the subject. The lack of inverse scope of modified cardinals, illustrated in (12a–c), is unexpected under the hypothesis that these indefinites behave like quantificational DPs. If modified cardinals were quantified DPs, they would be subject to Quantifier Raising, which would predict the wide scope reading, just like in the case of *every book* in (12d):

(12)  
1. At least two critics panned every book by H. Miller. \((S > O, O > S)\)

In sum, the fact that modified cardinals in object position cannot take scope over the subject DP argues against the quantificational analysis of modified cardinals advocated by Kamp and Reyle.

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\(^6\)\(S > O\) and \(O > S\) indicate wide scope of the subject over the object and wide scope of the object over the subject, respectively. \(\ast O > S\) says that the object cannot scope over the subject.

\(^7\)Inverse scope corresponds to a situation where the order of interpretation of two DPs is inverted with respect to their order in surface structure.
6.2.2 Inverse Scope and Individual-Type Denotation

Let us now consider the following examples, in which an indefinite in object position can take scope over the subject (inverse scope):

(13) a. Every student saw a counselor. (S > O, O > S)
    b. Every woman will consult two doctors. (S > O, O > S)

If indefinite DPs were assumed to be ambiguous, allowing either a quantificational or a non-quantificational construal, their inverse scope could be analyzed as being due to Quantifier Raising (see in particular, Diesing (1992)). But this account cannot be integrated in the analysis we pursued so far: since their determiners are both intersective and symmetric, indefinites are not inherently quantificational and as such they are invisible for QR.

The hypothesis that the inverse scope of indefinites is not derived by QR is supported by the observation, that the inverse scope reading of an indefinite (see (13a–b)) is more easily accessible than the inverse scope reading of quantified DPs ((14a–b)):

(14) a. A professor examined every student. (O > S)
    b. A student read every book. (?? O > S)

If QR was needed in both (13a–b) and (14a–b), we would expect the wide scope reading of the object to be equally available in the two groups of examples. The observed difference between (13a–b) and (14a–b) suggests that the so-called ‘inverse scope’ reading of the object in (13) is not derived by QR (nor “Quantifying-in”) but depends on an individual-type denotation (type e), which correlates with specificity.

This conclusion is confirmed by the fact that the inverse scope reading of plural indefinites in object position does not correlate with a dependent reading of the subject:

(15) a. Three experts will review each paper.
    b. Three experts will review two papers.

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8Although the inverse scope reading can be hard to obtain, this interpretation is available both in English and French. Note that when the sentence contains indefinite pronouns like quelqu’un ‘somebody’ or personne ‘nobody’, the ambiguity is salient, as made explicit in (i’) and (ii’)

(i) Quelqu’un relira chaque papier soumis.
    Somebody will read each submitted paper.

(i’) One and the same person will read each of the submitted papers.

(ii”) Each submitted paper will be reviewed by somebody, but not necessarily by the same person.
Focusing on inverse scope readings only, note that in (15a), with a quantified DP in object position, there is a correlation between wide scope of the object over the subject and the dependent reading of the indefinite subject. The interpretation of *three experts* varies with the interpretation of *every paper*: each paper may be submitted to a different group of three experts.

On the other hand, the inverse scope reading in (15b) is clearly different from the one just described for (15a). Under the most salient interpretation, there is a specific set of two papers, for example the best two papers, which will be reviewed by a specific group of three experts: in other words, the total number of experts is not higher than three. This type of reading (known as the cumulative reading, see a. o., Scha (1981), Krifka (1992a), Kratzer (2007)) is typically associated with referential expressions, especially definite DPs, as shown in (15c):

(15) c. Three experts will review the best two papers.

On the basis of the following examples, Ruys (1992) and Reinhart (1995) point out that the same generalization holds for indefinites which scope outside their minimal clause: an inverse scope indefinite does not give rise to a dependent reading of another indefinite:

(16) a. If three aunts of mine die, I will inherit a house.
    b. Exactly half the critics heard the rumor that two books by Henry Miller had been panned.

The sentence in (16a) can be paraphrased as in (17) but, crucially, cannot have the reading in (18):

(17) There are three aunts of mine such that, when they are all dead, I inherit a house.
(18) There are three aunts of mine such that, for each of them, if she dies, I inherit a house.

Similarly, in (16b), we can talk about two specific books, in which case *two books by Henry Miller* has inverse scope. However, the DP *exactly half the critics* does not acquire dependent scope: the sentence in (16b) refers to a specific group of critics, the same for both books. The sentence cannot make reference to two different groups of critics, one for each book by Henry Miller, with each group containing exactly half of the critics.

We conclude that the so-called ‘inverse scope’ reading of indefinites is different from the inverse scope of quantified DPs. Whereas the inverse scope reading of quantified DPs is necessarily associated with the dependent interpretation of some other DP, no dependency relation can be observed for the inverse scope reading of an indefinite. This generalization can be reformulated in terms of distributivity: a quantificational DP is distributive and thus induces a referentially dependent reading of a DP within its scope; in contrast to this, an indefinite DP is not inherently distributive and therefore a ‘wide-scoped’ object indefinite does
not trigger any dependency effect on another indefinite. In sum, the inverse scope interpretation of indefinites is merely a non-dependent reading: the indefinite is referential or specific.

6.3 The Distributivity of Indefinites: Quantification or Distributive Predication?

Due to their inherent distributivity, quantificational DPs may induce dependent readings on indefinites occurring within their scope. Because indefinite DPs are not inherently distributive, we expect that the so-called ‘inverse scope’ of object indefinites does not induce dependent readings on subject indefinites. The examples discussed in the previous section confirm this prediction. There are, however, indefinites which seem to contradict this generalization. In the following section, we show that the distributivity of specific indefinites is the result of distributive predication. In Sect. 6.3.2, we show that the subject position can give rise to distributivity effects for indefinites, even in cases where they are non-specific. This is expected under the analysis put forth in Chap. 5, according to which indefinite DPs in subject positions can be represented as quantificational.

6.3.1 The Distributivity of Inverse Scope Specific Indefinites

The distributive reading of an indefinite in object position is more easily accessible if the indefinite is interpreted as specific (cf. Ben-Shalom 1993; Dobrovie-Sorin 1995; Krifka 1992a). A clear set of empirical data arguing in favor of this generalization is provided by Romanian examples, such as (19)a–b, in which a prepositional accusative co-occurs with an indefinite subject marked by câte, which triggers a “distributed” reading.9

    cate a boy them-has invited PE three girls  
    ‘A boy invited three girls’

9The type of interpretation induced by câte is easier to grasp in the example in which câte attaches to the object DP.

(i) Fetele vor citi câte o poezie.  
    the girls will read cate a poem  
    ‘The girls will each read a poem’

10In contemporary Romanian, object clitic-doubling is obligatory with objects marked by prepositional accusative.
b. Pe trei fete le-a invitat câte un băiat.
   A boy invited three girls’

The difference in acceptability between (19)a–b and (20)a–b shows that the prepositional accusative – which induces specificity (see Chap. 5, Sect. 5.1.4) facilitates the distributive reading of the object:

(20)  a. *Câte un băiat a invitat cel puţin trei fete.
    A boy invited at least three girls’

b. ?? Câte un băiat a invitat trei fete.
    ‘A boy invited three girls’

The ungrammaticality of the example in (20a) comes from the co-occurrence of two diverging markers, the presence of câte on the subject and modified cardinals in the object position. The presence of câte on the subject requires distributivity of the object indefinite, which can only arise if the indefinite object is specific (see below). But modified cardinals cannot have a specific interpretation (see Chap. 5, Sect. 5.1.3). This is illustrated by example (21).

(21)  a. Ion i-a examinat pe doi elevi.
    John them-has examined two students
    ‘John examined two students’

b. ?? Ion i-a examinat pe cel puţin doi elevi.
    John them-has examined at least two students
    ‘John examined at least two students.’

The example in (20b) is slightly more acceptable than (20a) because a non-modified cardinal can acquire a specific interpretation (cf (21a) vs. b). If the specificity is overtly marked by the prepositional accusative, as in (19a), the acceptability improves. And finally, the example is perfectly grammatical when the relative order of the two indefinite DPs at S-structure matches their order of interpretation (see the contrast between (19a) and (19b)).

It is well-known that distributive readings may come from two different sources, namely quantification and plural predication, i.e., predication applying to a plurality. Since indefinites are not inherently quantificational, a quantificational reading of indefinite objects cannot be assumed. We may therefore analyze the distributive readings of specific indefinites as resulting from plural predication, rather than from a quantificational structure: (19b) is true if and only if the individual denoted by trei fete ‘three girls’ belongs to a predicate obtained by the pluralization of the predicate obtained by lambda-abstraction over the position it occupies; the pluralization (notated by the so-called ‘star operator’) of the predicate is triggered by the fact that
the argument of the predication, i.e., \textit{three girls}, is plural. In other words, (19b) is verified if and only if:

\begin{equation}
\text{[[three girls]]} \in \text{*invited-by-a-boy}
\end{equation}

(22) says that \text{[[three girls]]} belongs to the set of individuals and sums of individuals invited by a boy. Due to the presence of the preposition \textit{pe} in (19b), the DP \textit{three girls} denotes a specific group of three girls, which can be represented as \(g_1 + g_2 + g_3\). (22) is true if \(g_1 + g_2 + g_3\) belongs to the denotation of the pluralized predicate, i.e., if \(g_1 + g_2 + g_3\) is one of the groups in the set denoted by the predicate. The distributive interpretation is due to the generalization in (23):

\begin{equation}
\text{If a sum of individuals satisfies a pluralized predicate then each individual in that sum satisfies the corresponding singular predicate (see Link 1983 and Landman 1989a, b).}
\end{equation}

Accordingly, the sentence is verified if each girl was individually invited by a (potentially different) boy.

### 6.3.2 The Quantificational Status of Indefinites in Subject Position

So far, we have argued that the distributive reading of object indefinites cannot be due to a quantificational structure but rather to distributive predication, which depends on specificity. In what follows, we show that subject indefinites can be distributive even when non-specific. In view of these facts, we are led to propose that indefinites can acquire a distributive interpretation due to their syntactic position.

In order to illustrate this point let us consider again the behavior of modified cardinals. We have already shown that (i) modified cardinals cannot take a type e denotation (a restriction that applies to both object and subject positions, see the discussion in Sect. 5.1.3 in Chap. 5) and (ii) they should be analyzed as amount-referring in the object position (see the discussion of examples (10)–(12) in

\footnote{See Landman (1989a, b), who extends Link’s (1983) analysis of plural nominal predication to plural verbal predication. Generally speaking, a predicate that denotes a set of atoms is pluralized if its subject DP is plural.}

\footnote{Pluralized predicates should be distinguished from collective predicates of the type \textit{meet}.}

\footnote{This generalization follows from the definition of the pluralization operation itself: since the predicate is derived by pluralization from the corresponding singular predicate, each of the individuals in any of the groups in the denotation of the pluralized predicate necessarily satisfies the corresponding singular predicate.}
Sect. 6.2.1.2). Note now that examples such as (24) indicate that modified cardinals in the subject position favor a distributive reading:

(24) a. At least two students offered me a gift. (S>O)
b. Exactly two students offered me a gift. (S>O)
c. At least three boys invited a girl. (S>O)

Modified cardinals can thus acquire clearly different interpretations according to whether they occupy an object or a subject position: in the object position, they can only be amount-referring, whereas in the subject position, they can have a distributive reading, which can be analyzed as being due to a quantificational representation.

We may thus conclude that indefinites are quantificational only when they occur in the preverbal subject position. A natural assumption to make is that intersective and symmetric determiners can function as quantificational determiners only if the asymmetry that is characteristic of quantificational structures is a property of the syntactic context in which they occur. We may thus suggest that an intersective determiner can function as a quantifier only if the partition between restriction and scope corresponds to overt syntax (preverbal subjects are mapped onto the restriction) or to information structure (Themes are mapped onto the restriction).

6.4 Referential Dependencies and Skolem Functions

In the previous sections, we argued that the scope effects exhibited by indefinites should in fact be analyzed in terms of dependency relation. Let us go back to the different readings of a sentence like (6a), repeated below as (25). According to our analysis, the wide scope interpretation paraphrased in (26a) corresponds to a non-dependent reading of the indefinite, whereas the intermediate (26b) and narrow scope (26c) readings are the result of dependency relations of the indefinite DP with respect to other DPs in the sentence:

(25) Every professor rewarded every student who read a novel.
(26) a. Il existe un roman et un seul, tel que chaque professeur a récompensé chaque étudiant qui l’a lu.
   ‘There is a unique novel, such that every professor rewarded every student who read it’
b. Chaque professeur a choisi un roman particulier et a récompensé tous les étudiants qui l’ont lu.
   ‘Every professor chose a specific novel and rewarded every student who read that novel’
c. Chaque professeur a récompensé chaque étudiant qui a lu un roman quelconque.
   ‘Every professor rewarded every student who read some novel.’
In (26b), the indefinite DP *a novel* is dependent on the quantified DP *every professor*: there are at most as many different novels as (there are) professors. In (26c), the indefinite DP *a novel* is dependent on the quantified DPs *every professor* and *every student*: there can be as many different novels as there are (professor, student) pairs. Let us illustrate these various readings with an example: assume a world in which there are three professors and two students. The same student can attend several courses and thus have several professors. In the case of the so-called intermediate scope reading in (26b), each professor picks some novel and rewards all the students who read that novel. Since there are three professors, there can be at most three novels. In the narrow scope reading, each student can read some novel, so for any given course, each student can read a different novel: there can be at most two different novels in each course; since there are three professors and thus three courses, the number of novels is multiplied and can be six (three times two).

In order to represent this dependency, we can use Skolem functions. A Skolem function is a function that maps an element \( x \) onto an element \( y \), such that \( y = f(x) \). By writing \( f(x) \) instead of \( y \), we make it clear that \( y \) depends on \( x \). Hintikka (1974, 1986), Groenendijk and Stokhof (1984) and Engdahl (1986) were among the first to use Skolem functions to account for the type of data illustrated in (27):

(27) Every man hates a (certain) woman, his mother-in-law.

In (27), the indefinite DP *a (certain) woman* does not refer to a unique individual, the same woman for every man, but instead it varies depending on the man. This dependency relation can be indicated by translating *a certain woman* by the functional term \( f(x) \), where \( x \) ranges over men; *mother-in-law* can be taken as the name of the function \( f \) that relates every man \( x \) to the woman \( y \) that he hates. The sentence in (27) can then be represented by the tripartite formula in (27'). In (27'), *every man* translates as the universal quantifier \( \forall x \) followed by the restrictive term \( \text{man}(x) \). The whole of the sentence with \( x \) in the position of the quantified DP *every man* and \( f(x) \) translating *a woman* constitutes the nuclear scope (indicated by square brackets) of the quantifier.

(27') \( \exists f \forall x \ (\text{man}(x)) \ [\text{hate}(x,f(x)) \land \text{woman}(f(x)) \land \text{mother-in-law}(f(x),x)] \)

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14Skolem functions were initially used in logic in order to eliminate existential quantifiers in the scope of a universal quantifier, the existential quantifier that binds the Skolem function itself always takes largest scope (over the universal quantifier). Thus, the formulas in (i) and in (ii) are truth-conditionally equivalent:

(i) \( \forall x \exists y \ (\phi(x,y)) \)
(ii) \( \exists f \forall x \ (\phi(x,f(x))) \)

In (i), \( y \) depends on \( x \) because the existential quantifier \( \exists \) binding \( y \) is within the scope of the universal quantifier \( \forall \) that binds \( x \). In (ii), this dependency is expressed in functional terms: \( y \) is replaced by \( f(x) \).
The tripartite representation in (27′) is equivalent to the logical formula in (27″):

\( (27″) \exists f \left[ \forall x \left[ \text{man}(x) \rightarrow (\text{hate}(x,f(x)) \land \text{woman}(f(x))) \right] \land \text{mother-in-law}(f(x),x) \right] \)

The first conjunct ‘\( \forall x \left[ \text{man}(x) \rightarrow (\text{hate}(x,f(x)) \land \text{woman}(f(x))) \right] \)’ corresponds to ‘every man hates a woman’; the second conjunct ‘mother-in-law \((f(x),x)\)’ indicates the name of \(f\). The woman in question is every man’s mother-in-law.

In order to replace a variable \(y\) with a functional term, marking the dependency of \(y\) with respect to \(x\) (i.e. \(y = f(x)\)), the function \(f\) has to be properly defined, namely to associate to every \(x\) a single element \(y\), such that \(y = f(x)\). In (27), these conditions are met: \(\text{mother-in-law}\) is a function whose domain is the set of married men (the overtly expressed restrictor \(\text{man}\) can be easily accommodated to refer to married men rather than to the overall domain of men), its range is the set of women, this function associates with each married man a unique woman, his mother-in-law. The degree of acceptability of a sentence decreases when these requirements are not observed or hard to accommodate.

(28) a. ? Every man hates someone. His elder brother.
   b. ?? Every man hates an animal. His snake.

In (28a), we have to accommodate the domain of \(f\) by restricting it to men who have an elder brother. The decreased acceptability of (28b) can be attributed to the fact that its interpretation requires two accommodations: not only do we have to restrict the domain to men owning snakes but we must further restrict it to men who own only one snake. This second readjustment is needed because a function can be defined if and only if each element in the domain is mapped to one and only one element of the co-domain. Therefore, in (28b) \(\text{his snake}\) can be represented as a Skolem function \(f(x)\) if and only if the domain is restricted to men owning one and only one snake. If a man owns more than one snake, it is impossible to define a function \(f\) such that \(f(x)\) is ‘the snake of \(x\)’.

Going back to example (25), repeated below, we can make use of Skolem functions to account for intermediate scope (26b) and narrow scope (26c) readings, represented by the tripartite configurations in (29) and (30):

(25) Every professor rewarded every student who read a novel.

(29) \( \exists f \forall x \forall z \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x)) \land \text{read}(z,f(x)) \right) \land \text{rewarded}(x,z) \)

(30) \( \exists f \forall x \forall z \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x,z)) \land \text{read}(z,f(x,z)) \right) \land \text{rewarded}(x,z) \)

In these representations, the two quantified DPs (\(\text{every professor}\) and \(\text{every student who read a novel}\)) are mapped onto the two first parts, the quantificational part (\(\forall x \forall z\)) and the restriction (\(\text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x)) \land \text{read}(z,f(x))\)) in (29) or (\(\text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x,z)) \land \text{read}(z,f(x,z))\)) in (30). The nuclear scope, [\(\text{rewarded}(x,z)\)], corresponds to the whole of the sentence, in which the two quantified DPs have been respectively replaced by the variables that they bind, \(x\) and \(z\).

In (29), which corresponds to the “intermediate scope” reading, the procedure of skolemization applies once, \(f(x)\) refers to the novel recommended by the professor.
x to all of his students. The choice of novels varies with professors. In (30), which translates the “narrow scope” reading, the procedure of skolemization applies twice. The $f$ function depends both on $x$ and on $z$ and attributes a novel to pairs of elements (professor, student).

The tripartite representations in (29) and (30) are equivalent to the logical formulas in (29$'$) and (30$'$), respectively:

$$(29') \exists f \forall x \forall z \left[ \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x)) \land \text{read}(z,f(x)) \right) \rightarrow \text{rewarded}(x,z) \right]$$

$$(30') \exists f \forall x \forall z \left[ \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x,z)) \land \text{read}(z,f(x,z)) \right) \rightarrow \text{rewarded}(x,z) \right]$$

These two formulas are, however, problematic, because there is no constraint on the existentially-quantified function, meaning that the formulas in (29$'$) and (30$'$) are always true: any choice of function that falsifies the antecedents in (29$'$) and (30$'$) makes the formulas true. Thus, if we choose a function that does not associate a novel to $f(x)$, then the condition $\text{novel}(f(x))$ is false and the result is always true. The problem was noticed by Winter (1997) and Dekker (2004), among others. This problem can be solved by introducing constraints forcing the function to be an appropriate Skolem function, by specifying its domain and range.

But we will choose an alternative solution by adopting Steedman’s (2003) implementation in terms of Skolem terms. Using Skolem terms, we can associate the LFs in (29$''$) and (30$''$) with the “intermediate scope” and the “narrow scope” readings of (25):

$$(29'') \forall x \forall z \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x)) \land \text{read}(z,f(x)) \right) \rightarrow \text{rewarded}(x,z)$$

where $f$ is a function from the set of professors to the set of novels

$$(30'') \forall x \forall z \left( \text{professor}(x) \land \text{student}(z) \land \text{novel}(f(x,z)) \land \text{read}(z,f(x,z)) \right) \rightarrow \text{rewarded}(x,z)$$

where $f$ is a function from the set of (professor, student) pairs to the set of novels

Our account is similar to the one advocated in Steedman (2003): the dependent indefinite DP is not represented as an existentially-quantified function variable but rather as a Skolem term, i.e., the value of a Skolem function $f$; $f$ is the name of a function; $f$ does not vary, it is only the value of $f(x)$ or $f(x,z)$ that varies. The specification of the range and the domain of $f$ are not indicated inside the formulas but are stated as a constraint on $f$.

The constraints on the Skolem function that hold for the intermediate and narrow scope readings are given by the linguistic form of the sentence. The domain of $f$ is the extension of the noun generating the dependency (professor) in the “intermediate scope” reading.

---

15In the following formula, which refines (29$'$), the range and the domain of the function are specified in the first conjunct:

$$(i) \exists f \left[ \forall x \forall y \left[ \left( \text{professor}(x) \land f(x) = y \right) \rightarrow \text{novel}(y) \right] \land \forall x \forall z \left[ \left( \text{professor}(x) \land \text{student}(z) \land \text{read}(z,f(x)) \right) \rightarrow \text{rewarded}(x,z) \right] \right]$$
reading” of (25) for example), the range of f corresponds to the extension of the dependent noun (novel in both readings of (25)) and the function itself can also be explicit, as in the case of mother-in-law in (27).

As observed in Kratzer (1995), intermediate scope readings can be hard to obtain but become more accessible when the dependent noun is modified by a relative that contains a pronoun that is anaphorically related to the (dependency-inducing) quantified expression. Consider the following examples, adapted from Kratzer (1995):

(31) a. Every professor rewarded every student who read a/some book I had recommended.
   b. Every professor rewarded every student who read a/some book he had recommended.
   c. Every professor rewarded every student who read a/some book he had recommended to him.

In (31a), a/some book that I had recommended can acquire a wide scope interpretation, where it denotes a specific book. Another possibility is the narrow scope reading, according to which the indefinite DP depends both on professors and students. The intermediate scope reading, where books vary with professors but not with students is possible but rather difficult. In (31b), the occurrence of the pronoun he (instead of I), which gets bound by the quantified expression every professor, favors the intermediate reading, in which a/some book is a dependent indefinite. Due to the presence of he, the value of the f function is almost explicit in this sentence: f is a function that has in its domain the set of professors, in its range the set of books and that associates every professor to the book he recommended. If a professor recommended several books, one book is chosen from the set of possible ones. In (31c), the presence of two bound variable pronouns (he and to him) rules out both the wide scope and the intermediate scope readings: the indefinite DP is in the dependency of both quantified expressions, the books vary both with professors and with students.

Turning finally to the wide scope reading, it need not be represented in terms of Skolem functions, given that the so-called ‘wide scope’ indefinites are not dependent on any other quantified DP but only on the situation. These indefinites can be represented as referential terms, as in (32a) or (32b):

(32) a. ∀x∀y ((professor(x) ∧ student(y) ∧ read(y,n) ∧ novel(n)) → rewarded(x,y))
   b. ∀x∀y ((professor(x) ∧ student(y) ∧ read(y,f(novel))) → rewarded(x,y))
   where f is a function defined over the domain of novels and distinguishes one novel among all novels.

In (32a) the referential indefinite a novel is represented by a constant and in (32b), which is equivalent to (32a), it is represented by f(novel), where f is the name of a choice function applied to the domain of novels. Choice functions can be viewed as a special case of Skolem functions, where there is no dependency on other quantified DPs.
6.5 Conclusions

Summarizing, we have shown that scope effects can be analyzed as dependency relations. Among the different semantic types of indefinites identified in previous chapters, only referential indefinites, i.e., indefinites of type e, can be dependent. Dependent indefinites can be represented as Skolem terms, the reference of which co-varies with the quantificational DPs on which they depend.

When an indefinite DP of type e is not dependent, it is specific and functions as a constant. These indefinites are improperly called wide scope indefinites.
In line with most theoreticians of genericity, we assume that there are two types of genericity: the so-called ‘nominal’ genericity associated with DPs denoting kinds and the so-called ‘sentential’ genericity associated with generic quantification. We will also follow the current view that the generic reading of indefinites is not related to kind denotation¹ but instead depends on sentential genericity: the indefinite contributes an individual variable that gets bound by an overt adverb of quantification or by a covert generic operator $GEN$ (which can be assimilated to an adverb of quantification).

Current theories differ, however, regarding the analysis of adverbs of quantification, which leads to different analyses of generic indefinites and bare plurals. According to Lewis (1975), Kamp (1981) and Heim (1982), adverbs of quantification are unselective: they bind all free variables in their domain. This “unselective binding” hypothesis is confronted with several empirical and conceptual problems, which led theorists to gradually abandon it. The two competing hypotheses still under debate are:

(i) In all of their contexts, Q-adverbs quantify over events or situations (Rooth 1985, 1995; Schubert and Pelletier 1987, 1988; de Swart 1991, 1996; Krifka et al. 1995; Krifka 1995, etc.).² The configurations in which adverbs of quantification seem to bind one or more individual variables (or a tuple of individuals) would constitute a side effect of quantification over events: quantifying over events induces quantifying over the tuple of participants in the event. According to this analysis of adverbs of quantification, a generically-interpreted indefinite (“generic indefinite”, henceforth) is always indirectly bound by an adverb quantifying over events.

¹ In this chapter we set aside the taxonomic readings of indefinites, which do not raise any particular problem: with kind predicates, or in contexts that trigger a kind interpretation, indefinites take a taxonomic reading (e.g., Two tigers are extinct, Some musk rats arrived in Europe during the sixteenth century).

² Although event-based and situation-based approaches are technically different, there are many cases in which they have the same empirical coverage. Here, we will use an event-based notation.
(ii) Depending on the context, Q-adverbs quantify either over events or over individuals (Chierchia 1998; Kratzer 1998).

In this chapter, we will assume the second hypothesis. The distinction between these two types of quantification correlates with a distinction between two types of indefinites occurring in generic contexts: those indefinites that are bound by the Q-adverb have a genuine generic reading, whereas those indefinites that occur in the context of a Q-adverb that quantifies over events are ‘pseudo-generic’. These distinctions will prove crucial for the analysis of habitual sentences (cf. Sect. 7.2) and of the constraints on the generic readings of singular (cf. Sect. 7.3) and plural (cf. Sect. 7.4) indefinites. We will show that those plural indefinites (e.g., French des-indefinites) that are directly bound by an adverb of quantification can only express generalizations over groups of individuals. The analysis of plural indefinites sheds light on the analysis of bare plurals and constitutes an argument in favor of the hypothesis that, on their generic reading, bare plurals should not be analyzed as indefinite DPs but rather as kind-referring DPs (cf. Carlson 1977a, c).

7.1 Generic Indefinites: Quantification over Events and over Individuals

7.1.1 Quantification over Events and Indirect Binding of Indefinites

Consider example (1), which may be represented as in (1’), where the adverb toujours ‘always’ has been replaced by the universal quantifier:

(1) When John invites a friend, he always cooks dinner for her.
(1’) $\forall e,x (\text{invite}(e, \text{John}, x) \land \text{friend}(x)) [\exists e’ (\text{overlap}(e, e’) \land \text{cook-dinner}(e’, \text{John}, x))]

Representations of the type in (1’), where different variables corresponding to different types (i.e., e for events and x for individuals) are bound by the same quantifier, are used by different theorists to mean different things. Lewis (1975), for example, uses this kind of notation to represent unselective binding (the adverbs of quantification bind all free variables in their scope), whereas Chierchia (1995c) uses it to represent multiple binding.\(^3\) Other authors assume that in if/when-clauses, the adverb quantifies only over events, the individual variables being indirectly bound

\(^3\) Chierchia (1995c: 101–102) examines the asymmetric readings of sentences such as When a painter lives in a village, it is usually pretty. This sentence is ambiguous between a generalization over painters living in a village and a generalization over villages in which a painter lives. Chierchia suggests that the difference between the two readings can be explained if we assume that a quantifier may bind an event as well as an individual variable. For an alternative solution to the problems that asymmetric readings of if/when-clauses pose, see Chap. 8.
7.1 Generic Indefinites: Quantification over Events and over Individuals

(Rooth 1985, 1995; Schubert and Pelletier 1987; 1988; de Swart 1991, 1996; Krifka et al. 1995; Krifka 1995, etc.). For this third type of analysis, the notation in (1’) is not adequate. We may instead assume a representation of the type in (1”) inspired by Steedman (2003), in which the indefinite a friend translates as an event-dependent Skolem term (see Chaps. 6 and 8) notated f(e), where f(e) is interpreted as Theme(e):

(1”) \forall e (invite (e, John, f(e)) \land friend (f(e))) [\exists e’ ((overlap (e, e’) \land cook-dinner (e’, John, f(e))))]

The adverb of quantification binds the event variable, which ranges over events in which John invites someone. The indefinite in (1”) is represented by means of a Skolem term f(e) denoting an individual (type e) that is the Theme of the invitation and whose referent varies depending on the inviting events.

7.1.2 Adverbial Quantification over Individuals

Characterizing sentences of the type in (2), built with individual-level predicates, express generalizations that hold of classes of individuals:

(2) A dog is usually intelligent.

(2’) GENx (dog (x)) [intelligent (x)]

Representations such as (2’) assume the analysis of adverbs of quantification proposed by Lewis (1975), Kamp (1981) and Heim (1982), according to which (overt or covert) adverbs of quantification are unselective: they bind any kind of free variable occurring in their scope and since i-level predicates such as intelligent supply an individual variable and no time variable, the adverb of quantification binds an individual variable.

Other authors adopt a more constrained view, according to which adverbs of quantification can quantify only over events or situations (Rooth 1985, 1995; Schubert and Pelletier 1987, 1988; de Swart 1991). Note however that some of these theorists were led to relax this assumption: de Swart and Farkas (2005) and Farkas and de Swart (2007) propose that in examples such as (2), which express generalizations over individuals, the Q-adverb binds both an event-variable and the variable supplied by the indefinite, whereas in examples that express quantification over events (see example (1) above), the Q-adverb binds only an event-variable. Such a differentiated analysis is an implicit acknowledgment of the fact that a

4The cooking event may itself be represented as a Skolem term depending on inviting events, which allows us to dispense with the existential closure of the variable over cooking events: (e)

(i) \forall e (invite (e, John, f(e)) \land friend (f(e))) [cook-dinner (g(e), John, f(e))].
uniform analysis of Q-adverbs as exclusively quantifying over events cannot be maintained.\footnote{Empirical arguments against representing characterizing sentences built with i-level predicates as relying on quantification over events can be found in Dobrovie-Sorin (2003).}

In this chapter we will assume without further discussion that Q-adverbs can quantify not only over events but also over individuals (Lewis 1975; Kamp 1981; Heim 1982; Kratzer (1988, 1995); Diesing 1992; Chierchia 1995a; Krifka et al. 1995). This does not, however, mean that Q-adverbs are unselective quantifiers: in one and the same context they can quantify either over events or over individuals; in other words, Q-adverbs can only bind one variable in a given context.

### 7.1.3 Syntax-Semantics Mapping Rules

If we allow adverbs of quantification to quantify not only over events but also over individuals, the question that arises is how to choose between these two possibilities: when does an adverb quantify over events and when does it quantify over individuals? We will assume that overt syntax (including information structure) is mapped onto LF representations by rules such as (3)–(5):

(3) If /when-clauses go to the restriction of adverbs of quantification (Lewis 1975; Heim 1982, a.o.).

(4) Subjects of generic predicates\footnote{This label groups together individual-level predicates such as intelligent, handsome, blond, etc. (Carlson 1977a, c; Kratzer 1988, 1995) and stage-level predicates on their habitual or dispositional use (e.g., John reads novels, Paul smokes, Mary drinks wine). Leaving aside their differences, these two types of predicates are alike in that their arguments are individuals rather than stages of individuals.} go to the restriction of adverbs of quantification.\footnote{This principle is reminiscent of Diesing’s (1992) hypothesis that DPs sitting in Spec IP (the preverbal subject position) go to the restriction of adverbs of quantification. Yet, the mapping rule (4) differs from Diesing’s principle in that it is not stated in terms of a particular syntactic position; the notion of ‘subject of a generic predicate’, used in (4), depends on (i) a lexical distinction between classes of predicates and (ii) information structure.}

(5) A sentence containing an adverb of quantification goes to the nuclear scope and the restriction is filled by its “focus closure”, obtained by replacing the focused constituent with a variable (Rooth 1985, 1995).

The choice among these different rules depends on the lexical properties of the main predicate, on the syntactic configuration and on information structure. Quite clearly, the rule in (3) can apply in (1) but not in (2), which does not contain a
subordinate \( if / when \)-clause. The rule in (4), on the other hand, cannot apply in (1) but can apply in (2),\(^8\) yielding the representation in (2'), where the adverb quantifies over individuals.

Rule (5) is needed in order to analyze examples such as (6), in which the capital letters indicate the focused constituents:\(^9\):

\[
\begin{align*}
(6) & \quad a. \text{ In St. Petersburg OFFICERS always escorted ballerinas.} \\
& \quad b. \text{ In St. Petersburg ofﬁcers always escorted BALLERINAS.}
\end{align*}
\]

\[
\begin{align*}
(6') & \quad a. \forall e,x,y (\text{escort } (e,x,y) \land \text{ballerinas } (y)) \\
& \quad \quad \quad \quad [\text{escort } (e,x,y) \land \text{ballerinas } (y) \land \text{officiers } (x)] \\
& \quad b. \forall e,x,y (\text{escort } (e,x,y) \land \text{officiers } (x)) \\
& \quad \quad \quad \quad [\text{escort } (e,x,y) \land \text{ballerinas } (y) \land \text{officiers } (x)]
\end{align*}
\]

These two representations capture the different interpretations associated with the two sentences, which express different generalizations according to the placement of focus: (6a) says that every time ballerinas were escorted, they were escorted by ofﬁcers, whereas (6b) says that every time ofﬁcers escorted someone, they escorted ballerinas.

In sum, quantiﬁcation over events obtains due to an application of rule (3) or rule (5), whereas quantiﬁcation over individuals obtains due to an application of rule (4).

### 7.1.4 Two Types of Generic Readings for Indefinites

Given the difference between quantiﬁcation over events and quantiﬁcation over individuals, it is possible to distinguish between two types of generic readings for indefinites:

\[
\begin{align*}
(7) & \quad a. \text{ An indeﬁnite DP takes a ‘truly’ generic reading if and only if it is directly} \\
& \quad \quad \text{bound by an adverb of quantiﬁcation (in other words, the adverb quantiﬁes} \\
& \quad \quad \text{over the set of individuals supplied by the indeﬁnite NP).} \\
& \quad b. \text{ An indeﬁnite DP takes a ‘pseudo-generic’ reading if and only if it is} \\
& \quad \quad \text{indirectly bound by an adverb of quantiﬁcation that quantiﬁes over events.}
\end{align*}
\]

The LFs given in (1") and (2'), repeated here with the corresponding examples, allow us to distinguish between pseudo-generic readings and truly generic readings of indefinites:

\[
\begin{align*}
(1) & \quad \text{When John invites a friend, he always cooks dinner for her.} \\
(1") & \quad \forall e \ (\text{invite } (e, \text{John, } f(e)) \land \text{friend } (f(e))) [\exists e' \ (\text{overlap } (e, e') \land \text{cook-dinner} \\
& \quad \quad \quad \quad (e', \text{John, } f(e)))]
\end{align*}
\]

---

\(^8\)This does not exclude the possibility of ﬁnding examples where the syntax allows for two different mapping rules, which would give rise to an ambiguity.

\(^9\)These examples are due to Rooth (1985, 1996:272).
(2) A dog is usually intelligent.
(2') GENx (dog (x)) [intelligent (x)]

In the first case the indefinite translates as an event-dependent Skolem term and in the second case as an individual variable bound by a generic operator. The Skolem term f(e) is a function that applies to an event and returns an individual participating to the event (see Parsons’ 1990 neo-Davidsonian theory). Since the value of f(e) varies with the value of the event itself, the result is a dependent reading (of a friend as well as of the anaphoric pronoun her).

In sum, we assume that Q-adverbs quantify, depending on the context, either over events or over individuals. Consequently, the indefinites that occur in generic contexts can be analyzed either as Skolem terms depending on an event variable or as individual variables bound by a Q-adverb. In what follows, we will show that the distinction between the two types of adverbial quantification and the correlative difference between the two types of indefinites occurring in generic contexts is crucial in explaining the constraints on the generic readings of indefinites.

### 7.2 Characterizing Sentences with Habitual Predicates

Let us now examine examples of the type in (8):

(8) A bird flies.

It is commonly accepted that the representation of sentences such as (8) involves a default adverb of quantification GEN, which is the ‘silent’ counterpart of overt adverbs such as usually, habitually, etc. However, there is no consensus concerning the domain of quantification of this GEN operator. The two analyses that can be found in the current literature are given in (8'a) and (8'b):

(8')

a. GENe,x (bird (x) \& C(e,x)) [fly (e,x)]
b. GENx (bird (x)) [fly (x)]

According to the LF in (8'a), GEN quantifies over event-individual pairs (see Chierchia (1995a, b), Schubert and Pelletier (1988), Krifka et al. (1995), among many others). The corresponding interpretation can be paraphrased as follows: “Take any bird and any situation in any world maximally similar to ours where the felicity conditions for flying (such as, e.g., presence of the right triggers) are satisfied […]. Any bird will fly in such a situation” (Chierchia 1995b:196). C(e,x) is a condition that restricts the domain of quantification to relevant situations; C is a contextually-specified constant. In the case under consideration, only birds that are in a situation in which they are likely to fly are taken into account. This allows us to exclude other situations, like for instance, situations in which the birds are sleeping.
On the analysis adopted here, this kind of representation can be rewritten using quantification over events as in (8′c), where the indefinite is represented as a Skolem term:

\[(8') \quad \text{c. } \text{GENe} \left( \text{bird} \left( f(e) \right) \land C(e,f(e)) \right) [\text{fly} (e,f(e))] \]

As for the LF given in (8'b), it relies on the hypothesis that GEN quantifies over an individual variable supplied by the indefinite (Heim 1982; Diesing 1992).

We will show that LFs (8′a–c) are problematic and that examples of the type in (8) rely on generic quantification over individuals combined with a habitual predicate. Quantification over individuals is allowed due to the fact that the s-level predicate is turned into an i-level predicate via a HAB operator.

### 7.2.1 Adverbial Quantification over Events

The representations in (8′a) and (8′c) cannot explain why sentences such as those in (9) cannot have a generic reading:

\[(9) \quad \text{a. } A \text{ dog is tired.} \\
\text{b. } A \text{ cow is infected.} \\
\text{c. } A \text{ police officer is available.} \]

These examples are similar to (8) insofar as they are built with an indefinite in the subject position of an s-level predicate and therefore they should in principle be analyzed in a similar way, i.e., as expressing generalizations over episodic events:

\[(9') \quad \text{a. } \text{GENe} \left( \text{dog} \left( f(e) \right) \land C(e,f(e)) \right) [\text{tired} (e,f(e))] \]

Since the LFs in (8′c) and (9′a) are built in the same way, they are equally well-formed. The unacceptability of the generic reading for sentences like (9) is therefore surprising.

Another problem arises with ambiguous examples such as (10) below, which can be paraphrased as (10a) and (10b), respectively:

\[(10) \quad \text{A student rarely smokes.} \\
\text{a. } \text{Few students smoke.} \\
\text{b. } \text{Generally, a student smokes rarely.} \]

In (10a), the adverb of quantification *rarely* (translated as *few* in the gloss (10a)) quantifies over individuals, whereas in (10b), the same adverb is analyzed as a frequency adverb, translated as *rarely* in (10b). This ambiguity is unexpected on the analysis given above, on which (10) would have only one representation, that in (10′):

\[(10') \quad \text{FEWe} \left( \text{student} \left( f(e) \right) \land C(e,f(e)) \right) [\text{smoke} (e,f(e))] \]
The interpretation associated with the LF in (10') can be paraphrased as follows: few events in which smoking by students might take place are events in which smoking by students really takes place. This analysis is problematic, since it does not distinguish between the interpretations in (10a) and (10b).

### 7.2.2 Adverbial Quantification over Individuals

According to another widespread view, (8) can be analyzed as involving quantification over individuals:

(8) A bird flies.

(8') b. GENx (bird (x)) [fly (x)]

The intuition behind this analysis is that (8) expresses a generalization over individuals (birds) rather than over events or situations. The problem with the representation in (8'b) is that the main predicate in (8) is a stage-level predicate, which projects a time variable (Kratzer 1988, 1995) but this has not been represented in (8'b). If we introduce a time variable and we allow the GEN operator to bind both variables, t and x, we obtain GENx,t (bird (x)) [fly (x,t)], which would correspond to the following interpretation: ‘in general, any bird at any moment flies’. But this interpretation does not correspond to the intuitive reading. On the other hand, if we assume that GEN binds only individual variables, we obtain the illegitimate representation in (8'd), in which the time variable remains free:

(8') d. # GENx (x is a bird) [x flies at t]

### 7.2.3 Proposal: Quantification over Individuals Combined with Quantification over Times

Following Dobrovie-Sorin (2003) we will assume that generic characterizing sentences (i.e., sentences that attribute a property to a class of individuals) built with a habitual or dispositional predicate (i.e., a transitory predicate used habitually or dispositionally) involve not one but two different adverbs:

(8') e. GENx (bird (x)) [HABt [fly (x,t)]]

These two operators differ in two respects. On the one hand, they quantify over different domains (individuals and times, respectively) and, on the other, one of them is two-place and the other is unary. GEN is a two-place operator: it denotes the relation between two sets corresponding to the restriction and the scope. HAB, on
the other hand, is comparable to a frequency adverb\(^\text{10}\): it is a unary operator that applies to a transitory predicate, binding its time variable and returning the corresponding habitual predicate.

The hypothesis that a covert frequency adverb HAB co-exists with the binary operator GEN enables us to reconcile Carlson’s (1977a, c) proposal, according to which a generic operator is unary, with later analyses, including Carlson (1989), which introduce a binary operator. On the analysis proposed here, these two accounts are not mutually exclusive; rather, they are both necessary. Following Carlson (1977a, c), we assume that the operator responsible for the habitual use of episodic predicates is unary. But unlike Carlson, we also assume a two-place operator GEN.

The co-occurrence of a frequency adverb and an adverb of quantification is supported by examples such as (11), with two overt adverbs:

(11) In general, a student rarely reads novels.
(11‘) GEN\(_x\) (student(x)) [FEW\(_t\) (reads novels (x, t))]

The hypothesis assumed here, according to which a default frequency adverb HAB co-occurs with a binary operator GEN is plausible given the systematic ambiguity of overt adverbs of quantification. With possible few exceptions, adverbs of quantification (in particular, rarely, sometimes, usually) may function, depending on the context, both as quantifiers and as frequency adverbs (de Swart 1991).

Let us now show that the analysis of Q-adverbs proposed here can solve the problems noted above. To account for the impossibility of the generic reading of (9a–c), which are built with adjectival s-level predicates, we have to explain why examples of this kind cannot be associated with LFs such as (8‘e), i.e., with LFs that rely on HAB. In purely descriptive terms, the problem is clear: the main predicates in (9) cannot have a habitual interpretation (tired, infected, or available cannot be interpreted as meaning ‘usually be tired, infected, available’). The unavailability of this reading may be explained by assuming that unlike verbs,\(^\text{11}\) adjectives cannot legitimate the insertion of a default HAB operator. And because HAB is not inserted, the time variable remains unbound, yielding an ill-formed representation:

(9‘) a. # GEN\(_x\) (dog (x)) [tired (x, t)]

\(^{10}\)This does not mean, however, that HAB, which is covert, has the same scopal interpretation as an overt frequency adverb; HAB may instead be viewed as a pluractional operator, as proposed by van Geenhoven (2004, 2005). See Cabredo-Hofherr (to appear) on differences between plurational operators and frequency adverbs.

\(^{11}\)It might be the case that certain adjectives take a habitual reading and conversely that certain s-level verbal predicates do not. What is relevant here is the fact that certain s-level predicates (be they adjectives or verbs) cannot take a habitual reading.
Note now that the examples in (9) become acceptable if we add an overt Q-adverb:

(12)  a. A dog is rarely tired.
    b. A cow is rarely infected.
    c. A fireman is rarely available.

Because the Q-adverb can bind the time variable introduced by tired, infected or available, LFs such as (12’a) are well-formed:

(12’)  a. GENx (dog (x)) FEWt [tired (x, t)]

We can also account for the ambiguity of (11) if we assume the LFs in (11’a–b), where a default adverb (HAB and GEN, respectively) co-exists with an overt adverb, ‘rarely’, translated as FEW, which can function either as a binary operator or as a frequency adverb. The ambiguity of (11) can thus be analyzed as an ambiguity between the relative scope of two operators:

(11’)  a. GENx (student (x)) [FEWt [smokes (x, t)]]
    b. FEWx(student (x)) [HABt [smokes (x, t)]]

7.2.4 Conclusions

We have proposed that the LF representations of habitual characterizing sentences like (8) involve not one but two adverbs of quantification, a binary and a unary one (frequency adverb). According to this analysis, habitual characterizing sentences do not express generalizations over events but rather generalizations over individuals that are characterized by a habitual or a dispositional property.

7.3 The Genericity of Singular Indefinites

In this section we will examine two constraints on the generic readings of singular indefinites. The so-called ‘nomicity constraint’ concerns the type of predicate required in order for a subject indefinite to be interpreted as generic. The second constraint explains why indefinites in object positions cannot receive a genuine generic reading.

12 The genericity of plural indefinites raises further problems, which will be presented in Sect. 7.4 below.
7.3 The Genericity of Singular Indefinites

7.3.1 GEN and the Nomicity Constraint

Let us now consider the following examples, due to Lawler (1973) and Burton-Roberts (1977):

(13) a. ◊ A madrigal is popular.
    b. ◊ A king is generous.
    c. ◊ A room is square.

To account for the unacceptability of examples of this kind, Lawler and Burton-Roberts have proposed a nomicity constraint: the generic reading of singular indefinites is possible only if the generalization expresses a property that is nomic, necessary, essential, inherent or analytic (for a recent discussion of this constraint see Cohen (2001) and Greenberg (2007)). Note that the predicates in (13a–c) denote contingent properties (of the subject), whereas those in (14) denote inherent properties (of the subject):

(14) a. A madrigal is polyphonic.
    b. A square has four sides.

Note that (13a–c) can have a generic reading if we add an overt adverb of quantification:

(15) a. A madrigal is usually popular.
    b. A king is rarely generous.
    c. A room is usually square.

The contrast between (13a–c) and (15a–c) suggests that the unavailability of the generic reading of (13a–c) is not due to a constraint on adverbial quantification in general but rather to a constraint on the insertion of the default operator GEN. We can thus suggest that the nomicity constraint mentioned earlier is a condition on the insertion of GEN.

(16) In characterizing sentences, GEN can be introduced by default only if an inherent relation holds between the property denoted by the indefinite and the property denoted by the sentential predicate.

Bare plurals in English (as well as plural definite DPs in French) are not subject to this constraint. The glosses of the primed examples in (17) are not indicated

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13 The symbol ◊ means that the sentence cannot have a generic interpretation.

14 There are other factors that make the generic reading possible in these examples, such as the presence of modality, which can be expressed by a modal verb or simply by intonation:

(i) A king must be generous.

15 The contrast between singular indefinites and bare plurals in English with respect to the nomicity constraint was observed by Lawler (1972, 1973) and Burton-Roberts (1977). In Sect. 7.5 below we will show that English generic bare plurals cannot be analyzed as indefinite-like expressions.
because they are identical to the corresponding English examples (modulo the definite article):

(17) a. Madrigals are popular.
   a'. Les madrigaux sont populaires.
   b. Kings are generous.
   b'. Les rois sont généreux.
   c. Rooms are square.
   c'. Les chambres sont carrées.

The acceptability of these examples is expected on the hypothesis that the genericity of English bare plurals and French plural definites should be analyzed in terms of kind-reference (rather than in terms of an indefinite being bound by GEN). The examples in (17) can thus be analyzed as involving generic predication: a generic (i.e., stable) property is attributed to a kind-referring DP. Because GEN need not be introduced, the nomicity constraint is irrelevant for generic sentences built with kind-referring DPs (see Dobrovie-Sorin and Laca 1996): we can attribute to a kind (i.e., to a maximal intensional group of individuals) a contingent property as well as an inherent property.

Note that the constraint in (16) is also relevant for modified indefinites. Thus, the example in (18a) is more acceptable than that in (18b), because a relation exists between being good and being generous, whereas no natural (e.g., lexical or causal) relation exists between being blond and being generous:

(18) a. A good king is generous.
   a'. Un bon roi est généreux.
   b. ◊ A blond king is generous.
   b'. ◊ Un roi blond est généreux.

Note finally that the constraint in (16) does not concern generic sentences built with if/when-clauses. In this type of sentence, a default GEN operator is supplied by the connector if/when itself (Heim 1982; Farkas and Sugioka 1983):

(19) a. A madrigal is popular when it is short.
   a'. Un madrigal est populaire quand il est court.
   b. A madrigal is popular if it is written by Orlando di Lasso.
   b'. Un madrigal est populaire s’il est écrit par Orlando di Lasso.

(19') a. GENx (madrigal (x) ∧ short (x)) [popular (x)]
   b. GENx (madrigal (x) ∧ written-by (x, Orlando di Lasso)) [popular (x)]

These LFs can be rewritten as in (19''), where quantification over events is explicit.

(19'') a. GENe (short (e, f(e)) ∧ madrigal (f(e))) [popular (e, f(e))]
   b. GENe (written-by (e, f(e), Orlando di Lasso) ∧ madrigal (f(e))) [popular (e, f(e))]
The observations made in this section, which bear on indefinites in subject positions, can be summarized as follows:

(20)  a. The generic readings of indefinites in subject positions are due to sentential genericity: the presence of an overt or covert adverb of quantification is necessary.
    
    b. Depending on whether the adverb of quantification binds the indefinite directly or indirectly, we may talk of ‘truly generic’ readings and ‘pseudo-generic’ readings, respectively.
    
    c. A GEN operator can be supplied by default either due to the presence of an if/when operator or due to a ‘nomic’ relation between the predicates that are mapped onto the restriction and the scope.

7.3.2 Pseudo-Generic Indefinites in Object Positions

According to rule (4), quantification over individuals is obtained if: (i) the indefinite is in a subject position (more precisely in the preverbal subject position) and (ii) the predicate is generic (i.e., a predicate lexically specified as stable, or a transitory predicate in its habitual use). The constraint on the predicate can be easily explained: if the predicate denotes a transitory property, it projects a time variable that must be either saturated by a time index (in this case we obtain a particular and not a generic statement) or bound by the adverb of quantification, which therefore cannot bind the individual variable that the indefinite supplies (recall that we do not assume that Q-adverbs are unselective binders: depending on the linguistic context, they can bind either an event variable or an individual variable but not both of them). As for the constraint regarding the position occupied by the indefinite, we suggest that this constraint is due to the need for an asymmetric configuration such as subject/VP or Theme/Rheme, which is mapped onto the restriction / scope partition characteristic of quantificational structures.  

Rule (4) cannot apply if the indefinite occupies an object position, which explains why a generic reading is not available for the indefinite object in (21), which can only refer to a particular individual:

(21) John respects a professor.

The generic reading becomes available if (i) the verb is stressed or (ii) the indefinite in the object position contains an adjective or some other type of adnominal modifier:

(22)  a. In general, John RESPECTS a professor.
    b. In general, John respects an intelligent professor.
    c. In general, John respects a professor who takes care of his students.
    d. Mary rarely likes a short sleeved-dress.

The generic reading of (22a) is made possible by contrastive stress, which enables the application of rule (5). The whole sentence goes to the nuclear scope and the restriction is filled by focus closure, which is obtained by replacing the

\[^{16}\text{For a different account of the role that information structure plays in generic sentences and cor-
relatively in the choice of the generic interpretation of BPs, see Cohen & Erteshik-Shir (2002).}\]
focused constituent (i.e., the predicate *respect*) with a context-dependent predicate of events (*compatible-with-respect*):

\[(22') \ a. \ \text{GENe} \ (\text{compatible-with-respect} \ (e, \text{John}, f(e)) \land \text{professor} \ (f(e))) \]

\[\text{[respect} \ (e, \text{John}, f(e))\text{]}\]

This representation, in which the GEN operator quantifies over events, can be paraphrased as follows: most events compatible with respect in which John and a professor participate are events in which John respects that professor.

Turning now to (22b–c), we can assume that it is the presence of an adnominal modifier that allows the indefinite NP to occur in the restriction:

\[(23) \ \text{An indefinite DP that contains an adnominal modifier (adjective, relative clause, prepositional DP) goes to the restriction of the adverb of quantification that takes scope over it.}\]

\[(22') \ b. \ \text{GENx} \ (\text{professor} \ (x) \land \text{intelligent} \ (x)) \ [\text{respect} \ (\text{John}, x)]\]

\[\text{LFs such as (22'b), which contain two conditions in the restriction, can be rewritten using quantification over events, by analyzing the condition supplied by the modifier intelligent as a condition on events:}\]

\[(22') \ c. \ \text{GENe} \ (\text{intelligent} \ (e, f(e)) \land \text{professor} \ (f(e))) \ [\text{respect} \ (e, \text{John}, (f(e)))]\]

We can conclude that object indefinites can take pseudo-generic readings in those contexts in which quantification over events is induced by contrastive stress or nominal modification.

Since neither contrastive stress nor nominal modification are present in (24), the BP cannot be analyzed as an indefinite bound by a Q-adverb.\(^{17}\)

\[(24) \ \text{John respects teachers.}\]

In this example, the genericity of the bare NP can instead be analyzed as an instance of nominal genericity, as English bare plurals can function as names of kinds (Carlson 1977a, c).

The analysis sketched here explains why French definite plurals occurring in object positions can take generic readings, in clear contrast with French des-indefinites, which are not acceptable\(^{18}\):

\[(25) \ a. \ \text{Jean respecte les professeurs.} \quad \text{(generic/specific)}\]

\[\text{Jean respects the teachers}\]

\[b. \ ^{*}\text{Jean respecte des professeurs.} \quad \text{Jean respects DES teachers}\]

\[^{17}\text{See Laca (1990), Dobrovie-Sorin and Laca (1996) and Dobrovie-Sorin (1997a, b) for further evidence against this analysis of ‘generic objects’, advocated in particular by Diesing (1992) and Kratzer (1988, 1995).}\]

\[^{18}\text{Plural indefinites headed by certains ‘certain’ or quelques ‘some’ are acceptable in this context, but they can only take a specific reading:}\]

\[i. \ \text{Jean respecte certains/quelques professeurs.} \quad \text{Jean respects certain some teachers}\]
7.4 The Genericity of French des-Indefinites

The generic reading of French plural indefinites is known to be subject to strict constraints, depending on the type of plural determiner involved. We will focus on the properties of des-indefinites, leaving aside other plural determiners such as plusieurs ‘several’ or certains ’some’ etc. (for an overview of the basic data, see Corblin (1987, 2001), from whom we borrow most of the examples below). We distinguish ‘truly generic’ from ‘pseudo-generic’ indefinites and we show that while the former occur in sentences that express generalizations over groups of individuals, the latter are related to generalizations over events.

7.4.1 The Individuation Constraint on Quantification

Corblin (1987:57–58) observed that generic cardinal indefinites cannot express generalizations over atomic individuals: “Il n’existe pas d’interprétation générique distributive stricte des indéfinis nombrés” [‘There is no strictly distributive generic reading for cardinal/numbered indefinites’]. Corblin’s explanation relies on a pragmatic principle according to which examples like those in (26b) are blocked (or, in Corblin’s terms, neutralized) because they can be more readily expressed by using a singular indefinite (see (26a)) instead of a cardinal indefinite (see (26b)):

(26) a. Une tortue vit longtemps.
   ‘A turtle lives long-time.’
   b. *Deux / Trois tortues vivent longtemps.
   ‘Two/three turtles live long-time.’

Coming back to our present concerns, the same principle would account for similar restrictions on des-indefinites. Thus, examples like (27b) would be blocked by the corresponding (27a), with a singular indefinite:

(27) a. Un carré a quatre côtés.
   ‘A square has four sides.’
   b. *Des carrés ont quatre côtés.
   ‘Des squares have four sides.’

---

19 Corblin (1987) notes that ‘strictly distributive’ readings (i.e., generalizations over atomic individuals) are marginally possible with des-indefinites. We will come back to this issue in Sect. 7.4.3 but for now we focus only on examples that express generalizations over groups.
Below we give further examples of the same type, grouped according to whether they contain an overt adverb of quantification or not:

(28)  
\begin{align*}
\text{a.} & \quad \text{*Des enfants marchent rarement avant 10 mois.} \\
& \quad \text{Des children walk rarely before 10 months} \\
\text{b.} & \quad \text{*Des Indiens meurent en général jeunes.} \\
& \quad \text{Des Indians die usually young}
\end{align*}

(29)  
\begin{align*}
\text{a.} & \quad \text{*Des chats sont intelligents.} \\
& \quad \text{Des cats are intelligent} \\
\text{b.} & \quad \text{*Des Roumains parlent français.} \\
& \quad \text{Des Romanians speak French}
\end{align*}

Dobrovie-Sorin (2004) shows that in order to understand the generic readings of des-indefinites, we need to distinguish between examples of the type illustrated above, which rely on generic quantification over (plural) individuals and examples like (30), which rely on generic quantification over events\(^{20}\):

(30)  
\begin{align*}
\text{a.} & \quad \text{Méfie-toi, des guêpes énervées sont un danger terrible.} \\
& \quad \text{Watch out des wasps excited are a danger terrible.} \\
& \quad \text{‘Watch out, excited wasps are a terrible danger.’} \\
\text{b.} & \quad \text{Des éléphants blancs se promenant dans la rue ont parfois/} \\
& \quad \text{Des elephants white strolling in the street have sometimes/} \\
& \quad \text{toujours suscité une très vive curiosité.} \\
& \quad \text{always aroused a very vivid curiosity} \\
& \quad \text{‘Always/sometimes if white elephants stroll in the street they arouse} \\
& \quad \text{curiosity.’}
\end{align*}

In this section we will only be interested in adverbial quantification over individuals and therefore we will avoid overt Q-adverbs, modal operators or nominal modifiers, all of which may allow, in certain contexts, a quantification-over-events interpretation.

Going back to the unacceptability of the generic reading of plural des-indefinites illustrated in (27b) and (29), we will depart from Corblin’s pragmatic explanation and pursue the line of investigation originating in Dobrovie-Sorin and Mari (2007a, b) and further developed in Dobrovie-Sorin (to appear a), according to which the examples under examination here violate a constraint on quantification. The label and the definition in (31) are borrowed from Dobrovie-Sorin (to appear a):

(31) Individuation Constraint on Quantification (ICQ)

\begin{align*}
\text{A variable that ranges over elements ordered by the part-whole relation cannot} \\
\text{be bound by a quantifier.}
\end{align*}

\(^{20}\) Example (30b) is adapted from an Italian example due to Longobardi (2002). Longobardi’s account for generic indefinites is different from the one pursued here (for discussion, see Dobrovie-Sorin and Laca (2003)).
Following Link (1983), plural (and conjoined) DPs (Determiner Phrases) are viewed as denoting sums (of individuals), which are currently represented as elements of a join semi-lattice (Scha 1981; Link 1983; Landman 1989a, b):

\[(32)\]

\[
\begin{array}{c}
\text{a+b} \\
\text{a+c} \\
\text{a+b+c} \\
\text{b+c} \\
\text{a} \\
\text{b} \\
\text{c}
\end{array}
\]

This lattice structure is generated by applying the join-operation to the set of individuals that stands at its bottom, \{a,b,c\}. Thus, given a domain of reference that contains three boys, a, b and c, the denotations of boy and boys are those in (32'a–b)\[21\]:

\[(32')\]

\[
\begin{align*}
\text{a. } [\text{[boy]}] & = \{a, b, c\} \\
\text{b. } [\text{[boys]}] & = \{a + b, a + c, b + c, a + b + c\}
\end{align*}
\]

Plural definite DPs such as these boys or the boys refer to a unique sum (relative to a given context) in the domain, i.e., they refer to either a + b or to a + c, or to b + c or to a + b + c. Indefinite plurals, e.g., des garçons in French or some boys in English, as well as English bare plurals (on their existential readings) supply variables that range over the sums of the semi-lattice in (32).

Given this analysis of plural indefinites, the LF representation in (27'b) is ruled out (# indicates an illegitimate configuration) by the ICQ, because the variable supplied by des carrés ‘[DES] squares’ ranges over elements ordered by the part-whole relation and as such it cannot be bound by the Q-adverb:

\[(27')\]

\[
\text{b. } \# \text{ GEN X (X is a sum of squares) [X has four sides]}
\]

The ban against quantifying over elements ordered by the part-whole relation has been frequently invoked in relation to quantification over situations; see in particular Kratzer (1990, 1998) and Heim (1990). In the words of Kratzer (1995:169): ‘Quite generally, any sort of quantification seems to require that the domain of quantification is set up in such a way that its elements are truly distinct’, where ‘truly distinct’ means ‘not related to each other by part-whole relations.’ According to Kratzer (1990, 1998), situations are particulars that are parts of worlds (worlds are maximal situations, i.e., situations that are not a proper part of any other situation). Because of their inherent mereological part-whole structure, situations can be quantified over only if we take into account situations ‘of the right size’, a quite

\[21\] Theorists disagree as to whether the denotation of plural nouns contains the set of singular individuals that generates the lattice or not. For simplicity we will adopt the latter view in this chapter.
complex and highly debated issue not relevant for our present concerns, which relate to quantification over the domain of individuals.

Although central to the investigation of quantification over situations, the Individuation Constraint on Quantification has gone largely unnoticed (prior to Dobrovie-Sorin and Mari (2007a, b)) in the literature dedicated to quantification over individuals. The reason for this state of affairs is presumably the fact that singular count nouns denote sets of singular individuals, which are not ordered by the part-whole relation and as such trivially allow for quantification. Characterizing sentences built with bare plurals and Q-adverbs were themselves treated as involving quantification over singular individuals. Thus, examples of the type in (33) were analyzed as relying on the LF representations in (33’), in which the bare plural supplies a variable over singular individuals (Diesing 1992):

\[(33)\quad \text{Squares have four sides.}\]
\[(33')\quad \text{GENx (x is a square) [x has four sides]}\]

Granting that plural marking cannot be ignored by the syntax-semantics mapping rules and assuming that the bare plural in (33) is comparable to a plural indefinite (rather than a name of kind), the LF representation associated with (33) should be (27’b) rather than (33’). Note also that the analysis according to which (33) translates as (33’) predicts that French des-indefinites, which are the closest counterparts of indefinite-like English bare plurals, allow generic interpretations. The unacceptability of examples of the type in (27b) shows that this prediction is wrong.

The unacceptability of the generic reading of French plural indefinites sheds serious doubt on the hypothesis that English generic bare plurals are indefinite-like expressions. They can instead be analyzed as names of kinds, an issue that is not relevant at the present stage of this presentation. We will return to this issue in Sect. 7.5 below, where further arguments against representing (33) as relying on (33’) will be given.

The ICQ accounts not only for our initial examples, built with plural indefinites, but also for the unacceptability of generic mass indefinites, which have not been examined in previous literature:

\[(34)\]
\[a. \quad \text{*De l’eau est liquide.}\]
\[\text{DE L’water is liquid}\]
\[b. \quad \text{*De l’eau gèle à 0° Celsius.}\]
\[\text{DE L’water freezes at 0° Celsius}\]
\[c. \quad \text{*Du vin est cher ici.}\]
\[\text{DU wine is expensive here}\]

\[\quad \text{22 Although theorists of genericity do not agree on whether bare plurals in examples like (33) are indefinite-like (Diesing 1992; Kratzer 1988, 1995, a.o.) or kind-referring (Carlson 1977a, c), all of them seem to assume LFs of the type (33’).}\]
The variables introduced by mass indefinites range over amounts/portions of matter, which are ordered by the part-whole relation and as such cannot be bound by a Q-adverb.\(^{23}\)

It is easy to observe that des-indefinites can be represented as sum-variables bound by existential closure:

\[
\text{(35)} \quad \text{Dans la rue, des étudiants étaient en train de danser.} \\
\text{in the street DES students were PROG dancing} \\
\text{‘In the street, (unstressed some) students were dancing.’} \\
\text{(35')} \quad \exists X \ (X \text{ is a sum of students } \land X \text{ is dancing})
\]

We must therefore acknowledge that the ICQ does not concern existential closure. This is not surprising, since existential closure cannot be assimilated to two-place quantification. Note indeed that in order to assign a truth-value to an LF of the type in (35’) we do not need to count the sums of students in the domain. All we need to know is whether or not there is a sum that is students and dances.

Let us also observe that cardinal determiners, e.g., ten in *Ten students were dancing in the street*, are not problematic either, since in the corresponding LF such determiners do not function as genuine quantifiers (they do not denote relations between sets) but rather as cardinality predicates: \(\exists X \ (X \text{ is a sum of students } \land X \text{ is dancing } \land |X| = 10)\). To conclude, the ICQ does not prevent sums from being measured (with numbers or with other measure units).

### 7.4.2 The Generic Readings of Plural Indefinites Built with Symmetric Nouns

Let us now consider the examples in (36)\(^{24}\):

\[
\text{(36) a. Deux/Des parrallèles se croisent à l’infini.} \\
\text{Two DES parallels REFLEX cross at the infinite} \\
\text{‘(Two) Parallels cross each other at the infinite.’} \\
\text{b. Deux/Des pays limitrophes ont souvent des rapports difficiles.} \\
\text{Two DES countries neighboring have often DES relations difficult} \\
\text{‘(Two) Neighboring countries frequently/often have difficult relations.’}
\]

\(^{23}\)For further empirical support in favor of the ICQ see Dobrovie-Sorin (to appear a), who shows that this constraint is relevant not only for Q-adverbs but also for quantificational determiners such as *keine ‘no plur’* in German. The unacceptability of the generic readings of bare plurals and bare mass nouns in Romance languages other than French can also be explained as consequences of the ICQ (see Sect. 7.5).

\(^{24}\)The versions of (36a–c) built with *deux* are taken from Corblin (1987). We have added the examples with des-indefinites. For reasons we will not address here, the generic readings of des-indefinites are less acceptable than those of cardinal indefinites.
c. Deux/De vrais jumeaux se ressemblent dans les moindres détails.
   Two true twins refl. resemble in the smallest details
   ‘(Two) True twins look alike down to the smallest details.’

d. Deux/Des amis intimes se critiquent toujours.
   Two des friends intimate refl. criticize always
   ‘(Two) Intimate friends always criticize each other.’

Note that these examples are built with plural symmetric nouns, e.g., friends, twins, neighbors, etc., whereas the ungrammatical examples in (27b), (28)–(29) are built with plural sortal nouns, e.g., squares, child, cats, etc. Building on Dobrovie-Sorin and Mari (2007a, b), let us assume that plural symmetric nouns denote sets of groups. Compare the denotation of friends given in (37a) to the denotation of boys given in (32'b) and repeated in (37b):

(37)  a. \([\text{friends}] = \{P,Q,R\}\)
   (where P, Q and R are groups, the members of which entertain a reciprocal friendship relation)
   b. \([\text{boys}] = \{a+b, a+c, b+c, a+b+c\}\)
   (where a, b and c are individual boys)

Crucially, although friends is a plural form, it is not obtained by semantic pluralization from the singular noun friend (such singular nouns do not denote a set of individuals but rather a symmetric relation between two individuals). Such plural forms are ‘inherent plurals’, comparable to reciprocals (love/hate each other, meet, etc.). The group interpretation of friends represented in (37a) should be distinguished from the sum interpretation of friends. Note indeed that examples such as (38) are ambiguous between the two interpretations in (38a) and (38b)25:

(38)  John and Mary are friends.
   a. John and Mary entertain a friendship relation.
   b. John and Mary are friends of mine

The (b) interpretation relies on the pluralization of the singular noun friend, which has one of its argument positions saturated by an implicit argument (the speaker in this case). In other words, the sum-referring friends corresponds to the

\[\text{Note that in French this ambiguity exists for des-indefinites in predicate position (see (i)), whereas the BP in (ii) necessarily takes the reciprocal interpretation:}\]

(i)  Jean et Marie sont des amis.
   Jean and Mary are des friends
(ii) Jean et Marie sont amis.
     Jean and Mary are friends
     ‘Jean and Mary are friends’

25
7.4 The Genericity of French des-Indefinites

pluralization of friend (of me), whereas the group-referring friends is an inherent plural, which denotes a set of groups, each group being made up of individuals that entertain a friendship relation.

Since (under the relevant interpretation) plural symmetric nouns denote sets of groups (i.e., pluralities that are not ordered by part-whole relations), the variables supplied by plural symmetric nouns can be bound by a Q-adverb. In other words, the LF in (36’) is well-formed:

\[(36’) a. \ GENx (x is a group of parallels) [x cross each other at the infinite]\]

Dobrovie-Sorin and Mari (2007a, b) make two observations in support of their hypothesis that plural symmetric nouns may denote sets of groups. They point out that group-denotation requires the plural noun to describe a symmetric relation that holds among the elements of the group (Landman 1989b; Simons 1987; Moltmann 1997), which ensures that the elements of the plurality form an ‘integrated whole’ rather than a mere sum/aggregate of individuals that do not bear any relation to each other. More precisely, the groups denoted by symmetric plural nouns are examples of Simons’ (1987) ‘relation-based integrated wholes’. The second observation is that plural symmetric nouns do not satisfy cumulativity, in clear contrast with pluralized sortal nouns:

\[(39) a. A are children  
B are children
A and B are children  
b. A are friends (with each other)  
B are friends (with each other)
# A and B are friends (with each other)\]

The following examples, taken from Carlier (2000:184), provide further support for our analysis:

\[(40) a. Des amis s’ entraident.  
\textsc{des} friends \textsc{refl} mutual-help
‘Friends help each other.’  
b. Des soeurs rivalisent souvent.  
\textsc{des} sisters compete often
‘Sisters often compete with each other.’\]

\[26\]Dobrovie-Sorin (to appear a) observes that plural symmetric nouns are divisive (if A is friends, then any group that is part of A is friends), which is incompatible with Dobrovie-Sorin & Mari’s (2007a, b) view that such plural nouns denote sets of groups that are not ordered by the part-whole relation (since divisiveness depends on the part-whole relation). Dobrovie-Sorin (to appear a) was therefore led to revise the analysis of plural symmetric nouns: plural symmetric nouns allow generic readings because their domain contains a legitimate domain of quantification, namely the set of the maximal groups that satisfy the relation denoted by the noun.
c. Des aimants s’attirent.
   des magnets refl attract
   ‘Magnets attract each other.’

d. Des jumeaux ont souvent des affinités.
   des twins have often des affinities
   ‘Twins often have affinities.’

These examples are built with symmetric plural predicates and as such can be represented as relying on quantification over groups of individuals:

(40’) a. GEN X (friends (X)) [X help each other]

The interpretation conveyed by these LF representations corresponds to our intuitions: the sentences in (40) express generalizations over groups of individuals, who entertain a stable relation, which is either habitual or dispositional.

Summarizing, adverbial quantification over plural individuals is severely constrained: only variables that range over plural individuals that are not ordered by part-whole relations can be bound by a Q-adverb. This constraint explains why plural symmetric nouns but not plural sortal nouns allow generic readings.

7.4.3 The Pseudo-Generic Reading of Plural Indefinites

In this paragraph we will briefly examine examples that arguably rely on adverbial quantification over events (rather than over individuals).

Let us first consider the examples in (41):

(41) a. Trois/des hommes forts peuvent soulever un piano.
   Three des men strong can lift a piano
   ‘(Three) Strong men can lift a piano.’

b. Deux/des hommes grands attirent toujours l’attention.
   Two des men tall draw always the attention
   ‘(Two) Tall men always draw attention.’

c. Deux/Des pipelettes ne se supportent pas longtemps.
   Two des chatterboxes neg refl stand neg for long
   ‘(Two) Chatterboxes won’t stand each other for a long time.’

d. Deux/Des enfants en bas âge donnent toujours beaucoup de travail.
   Two des children small give always a lot of work
   ‘(Two) Small children always involve a lot of work.’

e. Trois/des petites filles sont toujours en train de te préparer une surprise.
   Three des small girls are always prog you prepare a surprise.
   ‘(Three) Small girls are always preparing surprises.’
The sentence in (41a) does not say that any group of men have a certain habit or typical behavior but rather that any events/situations in which three strong men try to lift together a piano are such that they manage to lift it. In order to account for this type of example, we must assume a new mapping rule:

(42) Plural indefinites can be analyzed as supplying a predicate of events paraphrasable as ‘be together’, which is mapped into the restriction.

This rule yields the representations in (41a–e):  

(41)  a. GENe (be together (e, f(e)) ∨ strong men (f(e)) ∧ |f(e)| ≥ 2) [can lift a piano (e, f(e))]
   b. GENe (be together (e, f(e)) ∨ tall men (f(e)) ∧ |f(e)| ≥ 2) [draw attention (e, f(e))]
   c. GENe (be together (e, f(e)) ∨ chatterboxes (f(e)) ∧ |f(e)| ≥ 2) [stand each other for a long time (e, f(e))]
   d. ∀e (be together (e, f(e)) ∨ small children (f(e)) ∧ |f(e)| ≥ 2) [involve a lot of work (e, f(e))]
   e. ∀e (be together (e, f(e)) ∨ small girls (f(e)) ∧ |f(e)| ≥ 3) [prepare surprise (e, f(e))]

Let us now observe that the examples in (43) are not necessarily interpreted as expressing generalizations about events that contain more than one lion. Therefore, we cannot assume that the restriction of the corresponding LFs contains ‘be together’:

(43)  a. Des lions blessés sont toujours vulnérables.
   DES lions injured are always vulnerable
   ‘Injured lions are always vulnerable.’
   b. Des enfants malades sont souvent grincheux.
   DES children sick are often grumpy
   ‘Sick children are often grumpy.’

As observed by Heyd (2002), these examples are built with des-indefinites modified by adjectives that can function as sentential predicates. Such adjectives can be analyzed as predicates of events and can thus provide the restriction of a quantifier over events:

(43’) a. GENe (injured(e,f(e)) ∨ lions (f(e))) [vulnerable (e,f(e))]
    b. GENe (sick (e,f(e)) ∨ children (f(e))) [grumpy (e,f(e))]

27 The LF in (41’), as well as most of the other LFs in this section, are simplified versions. Thus, in (41’a), the events of being together and being able to lift a piano are not the same event but rather two overlapping events (see the LF in (1’)). Furthermore, we have not given a full analysis of the DPs themselves, since we have not separated the predicates supplied by the noun from the predicates supplied by their modifiers.
Note finally that the (pseudo-)generic interpretation of plural indefinites is facilitated by the use of deontic modal verbs (Carlier 1989). Although the (b) example below does not contain any overt deontic operator, the negated verb is interpreted as containing a negated deontic: ‘do not behave like that’ means ‘must not behave like that’ (because if they behaved like that they would not be ‘true’ policemen):

(44)  a. Des jeunes filles doivent se montrer discrètes.
    DES young girls must REFL show discrete
    ‘Young ladies must behave discretely.’
  b. Des agents de police ne se comportent pas ainsi dans une situation d’alarme.
    DES agents of police NEG REFL behave NEG like this in a situation of alarm
    ‘Police agents do not behave like that in emergency situations.’

One may wonder why deontic modality facilitates the pseudo-generic reading of a plural indefinite. The first answer that comes to mind is that the modal operator, due to its introducing possible worlds into the computation, introduces quantification over events. However, this cannot be a complete solution, since it is not the case that all modal operators have the same effect. We may therefore conjecture that the role of the deontic operator is to express the idea that there is a necessary relation between the predicates in the restriction and in the scope of the Q-adverb.

If this suggestion is on the right track, it seems to indicate that some kind of ‘nomicity’ constraint holds not only for the default GEN operator that quantifies over individuals but also for the default GEN operator that quantifies over events. In other words, in the absence of an if/when configuration, a default GEN operator can be supplied only if a nomic relation can be established between the restriction and the scope. This suggestion is supported by Corblin’s (1987) observation that examples like (44) can be felicitously used only if the speaker talks to a group of police agents or young ladies. We may speculate that Corblin’s pragmatic condition on the use of examples like (44) can be explained as being due to the fact that the speaker intends his utterance as advice for the hearer(s) and as such the interpretation is facilitated if the subject of the generalization underlying the advice has the same cardinality as the hearer. In sum, utterances such as (44a–b) are intended to mean: ‘If young ladies [such as you] want to be considered to be true young ladies, then they must behave discreetly’; ‘If police agents [such as you] want to be considered to be true police agents, then they must not behave like that in an alarm situation.’

Let us now observe that in examples like (43) above, the plural indefinites are ‘number-neutral’, in the sense that they express generalizations that hold not only for plural individuals but also for atomic individuals. The examples in (30),

\[^{28}\text{According to Corblin (1987), the relevant examples allow ‘strictly distributive readings’. This generalization is correct only if we interpret ‘allow strictly distributive readings’ as meaning ‘number neutral readings’.}\]
introduced in Sect. 7.4.1 above and repeated below, illustrate the same phenomenon:

(30) a. Méfie-toi, des guêpes énervées sont un danger terrible.  
   watch out des wasps excited are a danger terrible.  
   ‘Watch out, excited wasps are a terrible danger.’

b. Des éléphants blancs se promenant dans la rue ont parfois/ 
   des elephants white strolling in the street have sometimes/ 
   toujours suscité une très vive curiosité.  
   always aroused a very vivid curiosity  
   ‘If white elephants stroll in the street they always/sometimes arouse 
   curiosity.’

The sentence in (30a) can be interpreted as a warning against either groups of 
excited wasps or against single wasps and in (30b) the curiosity might have been 
caused by groups of elephants or by a single elephant strolling in the street.

In what follows, we show that number neutralization can arise only in examples 
that rely on quantification over events.\footnote{It goes without saying that number neutralization cannot arise in examples such as (41), which according to the analysis presented above express generalizations over events of ‘being together’, thus constraining the cardinality of the event participants to be at least two.} Consider the LF representation of (30b):

(30') b. \( \forall e \text{(stroll in the street \( (e,f(e)) \) \& white elephants \( (f(e)) \))} \)
   [arouse curiosity \( (e,f(e)) \)]

In these LF representations, the plural indefinites are not translated as variables 
that range over (groups of) individuals but as Skolem terms, the values of which 
co-vary with the events they depend on. The event participants may be atomic indi-
viduals or groups, depending on the lexical properties of the main predicate as well 
as pragmatic factors. In sum, we propose that number neutralization characterizes 
event-dependent indefinites, which are represented as Skolem terms:

(45) des-indefinites that translate as event-dependent Skolem terms are number-
neutral.

Number neutralization should be kept distinct from strictly distributive 
readings. Strict distributivity, on which the main predicate holds of atomic indi-
viduals, is obligatorily associated with generic sentences built with singular 
indefinites (Sect. 7.3 above) and can sometimes characterize generic sentences 
built with plural definites (Sect. 7.5 below). Truly generic plural indefinites dis-
allow both number neutralization and strict distributivity: they supply a group 
variable and as such, the sentences containing them necessarily express gener-
alizations over groups.
7.4.4 Conclusions

To conclude, French plural *des*-indefinites have two different kinds of generic readings. On the one hand, plural indefinites can be *indirectly* bound: they are pseudo-generic, rather than truly generic. The adverb of quantification (or the default quantifier GEN) quantifies over events or situations and indirectly over groups of individuals. On the other hand, plural indefinites can be directly bound by the Q-adverb if they are built with symmetric relational nouns, which denote a stable property of groups of individuals.

7.5 The Genericity of English Bare Nouns

English bare plurals (and bare mass nouns) differ from their counterparts in Romance languages like Italian, Spanish or Romanian and from French *des*-indefinites as well as from French mass indefinites headed by *de la* or *du* (contracted form of *de* and *le*), insofar as they systematically allow generic readings.\(^{30}\) We assume that English bare plurals (and bare mass nouns) with generic readings should be analyzed as names of kinds (cf. Carlson 1977a), or more precisely as intensional maximal sums (Chierchia 1998; Dobrovie-Sorin and Laca 1999, 2003).

7.5.1 The Genericity of French Plural and Mass Indefinites and the Genericity of English Bare Nouns

As already mentioned in Sect. 7.4.1 in relation to examples (28), the restrictions on the generic readings of French plural *des*-indefinites cast serious doubt on the predominant analysis of English, according to which bare plurals like those in (46)–(47) are plural *indefinites* that are respectively bound by an overt adverb of quantification or by the generic operator GEN:

(46) a. Children rarely walk before the age of 10 months.
    b. Indians usually die young.

(47) a. Cats are intelligent.
    b. Romanians speak French.

\(^{30}\)Generic readings of modified bare nouns are possible in Italian for a restricted set of examples, which led Chierchia (1998) to analyze Italian bare nouns – and by extension bare nouns in Romance languages other than French – as kind-denoting. However, Longobardi (2002) and Delfitto (2002) have shown that modified bare nouns in Italian are ruled out in contexts that allow names of kinds. Consequently, a Carlson-style analysis cannot account for the Italian data. We agree with Longobardi and Delfitto that the generic reading of Italian bare plurals relies on quantification over events.
These examples contrast with the corresponding French sentences, built with *des*-indefinites:

    des children walk rarely before 10 months
b. *Des Indiens meurent en général jeunes.
    des Indians die usually young

(49)  a. *Des chats sont intelligents.
    des cats are intelligent
    des Romanians speak French

The examples below illustrate the perfectly parallel contrast between English bare mass nouns and French mass indefinites headed by *de la*/du*:

(50)  a. Water is liquid (most of the time).
    b. Gold is (often) yellow.

(51)  a. *De l’eau est liquide (la plupart du temps).
    de l’water is liquid the majority of time
b. *De l’or est (souvent) jaune.
    de l’gold is often yellow

Given the unacceptability of plural and mass indefinites in the examples in (48)–(49) and (51), the English bare nouns in (46)–(47) and (50) cannot be analyzed as indefinites. We are thus led to assume that English bare plurals (and bare mass nouns) function as names of kinds (Carlson 1977a, b) or rather as intensional maximal sums (Chierchia 1998) not only in sentences built with predicates that select kinds, e.g., *Cats are on the verge of extinction*, but also in generic characterizing sentences of the type in (46)–(47), built with Q-adverbs or the GEN operator.

On this proposal, the French counterparts of (46)–(47) and (50) are not the examples in (48)–(49) and (51) but rather those in (52)–(53), with plural and mass indefinites (see Dobrovie-Sorin and Laca 1996, 1999):

(52)  a. Les enfants marchent rarement avant 10 mois.
    the children walk rarely before 10 months
b. Les Indiens meurent en général jeunes.
    the Indians die usually young

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31 De Swart (1992, 1996) suggests that the restricted use of French *des*-indefinites is due to the fact that *des*/du* goes back to a partitivity marker, which would be incompatible with a quasi-universal, generic interpretation. However, this hypothesis cannot be maintained: on the one hand, the examples analyzed here contain *des*-indefinites with no partitive meaning and on the other, indefinites with partitive *des* can also have generic readings (see Heyd 2002).
7.5.2 Adverbs of Quantification and Kind-Predication

According to the current view (Chierchia 1998, a.o.), generic sentences built with names of kinds, e.g., (55a), repeated below, are to be represented as shown in (55’):

(55)  a. Les chats sont intelligents.
   the cats are intelligent
   ‘Cats are intelligent.’

(55’) a. GENx (x is an instantiation of ^cats) [x is intelligent]

In this representation, the name of kind (or more precisely the maximal intensional sum of cats, notated ^cats, which is obtained by applying the Down operator ^ to the plural property cats) has been shifted to the set of atomic individuals that realize the kind and the GEN operator binds a variable that ranges over those individuals. This type-shifting operation might be motivated by the need to adjust the denotation of the subject to the denotation of the main predicate: the main predicate expresses a property of individuals, whereas the subject refers to a name of kind. Note however that this motivation is rather weak, given that according to Chierchia, bare plurals are not really names of kinds (as they are for Carlson (1977a, c)) but rather intensional maximal sums of individuals and therefore no sortal conflict arises between the subject and the predicate. Moreover, this analysis cannot be extended to examples such as (54), repeated in (56) below, which are built with kind-referring mass DPs:

(56)  a. L’eau est liquide la plupart du temps.
      The water is liquid the majority of the time
      ‘Water is liquid most of the time’

b. L’or est souvent jaune.
   the gold is often yellow
   ‘Gold is often yellow.’
Given the analysis of kind-referring plural DPs sketched above, the LF representations of (56)a–b would be of the type in (56’):

(56’) GENX (X is an instantiation of $^\wedge$water) [X is liquid]

In (56’) $^\wedge$water notates the maximal intensional sum of water, obtained by applying the Down operator $^\wedge$ to the mass property water. We use capitals in order to notate variables that range over non-atomic entities, in this case, over amounts or portions of water. GEN quantifies over the portions that instantiate the maximal intensional amount of water.

The problem is that LFs of the type in (56’) are ruled out by the Individuation Constraint on Quantification, since in (56’), X ranges over elements ordered by the part-whole relation.

We are thus led to conclude that the possibility of the generic readings of definite mass nouns vs. the impossibility of the generic readings of indefinite/bare mass nouns cannot be explained by the current analysis of generic sentences and of mass quantification.

In order to solve this problem, we may adopt Higginbotham’s (1994) analysis of mass quantifiers. According to Higginbotham, mass quantifiers denote relations between objects (unlike count quantifiers, which denote relations between sets).

(57) Mass quantifiers denote relations between objects.

Higginbotham proposes to associate the FL in (58’) to examples like (58):

(58) a. All gold is yellow.
    b. Most water is liquid.

(58’) a. ALL$_{mass}$ (σx. gold(x), σx. yellow(x))
    b. MOST$_{mass}$ (σx. water(x), σx. liquid(x))

In (58’), σ is the sigma operator, the maximalizing operator that applies to a set and picks up the maximal element in that set. Sigma is comparable to Chierchia’s (1998) Down operator. According to (58’)a–b, mass quantifiers denote relations between two objects, more precisely two maximal sums, e.g., the maximal sum of

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32 On the use of the Down operator in the analysis of kind-referring mass nouns, see Dayal (2004). Chierchia himself uses the Down operator only for kind-referring plural DPs, e.g., bare plurals in English.

33 Quantification over amounts (or portions) of substance is assumed, implicitly or explicitly, by most theorists of mass quantification. Thus, according to Gillon (1992: 632), in examples of the type Most water is liquid, ‘[the quantifiers] range over elements in […] the greatest aggregate in the domain of discourse of which the mass noun is true.’ This type of analysis may be adequate if the pragmatic context makes obvious a certain partition of water, e.g., there are five buckets of water, three of which containing liquid water and the other two frozen water. But note that the partition provided by the pragmatic context allows the mass noun to function as a count noun. In other words, this is a case of covert mass-to-count coercion.
gold in the world and the maximal sum of yellow stuff in the world. The formal analysis of mass quantifiers is quite complex and cannot be presented here. Crucial for our present concerns is only the fact that under Higginbotham’s (1994) analysis, the restriction of mass quantifiers is not filled with a set but rather with an object, a maximal sum (see $\sigma x. \text{gold}(x)$ and $\sigma x. \text{water}(x)$ in (58')), which can be measured: in order to assign a truth value to (58'b) we compare the measure of the maximal sum of portions of water with the measure of the maximal sum of portions of liquid water. Crucially, in order to evaluate LFs of the type in (58'), we need to know the size of the object in the restriction of the quantifier but we do not need to count the number of parts of that object under a given partition.

This analysis explains why Q-adverbs allow kind-referring mass DPs in their restriction: kind-referring mass DPs are maximal intensional objects and the Q-adverb tells us what proportion of the kind satisfies the main predicate (in other words, the Q-adverb compares the size of the kind with the size of the part of it that satisfies the main predicate).

Turning now to Q-adverbs built with kind-referring plural terms (English bare plurals and French definite plurals), we may extend Higginbotham’s (1994) analysis of mass quantifiers to quantifiers over plural domains:

(59) Cats are intelligent.
(59') GEN$_{mass}$ $(\sigma x. \text{cats}(x), \sigma x. \text{intelligent}(x))$

The only difference between mass quantification over mass and plural domains is the measure unit that is used in order to evaluate the relevant LFs: since number is inherent to plural domains, the default measure unit for plural domains is number.

### 7.6 Conclusions

Summarizing, the generic reading of indefinites depends on an LF representation in which a Q-adverb binds the variable supplied by the indefinite. These configurations, in which the quantifier denotes the relation between two sets, are legitimate with singular indefinites and plural indefinites built with symmetric nouns because such indefinites supply variables over elements that are not ordered by the part-whole relation. Mass indefinites and plural sortal indefinites cannot receive generic readings because these indefinites supply variables over elements ordered by the part-whole relation, which cannot be bound by a Q-adverb (ICQ). Adverbial quantification is compatible with plural and mass definites (or names of kinds) because these expressions refer to objects that can be measured and therefore mass quantification can apply. In these cases, overt or covert Q-adverbs are analyzed as mass quantifiers.
Chapter 8
Dependent Indefinites in Donkey Sentences

Indefinite DPs occurring in the so-called ‘donkey sentences’ are interpreted as universally rather than as existentially quantified. In order to account for this old observation, Heim (1982) and Kamp (1981) proposed that indefinites are to be analyzed as free variables that get bound, depending on the context, either by an adverb of quantification (as in donkey sentences) or by existential closure. This proposal constitutes an important step towards a solution of the puzzles related to donkey sentences but is confronted with the so-called ‘proportion’ problem. We will therefore be led to depart from the DRT analysis of indefinites and assume instead Steedman’s (2003) view according to which indefinite DPs occurring in donkey sentences should be analyzed as dependent referential terms.

Pursuing the line of analysis adopted in previous chapters, we show that once we implement dependency relations in functional terms, we can account for donkey sentences without resorting to an analysis in terms of scope. By treating both indefinite DPs and pronouns occurring in donkey sentences as functional terms, this approach will be shown to provide a solution to the proportion problem.

8.1 Dependency and Donkey Sentences

8.1.1 Indefinite DPs and Universal Quantification

Sentences like (1) and (2), originally discussed in medieval texts and subsequently examined in detail by Geach (1962), are known as ‘donkey sentences’:

(1) Every farmer who owns a donkey beats it.
(2) If a farmer owns a donkey, he beats it.
These sentences raise two interrelated problems. The first one is that the indefinite DPs \textit{a donkey} in (1) and \textit{a farmer} and \textit{a donkey} in (2) are construed as universally quantified rather than as existentially quantified DPs. According to Geach (1962), the sentences in (1) and (2) have the LFs in (3):

\[(3) \forall x \forall y ((\text{farmer}(x) \land \text{donkey}(y)) \rightarrow \text{beat}(x,y))\]

In this representation, the indefinite DPs in (1) and (2) are translated as universal quantifiers and the pronouns \textit{it} in (1) and \textit{he} and \textit{it} in (2) are analyzed as bound variables: both \(x\) and \(y\) in the consequent of (3) are bound by the universal quantifiers \(\forall x \forall y\), which take scope over the implication. The first problem with this account is that indefinite DPs are analyzed, depending on the context, either by means of existential quantification, as illustrated by the LF in (4'), or by means of universal quantification, as in (3) above.

\[(4) \text{ John saw a donkey.}\]
\[(4') \exists x (\text{donkey}(x) \land \text{saw}(\text{John},x))\]

The second problem raised by the analysis in (3) is a syntax-semantics mismatch: the pronouns \textit{he} and \textit{it} in (1) and (2) are interpreted as bound by their respective antecedents, \textit{a farmer} and \textit{a donkey}, but they are not c-commanded\(^1\) by those antecedents; in other words, donkey pronouns are peculiar in that they are outside the scope of their antecedent. In (1), the indefinite DP \textit{a donkey} is embedded in a relative clause and therefore does not c-command the pronoun \textit{it} occurring in the main clause. Likewise, in (2), the indefinite DPs \textit{a farmer} and \textit{a donkey} do not c-command the pronouns \textit{he} and \textit{it} in the main clause, as they are embedded in a conditional clause.

Summarizing, there are two properties that characterize donkey sentences: (i) the presence of an indefinite DP interpreted as a universal quantifier; (ii) the presence of a pronoun that is analyzed as a variable bound by the universal quantifier corresponding to the indefinite DP but is not c-commanded by it.\(^2\) These sentences thus raise two intertwined questions, which concern the quantificational force of the indefinite DP and the status of the pronoun. What are the conditions on the universal quantifier?

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\(^1\)We will not discuss the details of the debate concerning the precise definition of c-command. The only relevant point here is the fact that the indefinite DPs, which are the antecedents of these anaphoric pronouns, appear in a position that does not allow binding: cf. Every man, loves his, mother vs. *His, mother loves every man;*

\(^2\)According to Heim (1982), we may talk about donkey sentences only for examples that are characterized by both of these two properties. Which means that the following sentences, though apparently similar, are in fact different:

\[(i) \text{ If someone lives in Paris, he does not live outside the capital.}\]
\[(ii) \text{ Someone who lives in Paris does not live outside the capital.}\]

While (i) is a donkey sentence, (ii) is not, because there is no anaphoric pronoun outside the relative clause. Other authors, e.g., Steedman (2003), adopt a less strict view, considering that only one of these conditions needs to be satisfied.
reading of an indefinite DP and what is the analysis of the pronoun? Both of these questions arise if we assume that indefinite DPs are to be analyzed as quantified expressions. It is however clear that indefinite DPs differ from other quantified expressions in more than one respect. In particular, it can be shown that there is a genuine difference between indefinite DPs and universally quantified DPs with respect to anaphoric processes (cf. Chierchia 1995c:2–10). In (1) and (2) for example, the indefinite DP *a donkey* cannot be replaced with quantified DPs built with *every, each* or *no*.

(5) a. *Every farmer who owns every/each/no donkey beats it.
(6) a. *If a farmer owns every/each/no donkey, he beats it.

Likewise, the indefinite DP *a farmer* in (2) cannot be replaced with *every farmer*. Indeed, (7) is not a possible paraphrase of the sentence in (2):

(7) ??If every farmer owns a donkey, he beats it.

If we abandon the hypothesis that indefinite DPs are quantified expressions, we are no longer confronted with the scope problem either: since the indefinite DP is not analyzed as a quantified expression, the pronoun is not analyzed as a variable bound by a quantifier and as such, it need not be in the c-command domain of the quantifier.

### 8.1.2 Indefinite DPs, Free Variables and Unselective Binding

Kamp (1981) and Heim (1982) argued in favor of an analysis of indefinite DPs in donkey sentences as free variables rather than as quantified expressions. On this view, (i) indefinites do not have any inherent quantificational force, (ii) the quantificational force of indefinites is provided by the first binder available in the sentence; this is a case of unselective binding of a free variable by a quantifier present in the context, (iii) a Q-binder introduces a tripartite structure of the form Q (A) [B], where A is the restriction of the quantifier Q, and B, its nuclear scope and (iv) a rule of existential closure assigns default existential force to unbound indefinite DPs.

According to this analysis, indefinites have a default existential value. This is illustrated in (8), where the indefinite DP *a man* contributes a free variable and the condition *man* on that variable. Applying rule (iv) to the resulting formula, we obtain (8′), where the free variable *x* supplied by the indefinite is existentially bound.

(8) A man is smoking.
(8′) \( \exists x \ (\text{man}(x) \land \text{smoke}(x)) \)

In certain contexts, however, indefinite DPs may acquire values other than existential. For instance, in *when/if*-clauses, indefinite DPs can be indirectly
bound by adverbs of quantification such as *rarely* ((9a)) or *sometimes* ((9b)), translated as FEW and SOME in the Logical Forms given in (9’) a–b:

(9)  
   a. Rarely, when a man owns a donkey, he beats it.
   b. Sometimes, when a man owns a donkey, he beats it.

(9’)  
   a. FEWx,y (man(x) ∧ donkey(y) ∧ own(x,y)) [beat(x,y)]
   b. SOMEx,y (man(x) ∧ donkey(y) ∧ own(x,y)) [beat(x,y)]

This analysis is reminiscent of Lewis (1975), who was concerned with examples of the type in (10), which show that the variables supplied by indefinites can be bound not only by adverbs of quantification but also by quantificational determiners (see also (1) above).

(10)  
   a. Usually/often/sometimes, if an Italian affords to drink, he is happy.
   b. Most/many/some Italians who afford to drink are happy.

In the absence of an explicit quantificational adverb in an *if/when*-clause, a generic operator GEN is introduced by default:

(11)  If John owns a donkey, he beats it.

(11’) GENX (donkey(x) ∧ own(John,x)) [beat(John,x)]

The major advantage of this kind of analysis (currently referred to as the DRT analysis) is that it abandons the idea that indefinite DPs are quantified expressions. As a consequence, the anaphoric relation between the pronoun and its indefinite antecedent in donkey sentences is no longer problematic. More specifically, the pronouns in donkey sentences are analyzed as instances of free variables, indirectly bound by the quantifier binding the indefinite DP. The scope problem observed by Geach disappears because the quantifier c-commands both the indefinite DP and the pronoun and therefore can bind both of them.

Thus although indefinite DPs are not themselves analyzed as quantified expressions, they end up being interpreted as quantificational expressions at the end of the evaluation procedure. There are three ways in which the variable introduced by an indefinite DP can be bound: (i) by existential closure, in which case the indefinite acquires an existential reading, (ii) by a quantifier introduced by the DP on which the indefinite depends (*every farmer* in (1)), in which case the indefinite receives a universal reading and (iii) by the quantification associated with the *if*-operator, as in (2), which, once again, yields a universal reading of the indefinite DP.3

Summarizing, the indefinite DPs in donkey sentences are always associated with logical formulas where a quantifier binds the variables that the indefinites introduce. However, an analysis of this kind cannot account for all possible scenarios.

3If there is a Q-adverb in the main clause of the *if/when* clause, we do not get universal quantification but e.g., proportional quantification as in (i):

(i) When an Italian drinks, he is rarely sad.
The unselective binding hypothesis advocated by Kamp and Heim predicts that in a sentence like (12), the generic operator GEN quantifies over \(<\text{farmer}, \text{donkey}>\) pairs.

(12) If a farmer owns a donkey, he beats it.

\[(12') \text{GEN}_{x,y} (\text{farmer}(x) \land \text{donkey}(y) \land \text{own}(x,y)) [\text{beat}(x,y)]\]

Yet, in addition to these so-called symmetric readings, several authors (Partee (1984), Kadmon (1987), Kratzer (1995), among others) have pointed out the existence of so-called asymmetric readings, which Kamp and Heim cannot account for. This is known as the proportion problem.

### 8.1.3 Symmetric and Asymmetric Readings of Donkey Sentences

The proportion problem arises for DRT analyses of donkey sentences as soon as we consider situations in which some farmers own more than one donkey. Does (13) mean that each farmer beats each of the donkeys he owns or that he beats at least one of his donkeys?

(13) a. Every farmer who owns a donkey beats it.

b. If a farmer owns a donkey, he beats it.

Certain authors, e.g., Cooper (1979) argue that sentences of this kind only refer to farmers that own a single donkey; they do not say anything about other farmers. But the LF in (12'), which Kamp and Heim propose for sentences like (13), does not allow this restriction to farmers that own only one donkey. (12') quantifies over \(<\text{farmer}, \text{donkey}>\) pairs, which means that for each farmer who owns more than one donkey, we will have as many pairs as the number of donkeys he owns. Thus, ten donkeys owned by the same farmer count ten times more than one donkey owned by one farmer.

The issue of what and how we count is even more relevant for sentences like (14), built with the quantifier \textit{most}:

(14) Most farmers who own a donkey beat it.

The question that (14) raises is whether the counting should take into account \(<\text{farmer}, \text{donkey}>\) pairs, in which case there is a one-to-one mapping between farmers and donkeys, or introduce an asymmetry between the two sets. Let us imagine there are only three farmers in the universe: one that owns one hundred donkeys and beats them all and two others who own one donkey each but neither beats his donkey. If we consider \(<\text{farmer}, \text{donkey}>\) pairs, we obtain one hundred and two pairs and the sentence in (14) is true. But if we count only the farmers, the sentence in (14) is false: only one out of three farmers beats his donkeys.

A sentence like (14) can thus yield three distinct readings, according to whether we consider \(<\text{farmer}, \text{donkey}>\) pairs, only the farmers (who own a donkey), or only the donkeys (that each farmer owns). The first case gives rise to a symmetric reading...
Dependent Indefinites in Donkey Sentences (cf. (15a)) and the last two cases give rise to asymmetric readings. We further distinguish between a subject-asymmetric reading, illustrated in (15b) and an object-asymmetric reading, in (15c). The LFs corresponding to these three readings are given in (15) below.

\[(15) \quad \begin{align*}
&\text{a. } \text{MOST}x,y \ (\text{farmer}(x) \land \text{donkey}(y) \land \text{own}(x,y)) \ [\text{beat}(x,y)] \\
&\text{b. } \text{MOST}x \ (\text{farmer}(x) \land \exists y \ (\text{donkey}(y) \land \text{own}(x,y))) \ [\text{beat}(x,y)] \\
&\text{c. } \text{MOST}y \ (\text{donkey}(y) \land \exists x \ (\text{farmer}(x) \land \text{own}(x,y))) \ [\text{beat}(x,y)]
\end{align*}\]

According to the unselective binding hypothesis advocated by Kamp (1981) and Heim (1982), the sentence in (14) has the representation in (15a), where the indefinite DP *a donkey* introduces a free variable y, which is bound by the unselective quantifier *most*. The unselective binding hypothesis does not predict the existence of asymmetric readings because the LFs in (15b–c) cannot be obtained via unselective binding. These LFs are moreover problematic because of the binding of the pronoun: the existential quantifiers that occur in the restriction do not c-command the variables y in (15b) and x in (15c), which occur in the nuclear scope ([\text{beat}(x,y)]).

The choice between the three possible readings (symmetric, subject-asymmetric and object-asymmetric) is determined by different factors, which have been discussed by Heim (1982), Kadmon (1987), Rooth (1985) and Kratzer (1995), among others. Rooth (1985) and Kadmon (1987), for instance, have shown that in English, different readings obtain depending on whether the indefinite DPs in the antecedent of a conditional are stressed or not. Thus, while (16a) gives rise to a subject-asymmetric reading, glossed as in (16b), (17a) gives rise to an object-asymmetric reading, glossed as in (17b).

\[(16) \quad \begin{align*}
&\text{a. } \text{If a farmer owns a DONkey, he usually beats it.} \\
&\text{b. } \text{Most of the farmers who own a donkey beat it.}
\end{align*}\]

\[(17) \quad \begin{align*}
&\text{a. } \text{If a FARmer owns a donkey, he usually beats it.} \\
&\text{b. } \text{Most of the donkeys that belong to a farmer are beaten by this farmer.}
\end{align*}\]

In (16a), the counting does not concern the *<farmer, donkey>* pairs but rather the farmers who own donkeys. Each farmer is counted once, regardless of whether he owns one or more donkeys. By contrast, in (17a), the counting concerns the donkeys (that are owned by the farmers).

Kratzer (1995) showed that, in addition to intonation and information structure, other parameters such as unaccusativity, type of predicate (stage-level or individual-level), scrambling, or the presence/absence of anaphoric pronouns in the consequent, can influence the preferred reading. For instance, when two indefinite DPs and no pronoun are present in the antecedent of a conditional as in (13b), there is a preference for the symmetric reading, whereas when there is one anaphoric pronoun in addition to the two indefinite DPs in the antecedent, the asymmetric reading is...

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4The stressed syllables are written in capitals.
favored, as in (18)–(19), due to Comorovski (1997), where the object-asymmetric reading is the preferred reading.

(18) When an article on his private life harms a politician, he usually tries to get it censored.
(19) If a picture depicting him flatters a politician, he usually tries to get it published.

In (18) and (19), usually quantifies over politicians, not over articles or pictures. Chierchia (1995c) suggests that there are interesting contrasts between donkey sentences with relative clauses (13a) and donkey sentences with conditionals (13b). More precisely, the former involve quantification over the individuals denoted by the head of the relative (i.e., farmers in (13a)). For this type of donkey sentences, the symmetric and object-asymmetric readings are unavailable.

An additional problem comes from the fact that asymmetric readings can be further divided into weak and strong readings (cf. Rooth, 1987 and Comorovski 1999 among others). On a weak reading, the sentence makes reference to those farmers who beat at least one of their donkeys, as illustrated by the LF in (20a). On a strong reading, the sentence refers to the farmers who beat all their donkeys, as illustrated by the LF in (20b).

(20) a. MOSTx (farmer(x) Ú ∃y (donkey(y) Ú own(x,y))) [∃y (donkey(y) Ú own(x,y) Ú beat(x,y))]
b. MOSTx (farmer(x) Ú ∃y (donkey(y) Ú own(x,y))) [∀y ((donkey(y) Ú own(x,y)) → beat(x,y))]

The example in (18) above can be analyzed in a parallel way. On a strong asymmetric reading, the sentence means that a politician tries to censor all the articles on his private life that harm him. By contrast, on a weak asymmetric reading, it means that a politician tries to censor one of the articles on his private life that harms him.

In sum, DRT analyses cannot account for the asymmetric readings of donkey sentences and a fortiori they cannot capture the difference between their weak vs. strong interpretations.

8.2 Dependent Indefinites

In what follows, we will develop a different analysis of donkey sentences, which provides a solution to the problems mentioned above. Following Steedman (2003), donkey indefinites will not be treated as variables bound by a quantifier but rather as dependent referential expressions. Likewise, the anaphoric pronoun will not be analyzed as the second occurrence of a variable bound by a quantifier but rather as a discourse pronoun co-referring with a dependent referential term.

Dependent referential terms will be represented as Skolem terms, notated f(x), i.e., as individuals obtained by applying a Skolem function to a variable that ranges over individuals. Skolem functions are used in logical representations in order to
eliminate existential quantifiers. In case an existential quantifier is not in the scope of any quantifier, it is deleted and the variable bound by it is replaced by a constant. In case the existential quantifier is in the scope of another quantifier, it is deleted and the variable bound by it is replaced by a Skolem term notated f(x). Thus, after Skolemization, a formula such as $\forall x \exists y P(x,y)$ becomes $\forall x P(x, f(x))$.

### 8.2.1 Dependency on a Situation

In the previous chapter, we have seen that generic quantification over individuals should be distinguished from generic quantification over situations or events:

(21) A dog has four legs.
(22) When John invites a friend, he (always) cooks dinner.

The sentence in (21) has the representation in (21'), in which the default GEN operator quantifies over individuals (i.e., dogs):

(21') GENx (dog(x)) [have-four-legs(x)]

The generic reading of (22), on the other hand, comes about as the result of quantification over situations: *always* translates as a universal quantifier over the situations described by the *when*-clause (which functions as the restrictor of the quantifier)⁵:

(22') $\forall e \ (invite(e, John, f(e)) \land friend(f(e)))$ [cook-dinner (e, John)]

The generic reading of the indefinite is not due to quantification over friends but rather to a representation in which the adverb quantifies over situations in which John invites a friend. It is the dependency on situations that is responsible for the pseudo-generic reading of the indefinite DP. This dependency is represented in functional terms in (22'), where the value of the indefinite *a friend* depends on the inviting event; f(e) is a referential term, whose denotation varies depending on the value of e. The representation in (22') can be paraphrased as in (23):

(23) Every time John invites a friend, he cooks dinner.

It should be stressed that the analysis in (22') goes against DRT type analyses according to which the variables supplied by indefinites are bound by unselective quantificational adverbs; on our analysis, they are referential terms (represented as Skolem terms) dependent on situations that are quantified over by a Q-adverb.

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⁵The LF in (22'), as well as other LFs in this chapter, is imprecise insofar as it does not explicitly indicate that the events in the restriction and in the nuclear scope are not identical but rather overlapping sub-events. This simplification does not affect the main argument.
Consider now (25), in which the matrix clause contains a pronoun that picks up the same referent as the situation-dependent indefinite:

(25) When John invites a friend, he cooks dinner for her.

The pronoun *her* in (25) refers to the same individual as the functional term \( f(e) \), i.e., the friend that John invites in situation \( e \). This interpretation is associated with the LF in (25'), where the first two occurrences of \( f(e) \) correspond to the dependent indefinite *a friend*, whereas the third corresponds to the pronoun *her*.

(25') \[ \text{GEN}e \text{ (invite (}e, \text{ John, } f(e) \text{) } \& \text{ friend (}f(e)\text{))} \]

\[ \text{[cook-dinner (}e, \text{ John, } f(e)\text{)]} \]

In (25'), the referential term \( f(e) \) is dependent on inviting events \( e \) and as such \( f(e) \) is indirectly bound by the GEN operator (GEN is supplied by default whenever no overt Q-adverb is present in the matrix clause associated with a *when*-clause), which quantifies over inviting events.

Any occurrence of \( f(e) \) bound by the GEN operator must be in its scope. This analysis correctly predicts that the use of an anaphoric pronoun further in the discourse is ungrammatical.\(^6\)

(26) When John invites a friend, he cooks dinner for her. *She enjoys it.

In (26), the pronoun *she*, which is anaphoric on the dependent indefinite DP, should be translated as \( f(e) \). But this occurrence of \( f(e) \) appears outside the scope of GEN; \( e \) is thus free and, as a result, the term \( f(e) \) that translates *she* cannot be interpreted as situation-dependent.

The analysis of the indefinites as dependent referential terms solves the problem raised by anaphoric pronouns in donkey sentences. According to the traditional logic account, indefinites are quantified expressions and anaphoric pronouns are variables bound by the quantifier that these expressions introduce. This approach leads to the well-known problem, first observed by Geach (1962) and later readdressed in the literature: a supposedly quantified DP (*a friend* in (25)) seems to bind a variable (*her*), which it does not c-command. On the analysis adopted here, this problem does not arise because dependent indefinite DPs are not treated as quantified expressions but rather as dependent referential terms. The referential nature of the dependent indefinite explains why it can co-refer with a pronoun occurring outside the minimal clause containing the indefinite. Moreover, the fact that the indefinite is dependent on an event explains why the anaphoric pronoun

\(^6\)For some speakers, the sequence in (26) is grammatical and has the same reading as the sentence in (i).

(i) When John invites a friend, he cooks dinner for her and she enjoys it.

On this reading, the example is acceptable because *she* appears in the matrix of the *when*-clause, i.e., in the scope of GEN.
must occur in the scope of the quantifier over events. Crucially, the pronoun need not be c-commanded by the indefinite DP itself but instead must be c-commanded by the operator that quantifies over the events on which it depends.

### 8.2.2 Dependency on a Quantified DP

An indefinite DP can be dependent on a quantified DP. In (27), for example, the indefinite expression *a donkey* is dependent on the quantified DP *every farmer*. This dependency can also be represented by means of a functional term (see \( f(x) \) in (27')).

(27) Every farmer who owns a donkey is rich.

(27') \( \forall x \left( \text{farmer}(x) \land \text{own}(x, f(x)) \land \text{donkey}(f(x)) \rightarrow \text{rich}(x) \right) \)

The reference of the indefinite *a donkey*, translated as \( f(x) \), depends on the value associated with the variable \( x \), which is bound by the universal quantifier corresponding to *every farmer*. As indicated by the fact that (27) cannot be paraphrased as in (28) below, the indefinite *a donkey* is clearly not a universally quantified expression.

(28) Every farmer who owns every donkey is rich.

Since it acts as a referential element, a functional term can serve as an antecedent for discourse anaphora. Accordingly, a functional term can have more than one occurrence within the same formula. This is precisely the case of donkey sentences such as (1), repeated here as (29) and translated as (29'):

(29) Every farmer who owns a donkey beats it.

(29') \( \forall x \left( \text{farmer}(x) \land \text{own}(x, f(x)) \land \text{donkey}(f(x)) \rightarrow \text{beat}(x, f(x)) \right) \)

The indefinite *a donkey* translates as the functional term \( f(x) \) in the representation in (29'), in which the Skolem function \( f \) assigns a different donkey to each farmer \( x \). The indefinite DP serves as an antecedent for the anaphoric pronoun *it*, which is associated with the third occurrence of \( f(x) \) in (29').

As already observed above in connection with the example in (26), with an event-dependent indefinite, any occurrence of \( f(x) \) must be in the scope of the quantifier that binds \( x \). Hence the ungrammaticality of the second sentence in (30), where the anaphoric pronoun is outside the scope of *every*:

(30) Every farmer who owns a donkey beats it. *It is maltreated.

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7 Besides *if/when* clauses, quantification over events and correlative dependency of participants on the event may be triggered by modal and intensional verbs or tenses such as the generic present. All the examples paraphrasable by “in all events in which…” involve quantification over events and dependency of the participants on the event.
Let us insist on the fact that the relation between a donkey and it in (29) should be kept distinct from the type of relation illustrated in (31) and represented in (31’), between a quantified DP and a bound variable:

(31) Every farmer says that he is happy.
(31’) ∀x [farmer(x) → x says that x is happy]

In (31), he is interpreted as a variable bound by the universal quantifier; in (31’), he corresponds to the second occurrence of the variable x in the consequent of (31’).

In (29), on the other hand, it is an anaphoric pronoun whose antecedent is a referential term dependent on a quantified DP (a donkey, which depends on every farmer). Both the antecedent indefinite DP and the donkey pronoun are notated f(x), which corresponds to the donkey(s) owned by the farmers x.

We can thus distinguish two types of pronouns: (i) pronouns that function as bound variables, which must be in the scope of the quantifier that binds them and (ii) pronouns that are anaphoric on a dependent indefinite DP. It is this latter kind of pronouns that are called ‘donkey pronouns’.

8.3 Dependency and Proportion

8.3.1 Symmetric and Asymmetric Readings

The so-called ‘proportion problem’ can be accounted for in terms of dependency relations. Let us consider the sentence in (32), which contains more than one dependent indefinite DP: a donkey and a farmer.

(32) If a farmer owns a donkey, he usually beats it.

As already observed in Sect. 8.1.3, the sentence in (32) is ambiguous. On its symmetric reading, both indefinite DPs are represented as Skolem terms (f(e) and g(e), which respectively correspond to a farmer and a donkey), which depend on the event variable introduced by the conditional clause and bound by MOST, corresponding to the quantificational adverb usually.

(32’) a. MOSTe (own(e) ∧ Agent(e, f(e)) ∧ farmer(f(e)) ∧ Theme(e, g(e))
∧ donkey(g(e))) [beat (e, f(e), g(e))]

According to this representation, the adverb of quantification quantifies over events and indirectly over pairs of farmers and donkeys. The two indefinite DPs depend on the situation e but are independent with respect to each other, which explains why the interpretation is ‘symmetric’.

(32’a) has the same truth-conditions as the LF in (33a), which relies on the hypothesis that the Q-adverb quantifies over pairs of individuals, along the lines of Lewis (1975) and DRT analyses.
Besides the symmetric reading, (32) can also have asymmetric readings, arising when there is a dependency between the indefinite DPs. There are two different asymmetric readings, according to whether the subject depends on the object or vice versa.

On the subject-asymmetric reading, a donkey is dependent on the indefinite DP a farmer, which is itself dependent on the situation e. Consequently, a farmer, which is situation-dependent, is represented in (32'b) by the Skolem term f(e) and a donkey, which exhibits a double dependency, is represented by the Skolem term g(f(e)), where the function g marks the dependency of a donkey on a farmer and the function f marks the dependency of a farmer on the situation:

\[ (32'\text{b}) \quad \text{MOSTe} (\text{own}(e) \land \text{Agent}(e, f(e)) \land \text{farmer}(f(e)) \land \text{Theme}(e, g(f(e))) \land \text{donkey}(g(f(e))) \land \text{beat}(e, f(e), g(f(e))) \]  

The formula in (32'b) is equivalent to that in (33b), where the dependency on the situation is not explicitly marked and the dependency of one DP on the other is marked in functional terms.

\[ (33) \quad \text{MOSTx} (\text{farmer}(x) \land \text{donkey}(f(x)) \land \text{own}(x,f(x))) \land \text{beat}(x,f(x)) \]  

As for the object asymmetric reading, it corresponds to the case where the indefinite DP a farmer is dependent on the indefinite a donkey, which is itself dependent on the situation. This time, it is the DP a farmer that exhibits a double dependency: it depends on a donkey, which depends on the situation:

\[ (32'\text{c}) \quad \text{MOSTe} (\text{own}(e) \land \text{Agent}(e, g(f(e))) \land \text{farmer}(g(f(e))) \land \text{Theme}(e, f(e)) \land \text{donkey}(f(e)) \land \text{beat}(e, g(f(e)), f(e))) \]  

The formula in (32'c) can be simplified by leaving the dependency on the situation implicit, as in (33c):

\[ (33) \quad \text{MOSTy} (\text{farmer}(f(y)) \land \text{donkey}(y) \land \text{own}(f(y),y)) \land \text{beat}(f(y),y) \]  

### 8.3.2 Weak and Strong Asymmetric Readings

As already observed in Sect. 8.1.3, asymmetric readings can be either ‘weak’ or ‘strong’. We must thus distinguish between the two subject-asymmetric interpretations of the example in (32), repeated below in (34), which would correspond respectively to the LFs in (35a) and (35b):

\[ (34) \quad \text{If a farmer owns a donkey, he usually beats it.} \]
(35)  a. MOSTx (farmer(x) ∧ ∃y (donkey(y) ∧ own(x,y)))
    [∃y (donkey(y) ∧ own(x,y) ∧ beat(x,y))]
  
  b. MOSTx (farmer(x) ∧ ∃y (donkey(y) ∧ own(x,y)))
    [∀y ((donkey(y) ∧ own(x,y)) → beat(x,y))]

In both cases, the indefinite DP *a donkey* depends on the indefinite DP *a farmer*. By representing dependent indefinites as Skolem terms rather than as existentially closed variables, the LFs in (35a–b) can be rewritten as in (36a–b):

(36)  a. MOSTx (farmer(x) ∧ donkey(f(x)) ∧ own(x,f(x)))
    [∃y (donkey(y) ∧ own(x,y) ∧ beat(x,y))]
  
  b. MOSTx (farmer(x) ∧ donkey(f(x)) ∧ own(x,f(x)))
    [∀y ((donkey(y) ∧ own(x,y)) → beat(x,y))]

In order to account for the weak and strong asymmetric interpretations, Comorovski (1999) draws on insights from Lappin and Francez (1994), who suggested that the function f, which establishes the dependency between the two DPs *a farmer* and *a donkey*, instead of ranging over atomic individuals, here the set of donkeys, ranges over a set that contains not only atomic but also plural individuals. So f(x) may be either one or several donkeys. In other words, f(x) corresponds to either the donkey that the farmer x owns, or the donkeys that the farmer x owns. On a strong asymmetric reading, f maps every farmer x onto the maximal sum of donkeys that x owns. On a weak reading, f maps every farmer x onto the sum of the donkeys that x beats and only those donkeys. In the case where a farmer does not beat all of his donkeys, this plural entity is different from the maximal sum of donkeys that x owns. In other terms, the weak and strong asymmetric readings of (34) are analyzed as two pragmatic versions of the same LF representation, (36c). Note that this representation is identical to that in (33b), the only difference being that the predicates *donkey*, *own* and *beat* are starred, which indicates that their arguments may be either atomic or plural entities.

(36)  c. MOSTx (farmer(x) ∧ donkey*(f(x)) ∧ own*(x,f(x))) [beat*(x,f(x))]

Krifka (1996) tried to show that the preference for a weak/strong reading is due to certain semantic or lexical parameters. However this is not totally correct. Even if the type of predicate – eventive versus non-eventive (cf. von Fintel (1994)) or partial versus total (cf. Krifka (1996)) – may favor one reading or the other, Dekker (2004) and Steedman (2003) have argued that the problem that these readings pose is not semantic but rather pragmatic. For example, in (37) below, the preference for the weak asymmetric reading is due to our world-knowledge: one person cannot wear several masks at the same time:

(37)  Every person who owns a mask wears it.
8.4 Dependency and Reference

In this section, we focus on the referentiality of dependent indefinite DPs and anaphoric pronouns that occur in donkey sentences. The indefinites in donkey sentences should by no means be analyzed as quantificational expressions, neither as first-order quantifiers (quantifying over individuals) nor as second-order quantifiers (quantifying over functions). Contrary to Comorovski (1999), we have avoided existential quantification over functions \( f \) and followed Steedman (2003) in using Skolem terms\(^8\) (rather than variables over Skolem functions, as Comorovski). With this approach, indefinite DPs in donkey sentences are represented as entity-refering dependent Skolem terms notated \( f(x) \) or \( f(e) \),\(^9\) in which a name of function \( f \) applies to an individual or an event variable, respectively. Their distinctive feature is that they do not have fixed reference; their reference co-varies with the value of the element on which they depend. Skolem terms thus allow us to capture dependency relations.

It is important to note that as far as anaphoric processes are concerned, these dependent indefinites are more like proper names or definite descriptions than like universal quantifiers. Thus, the indefinite DP \( \text{a donkey} \) in donkey sentences is similar to \( \text{Dexter} \) in (38) and differs from a quantified DP like \( \text{every donkey} \) in (39) in that it allows an anaphoric pronoun that it does not c-command either outside the relative clause, as in (a), or further in the discourse, as in (b):

(38)  a. Every person who knows Dexter
b. Adores him.

(39)  a. * John who owns every donkey
b. Adores it.

Moreover, just like definite descriptions, which can serve as antecedents for anaphoric definite descriptions (cf. (40)), dependent indefinites may also serve as antecedents for anaphoric definite descriptions (cf. (41)). By contrast, this is never the case for universally quantified expressions (cf. (42)).

(40)  a. (John’s wife) came. She had forgotten her keys.
b. (John’s wife) came. The poor woman had forgotten her keys.

(41)  a. Every farmer who owns a donkey feeds it.
b. Every farmer who owns a donkey feeds his animal.

(42)  a. Every farmer thinks that he has to feed his donkey.
b. *Every farmer thinks that the poor man has to feed his donkey.

The analysis of dependent indefinite DPs as referential terms explains why, with respect to anaphoric processes, they are closer to proper names or definite descriptions,

\(^8\)Steedman (2003) uses a different notation.

\(^9\)Steedman insists that Skolem terms do not denote functions (a name of function is merely part of their representation) but are referential terms (type e).
which are also of type e, than to quantified expressions, of type $<e,t>,t>$. Nevertheless, because they are dependent terms, these indefinite DPs do not have all the anaphoric properties that proper names or definite descriptions have.

It is furthermore interesting to note that like indefinite DPs, definite DPs such as his mother-in-law or the meal can exhibit a dependent behavior, as illustrated in (43a–b):

\begin{enumerate}
\item When a man does not like his mother-in-law, she does not have an easy life.
\item When a man prepares the meal, it is rarely a success.
\end{enumerate}

### 8.5 Conclusion

In order to solve the problems raised by donkey sentences, various solutions have been proposed in the literature. We have reviewed the limits of a quantificational approach to indefinite DPs in donkey sentences as well as the limits of DRT analyses, for which the asymmetric readings are problematic. These accounts are problematic because they treat indefinite DPs on a par with quantified expressions. We have instead proposed that indefinite DPs in donkey sentences should be analyzed as dependent DPs represented as Skolem terms. This type of analysis accounts for the whole range of available readings (symmetric/asymmetric, weak/strong) and also explains why they cannot serve as antecedents of anaphoric pronouns in examples such as (26) or (30) above.

### 8.6 Appendix

Here we will present two pre-DRT proposals that attempted to solve the problems raised by donkey sentences. The first is due to Egli (1979), who elaborated an algorithm that translates a fragment of English (including DPs headed by every, indefinite DPs, proper names and pronouns) into formulas of predicate logic. Egli’s proposal presents two drawbacks: it predicts some readings that do not exist and it postulates rules of translation for indefinite DPs that are context-dependent. It turns out that this semantics of indefinite DP’s is not compositional (see Sect. 8.1). The second proposal, due to Evans (1980) relies on the idea that pronouns in donkey sentences are not bound pronouns but rather ‘E(vans)-type pronouns’, which are disguised definite descriptions, since they are equivalent to definite descriptions that can be recovered from the context (see Sect. 8.6.1). Cooper (1979) proposed a formal analysis of pronouns, which can be used to account for donkey sentences.

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10For a presentation of three other accounts of donkey sentences, the interested reader is referred to the appendix.
The major problem with Cooper’s proposal is that it predicts too many interpretations due to the fact that the interpretation of the pronoun does not depend on the syntactic environment of the pronoun but on pragmatic factors (see Sect. 8.6.2).

8.6.1 Egli’s (1979) Solution

Egli (1979) argues that in predicate logic, the formulas in (1a) and (1b) are equivalent, as long as there is no free occurrence of $x$ in $\varphi$.

(1)  a.  $(\exists x \, \Phi) \rightarrow \varphi$
    b.  $\forall x \, (\Phi \rightarrow \varphi)$

An existential quantifier in the antecedent of a conditional clause is equivalent to a universal quantifier taking scope over the conditional. This equivalence can explain the universal interpretation of indefinite DPs in donkey sentences if there is no anaphoric pronoun in the consequent. However, since the equivalence in (1) only holds for cases where there is no free occurrence of $x$ in $\varphi$, it cannot account for cases where there is a pronoun in the consequent, which acts as a free variable.

Egli suggests that the logical equivalence in (1) holds in natural language, where the restriction concerning the variables in $\varphi$ does not apply. According to him, it is always possible to replace the existential quantifier in the antecedent of a conditional with a universal quantifier having wide scope over the conditional, regardless of whether or not the consequent contains unbound occurrences of the free variable. His hypothesis is supported by other cases of binding of pronouns that occur outside the scope of their antecedent.

(2)  a.  Somebody left, and he went home.
    b.  Somebody left. He went home.
    c.  Somebody left and went home.

In other words, on Egli’s proposal, there is a mismatch between scope in logic and scope in natural language.

In order to account for the interpretation of indefinite DPs in conditionals, Egli posits the existence of a specific rule, without, however, taking a clear position on the precise nature of this rule. Apparently, it is not a grammatical rule but a rule that applies to an intermediate level, where the meaning of the sentence is computed. For example, in analyzing (3), Egli first builds the intermediate representation (3′a) in which the quantified DP is translated as a universal quantifier that scopes over the implication. He then applies a conversion rule, which turns the existential $\exists$ corresponding to the indefinite DP a donkey into the universal $\forall$ resulting in the representation in (3′b).

(3)  Every farmer who owns a donkey beats it.

(3′) a.  $\forall x [(\text{man}(x) \land x \text{ owns a donkey }) \rightarrow (x \text{ beats it })]$
    b.  $\forall x \forall y [(\text{man}(x) \land \text{ donkey}(y) \land x \text{ owns } y) \rightarrow (x \text{ beats } y)]$
Egli’s solution has several advantages but also a number of shortcomings. One advantage is that it captures the interpretation of examples such as (4a), which cannot be paraphrased as in (4b):

(4)  
- a. One of my friends who owns a donkey beats it.
- b. For each donkey, if one of my friends owns it, then, he beats it.

(4’)  
- a. $\exists x \ (\text{friend-of-mine}(x) \land x \text{ owns a donkey} \land x \text{ beats it})$
- b. $\exists x \ \forall y \ (\text{friend-of-mine}(x) \land \text{own}(x,y) \land \text{donkey}(y) \land \text{beat}(x,y))$

The fact that (4a) cannot be paraphrased as (4b) is due to the nature of the DP on which the relative depends. The DP *one of my friends* (unlike *every farmer* in (3) above) is not a universally quantified DP; rather, it is an indefinite DP that is associated with existential quantification. The sentence in (4a) has the intermediate representation in (4’a). Notice that the conversion rule that transforms the existential $\exists$ corresponding to the indefinite DP *a donkey* into the universal $\forall$ does not apply in this case, because there is no logical implication in (4’a) (contrary to what happens in (3’a)). The representation in (4’b) is obtained by replacing a donkey in (4’a) with a variable bound by an existential quantifier. To sum up, when the DP on which the relative clause depends is not universally quantified, we are not in a *donkey* context anymore.

However, Egli’s solution raises at least two problems. As we have already said, it is not clear what the nature of the rule that converts $\exists \to \forall$ is. It is also unclear why the constraint on the absence of free variables disappears in natural language.

Note moreover that in addition to the equivalence in (1), the equivalence in (5) also holds in predicate logic. According to this equivalence, a universal quantifier can scope out of the antecedent of a conditional once it is assigned an existential value, provided there are no free occurrences of $x$ in $\varphi$:

(5)  
- a. $(\forall x \ \Phi) \rightarrow \varphi$
- b. $\exists x \ (\Phi \rightarrow \varphi)$

The question is why the logical equivalence in (5) does not hold for natural language sentences (possibly with the difference observed for (1) concerning the variables in $\varphi$). Egli observes this difference between predicate calculus and natural language LFs but does not provide an explanation. He points out that binding is not possible in examples such as (6) but does not consider sentences such as (7a), which would come out equivalent to (7b), if the rule in (5) applied. And yet, (7a) and (7b) have clearly different meanings:

(6)  *If every farmer works, he becomes rich.*

(7)  
- a. If every farmer vaccinates his donkey, the disease will not spread.
- b. There is a farmer such that, if he vaccinates his donkey, the disease will not spread.

By changing the notion of scope, Egli treats connectives like $\land$ and $\rightarrow$ as dynamic connectives but this provides only a partial and somewhat *ad hoc* solution to the problem of donkey sentences. Egli’s solution is not entirely satisfactory because he
analyzes indefinite DPs as quantified expressions and it is precisely this assumption that needs to be changed.

### 8.6.2 E-type Analyses

Another way of accounting for donkey sentences is to analyze the pronouns that occur in these contexts not as bound pronouns but as disguised definite descriptions.

#### 8.6.2.1 E-type Pronouns: Evans (1980)

Evans (1980) puts forth a different classification of pronouns. The originality of this approach consists in introducing a novel class of pronouns, which he calls E-type pronouns, where E is the first letter of his name. E-type pronouns are those pronouns whose antecedent is a quantified expression and which are not in the scope of the quantifier that the antecedent introduces. To put it differently, Evans makes a distinction between bound pronouns, which act as variables bound by a quantifier, and E-type pronouns. The pronoun *his* in (8) for example is a bound pronoun and *them* in (9) is an E-type pronoun.

(8) Every man loves his mother.
(9) John owns some sheep and Harry vaccinates them.

There are two tests that distinguish E-type pronouns from bound pronouns. On the one hand, unlike what happens in the case of bound pronouns, the antecedent of an E-type pronoun cannot be replaced with an expression such as *no N*:

(10) a. Every farmer who owns a donkey beats it.
    b. *Every farmer who owns no donkey beats it.
(11) a. Every man loves his mother.
    b. No man loves his mother.

On the other hand, E-type pronouns, but not bound pronouns, have interrogative counterparts:

(11) c. ??Who does every man love? Every man loves his mother.
(12) John owns some sheep and what does Harry vaccinate? John owns some sheep and Harry vaccinates them.

E-type pronouns are reminiscent of Russell’s view of pronouns as abbreviations of complex nominal expressions, which are used instead of full DPs for stylistic reasons. It is however difficult to determine what exactly these pronouns replace. One possibility would be to assume that they replace their antecedent, which would
suffice to copy in order to obtain a paraphrase. It is however rarely the case that we obtain a good paraphrase by replacing the pronoun with its antecedent:

(13)  
   a.  John is tall. He is handsome.  
   b.  John is tall. John is handsome.

(14)  
   a.  A man walks in the garden. He smokes.  
   c.  A man walks in the garden. This man smokes.  
   d.  A man walks in the garden. The man who walks in the garden smokes.

While (13a) and b are equivalent, this is not the case for (14a) and b. We can paraphrase (14a) either by replacing the pronoun with a demonstrative DP, as in (14c), or by reconstructing a definite description, as in (14d).

The problem observed in (14) also appears with E-type pronouns. Substituting the pronoun with its antecedent changes the meaning of the sentence, as shown in (15) and (16).

(15)  
   a.  Every farmer who owns a donkey beats it.  
   b.  Every farmer who owns a donkey beats a donkey.  
   c.  Every farmer who owns a donkey beats (this donkey/the donkey he owns).

(16)  
   a.  John owns some sheep and Harry vaccinates them.  
   b.  John owns some sheep and Harry vaccinates some sheep.  
   c.  John owns some sheep and Harry vaccinates (these sheep/the sheep that John owns).

In these examples, the E-type pronouns were replaced with definite descriptions. This step is intuitively correct but raises several problems. On the one hand, in order to make the procedure compositional, one needs to explain how the definite description is built, a non-trivial task considering that the reference of the noun is always restricted by the relative clause. This is particularly problematic for those sentences where the antecedent of the E-type pronoun is a quantified expression such as someone, as in (17):

(17)  
   a.  If someone lives in Paris, he does not live in London.  
   b.  If someone lives in Paris, this someone does not live in London.  
   c.  If someone lives in Paris, the person who lives in Paris does not live in London.

On the other hand, the reconstructed definite description carries a uniqueness presupposition, which seems counter-intuitive. Consider example (15) again. In (15c), the donkey he owns is a definite description that presupposes that the person in question owns only one donkey. Yet, it seems obvious that the sentence in (15a) does not presuppose that there is no farmer who owns more than one donkey. It also seems difficult to assume that the sentence only refers to those farmers who own a single donkey and does not say anything about the other farmers. Many scholars
have tried to understand what exactly (15a) says about farmers who own more than one donkey. Is the sentence in (15a) appropriate or inappropriate in a context where a farmer owns several donkeys and beats only one? This brings us back to the proportion problem, discussed in Sect. 8.1.3 and Sect. 8.3 above.

Let us return to example (17a) and its version in (17b), where the E-type pronoun was replaced with a definite description. Heim (1982) showed that an E-type pronoun analysis induces the presupposition that there is only one person who lives in Paris, which is untenable. One solution proposed by Davidson, Parsons and others is to say that the uniqueness presupposition is associated with situations/events, rather than with donkeys or inhabitants of Paris. We may then consider a minimal situation where there is only one person living in Paris.

There still remains one problematic case, namely the case of symmetric situations pointed out by van Eijck and Kamp (1997) and illustrated in (18):

(18) a. If a man lives with another man, he shares the desk with him.
   b. If a cardinal meets another cardinal, he blesses him.

These examples are problematic for the minimal situation approach, since the minimal situation in which the sentence is true contains two individuals and therefore the uniqueness presupposition does not hold.

It seems nevertheless quite clear that the pronouns that are used in donkey sentences are E-type pronouns. In the next section, we review the formal implementation of this kind of analysis, due to Cooper (1979).

### 8.6.2.2 A Formal Analysis with Lambda Operators

Cooper (1979) proposed that pronouns should be analyzed as incomplete definite descriptions. This can be formally represented by means of a lambda operator, which abstracts over a free variable denoting an n-ary relation. The value of this n-ary relation, just like the value of the relation holding between the variables \( v_1, \ldots, v_{n-1} \), is determined by the context:

(19) \[ \lambda K \exists x [\forall y [R(v_1, v_2, \ldots, v_{n-1}, y) \leftrightarrow x = y] \land K(x)] \]

This implementation has the advantage of giving a uniform account of pronouns: it accounts for E-type pronouns as well as ordinary pronouns. To allow a pronoun to pick up the same referent as its antecedent, it suffices to empty the content of the R-relation by reducing it to, say, an identity relation. On this view, the representation in (19) is reduced to (20):

(20) \[ \lambda K K(x) \]

This analysis can also account for the so-called *laziness pronouns*, as in (21):

(21) John gave his paycheck to his mistress. Everyone else kept it for himself.
The pronoun *it* in the second sentence corresponds to the definite description *his own paycheck* and can be formally represented by means of a n-ary relation:

\[(22) \; \lambda K \exists x [\forall y \{ \text{paycheck}(v_1, y) \leftrightarrow x = y \} \land K(x)]\]

This kind of account also captures the interpretation of E-type pronouns. Its major drawback is that anaphora resolution is relegated to pragmatics, since it is the job of pragmatics to determine how the n-ary \( R \) relation is instantiated. Moreover, according to this analysis, all pronouns are analyzed in the same way, regardless of whether their antecedent is a proper name, a definite, an indefinite or a quantificational DP. It is important to note that Cooper’s solution is based exclusively on the analysis of pronouns; the representation of the indefinite DP in sentences such as (15a) is taken to be irrelevant. The element that acquires a universal interpretation (see \( \forall \) in the formula in (19)) is not the indefinite DP but the definite description that stands for the pronoun. When the reconstructed definite description is in the singular, *the N W* carries a uniqueness presupposition and when it is in the plural, *the N Ws* reads as *all of the N W*. 
Having reached the end of our investigation of indefinites, which consisted in a series of specific studies (on bare nouns, existential constructions, weak and strong interpretations, scope and genericity), we can provide a short summary of our main results.

**Two Types of Entities: Individuals and Amounts**

In order to characterize indefinites, we need to assume, following Link (1983), an enriched ontological space that contains amounts in addition to individuals (and groups). Just like individuals, amounts are entities but non-individuated ones. Mass indefinites constitute the paradigmatic example of amount-referring expressions: 200 g of butter does not refer to an identifiable entity but rather to an equivalence class, the class of all pieces of butter that weigh 200 g. These pieces are not individuated portions, unlike John and Mary, who are distinct individuals. We have shown that both mass nouns and weak plural indefinites refer to amounts: on its weak reading, two books refers to any quantity of two books.

**The Weak/Strong Distinction**

We have provided evidence that Milsark’s (1977) two-way distinction between weak and strong indefinites should be replaced by a three-way distinction: in addition to the weak reading, we have distinguished two types of strong readings, a quantificational and a non-quantificational referential one. We proposed that the difference between weak and strong indefinites is denotational: weak indefinites denote existential generalized quantifiers over amounts, to be distinguished from generalized quantifiers over individuals, which correspond to strong indefinites.
The difference between strong referential and strong quantificational indefinites is not a matter of ambiguity, the choice between the two options being determined by the context.

The strong or weak interpretation of indefinites is determined by their internal structure: the presence or absence of a determiner, the lexical properties of the determiner and the noun and singular or plural number markings. Certain indefinites, in particular singular indefinites and cardinal indefinites, are ambiguous between a weak and a strong reading, the choice between the two being determined by the syntactic context: certain contexts, e.g., existential sentences, allow only weak indefinites, whereas other contexts, e.g., the position of the external subject, allow only strong DPs. Other indefinites can be only weak (bare plurals in Romance languages other than French, des indefinites in French and mass indefinites crosslinguistically) or only strong (certain in English and certains in French). Unacceptability arises when the reading determined by the internal structure of an indefinite DP clashes with the requirements imposed by the syntactic context in which the indefinite occurs.

Two Types of Predicates

Among the contextual factors that bear on the denotation of indefinites are the lexical properties of the main predicates of which indefinites are arguments: certain predicates, which we labeled ‘existential predicates’, e.g., run, dance or eat, write, etc., allow both weak and strong readings of indefinites occurring in their subject or object positions, whereas other predicates, which we labeled ‘entity predicates’, e.g., intelligent, sad or love, hate, allow only strong readings. All theories of indefiniteness share the hypothesis that the weak reading of indefinites is allowed only if the main predicate can be represented as ‘existential’, i.e., as supplying an existential quantifier over the position of the indefinite. However, the lexical characterization of the relevant classes of predicates is still under debate. We show that Carlson’s (1977a, c) distinction between s-level and i-level predicates does not exactly parallel the distinction between existential and entity predicates needed for the account of weak vs. strong readings and we follow Dobrovie-Sorin (1997a) in proposing that space localization is the criterion that distinguishes between the two classes.

Weak Indefinites as Generalized Quantifiers over Amounts

In terms of formalization, the main original contribution of this book is the representation of weak DPs (in particular bare plurals and bare mass nouns): they are not property-referring expressions (as in van Geenhoven (1996) or Dobrovie-Sorin and Beyssade (2004)) but rather existential generalized quantifiers over amounts. Qua generalized quantifiers over amounts, weak indefinites cannot combine with entity
predicates, which can only combine with DPs that denote either individuals (type e) or generalized quantifiers over individuals (type <<e,t>,t>). They can only combine with existential predicates (or appear in *there is* or *il y a* sentences), the role of which is to supply an existentially bound variable over individuals, which is identified with the amount variable introduced by the generalized quantifier over amounts.

### Three Types of Indefinites

Besides denoting generalized quantifiers over amounts (which is allowed only for indefinites, on their weak reading) indefinites may take the other canonical types of denotation for predicates and arguments. In predicate positions, indefinites denote properties (type <e,t>), whereas in argument positions, strong indefinites denote either individuals (type e) or generalized quantifiers over individuals (type <<e,t>,t>).

By adopting this analysis, we have largely departed from the tradition going back to the theories of Heim and Kamp, which hold that indefinite DPs are to be analyzed as free variables, a proposal that we adopted at the beginning of our investigation (see in particular Dobrovie-Sorin and Beyssade (2004)). In this book we followed Steedman (2003) in assuming that strong indefinites are not free variables but rather Skolem terms of the form f(x) or f(e), where f is a constant function that applies to an individual or event variable, which is itself bound by a quantifier. All indefinite DPs that refer to an individual were treated as Skolem terms, both in the case of dependent DPs, whose reference varies with the context and of specific DPs, which have a fixed but undetermined or underspecified reference, which depends on the speaker.

Summarizing, the three types of indefinites distinguished in this book correspond to three distinct denotational types:

(a) Weak indefinites denote existential generalized quantifiers over amounts.
(b) Non-quantiﬁcational strong indefinites are referential expressions that are represented as Skolem terms.
(c) Quantiﬁcational strong indefinites are generalized quantifiers, which we have represented in terms of tripartite conﬁgurations.

### No Existential Closure

The use of Skolem terms enables us to dispense with the rules of existential closure proposed in Heim (1982). Thus, in the Logical Form of a sentence like *A man has entered the room*, the indefinite DP *a man* is represented as a Skolem term f(s), where f is a constant function that applies to the situation of utterance and yields a specific individual that ranges over the set of men. Since f is not a variable, no existential quantiﬁer is needed for the representation of this sentence. Similarly, the sentence
Every farmer who owns a donkey beats it is associated with the Logical Form $\forall x [(\text{farmer}(x) \land \text{owns}(x, f(x)) \land \text{donkey}(f(x))) \rightarrow \text{beats}(x, f(x))]$, which also lacks an existential quantifier. The indefinite DP *a donkey*, as well as the anaphoric pronoun *it*, are represented as the Skolem term $f(x)$, whose value varies according to the value of the variable $x$, which ranges over the set of farmers and is bound by the universal quantifier introduced by the quantified NP *every farmer*. Finally, the Logical Forms of sentences like *Whenever John invites a friend, he cooks dinner for him*, which involve quantification over events, make use of a Skolem term $f(e)$, with an event variable bound by the generic quantifier GEN: \[\text{GENe (invitation}(e) \land \text{Agent}(e, \text{John}) \land \text{Theme}(e, f(e)) \land \text{friend}(f(e))) \rightarrow \text{make-dinner}(e, \text{Jean}, f(e))].\]

Diesing’s (1992) rule of VP-level existential closure is also dispensed within our account of weak indefinites and its import is taken over by the use of an existential predicate in the lexical representation of certain predicates, as in Carlsonian kind-based accounts or in semantic incorporation accounts. However, as already explained above, our analysis of weak indefinites as generalized quantifiers over amounts differs from both kind-based and property-based accounts of bare NPs (and more generally, of weak indefinites).

**Generic Indefinites**

The original contribution of the chapter devoted to generic indefinites concerns the analysis of plural *des* indefinites and mass *de la/du* indefinites in French. We propose that the strict restrictions to which they are subject are due to an Individuation Constraint on Quantification. This proposal has two far-reaching consequences. On the one hand, the generic readings of bare plurals or bare mass Ns (see English in particular but we believe this is a general, possibly universal generalization) cannot be attributed to an indefinite-like nature of bare plurals and bare mass nouns (as in Diesing (1992) or Kratzer (1995)): because they refer to amounts, indefinite-like bare plurals and bare mass Ns (see Romance languages other than French or Brazilian Portuguese) cannot take generic readings, on a par with *des* and *de la/du* indefinites in French. The generic readings of bare NPs can therefore only be attributed to kind reference, as in Carlson (1977a, c). On the other hand, quantification over mass domains, analyzed as in Higginbotham (1994), should be extended to plural domains and should be clearly distinguished from what we may call ‘distributive’ quantification (see determiners built with singular NPs and indefinite DPs mapped onto the restriction of adverbs of quantification).

**Comparison with Other Approaches**

In order to assess the specificity and the advantages of our account, let us briefly compare it with other approaches in the literature, such as the Theory of Generalized Quantifiers, DRT and analyses in terms of properties.
Our proposal differs from the Theory of Generalized Quantifiers, which assumes a uniform treatment of DPs as generalized quantifiers. We have tried to establish the need to keep apart referential and quantified expressions and have shown how a reformulation in terms of dependency allows a better account of scope phenomena.

The present account also departs from analyses pursued in the DRT framework, which assume that indefinite DPs\(^1\) always introduce a discourse referent.\(^2\) Even though indefinite DPs are not treated as quantified expressions \textit{per se}, at the end of the evaluation procedure, any discourse referent introduced by an indefinite NP in a given DRS is analyzed as a quantified expression (bound \textit{via} default existential closure, or \textit{via} unselective binding of a quantifier in the context). The analyses proposed in this book are instead based on the hypothesis that indefinites allow for the three types of denotation listed in (a)–(c) above.

Regarding the analysis of weak indefinites, we have departed from the widely assumed mechanism of ‘semantic incorporation’ according to which weak indefinites denote properties (type \(<e,t>\)), despite occurring in argument positions. This hypothesis cannot explain a number of empirical generalizations, such as (i) the contrast between bare plurals and count bare singulars in Romance languages like Romanian, Spanish or Catalan, (ii) argument-predicate contrasts regarding the use of bare NPs (in French, bare NPs are allowed in post copular positions but not in argument positions) and (iii) the fact that adjectives cannot occur in argument positions. Our account avoids all these problems: (i) bare plurals (as well as bare mass nouns and more generally all weak indefinites) denote generalized quantifiers over amounts; (ii) bare plurals and bare mass nouns denote properties when they occur in predicate positions but generalized quantifiers over amounts when they occur in argument positions; (iii) adjectives denote properties and as such cannot occur in argument positions. Our account of bare plurals (and bare mass Ns) allows us to explain the contrasts observed by Carlson (1977a, c) between bare plurals and singular indefinites without assuming Carlson’s view that existential bare plurals are kind-referring. This hypothesis cannot be correct for Romance languages (other than Brazilian Portuguese), in which bare NPs cannot function as names of kinds.

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\(^1\)Standard DRT (Kamp 1981; Kamp and Reyle 1993) does not distinguish between weak and strong indefinites and the proposed accounts, summarized here, concern only strong indefinites. DRT accounts of weak indefinites, which are relatively recent (Kamp and Bende Farkas 2001; Farkas and de Swart 2003), rely on unification and seem to be DRT implementations of the property analysis.

\(^2\)This discourse referent can be (i) introduced at the upper level of the DRS, in which case it is interpreted as existentially quantified; (ii) be introduced in a DRS embedded under the main DRS, in which case it is indirectly bound and thus analyzed as a quantified DP.
What We Have Set Aside

The set of phenomena relevant for the study of indefinites is extremely wide, which means we were forced to set aside a certain number of issues, such as the relations between indefinites and negation (negative polarity items), indefinites and interrogative phrases, or the behavior of free-choice indefinites like English *any*. The indefiniteness of so-called indefinite pronouns (*somebody, something, nobody*) would have also been relevant, as well as the study of relative and interrogative pronouns, which in some languages seem to exhibit a strong vs. weak distinction. Nevertheless, we hope that the formal tools and the theoretical distinctions proposed in this book may contribute to the future investigation of these empirical areas.
Interactions in Romance. Selected papers from the 38th linguistic symposium on Romance
Languages (LSRL), Urbana Champaign, April 2008, John Benjamins.
Dordrecht: Kluwer.
Berlin: Springer.
language. Berlin: De Gruyter.
California, Los Angeles.
Publications.
Delaware.
Technology.
lengua española*. Madrid: Visor.
Bosque, I., and V. Demonte, eds. 1999. *Gramática descriptiva de la lengua española*. Madrid:
Espasa Calpe.
Thèse de doctorat, Gröningen.

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© Springer Science+Business Media B.V. 2012


Chierchia, G. 1995b. *Plurality of mass nouns and the notion of “Semantic Parameter”*. Milan: Ms, University of Milan et DIPSCO.


Bibliography


Farkas, D. 1978. Direct and indirect object reduplication in Romanian. Papers from the fourteenth regional meeting. CLS, Chicago Linguistic Society, University of Chicago, Chicago, IL.


Schmitt, C., and A. Munn 1999. Against the nominal mapping parameter: Bare nouns in Brazilian Portuguese. In Proceedings of NELS 29, University of Massachusetts, Amherst.
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