The Semantics of Incorporation
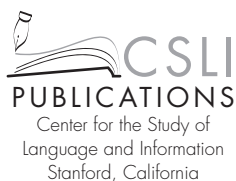
STANFORD MONOGRAPHS IN LINGUISTICS

The aim of this series is to make exploratory work
that employs new linguistic data, extending the scope or domain
of current theoretical proposals, available to a wide audience.
These monographs will provide an insightful generalization
of the problem and data in question which will be
of interest to people working in a variety of frameworks.

THE SEMANTICS OF INCORPORATION
From Argument Structure to Discourse Transparency

Donka F. Farkas
Henriëtte de Swart

To the memory of my father, David Fränkel
DFF

To Milena and Jaromir
HdS

Contents

Introduction

This book is concerned with the semantic properties of incorporated nominals, i.e., nominals that form a particularly tight unit with the predicate they are arguments of. In the type of incorporation constructions we are interested in here, the nominal is active at the clausal syntactic and semantic combinatorial level. From the point of view of semantics, such nominals exhibit a complex cluster of properties, ranging from static characteristics concerning argument structure, scope, and the relation between morphological and semantic number to dynamic behavior governing discourse transparency. This book develops an analysis of incorporation in the framework of Discourse Representation Theory, a theory that is well-suited for connecting sentence level and discourse level semantics. We concentrate on data from Hungarian, where incorporated nominals may be either morphologically singular or plural. We set out to capture two sets of contrasts: (i) those we find when comparing incorporated nominals on the one hand and their non-incorporated, full-fledged argument sisters on the other, and (ii) those we find when comparing morphologically singular and morphologically plural incorporated nominals. When constructing the analysis of the Hungarian facts, we consider the problems involved in extending it to similar phenomena in other languages discussed in the semantic literature on incorporation attempting to explain both cross-linguistic similarities and variation.

The proposal rests on a version of DRT which separates discourse referents and thematic arguments. Thematic arguments are part of the predicative conditions contributed by lexical predicative expressions such as nouns, verbs and adjectives, and form the targets of selectional restriction and thematic role assignment. Discourse referents are introduced by determiners, proper names and pronouns.

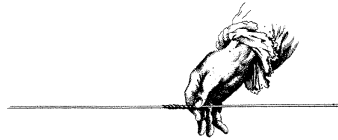In the process of constructing the meaning of the sentence, discourse referents replace thematic arguments by a general rule we call Instantiation. These additions to the framework, whose justification is independent of incorporation, are then applied to implement the idea that incorporation involves predicate modification. We treat singular incorporated nominals as predicative, i.e., as contributing a predicative condition but no discourse referent. They combine with their predicate by means of a process that unifies two thematic arguments, one contributed by the incorporated nominal and the other contributed by the verb. Our proposals concerning the analysis of plurality as a dynamic feature of discourse referents accounts for the contrasts between incorporated singulars and plurals in Hungarian: the former are number neutral, syntactically restricted, and exhibit reduced discourse visibility, while the latter are semantically plural, syntactically free, and fully discourse transparent. The full picture of number interpretation as well as our account of 'shades' of discourse transparency make crucial use of the posited distinction between discourse referents and thematic arguments.

The relevance of the material covered in this book extends beyond the area of incorporation to issues involved in understanding discourse anaphora, as well as to further questions in nominal semantics, such as the typology of indefinites, a typology of anaphoric expressions, the semantics of determiners and of number, and issues involving bare plurals and genericity. The work is therefore of potential interest to linguists and logicians working on the relation between morpho-syntax and meaning, discourse structure, and cross-linguistic semantics.

This work is meant as a contribution to current debates on the topics it deals with, and therefore one class of readers it is addressed to are those familiar with the problems it wrestles with and with the previous solutions to them. We have attempted, however, to formulate our proposals in such a way as to be understandable to a novice semanticist. Consequently, we hope the monograph is well suited as a reading item in a graduate course or seminar whose concerns overlap with the issues this work is relevant to.

We started working on this project around the end of the previous century. Because of geographical and biographical reasons, work on it, though intense, was intermittent, and thus it remained at the level of discussion, notes and oral presentations until the summer of 2001, when it took the form of a paper we included as part of our reader for a course on bare arguments and the typology of indefinites that we co-taught as part of the ESSLLI summer school in Helsinki. Since then it reached, for both of us, the level of obsessiveness that makes writing a longer work possible (and perhaps necessary).

1 Incorporation: the semantic challenge
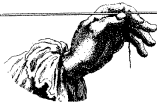
The term 'incorporation', in its non-technical sense, is used to describe constructions in which a verb and one of its arguments form a particularly tight unit. Initially, this phenomenon attracted the attention of linguists because of its morpho-syntactic interest. In what follows, after a quick tour of the literature pertaining to the semantics of incorporation, we introduce the main semantic properties of incorporated nominals in sections 2-4 and close, in section 5, with a brief look at the road covered in this chapter and a longer look at what is to come.

1.1 Background

The major theoretical focus of Sadock's (1980) pioneering work on West Greenlandic concerns questions about the interface between syntax and morphology raised by incorporation in this language, where certain verbs and their direct objects appear as a single morphological word with the verb realized as a suffix on the nominal. The contrast between constructions involving incorporation and those that do not in West Greenlandic is exemplified in (1), taken from Van Geenhoven (1998):

(1) a. Angunguu-p aalisagaq neri-v-a-a.
   A.-Erg   fish.Abs   eat-Ind-[+tr]-IIISg.IIISg
   'Angunguaq ate the/a particular fish.'

   b. Arnajaraq eqalut-tur-p-u-q.
   A.ABS   salmon-eat-Ind-[-tr]-IIISg
   'Arnajaraq ate salmon.'

Sentence (1a) illustrates the standard transitive verb construction with a subject in ergative case, and an object in absolutive case, and object agreement on the verb. Example (1b) involves an incorporated nominal as part of an intransitive verb. This time the verb shows no object agreement, and the subject is in absolutive case. A broad-based typology of incorporation phenomena is to be found in Mithun (1984).

The term 'incorporation' is used under a narrower, technical interpretation in Baker (1988). This is an extensive study of the morphosyntax of a subset of cases involving incorporation in Mithun's sense. In Baker's technical sense, incorporation is defined in syntactic derivational terms as involving the adjunction of a lexical category X^0 to another lexical category Y^0, a movement operation which in the case of nominal incorporation is triggered by X^0 failing to receive Case in the position in which it is generated. Syntactic details aside, this technical sense of the term is meant to cover only cases where the incorporated entity is of bar level zero, i.e., it is made up of an unmodified noun.[1]

Massam (2001) discusses the case of nominal incorporation in Niuean under the label of 'pseudo noun incorporation' because in this language the nominal that exhibits a 'closer-than-usual relation with the verb' may be modified by adjectives (and in some cases by relative clauses), but cannot be preceded by articles. Under standard assumptions, such nominals are of category NP, contrasting both with lexical heads, of category N^0, and full-fledged, maximally projected nominals, of category DP. We exemplify with (2), where the pseudo-incorporated nominal is *kofe kono* 'bitter coffee' (Massam's example (6)a, p. 158):

(2) Ne inu   kofe kono a   Mele.
    Pst drink coffee bitter Abs Mele
    'Mary drank bitter coffee.'

Under Massam's analysis the 'pseudo-incorporated' NP is base-generated in its surface position rather than being moved there as in the case of Baker's incorporated nominals.

In this book we are concerned with the interpretive and dynamic properties of incorporated nominals in the wide sense of the term. We will therefore use the term 'incorporated nominal' here for both nominals that are incorporated in Baker's technical sense and for those that are pseudo-incorporated in Massam's sense, distinguishing between the two only when relevant. As discussed in more detail below, we do not adopt a purely semantic view of incorporation, however, as done in Van

---

[1]More recently, Baker (1997) restricts the application of the term even further, requiring the incorporated noun root to be fully integrated morphologically with the verb.

Geenhoven (1998), for whom all narrowest scope indefinites are 'semantically incorporated'. Incorporated nominals, in the sense in which the term is used in this book are special both with respect to their morpho-syntax and with respect to their semantics. Incorporated nominals, in our sense, exhibit special morpho-syntax that is in contrast with the morpho-syntactic characteristics of full-fledged unincorporated noun phrases in the language in question. The special morpho-syntax of incorporated nominals may manifest itself in the absence of a determiner, or in the presence of a special, morphologically deficient one, or such nominals may exhibit reduced morphological marking with respect to number or case (or both), they may be restricted to occurring in a special position, adjacent to the verb, or they may involve a combination of the above. The special morpho-syntax, we claim, correlates with a special, reduced, semantic role incorporated nominals play, which explains their core static and dynamic semantic properties.

Aspects of the phenomenon of incorporation that are relevant to semantics have been in the background or even the foreground of the discussion from the beginning. Thus, the question of the discourse transparency of the nominal in an incorporated construction figured prominently in Sadock (1980), as a central argument for the syntactic nature of the process of incorporation. (A nominal is considered to be discourse transparent if it can serve as the antecedent of a pronoun in subsequent discourse.) Mithun (1984) showed that there is cross-linguistic variation with respect to whether an incorporated nominal is discourse transparent or not.

Discourse transparency has become, of course, a central concern in its own right in dynamic semantics. Incorporation, however, has captured the attention of semanticists not because of its connection to this problem but rather because of its relevance to studies of scope and the semantics of indefinite noun phrases. A cross-linguistically stable property of incorporated nominals that has been noted from the earliest work is their inability to take wide scope over other elements in their sentence. The term 'incorporation' is used in de Hoop (1992) in connection with such 'narrow scope only' indefinites. The seminal work of Van Geenhoven (1998) highlights the semantic similarities between incorporated nominals in West Greenlandic and weak, narrow scope indefinites in English and German. As a result of Van Geenhoven's work, incorporation has become connected to another star problem in semantics, namely the account of the semantic properties of bare plurals (see Carlson 1977, Krifka et al. 1995, Chierchia 1998). Van Geenhoven's approach to incorporation is eminently semantic. She coined the term 'semantic incorporation' under whose wing she gathers all narrowest

scope indefinites, independently of their morpho-syntactic characteristics. As mentioned above, we depart from Van Geenhoven in this respect, and argue for the necessity of distinguishing narrowest scope full-fledged indefinites from incorporated nominals.

Dayal (1999) picks up the bare plural thread. An important aspect of her work is the attention paid to the question of number, an issue that did not figure prominently in previous work on this phenomenon. While some languages do not differentiate between morphologically singular incorporated nominals and morphologically plural ones, Hindi does. The distinction, Dayal argues, has semantic repercussions. The question of number has thus been placed on the agenda of semanticists dealing with incorporation. It will figure prominently in our discussion as well.

Most recently, Chung and Ladusaw (2003) highlight the relevance of incorporation to argument structure. Argument structure concerns the question of arguments, predicates and the connection between them. Working in a type-theoretical framework, Chung and Ladusaw propose a new type of mode of composition of a predicate with an argument, and show how it can be used to account for some of the properties commonly associated with incorporated nominals.

A central empirical issue they address involves the phenomenon Mithun called 'doubling'. 'Doubling' refers to cases where the incorporated nominal is doubled by a full DP, resulting in constructions whose glosses would be something like *John pet-has a dog*. We give a Caddo example, taken from Mithun (1984) in (3), and a Chamorro example from Chung and Ladusaw (2003) in (4):

(3) kassi' háh-'ič'á-sswí'-sa'
    bead Prog-eye-string-Prog
    'She is stringing beads'

(4) Gäi-ga'   un ga'lagu ennao na patgun.
    agr.have-pet a dog   that L child
    'That child has a pet dog.'

In (3), the incorporated N root *'ič'ah-* 'eye' (used for any sort of small, round objects when incorporated) is doubled by the nominal *kassi'* ('bead'). The predicate in (4) is the existential verb *gäi* and the incorporated nominal is *ga'* 'pet'. The doubling DP is *un ga'lagu* 'a dog', occurring in the unmarked morphological case. Chung and Ladusaw argue persuasively that this extra noun phrase is a syntactic adjunct but a semantic argument. Just like Chung and Ladusaw, we want to predict the theoretical possibility of doubling and connect the realization of this possibility in a particular language to the details of the morpho-syntax of the language in question.

This quick survey shows that the phenomenon of incorporation is relevant to classical problems like argument structure, bare plurals and scope, as well as to the less talked about but equally important question of number interpretation. It is also relevant to the driving question of dynamic semantics, namely the issue of discourse transparency. Thus, the theoretical threads that incorporation brings together and which we pursue in this book are argument structure, discourse transparency and the interpretation of number. The more general semantic issues our discussion is relevant to, besides the proper semantic account of incorporation, involve traditional problems such as the semantic typology of noun phrases in general and of indefinites in particular, the semantics of bare plurals, scope, and the semantics of determiners.

The language most extensively studied in this book is Hungarian, a language that was argued to have an incorporation construction as early as Mithun (1984). Incorporated nominals in this language exhibit reduced morpho-syntax in that they must occur without a determiner, though they are marked for case and may be inflected for number. The contrast in number marking correlates with several semantically relevant properties, which we find echoed in Hindi (Dayal 1999) as well, and whose account poses significant analytical challenges not found in the simpler cases where incorporation excludes number marking. In the next three sections we introduce the semantic properties associated with incorporation that our analysis aims to account for, starting with core distinctions between incorporated and non-incorporated nominals and then turning to the less discussed issues involving number contrasts and discourse transparency. In the process we also present the core phenomena in Hungarian that our analysis aims to capture.

The semantic contrasts between incorporated and non-incorporated arguments which have attracted the interest of semanticists involve scope and argument structure. We illustrate by considering the Hungarian minimal pair in (5) and (6):[2]

(5) Mari olvas egy verset.
    Mari read a   poem.Acc
    'Mari is reading a poem.'

(6) Mari verset   olvas.
    Mari poem.Acc read
    'Mari is reading a poem/poems.'

---

[2]In our Hungarian glosses III person will not be marked, since it is the morphologically unmarked verb form. We do not mark singular number either, for the same reason.

The English translations show how difficult it is to express the meaning of an incorporated nominal in a language that does not allow this construction. One problem is that the incorporated nominal is number neutral while its unincorporated sisters are not. We indicate this fact by including both the singular and the plural form in our glosses.

Morpho-syntactically, these two sentences contrast in that the D(irect) O(bject) is realized by a full-fledged argument in (5) and an incorporated one in (6). Thus, in (5), the DO noun phrase is a full DP consisting of the indefinite determiner *egy* and the head noun in the Accusative case. In (6) on the other hand, the DO is, significantly, bare, i.e., not preceded by a determiner, though case marking is still present on the head noun. Syntactically, the bare nominal occurs immediately before the V while the full DP occurs here post-verbally. We refer to the nominal in (6) as an I(ncorporated) N(ominal).

We will see in chapter 4 that the syntactic position of the bare nominal is relatively fixed compared to that of the full DP: the former must be adjacent to the verb, while the latter enjoys considerable word order freedom. We will also see that we are dealing here with 'pseudo-incorporation' in the sense of Massam (2001), rather than (strict) incorporation in Baker's technical sense since the special preverbal position may be occupied not only by bare N^0 but also by bare NP constituents.[3]

We embark upon this book's journey by asking the following question: what are the semantic contrasts between the two Hungarian sentences above, and how could they be accounted for? The answer takes us first to issues involving sentence-level semantics: truth-conditions and scope, and matters pertaining to argument structure. Turning to the level of the discourse, we will have to deal with questions concerning number interpretation and discourse transparency. In the rest of this chapter we outline the main empirical challenges which the rest of the book is devoted to solving.

1.2 Truth-conditions and scope

First, note that (5) and (6) do not differ with respect to truth-conditions. The existence of a poem Mary is reading renders both true. More generally, except for idiomatic cases, the only difference between the two constructions involves a subtle contrast in number interpretation to be discussed in section 1.4. Aside from that issue, a sentence involving an IN entails and is entailed by its minimal pair

---

[3]We will use the term DP to refer to the highest possible nominal projection, the term NP to refer to the constituent made up of a lexical nominal head, its modifiers and its arguments, and the term 'nominal' to refer to nominal projections in a neutral way.

involving a full DP under the narrowest scope interpretation of the latter. We might be dealing here with semantically irrelevant morpho-syntactic variation, a subject not appropriate for two semanticists to write a book about. There is, however, a difference that is well-known to semanticists familiar with recent work on semantic incorporation. Work on nominal incorporation in a variety of languages has shown that INs are special in that the nominal is *scopally inert*, i.e., it must scope with the predicate and therefore cannot have wide scope relative to any operator or quantifier in whose scope the predicate occurs. Scopal properties of incorporated nominals are discussed in detail in Sadock (1980), Van Geenhoven (1998), Bittner, (1994), Dayal (1999), and Chung and Ladusaw (2003).

What we call an IN in Hungarian shares this property. Thus, (7), just like its English translation, is scopally ambiguous: under the wide scope reading of the indefinite relative to the intensional operator, there is a particular poem Mary has to read. Under the narrow scope reading, Mary fulfills her obligation if she reads any old poem.

(7) Mari kell olvasson egy verset.
    Mari must read.Subj. a   poem.Acc
    'Mary must read a poem.'

By contrast, sentence (8), which differs minimally from (7) in that it has an incorporated rather than a full-fledged DO, lacks the reading in which the indefinite has wide scope over the intensional predicate:

(8) Mari verset   kell olvasson.
    Mari poem.Acc must read.Subj.
    'Mari poem must read.'
    'Mari must read a poem/poems.'

The pattern is constant across other quantifiers or operators, such as negation, modality or adverbs of quantification taking the predicate in their scope. Thus, the IN can only receive a narrow scope interpretation relative to negation, the universal and the adverb of quantification in the examples below:

(9) Mari nem olvas verset.
    Mari not read poem.Acc
    'Mari is not reading a poem/poems.'

(10) Minden gyerek verset   olvas.
     every child poem.Acc read
     'Every child reads a poem/poems.'

(11) Mari általában verset   olvas.
      Mari usually   poem.Acc read
      'Mari usually reads poetry/poems.'

All these sentences except the first have minimal pairs involving a full-fledged DP in argument position which is ambiguous between a wide and a narrow scope reading.[4] As has been mentioned before, this type of scopal inertia is characteristic of INs across languages. In the analysis we develop in this book, being incorporated is one cause of scopal inertia but not the only one; bare plurals in argument position in both Hungarian and English will be argued not to involve the mechanism of incorporation even though they are scopally inert.

The scopal behavior of INs is different from what we find with other scopally restricted DPs such as 'dependent' (or necessarily co-varying) DPs and 'roofed' DPs, i.e., DPs that must occur within the scope of a certain class of operators, such as various shades of N(egative) P(olarity) I(tems).[5] We illustrate by contrasting INs in Hungarian with indefinites involving a special, reduplicated form of the indefinite determiner exemplified in (12):

(12) A gyerekek/minden gyerek olvastak/olvasott   egy-egy
      The child.Pl/every   child   read.Past.Pl./read.Past a-a
      verset.
      poem.Acc
      'The children/every child read a poem each.'

Farkas (1997a) shows that indefinites with reduplicated determiners must be interpreted as co-varying with a variable contributed by another expression. As a result, they can occur only within the scope of the expression contributing the variable in question. The reduplicated DP, in (12), just like the INs in (11), must be interpreted as having narrow scope relative to the universal or the implicit distributive operator. However, INs differ from may occur in the absence of a 'licensing' operator (as illustrated in (2) above), but reduplicated indefinites may not. The fact that reduplicated indefinites cannot occur in the absence of a licensor is shown by the ungrammaticality of (13a). Examples (13b,c) show that the licensor of such indefinites cannot be a negation or a modal.

---

[4]Ordinarily, a full-fledged indefinite DP may not be interpreted as scoping under negation. We come back to this matter in chapter 4.

[5]There is considerable terminological variation in the literature concerning the naming of the various types of scopally restricted DPs. Thus, Giannakidou (2002) uses the term 'dependent' differently from Farkas (1997a, b) for instance. Because of this, we avoid the term *dependent* in what follows.

(13) a. *Mari olvas egy-egy verset.
           Mari read a-a   poem.Acc

    b. *Mari nem olvas egy-egy verset.
           Mari not read a-a   poem.Acc

    c. *Mari kell olvasson   egy-egy verset.
           Mari must read.Subj. a-a   poem.Acc

Further semantic distinctions between INs and reduplicated indefinites will be discussed in chapter 4.

Turning now to Negative Polarity Item-type nominals, we note that they are scopally restricted in the sense that they must be interpreted within the scope of a certain (type of) operator, even if the result does not involve co-variation. Thus, in (14),

(14) Mary didn't read any poem.

the DP *any poem* must be interpreted within the scope of negation. Such 'roofed' nominals, just like necessarily co-varying ones, must occur within the scope of some operator or quantifier.

INs on the other hand do not require a licensor in this sense. They are scopally restricted, however, unlike ordinary full-fledged indefinite arguments in the sense that they must scope with the predicate they are arguments of. Scopal behavior has been an obsession of semantics in the last two decades, and therefore predicting it is high on the list of semantic accounts of the phenomenon of nominal incorporation.

This brief discussion of other scopally restricted noun phrases points to the need of accounting for the special scopal properties of INs with tools that are sensitive enough to differentiate between various types of scopally handicapped nominals.

1.3   Relevance of argument structure

The differences in scopal behavior between incorporated and unincorporated arguments suggest a connection with argument structure. Incorporated arguments always scope with the verb, because incorporation in Hungarian and elsewhere involves an especially tight relation between a predicative expression (a verb) and a nominal that is connected to one of the arguments of the predicate. One fundamental question that needs to be answered is what the nature of this connection is.

The linguistic manifestation of the connection between predicates and their arguments involves grammatical relations. Common to languages that exhibit nominal incorporation is the existence of restrictions concerning the grammatical relation of the incorporating (or incorporated) nominal. In some languages, such as West Greenlandic,

incorporation may only involve DOs, while in others it is more permissive. Subjects are least likely to incorporate, and within the category of subjects, subjects of i(ndividual)-level predicates are most resistent to incorporation. As we will see in chapter 4, Hungarian places no restriction on the grammatical role of the IN, allowing, in special instances, even subject incorporation, as illustrated in (15):

(15) Gyerek sírt   a   közelben.
     Child   cry.Past the vicinity.in
     'A child/children was/were crying in the vicinity.'

But even in a permissive language like Hungarian, incorporation of subjects of i-level predicates is ruled out:

(16) *Gyerek okos.
     Child   clever

The ban on incorporation of subjects of i-level predicates is cross-linguistically stable and falls squarely into the semanticists' court. One approach to incorporation that accounts for this restriction and which has been proposed for Hungarian in Szabolcsi (1997) is to treat INs as 'predicate modifiers' rather than full-fledged arguments of the predicate. Predicate modifiers lack the independence required of subjects of i-level predicates, under the view that subjects of i-level predicates are 'logical subjects' of categorical statements in which the predicate predicates something of an independently established referent. (See Ladusaw 1994 and references therein.) The analysis we develop in this book is a version of a treatment of incorporated nominals as predicate modifiers, and therefore the restriction on the subject position of i-level predicates follows from it.

   In relation to argument structure, there is a further issue that any version of 'incorporation as predicate modification' has to face. This concerns the issue of argument saturation and doubling. If incorporated nominals are treated as predicate modifiers, rather than as real arguments, the question arises whether they actually fill the relevant argument position of the verb. There is normally a one-to-one mapping between the number of argument positions of a verb, and the number of syntactic arguments it takes. Thus, transitive verbs usually occur in sentences that have both a subject and an object. But what if the sentence involves a subject and an incorporated object? Will the complex verb be transitive or intransitive? Can a full-fledged DP be linked to the argument already modified by the incorporated nominal? The answer to these questions depends on the language at hand. As pointed out by Sadock and Van Geenhoven, West Greenlandic uses the intran-

sitive form of the verb in incorporation constructions. Compare again the examples given in (1) above, repeated here as (17):

(17) a. Angunguu-p aalisagaq neri-v-a-a.
        A.-Erg   fish.Abs   eat-Ind-[+tr]-3Sg.3Sg
        'Angunguaq ate the/a particular fish.'

     b. Arnajaraq eqalut-tur-p-u-q.
        A.Abs   salmon-eat-Ind-[-tr]-3Sg
        'Arnajaraq ate salmon.'

The incorporated nominal here appears not to count as a 'real' argument of the verb, given that the verb in sentence (17b) is intransitive. In Hungarian, on the other hand, the incorporated nominal occurs as a syntactic argument of the verb, marked with whatever case the full-fledged, unincorporated DP would bear. The key to understanding these differences, we believe, is in the details of the morpho-syntax of the two languages. The semantic characterization of incorporation we give in this book allows the possibility of such reduced transitivity effects without, however, predicting that they will necessarily occur.

   With respect to the question of the possibility of 'doubling' an incorporated nominal by a full-fledged DP, we find languages that allow it and others that do not. Caddo and Chamorro are in the first category, as illustrated in (3) and (4) above, repeated in (18) and (19) (see Mithun 1984, Rosen 1989, Chung and Ladusaw 2003).

(18) kassi' háh-'ič'á-sswí'-sa'
      bead Prog-eye-string-Prog
      'She is stringing beads'

(19) Gäi-[ga']   un ga'lagu ennao na patgun.
      agr.have-pet a dog   that L child
      'That child has a pet dog.'

In many languages however, such doubling is not allowed. We illustrate with Hungarian in (20):

(20) *Mari újsagot   olvasott   a   *Times*-t.
       Mari newspaper.Acc read.Past the Times.Acc

A semantic theory of incorporation has to allow for the possibility of doubling. The account developed in this book does so. Whether this possibility is realized in a language depends on the morpho-syntax of the language in question, as pointed out by Chung and Ladusaw (2003).

   The properties of incorporation surveyed above have been central to semantic discussions of the phenomenon, and our analysis will have to account for them. Besides the questions raised in the sentence-level se-

mantics of incorporation, one has to address the role these construction play at the discourse level. In order to do so, we turn to the issue of number in incorporation constructions, an area that has been unfairly neglected in most of the semantic side of the incorporation literature, and then to discourse anaphora. The singular/plural contrast has an effect on truth conditions as well as on the dynamic behavior of the incorporated nominal.

1.4 The singular/plural constrast

Languages differ in whether they allow number contrast to be morphologically manifested in incorporated constructions. In Hungarian, like in Hindi and unlike in West Greenlandic, incorporated nominals show a morphological contrast between singulars and plurals, a contrast that has significant semantic repercussions. Thus, the minimal pair we started our discussion with expands into the triplet in (21).

(21) a. Mari olvas egy verset.
          Mari read a   poem.Acc
          'Mari is reading a poem.'

      b. Mari verset   olvas.
          Mari poem.Acc read
          'Mari is reading a poem/poems.'

      c. Mari verseket   olvas.
          Mari poem.Pl.Acc read
          'Mari is reading poems.'

These examples contrast both with respect to the sentence internal matter of number interpretation and with respect to the dynamic potential of the DOs. In this subsection we preview the former, and in the next, the latter.

In Hungarian, as generally in languages with productive morphological number, the singular form is unmarked, while the plural is indicated with a special morpheme. Within the nominal paradigm, the plural morpheme -*Vk*, found in (21c), is suffixed on head nouns. The presence and quality of the vowel in this morpheme is a morpho-phonological matter that will be ignored here. In the absence of a plural morpheme, a noun counts as being morphologically singular.[6]

---

[6]Number is the only morphologically relevant ϕ feature of Hungarian common nouns. Person distinctions are relevant in Hungarian for pronouns and verbs, but they do not play a role in the discussion that follows. Gender is inoperative in the morphology of this language altogether. Hungarian has an elaborate case marking system, and, as already illustrated, INs bear morphological case. We treat number and morphological case as features rather than inflectional projections here, though

1.4.1 Number neutrality of singular INs

We start with the contrast between (21a) and (21b). Although both nominals are unmarked for number, and therefore morphologically singular, the two examples differ with respect to the semantic weight of this lack of number marking. In canonical cases, full-fledged morphologically singular DPs such as the one illustrated in (21a), count as semantically singular in the sense that the referent of the DP has to be chosen from the set of atomic entities in the denotation of the CN. Thus, (21a) entails that there is a single poem Mary read. This atomicity entailment explains the fact that such DPs may not occur as arguments bearing a non-atomic entailment coming from the predicate. Thus, in both English and Hungarian, ordinary singular DPs may not occur as arguments bearing non-atomicity entailments coming from the predicate. This is illustrated in (22) and (23), which are well-formed only if a taxonomic reading is imposed on the singular DO:

(22) #Mary collects a/the stamp.

(23) #Mari gyűjt egy bélyeget.
　　 'Mari　collect a　 stamp.Acc'

An ordinary DP that is marked for plural, on the other hand gets a non-atomic interpretation. Thus, (24) in Hungarian and its English translation both entail that there was more than one child watching a movie.

(24) A　　gyerekek néztek　　　egy filmet.
　　 The child.Pl watch.Past.Pl a　　movie.Acc
　　 'The children were watching a movie.'

We conclude that in Hungarian, just like in English, semantically singular DPs contrast with semantically plural ones in that only the latter are compatible with non-atomicity entailments.[7]

　　Morphologically singular INs contrast with morphologically singular DPs in Hungarian. Unlike their full DP counterparts, morphologically singular INs are number neutral in the sense that they are not associated with atomicity entailments. The fact that the counterpart of (23) involving a singular IN is impeccable shows that such nominals are compatible with non-atomic interpretations:

(25) Mari bélyeget　　gyűjt.
　　 Mari stamp.Acc collect
　　 'Mari is collecting stamps.'

---

nothing crucial depends on this choice.

[7]We will see in chapter 2 that the situation is slightly more complex in Hungarian, but in ways that do not affect the basic observations made here.

Note now that morphologically singular INs may also occur in the presence of (contextual) atomicity entailments, as shown in (26):

(26) Feri feleséget keres.
    Feri wife.Acc seek
    'Feri is looking for a wife.'

Note that the English translations here involve a plural in (25), and a singular in (26), reflecting the entailments concerning number.

These facts show that morphologically singular INs are semantically number neutral whereas ordinary singular DPs are not. By number neutrality we understand here compatibility with atomicity as well as non-atomicity entailments coming from the predicate or from the context. The literature on incorporation shows that number neutrality is a cross-linguistically stable property of morphologically singular INs, as discussed in Van Geenhoven (1998), Dayal (1999), and Chung and Ladusaw (2003). Despite this fact, it has not received much attention in the semantic literature on incorporation, with the exception of Dayal (1999). Our approach makes the relation between morphological and semantic number of incorporated nominals one of its central concerns.

1.4.2   The special nature of plural INs

We turn now to the contrast in number interpretation between singular and plural INs in Hungarian, which will lead to a brief excursion into the exciting but dangerous land of bare plurals in general.

Note first that with respect to morpho-syntax, the only difference between singular and plural preverbal bare nominals in Hungarian is the obvious one, namely that the latter is morphologically marked for plural. We will refer to bare plurals in this position as plural INs. Semantically, the most obvious difference between a plural and a singular IN is that the former, unlike the latter, is not number neutral, but rather, has a semantic plurality entailment parallel to that of full-fledged plural DPs. Just like an ordinary plural DP, a plural IN cannot be used when a non-atomic interpretation is ruled out. Thus, (27) entails that Feri is looking for several wives, in contrast with (26):

(27) Feri feleségeket keres.
    Feri wife.Pl.Acc seek
    'Feri is looking for wives.'

The fact that plural INs are semantically plural is also a stable characteristic of INs in languages that allow incorporation of plurals (compare Dayal 1999 for similar data from Hindi).

We have seen so far that morphologically plural INs in Hungarian pattern with full DPs and contrast with morphologically singular INs

as far as number interpretation is concerned. With respect to scope and argument structure, however, they pattern with morphologically singular INs. Just like incorporated singulars, plural INs are scopally inert and may not serve as subjects of i-level predicates under neutral intonation. Thus, sentence (28) may only be interpreted with the IN within the scope of the modal, while sentence (29) is ill-formed:

(28) Mari verseket   kell   olvasson.
     Mari poem.Pl.Acc must read.Subj.
     'Marie must read poems.'

(29) *Gyerekek okosak.
     Child.Pl   clever.Pl

(30) Children are clever

If (29) is analyzed as involving an incorporated subject, its ungrammaticality would be connected to the ban against incorporated subjects of i-level predicates. Note that the English counterpart of this sentence in (30), involving a generic generalization, is well-formed. Although bare plurals in Hungarian may occur in full argument positions, as we will see below, generic readings for these nominals are not available.

The contrast between (29) and its grammatical English counterpart brings us to the issue of unincorporated bare plurals. Incorporated plurals in Hungarian are bare plurals in the sense of occurring without a determiner. We called them incorporated because they may occur in the special position in which singular INs are found.

Bare plurals in Hungarian, however, are syntactically more versatile than their singular counterparts in that they may occur not only in the special V-adjacent position but also in the regular post-verbal position reserved for full-fledged arguments, as exemplified in (31):

(31) Benéztem   az   ablakon   és   láttam   egy asztalnál
     in.look.Past.I the window.on and see.Past.I a   table.at
     szépen   felöltözött gyerekeket amint kakaót
     beautifully   dressed   child.Pl.Ac while cocoa.Acc
     ittak.
     drink.Past.Pl
     'I looked through the window and saw at a table well-dressed children drinking cocoa.'

The counterpart of (31) with a bare singular is not grammatical:

(32)   *Benéztem   az   ablakon   és   láttam   egy asztalnál
      in.look.Past.I the window.on and see.Past.I a   table.at
      szépen   felöltözött gyereket amint kakaót   ivott.
      beautifully dressed   child.Acc while cocoa.Acc drink.Past
      'I looked through the window and saw at a table well-dressed
      child drinking cocoa.'

The contrast between (31) and (32) shows the need to establish a fundamental distinction between incorporated and non-incorporated arguments, since one has to block full DPs from incorporated positions, and bare singulars from full argument positions.[8] Bare plurals in Hungarian are special, however, in that they show up in both incorporated and non-incorporated positions, without any difference in truth-conditions.

    This dual nature of bare plurals in Hungarian requires an analysis that allows bare plurals to hold dual membership, both in the set of INs and in that of full argumental DPs. Recall also that bare plurals in argument position in Hungarian contrast with their English counterparts in that in English bare plurals may receive either a generic or an existential interpretation, while in Hungarian the generic reading is ruled out. To exemplify the situation in English, (33) shows that bare plurals may be used, alongside singular indefinites, in generic generalizations:

(33)   a. A bear is intelligent.

        b. Bears are intelligent.

The existential reading of bare plurals in English is exemplified in (34):

(34)   Cats were playing in the yard.

In all languages that have bare plurals in argument position, such nominals may receive an existential interpretation along the lines of (34). However, a generic reading along the lines of (33) is not always available. Generic statements in these languages require either an indefinite singular DP or a definite plural one. We exemplify with Romanian:

(35)   Peste tot   vedeai   studenţi.
      Over everywhere see.Past.II student.Pl
      'You saw students everywhere.'

(36)   a. *Pisici sînt inteligente.
           Cat.Pl are intelligent.Pl

---

[8]We restrict our attention in this book to languages that have articles but allow, in special circumstances, bare nominals. The case of languages whose nominal system is radically different in that the canonical situation is for nominals to occur without an article lies beyond the scope of our work.

    b. Pisicile   sînt inteligente.
       Cat.Pl.Def are intelligent.Pl
       'Cats are intelligent.'

As mentioned, bare plurals in argument position in Hungarian behave like their counterparts in Romanian and other Romance languages in that they may only get existential readings; generic statements require an indefinite DP or a definite one.

(37) a. *Medve okos.
       Bear   intelligent.

    b. Egy medve okos.
       a   bear   intelligent
       'A bear is intelligent.'

    c. A   medvék okosak.
       The bear.Pl intelligent.Pl
       'Bears are intelligent.'

This brief discussion leads to the following two conclusions concerning bare plurals: (i) in languages like Hungarian and Hindi, bare plurals may be either incorporated or not, while bare singulars must be incorporated; (ii) there is cross-linguistic variation with respect to the interpretation possibilities of argumental bare plurals; in some languages (English) such arguments may receive both an existential and a generic interpretation, while in others (Hungarian, Romance languages) they must be interpreted existentially. The combination of the semantics of incorporation and the semantics of number interpretation to be developed in this book predicts the distributional and interpretive restrictions on bare singulars in Hungarian, Hindi and English as well as the syntactic and interpretational versatility of bare plurals.

1.5   Discourse transparency

The question whether INs may or may not act as antecedents for pronouns in subsequent discourse has been raised from the earliest modern discussions of INs in the literature. Following current terminology, we call nominals that may serve as antecedents to pronouns in discourse *discourse transparent*, and those that may not *discourse opaque*. In Sadock (1980) and Mithun, (1984), the discourse transparency/opacity of INs was discussed in connection with the issue of the syntactic or morphological nature of the process of incorporation. Morphological processes are involved in word formation. Following Postal's lexical islandhood hypothesis, parts of words were assumed to be invisible as far as anaphora was concerned. Sadock (1980) used the discourse

transparency of INs as an important argument in favor of a syntactic treatment of the process of incorporation in West Greenlandic.

The division of labor between morphology and syntax is not a concern of the present work. Discourse transparency, however, remains an important point on the agenda. A major driving force in the development of dynamic semantics in the last two decades has been the desire to account for intra-sentential and inter-sentential anaphora. Let us take as a starting point the assumption that discourse transparency involves a binary distinction: an item is either discourse transparent (in which case it may act as the antecedent to a pronoun in subsequent discourse), or it is discourse opaque, in which case it may not. The question that arises is: are INs discourse transparent or not. It turns out that the best answer one can give to this question is 'It depends.' We see in this book that the discourse transparency of INs depends on the language we are considering, on the morphological number of the IN and on the type of anaphor considered. Here we show the relevance of these last two factors in Hungarian, and thereby conclude the review of the contrast between singular and plural INs in Hungarian.

In languages like West Greenlandic, and Chamorro, INs which are unmarked for number are discourse transparent. Dayal (1999) shows that morphologically singular INs in Hindi are discourse opaque while plural ones are discourse transparent. The same appears to be true for Hungarian, compare (38) and (39):

(38) a. János$_i$ egy beteget$_j$ vizsgált a rendelőben.
     J.$_i$ a patient.Acc$_j$ examine.Past the office.in
     'Janos examined a patient in the office.'

   b. pro$_i$ Túl sulyosnak találta **őt**$_j$ és
      pro$_i$ too severe.Dat find.Past he.Acc$_j$ and

      beutaltatta pro$_j$ a korházba.
      intern.Cause.Past pro$_j$ the hospital.in
      'He found him too sick and sent him to hospital.'

(39) a. János$_i$ beteget$_j$ vizsgált a rendelőben.
     J. patient.Acc$_j$ examine.Past the office.in
     'Janos patient-examined in the office.'

   b. ??pro$_i$ Túl sulyosnak találta **őt**$_j$ és
      pro$_i$ too severe.Dat find.Past he.Acc$_j$ and

      beutaltatta pro$_j$ a korházba.
      intern.Cause.Past pro$_j$ the hospital.in
      'He found him too sick and sent him to hospital.'

(We use *pro* for covert pronouns.) The full indefinite in regular argu-

ment position in (38) can be the antecedent of a discourse pronoun
in the next sentence, as expected. Although discourse transparency
judgments are notoriously subtle, our consultants agree in finding (39)
significantly worse than (38), which justifies calling morphologically
singular INs opaque as far as overt discourse pronouns are concerned.

Just like in Hindi, morphologically plural INs in Hungarian contrast
with their singular counterparts in that the former are fully discourse
transparent. The discourse in (40), which differs from that in (39) only
in the number marking of the INs is impeccable:

(40) a. János$_i$ betegeket$_j$ vizsgált   a rendelőben.
         J$_i$.   patient.Pl.Acc$_j$ examine.Past the office.in
         'Janos patients-examined in the office.'

      b. pro$_i$ Túl sulyosnak találta   **őket**$_j$ és
         pro$_i$ too severe.Dat find.Past he.Pl.Acc$_j$ and
         beutaltatta   pro$_j$ a korházba.
         intern.Cause.Past pro$_j$ the hospital.in
         'He found them too sick and sent them to hospital.'

The final complication is that discourse transparency may be affected
by the nature of the anaphor as well. Hungarian has both overt and
covert pronouns. While morphologically singular INs are opaque with
respect to overt pronouns, as illustrated above, there are informants
who find them transparent with respect to covert pronouns. Thus, (41)
is judged as being significantly better than (39):

(41) a. János$_i$ beteget$_j$ vizsgált   a   rendelőben.
         J$_i$.   patient.Acc$_j$ examine.Past the office.in
         'Janos patient-examined in the office.'

      b. pro$_i$ Túl sulyosnak találta   **pro**$_j$ és
         pro$_i$ too severe.Dat find.Past pro$_i$ and
         beutaltatta   pro$_j$ a korházba.
         intern.Cause.Past pro$_j$ the hospital.in
         'He found him too sick and sent him to hospital.'

These facts lead us to conclude that morphologically singular INs in
Hungarian are neither fully transparent (like full-fledged DPs or plural
INs) nor fully opaque, but rather, that they are discourse translucent.

Obviously, neither analyses that predict full discourse transparency
for INs nor those that predict full opacity can deal with the cross-
linguistic and intra-linguistic contrasts surveyed here. The discourse
translucency of singular INs in Hungarian points to the necessity of al-
lowing more fine-grained distinctions in this area than we have hitherto

been accustomed to.

Another challenge is to predict the discourse transparency of plural INs and the contrast in the discourse transparency of singular INs and plural ones in languages like Hungarian and Hindi. Ideally, the account of this contrast should be connected to the other ways in which these two types of INs differ.

1.6 Conclusion and Preview

The discussion in the last four sections is indicative of the semantic properties that we take to correlate with incorporation in our inclusive sense of the term. INs are scopally inert, number neutral when not morphologically marked as plural and unable to serve as subjects of i-level predicates. When not marked for plural, they may exhibit reduced discourse transparency. In order for a nominal to count as incorporated in the sense of the term we use in this book, it has to exhibit reduced morpho-syntax.

Summing up the problem raised by the Hungarian data, our goal is to account for the semantic contrasts in the minimal triplet in (42):

(42)   a.   Mari olvas egy verset.
            Mari read a   poem.Acc
            'Mari is reading a poem.'

       b.   Mari verset   olvas.
            Mari poem.Acc read
            'Mari is reading a poem/poems/poetry.'

       c.   Mari verseket   olvas.
            Mari poem.Pl.Acc read
            'Mari is reading poems.'

The analysis should capture the contrast in scope and subject restrictions between the INs in (42b,c) on the one hand, and the full-fledged DP in (42a) on the other. It should also explain why singular INs (42b) contrast with both full-fledged DPs (42a) and plural INs (42c) in being number neutral. Finally, we have to predict the contrast between (42b) on the one hand, and (42a,c) on the other hand with respect to discourse transparency and syntactic versatility.

The analysis of the Hungarian facts has to generalize to similar phenomena in other languages in a way that captures the cross-linguistic semantic similarities and differences we find. The account has to predict the cross-linguistic stability of scopal behavior, number interpretation and subject constraints as well as the variability in discourse visibility and the correlations we find between discourse transparency and

plural marking. The challenge in this respect is to account for the stable discourse transparency of plural INs and the possibility of reduced discourse transparency for their singular counterparts.

The account developed in this book is formulated within the framework of Discourse Representation Theory (DRS), and takes Kamp and Reyle (1993) as its starting point. This choice is motivated by the nature of our problem, which involves static, truth-conditional issues as well as dynamic ones. DRT was set up precisely to bridge sentence-level semantics and dynamic, discourse-level aspects of semantic interpretation. In this theory, the interpretation process involves updating the semantic representation with material that affects both the truth-conditional and the dynamic aspects of discourse, opening up the possibility of capturing and relating the static and dynamic properties of INs. In order to formulate our analysis of incorporation in DRT, we develop certain details of the theory as presented in Kamp and Reyle (1993). While these innovations are crucial for our analysis, they do not involve fundamental changes in either theoretical assumptions or technical machinery.

The map of our journey is as follows. The first stage (chapter 2) deals with preliminary issues that are crucial for what follows, but which are independent of incorporation as such. The key proposal concerns the separation of two theoretical concepts, discourse referents and thematic arguments of predicates. This distinction is at the heart of our discussion of argument structure, number interpretation, discourse transparency and incorporation.

Thematic arguments, we suggest, are introduced by predicative expressions (nouns, verbs, certain prepositions), while discourse referents are introduced by full-fledged argumental DPs. In the case of descriptive DPs, it is the determiner that is responsible for the introduction of the discourse referent. The connection between discourse referents and thematic arguments is done by a construction rule we call Instantiation. Instantiation substitutes a discourse referent for the appropriate thematic argument of the predicate, thereby saturating the predicate with respect to that particular thematic argument.

Once we go into the details of the interpretation of DPs, we need to rethink the analysis of plurality in DRT. We maintain Kamp and Reyle's insight that semantic number is represented on discourse referents. The account we propose differs from theirs, however, in that we take discourse referents as having a default atomic interpretation, and therefore we assign no semantic weight to singular forms. The plural on the other hand is taken as predicating non-atomicity of a presupposed discourse referent. This presupposed referent is bound by the discourse referent introduced by the determiner, if a determiner is present, or is

accommodated, in case the nominal is bare. In this account, morphologically plural nouns have a dynamic discourse potential that their morphologically singular counterparts lack. This, in our view, is the key to understanding the contrasts between singular and plural bare nominals in languages like Hungarian and English.

Instantiation is the semantic operation that connects a full-fledged DP to the verb. We begin chapter 3 by making a case for allowing uninstantiated thematic arguments in final DRSs. Thematic arguments and discourse referents are treated as two types of individual variables distinguished in dynamic potential. We justify this move by developing recent proposals in the literature which rely on uninstantiated thematic arguments for the interpretation of the implicit argument in agentless passives such as *The painting was stolen.* We define embeddability conditions for DRSs containing uninstantiated thematic arguments which account for the existential entailment associated with them, as well as for their scopal properties and number neutrality.

In the rest of chapter 3, we set forth the gist of our proposal concerning the semantics of incorporation. We suggest that certain nominal arguments (the ones we call incorporated) are deficient in that they do not introduce a discourse referent, but only a predicative condition involving a thematic argument. Such nominals combine with a predicate by a construction rule we call Unification, which replaces the relevant thematic argument of the predicate by the thematic argument of the common noun. The semantic core of incorporation in our proposal is the combination of a nominal expression with a predicate by Unification. We end the chapter by considering the predictions this approach to incorporation makes with respect to semantic number, scope, argument structure, discourse transparency and morpho-syntax.

Chapters 4 and 5 contain our analysis of incorporation in Hungarian. Chapter 4 applies the general framework to account for singular INs. It checks the predictions made by the theory, and shows that they are borne out by the facts that have been previewed already in this chapter. Chapter 5 extends the discussion to bare plurals in Hungarian, accounting for the contrasts between singular and plural INs. The account of the full discourse transparency of bare plurals, whether incorporated or not, exploits the dynamic potency of morphological number argued for in chapter 2. This is also the essential ingredient for our account of the syntactic versatility of bare plurals in Hungarian. We end the chapter with a discussion of the consequences of our analysis for the scopal and interpretational potential of bare plurals, including genericity.

Chapter 6 takes up the problem of shades of discourse transparency. We argue for a fine-grained view of discourse transparency, which makes

room for discourse translucency, and accounts for the contrast in discourse visibility between singular and plural INs.

Chapter 7 returns to issues touched upon in the first section of the present one by considering alternative approaches to the semantics of incorporation and bare NPs. We point out what our approach shares with its predecessors and in what it differs from them.

A core contribution of our proposal concerns the interpretation of morphological number, and the way it interacts with incorporation and dynamic behavior. The analysis developed in this book accounts for the distributional and interpretive properties of bare singulars and plurals in Hungarian by connecting their similarities to their obvious shared property, namely lack of a determiner, and by connecting their differences to the equally obvious difference between them, namely the fact that only plurals are morphologically marked for number. We arrive at these results by building on the distinction we draw between thematic arguments and discourse referents. This distinction, and our approach to number interpretation that it leads us to are the main themes of the next chapter.
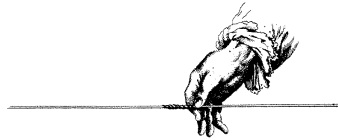
2 Discourse referents, thematic arguments and plurality
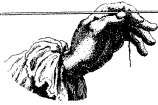
In this chapter we plan to achieve two goals. First, we develop a more fine-grained theory of argument structure than the one in the 'standard' version of DRT as presented in Kamp and Reyle (1993). Second, we work out an account of morphological number interpretation within the new version of the theory. The finer details of interpretation we put forth here are exploited in the account of nominal incorporation we give in the rest of this book. The proposals made in this chapter do not add any radically new mechanism to the theory, nor do they change any of its fundamental assumptions. What emerges therefore is not a new framework but rather, the old story with new details. The more articulated view of predicate-argument structure we work out below allows significant distinctions to be made with respect to discourse transparency, as well as with respect to the way predicates combine with arguments. The former issue is at the heart of dynamic semantics; the latter is a fundamental concern of sentence-level semantics.

The version of DRT developed in Kamp and Reyle (1993) focuses on the role of various types of DPs (proper names, indefinites, and quantificational noun phrases) at the discourse level. We begin this chapter by separating two notions that are conflated in Kamp and Reyle's work, namely discourse referents and thematic arguments of a predicate. Thematic arguments are contributed by nominal and verbal predicates, while discourse referents are standardly contributed by determiners, proper names and pronouns. In the process of combining a determiner with an NP, and a DP with the VP, the thematic arguments of the predicates are bound to the relevant discourse referent introduced as

part of the interpretation of the DP. This process, which we call Instantiation, is the standard way of combining a predicate with the semantic contribution of its syntactic argument. Sections 2.1 and 2.2 are devoted to the separation of discourse referents and thematic arguments, and to the details of the process of Instantiation respectively. The more elaborate internal structure of the DP has important consequences for the dynamic interpretation of morphological number, which is the topic of Section 2.3. We propose an interpretation of plural morphology as a presupposition trigger. More specifically, the plural morpheme on nominals introduces a presupposed discourse referent and a predicate of plurality on it. In the context of a full-fledged DP, this discourse referent is bound by the discourse referent introduced by the determiner (cf. Section 2.3.6). In the case of bare plurals, it has to be accommodated (cf. Section 2.3.6). The semantic and dynamic potential of the plural feature provides a natural explanation for the fact that bare plurals do, but bare singulars do not occur in full argument position in languages such as English and Hungarian.

The proposals we work out in this chapter serve as background to the rest of the book, where we first develop a general approach to incorporation, and then apply it to the complex case of Hungarian while keeping in sight the existence and the limits of cross-linguistic variation with respect to various properties of incorporated nominals.

2.1 Discourse referents and thematic arguments

DRT builds upon the initial insight of Karttunen (1976). Karttunen was the first to treat DPs in argument position as introducing a discourse referent which functions as an argument of the predicative expression the DP is a syntactic argument of. We maintain this insight, but refine the representation by making room for thematic arguments, contributed by lexical predicates.[9] The gist of our proposal is that thematic arguments are variables introduced by lexical predicates, which occur only in predicative conditions and therefore do not have an independent life at the level of discourse structure. This means that unlike discourse referents, they do not appear in the universe of a DRS and are not assigned values by embedding functions but rather, are interpreted

---

[9]Precursors of our proposal are to be found in Kamp and Rossdeutscher (1994), Farkas (2001), Koenig and Mauner (2000), Kamp and Bende-Farkas (2001). What we call *thematic arguments* here are called *schematic discourse referents* in Kamp and Rossdeutscher, who go into details concerning thematic roles and selectional restrictions that we do not deal with here. We do, however, consider issues that have not been addressed before, such as the finer details of interpretation at the nominal and clausal levels.

as part of the predicative condition in which they occur. We begin by taking a closer look at the notion of discourse referents in standard DRT in 2.1.1 before introducing thematic arguments in 2.1.2.

2.1.1 Discourse referents in 'standard' DRT

In DRT, the contribution of argumental DPs to the semantic representation of the discourse consists of a discourse referent and a condition on it. Descriptive DPs (i.e., DPs involving a lexically headed NP) contribute a predicative condition. The main verb of the sentence contributes an n-place predicate. In the process of interpreting the nodes in which the main predicate is combined with its syntactic DP arguments, the discourse referents introduced by these arguments fill the argument positions of the predicate. To illustrate, consider the example in (43).

(43) A student left.

In Kamp and Reyle (1993), the singular indefinite DP introduces a new discourse referent u, and a condition on that discourse referent requiring the value assigned to u to be a student. The construction rules lead to the DRS in figure 1:

$$
\boxed{
\begin{array}{c}
u \\[4pt]
\text{student(u)} \\
[_S \, [_{DP} \; u \;] \; [_{VP} \; \text{leave}]] \\
\end{array}
}
$$
A student left.
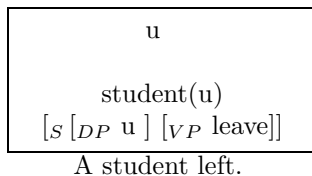
FIGURE 1 Kamp and Reyle's analysis

Given that the second condition is irreducible in Kamp and Reyle's system, it leads directly to the final DRS in figure 2:

$$
\boxed{
\begin{array}{c}
u \\[4pt]
\text{student(u)} \\
\text{leave(u)} \\
\end{array}
}
$$
A student left.
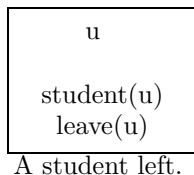
FIGURE 2 final DRS

Note that there are no separate rules for the determiner a and the common noun.[10] The construction rule takes the DP as a whole and

---

[10]The separation is introduced in Van Eijck and Kamp (1998), where the function of determiners is, as in our proposal, the introduction of discourse referents into the

does two things: it introduces a new discourse referent and it provides a descriptive condition on it. Predicates, whether nominal or verbal, appear with the appropriate discourse referents as arguments directly. The thematic arguments of a predicate, as found in lexical theories of argument structure, play no role in the derivation.

In this system, discourse referents play a dual role: (i) they appear at the top of the DRS, as elements of its universe, and as such are the pillars of discourse coherence in that they may serve as the antecedent of a discourse pronoun and various other anaphoric elements; (ii) they appear as arguments of predicates and therefore they realize the various thematic roles predicates come with. Thus, figure 2 encodes two types of information: (a) information concerning what discourse entities have been introduced so far (one, u, who is a student), and (b) information concerning a leaving event in which u is assigned the role of the 'leaver'. The information in (a) is contributed by the DP, while that in (b) is contributed by the rest of the sentence.[11]

As just illustrated, the construction rules in Kamp and Reyle (1993) are coarse-grained in the sense that they do not go into the contribution of subparts of the DP. Also undiscussed are the details of the connection between DPs and the discourse referents they introduce on the one hand, and the predicate and the argument slot which the discourse referent fills on the other, and which plays a crucial role in lexical semantics and in theories of argument structure. We need to have a more fine-grained theory of predicates, their arguments, and the way they combine, given the rich structure DPs may have, as well as given the complex issues involved in understanding predicate-argument structures and their relation to morphology and syntactic structure. We are starting on this project in the next subsection by establishing a distinction between thematic arguments of predicates and discourse referents.

2.1.2   Thematic arguments

We follow standard syntactic practice, and in particular Grimshaw (2000), in assuming that descriptive DPs consist of a nominal core, an NP consisting of an N, optionally followed by arguments and optionally modified by adjectives, and an inflectional layer whose highest head is a D:

---

universe of a DRS. In what follows, we push that line of analysis further by separating discourse referents from thematic arguments of predicates.

   [11]We are leaving out of our representations the event variable, because it is not directly relevant to our present concerns. For a theory of tense and aspect within the framework of DRT, see Kamp and Reyle (1993) and De Swart (1998).

(44) $[_{DP}$ D $\ldots [_{NP}$ N $\ldots]]$

Here N is the lexical head of the DP. We assume that nominal inflection, and in particular, morphological number, is part of the inflectional layer, and is encoded in the form of an inflectional feature. What syntactic weight such features are assigned is immaterial for our purposes.

In what follows, we 'unpack' the rules involved in the interpretation of this structure, and make concrete proposals concerning the contribution of the items in D to the dynamic semantic representation, as well as the contribution of information encoded by both the nominal core and morphological number. The result is an account of argumental DPs that relates sentence-level semantics and dynamic semantics.

We take predicative expressions (verbs, common nouns, adjectives, certain prepositions) to denote n-place relations. The term *thematic argument* is used to refer to variables filling the places of such an expression. The role of thematic arguments within the boundaries of lexical semantics is uncontroversial. We claim here that it is desirable to make room for them at the level of the DRS as well. We therefore propose that at the level of the DRS, there are two types of variables: discourse referents, denoted by u, v, t, and thematic arguments, denoted by x, y, z. (We will use primes if we run out of letters.) The latter are introduced into DRSs as arguments of predicates, while the former are introduced as part of the interpretation of the syntactic arguments of predicates. The DRS contribution of a noun like *student* is the condition *student(x)*. Verbs like *walk, write, give* contribute the conditions *walk(x), write(x,y), give(x,y,z)*. Part of the lexical information associated with each predicate specifies the number of thematic arguments the predicate has, as well as particular semantic properties that entities ultimately associated with these arguments must have. The construction rules we propose generate thematic arguments as arguments of predicative conditions in Con_K, and therefore these arguments do not appear in U_K, the universe of a DRS K.

The syntactic arguments of a predicate end up being connected to particular thematic arguments. Which syntactic argument connects to which thematic argument is the topic of 'linking theory'. We do not go here into issues raised by linking theory as such. We will, however, provide an explicit way of introducing thematic arguments into DRT, and of connecting them with discourse referents (cf. section 2.2 below).

Work in argument structure and linking theory has provided ample and convincing evidence for the relevance of thematic arguments to the connection between lexical semantics and morpho-syntax. Recall for instance that Dowty (1991) shows that predicates impose, as part of

their lexical meaning, a set of entailments on their thematic arguments. (These have been known in the linguistic literature as 'selectional restrictions'.) We suggest that such entailments should be treated as presuppositions on thematic arguments but will not go into the details here since they are immaterial to our main concerns. Lexical entailments play a crucial role in accounting for the connection between thematic arguments and the syntactic arguments of the predicative expression in question. An important feature of Dowty's work is that it points to the necessity of separating the entailments contributed by a predicate on its thematic arguments from entailments contributed by the content of the syntactic argument realizing the thematic argument in question. To exemplify, in

(45) The log/boy rolled down the hill.

the predicate *roll* is to be analyzed as imposing no animacy entailment on its external argument. Animacy (or sentience) entailments on this argument may come from the content of the DP that realizes it. In contrast, a verb like *interrogate* imposes an animacy/sentience entailment on both its thematic arguments. Predicate-imposed entailments play a role in argument selection. Entailments originating within the DP itself on the other hand, are relevant to morpho-syntactic issues such as special marking by a special case, preposition or agreement of a DO when animate, definite or specific, a phenomenon referred to as Differential Object Marking by Bossong (1985), discussed most recently in Aissen (2003). Thus, the referent of the subject of the sentence inherits entailments both from the predicate of the sentence and its own descriptive content.

Thematic arguments, we propose, make the argument structure of a predicative expression visible at the level of the DRS. Because thematic arguments do not show up in the universe of discourse of a DRS, but only play a role in predicative conditions, they do not have the referential status of discourse referents. In the next chapter we propose that they are, nonetheless, present in final DRSs in sentences involving implicit arguments, as well as in sentences involving incorporated nominals. The presence of these thematic arguments in final DRSs, and the difference we posit between them and discourse referents will allow us to propose a finer-grained view of discourse transparency in chapter 6.

With respect to discourse referents, we follow 'standard' DRT in assuming that they are elements of the universe of a DRS K, U_K, and are discourse markers assigned values by embedding functions. We propose that the primary dynamic role of determiners in argumental descriptive DPs, as well as the primary role of proper names and pronouns, is

to introduce discourse referents. If one follows Postal (1969), pronouns are determiners as well, and therefore their function of introducing a discourse referent is not surprising. Note also that Longobardi (1994) suggests that proper names move under D. Under these proposals then, the function of introducing a discourse referent is exclusively connected to occurrence under D. Our proposals are compatible with this syntactic analysis but do not rest on it.

According to what was said so far, the discourse referent introduced by a determiner has to be connected both to the thematic argument of the lexical predicate in the DP and to the appropriate thematic argument of the predicate the DP is a syntactic argument of. We now turn to the details of how this is achieved.

2.2 Instantiation

In our view, the role of non-quantificational determiners such as definite and indefinite articles, as well as numerals such as *two*, is to introduce a discourse referent and, potentially, place extra restrictions on it. Thus, *two* requires that the value of the discourse referent it introduces be a group with two members.[12] Quantificational determiners, on the other hand, introduce a discourse referent as part of a complex tripartite structure. Since issues concerning quantification are not central to our concerns, we illustrate here with two indefinite determiners in English, *a/an* and *two*.

Determiners (introducing discourse referents) are connected to NPs (involving predicative conditions over thematic arguments), and argumental DPs are connected to verbs and VPs (involving predicative conditions over thematic arguments). The discourse referents introduced by determiners end up connected to a thematic argument of the condition contributed by their nominal head, as well as to a thematic argument that occurs in the condition contributed by the predicative expression of the sentence. We turn next to the main topic of this section, the process of *Instantiation* that connects a discourse referent and a thematic argument.

2.2.1 General definition

The connection between discourse referents and thematic arguments is achieved by a process called *Instantiation*. Technically, Instantiation replaces a thematic argument by a discourse referent. We formulate it in (46):

---

[12]We will not be concerned here with the distinction between distributive and collective readings.

(46) *Instantiation of a thematic argument by a discourse referent*
     Substitute u for all occurrences of x in Con_K.

Thematic arguments occur both as arguments of conditions contributed by lexical heads of argumental descriptive DPs, and as arguments of main verbs. Consequently, there are two points in the construction of the representation of the meaning of a sentence at which Instantiation is relevant: the construction of the interpretation of a descriptive argumental DP, and the construction of the interpretation of expressions made up of a predicate and one of its syntactic arguments. We therefore propose that Instantiation is involved both in reducing the node made up of a D and its NP sister, and in reducing a node dominating a predicate expression and one of its syntactic arguments. We call the latter instance of Instantiation *Argument Instantiation,* or *A-Instantiation* and the former *Determiner Instantiation* or *D-Instantiation.* In the next two subsections, we give the details of the relevant rules. We start with Argument Instantiation, and turn to Determiner Instantiation in section 2.2.3.

2.2.2   Argument Instantiation

Let us start with the simple example in (47):

(47) A student left

Glossing over the details involved in the interpretation of the DP for now, we assume that its contribution is a discourse referent u and the condition *student(u)*. Abstracting away from details of event and tense/aspect semantics, the contribution of the intransitive VP *left* in (47) is the unary predicate *leave* followed by a thematic argument x. As mentioned already, this information comes from the lexicon. Figure 3 represents the DRS at the moment when the subject DP and the intransitive verb combine.

$$\boxed{\begin{array}{c} u \\[2mm] student(u) \\ [_S\,[_{DP}\ u\ ]\ [_{VP}\ leave(x)\ ]] \end{array}}$$
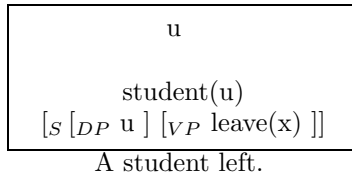A student left.

FIGURE 3   Interpretation of the VP.

We propose that the rule reducing S (the node having the DP and the VP as its daughters) involves the instantiation of the thematic argument x by the discourse referent u introduced by the DP. More gen-

erally, we assume that Instantiation is involved every time we reduce a node that combines a predicate expression with a discourse referent introducing syntactic argument. The discourse referent introduced by an argumental DP instantiates a particular thematic argument of the predicate the DP is an argument of. Which thematic argument is affected by which syntactic argument of the predicate expression is the topic of linking theory, and it will not be our concern here.

Note that it follows from our proposal that once a thematic argument has been instantiated by a discourse referent, it cannot be further instantiated by another discourse referent. Instantiation is not recursive. This ensures that a particular thematic argument will be linked to a single discourse referent.

The general form of the rule of A(rgument)-Instantiation is given in (48):

(48) *A-Instantiation*
Instantiate the n-th thematic argument of a verbal predicate by the discourse referent contributed by the fully interpreted nominal argument.

A-Instantiation is part of the rule that reduces the syntactic node at which the nominal forms a constituent with the verb or one of its projections. In the case of transitive and bi-transitive verbs, A-Instantiation applies each time the argument nominal is combined with the predicate. Thus, each discourse referent contributed by an argumental nominal ends up replacing a thematic argument of the predicate of the sentence. A-Instantiation manipulates the discourse referent contributed by the nominal and therefore it comes into play only at the time the nominal has been fully interpreted and shows up in syntactic structure as a discourse referent. This requirement is relevant to our account of the plural (cf. section 2.3.4 below).

In our example (47), the thematic argument x of the intransitive verb in figure 3 is instantiated by the discourse referent u introduced by the subject DP, resulting in the DRS in figure 4.

$$\boxed{\begin{array}{c} u \\[4pt] \text{student(u)} \\ [_S\,[_{DP}\,\text{u}]\,[_{VP}\,\text{leave(u)}\,]] \end{array}}$$
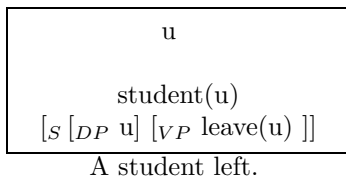A student left.

FIGURE 4   A-Instantiation.

This DRS contains only irreducible conditions, so it can be rewritten as the final DRS in figure 2. Our final interpretation is identical to what we get in the system in Kamp and Reyle (1993). The route is more circuitous because of the separation we propose between discourse referents (contributed by argumental DPs) and the predicative conditions contributed by the main predicative part of the sentence.

2.2.3 Determiner Instantiation

We turn next to what happens within the DP, restricting ourselves to DPs involving an article in D and an NP with a lexical head noun. Our aim is to provide a compositional account of the contribution of such DPs to the DRS in which they occur. In the case of argumental descriptive DPs we propose that the article in D contributes a discourse referent, while the NP contributes a predicative condition. Determiners differ from one another with respect to further restrictions they impose on the interpretation of the discourse referent they introduce. We return to this matter briefly below.

We illustrate here with the simplest case, where the NP dominates a single non-relational N and the D is *a/an,* the default article in English. The common noun *student* contributes a unary predicate, followed by one thematic argument. In figure 5, we give the result of reducing the common noun and the verb in the VP:

$$[_S [_{DP}[_D \text{ a } [_{NP} \text{ student}(z)]]][_{VP} \text{ leave(x)}]]$$
A student left.

FIGURE 5 Contribution of the common noun and the VP.

Within the DP the next step is to reduce the determiner *a.* The result is the introduction of a discourse referent u.[13] The DRS we obtain after reducing the determiner is given in figure 6. Now the discourse referent

---

[13]Farkas (1997a) and Corblin (2002) argue that conditions contributed by the descriptive content of a nominal should be differentiated from those contributed by the main predicative expression of the sentence. The role of the descriptive condition is to restrict the domain from which embedding functions may choose values for the discourse referent introduced by the determiner to the entities that satisfy it. Such constraints may be presupposed, in which case they have to be satisfied by the input function, as in the case of definite descriptions, or not, in which case they have to be satisfied by the updated, current function, as in the case of indefinite DPs. The role of the condition contributed by the predicative part of the sentence is to impose a requirement on the value the embedding function assigns to the relevant discourse referent. Since this distinction is not crucial to what follows, we will not mark it in our representations.

$$
\boxed{
\begin{array}{c}
\text{u} \\[4pt]
[_S \ [_{DP} \ [_D \ \text{u} \ [_{NP} \ \text{student(z)}]]] \ [_{VP} \ \text{leave(x)}]]
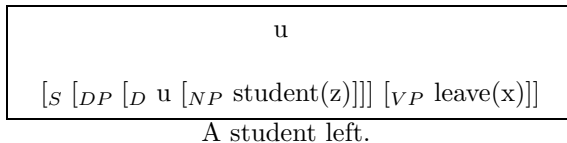\end{array}
}
$$

A student left.

FIGURE 6 Contribution of D.

contributed by D has to be connected to the thematic argument of the nominal. Note that this process is not parallel to what we find in the case of A-Instantiation: the D connects to the thematic argument of the NP without being a syntactic argument of the latter. We therefore suggest a distinct version of Instantiation in (49), called Determiner Instantiation or D-Instantiation, which accompanies the reduction of the DP.[14]

(49) *D-Instantiation*
Instantiate the thematic argument z of the NP by the discourse referent u contributed by material under D, and subscript u with the index x, writing u_x.

D-Instantiation replaces the thematic argument of the descriptive NP by the discourse referent introduced by the D, in the spirit of Higginbotham (1985). Just like A-Instantiation, D-Instantiation is a special version of the general process whereby a discourse referent binds a thematic argument of the predicate. Here, we index the discourse referent with the thematic argument it instantiates in order to keep track of the relation between the two. This is a notational device that we exploit when we give the interpretation of the plural morphology on the noun in section 2.3 below.[15] Application of the rule of D-Instantiation to figure 6 leads to the DRS in figure 7.

$$
\boxed{
\begin{array}{c}
u_z \\[4pt]
[_S \ [_{DP} \ [_D u_z [_{NP} \ \text{student}(u_z)]]] \ [_{VP} \ \text{leave(x)}]]
\end{array}
}
$$

A student left.
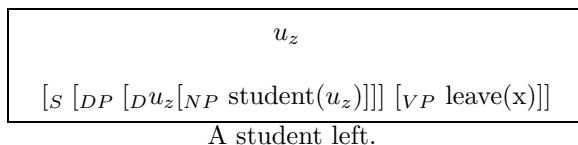
FIGURE 7 Application of D-Instantiation.

[14]In languages that do not systematically use articles, or use them only for definite and demonstrative DPs, the introduction of a discourse referent and the effect of D-Instantiation occurs in the absence of a determiner.

[15]In principle, we could use the subscripts with A-Instantiation as well but we do not because with respect to the issues addressed in this book there are no empirical reasons to do so.

This step completes the interpretation of the subject DP. The conditions in the DP are irreducible, so the DRS in figure 7 can be rewritten as in figure 3, modulo the subscript. Figure 3 was the input for A-Instantiation, and as we showed in section 2.2.2 above, this construction rule leads to the same final output as the one Kamp and Reyle obtain. The main difference is that we needed a number of intermediate steps, which were glossed over in previous work.

2.2.4   A note on determiners and scope

In our proposal, the canonical role of a determiner is to introduce a discourse referent, where the term 'determiner' is used as a cover term for morphemes such as articles, nominal quantifiers and numerals which occur in D or in the 'D area'. One cannot, however, maintain that only determiners may do so in view of the existence of pronouns and D-less proper names, which also introduce discourse referents, unless, of course, we follow the syntactic proposals of Postal (1969) and Longobardi (1994) mentioned above. One cannot maintain that all articles introduce discourse referents either, in view of their use in predicative nominals such as *Mary is a doctor.* In such cases the indefinite article is expletive in the sense that it has no (dynamic) semantic role.[16] We make the weaker claim that in the case of argumental DPs that introduce a discourse referent, in languages that have determiners, it is the determiner that does so. We follow proposals in Farkas (1997a, 2002a,b) in assuming that besides introducing a discourse referent, determiners may place various interpretive constraints on the discourse referent introduced, constraints that may affect its scopal potential. The reduplicated indefinite article in Hungarian for instance requires the discourse referent it introduces to co-vary with another individual or situational discourse referent. As a result, the co-varying discourse referent must be interpreted within the scope of a quantifier that binds the discourse referent it co-varies with. The special indefinite *a certain* in English imposes a particular interpretive constraint concerning the identifiability of its value. As a result of this constraint, such indefinites may not be interpreted within the scope of non-epistemic modals. In (50), the indefinite must be interpreted outside the scope of the modal:

(50) Paul should read a certain short story by Alice Munro.

The ordinary indefinite article in English, *a/an* (and its counterparts in other languages,) imposes no interpretive constraints on the discourse referent it introduces. As a result, there are no scopal constraints on

---

[16]See De Swart (2001) for an analysis of predicative constructions in terms of type-shifting.

the discourse referent introduced by it. Such discourse referents therefore my be interpreted in the current DRS box K or in any K' that is accessible to K. The indefinite determiner *two* imposes a cardinality requirement on its discourse referent. No scopal restrictions are entailed by this, and therefore DPs with *two* also scope freely.[17]

In short, we assume that the scopal properties of a discourse referent introducing nominal are determined by the item responsible for the introduction of the discourse referent. In the case of descriptive DPs, this is the material under D. The free scope of ordinary indefinites is the result of the lack of interpretive constraints associated with the ordinary indefinite article. Various indefinite (or definite) determiners impose special conditions on the discourse referents they introduce, which may limit their scopal behavior.

To sum up this section, we have proposed to represent in DRSs both discourse referents and thematic arguments. We introduced the rule of Instantiation, which replaces the former by the latter. We saw Instantiation at work both within the DP and at the sentence level. The proposal allows a more fine-grained, compositional interpretation of descriptive DPs, where the canonical role of determiners is to introduce a discourse referent that instantiates the thematic argument of the description. The properties of the determiner decide the scopal potential of the DP. In the next section, we extend the analysis to plural indefinites of the form *two students*. Given the more complex interpretation procedure we developed for DPs, it becomes important to discuss the interpretation of morphological number within our more detailed version of DRT. This will have an impact on our analysis of incorporation. Remember that in chapter 1, we already drew attention to the role of morphological number in incorporation constructions.

2.3   The dynamics of morphological number

In this section, we give an explicit account of the interpretation of number against the background of the distinction between thematic arguments and discourse referents established so far in this chapter. We first discuss the semantic import of morphological number on the noun (section 2.3.1), and then give our analysis of number interpretation of plural DPs (section 2.3.2) and singular ones (section 2.3.4). Next, we explore the consequences of the analysis in an account of English existential bare plurals (section 2.3.5). We conclude with a motivation

---

[17]The issue of the special restrictions on the scope of the distributive readings of numerals, discussed, for instance, in Ruys (1992) will not concern us here. For discussion, see Farkas (1997a) and Kamp and Bende-Farkas (2001) .

of why plurality needs to be predicated of discourse referents, and not of thematic arguments (section 2.3.7).

2.3.1 The semantic weight of morphological number

The nominal morphological features we encounter cross-linguistically are case, number, gender, and person. Among these, number is the only feature that plays a role in incorporation, and therefore we will focus here on the details of its interpretation. Our central claim is that number, unlike gender, plays a role in nominal dynamic semantics. We focus our attention on morphological systems that have a binary opposition between morphologically singular and morphologically plural nominals, as is the case in both English and Hungarian.

Morphological number on nominals conveys information concerning the atomic/non-atomic nature of the entity ultimately associated to the thematic argument of the nominal by constraining the value to be assigned to the discourse referent that instantiates it. Morphologically plural argumental nominals are associated with group level entities, while morphologically singular nominals, which are formally unmarked, are associated, by default, to atomic entities.[18] We capture this asymmetry between singular and plural forms by positing a privative number feature, *pl*, and analyze morphologically singular nominals as lacking number specification altogether. In what follows therefore, the term '(morphologically) singular nominal' refers to a nominal that lacks morphological number specification.

The classification of entities according to atomicity properties is a matter of ontology, or organization of the universe of discourse. We find it playing a role in predicate entailments, since certain roles in certain situations can be played only by atomic or only by non-atomic entities. Thus, a predicate like *gather* imposes a non-atomicity entailment on its external argument, while *collect* imposes a non-atomicity entailment on its internal argument:

(51) a. The students gathered in the square.
    b. *The student gathered in the square.
    c. The crowd gathered in the square.

(52) a. Mary is collecting stamps.
    b. *Mary is collecting a stamp.

---

[18] We see below an instance in Hungarian where this default is systematically overridden. Note also that there are discrepancies between morphological and semantic number, though less commonly than with gender. Thus, *scissors* could be taken to be semantically singular, but must be morphologically plural. We assume that this is a property lexically associated with the N *scissors* that affects a discourse referent that is assigned a pair of scissors as value.

    c. Mary is collecting a particular kind of stamp that is hard to find.

Note that the entailment involves atomicity rather than the morphological plural feature since the presence of a lexical non-atomicity entailment ensures the well-formedness of (52c) and (51c).

By contrast, in languages with arbitrary gender systems, information encoded in grammatical gender features concerns the classification of common nouns and does not relate directly to semantic or extra-linguistic properties. Such information is irrelevant to predicate entailments. Gender features are lexically associated with common nouns, whereas morphological number is normally not lexically marked, but arises in the course of inflection.

These differences, we claim, justify having the plural feature play a role in clausal DRS construction by contributing a predicate *plural* on a discourse referent requiring its value to be non-atomic. Gender features on the other hand, even if visible at this level, do not contribute a predicate of this sort. Thus, we do not have predicates like *feminine* or *neuter* contributed by morphologically feminine or neuter nominals on a par with *plural*. We therefore do not expect morphological gender to parallel the semantic behavior of morphological number. Below we work out a detailed account of the interpretation of number morphology after briefly reviewing its treatment in Kamp and Reyle (1993).

2.3.2 Number interpretation in standard DRT

In Kamp and Reyle (1993), singular indefinites such as *a student* in argument position are taken to introduce a discourse referent that can be picked up by an anaphoric expression later in the discourse. This discourse referent is taken to refer to an atomic individual in the sense that the embedding function must assign to it an atomic individual as value. Plural indefinites such as *two students* are different only in that the discourse referent they introduce is taken to refer to a group, or a non-atomic individual. At the DRS level, the difference between singular and plural indefinite DPs is reflected in the use of upper and lower case variables: u, v, w stand for discourse referents that must have atomic entities as values, while U, V, W stand for discourse referents that must have non-atomic, group referents. Singular indefinites such as *a student* introduce lower case discourse referents, while plural indefinites such as *two students* introduce upper case ones. To exemplify, a sentence like (53), is represented by the DRS in figure 8:

(53) Two students left.

$$\boxed{\begin{array}{c} \text{U} \\[4pt] \text{two(U)} \\ \text{student(U)} \\ \text{leave(U)} \end{array}}$$
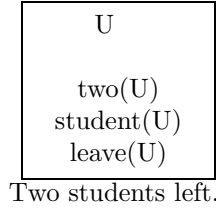
Two students left.

FIGURE 8 Plural DPs in Kamp and Reyle

This DRS differs from the DRS in figure 2 involving the singular indefinite *a student* in that here we have a plural discourse referent U, and an additional predicate *two(U)*, introduced by the determiner *two*, specifying the cardinality of the discourse referent U.

In the next section, we refine this analysis in the sense that we go into the details of the semantic contribution of morphological number information, and the steps involved in the interpretation of nominals.

2.3.3   A presuppositional analysis of plural morphology

As far as the morpho-syntax of plurals is concerned, we take it that plural morphology involves the presence of an inflectional feature *pl* realized on the lexical head noun. We assume that *pl* is a head feature, and therefore it projects to the highest projection of the nominal (NP or DP).[19] For a full-fledged plural DP such as *two cats*, this leads to the structure in (54):

(54) $[_{DPpl} [_{Dpl} \text{ two}] [_{NPpl} [_{Npl} \text{ cats}]]]$

We agree with Kamp and Reyle that the discourse referent introduced by this nominal gets a group-level individual as value. Kamp and Reyle encode this information by using specialized variables (cf. section 2.3.2 above). However, they make it clear that the instruction to introduce a non-atomic discourse referent U into the universe of a DRS K is an abbreviation of the instruction to introduce a discourse referent u into the universe of K and introduce the condition *non-atomic(u)* into Con_K. Similarly, the instruction to introduce a singular discourse referent involves the introduction of the condition *atomic(u)*. (Kamp and Reyle 1993:334). Here, we use the more elaborate instruction, and mark plurality as the predicate *plural(u)* on a discourse referent u. Because we treat plurality as a privative feature, we do not introduce any extra con-

---

[19] Alternatively, one could take it to be the functional head of a NumP to which N would move. Nothing crucial depends on this choice as long as the information that the DP is plural is encoded at the DP level, which is required anyway, for subject-predicate agreement purposes.

ditions for morphologically singular nouns, but treat them as unmarked (cf. section 2.3.6).

We take the feature *pl* to contribute the predicate *plural*. This predicate requires the discourse referent that instantiates the thematic argument of the nominal to be non-atomic. In the bottom-up interpretation we are assuming here, the discourse referent has not been introduced at the time the nominal bearing the plural feature is processed. In the standard case of a descriptive DP, it is the determiner that introduces the discourse referent that instantiates the thematic argument of the nominal. We capture the fact that the number information that is morphologically marked on the head noun imposes a requirement on the discourse referent to be introduced by the determiner by adopting a presuppositional analysis. We claim that the feature *pl* contributes a presupposed discourse referent and predicates plurality of it.

In full-fledged DPs, the presupposed discourse referent introduced by the plural is bound by the discourse referent introduced by the determiner. As we will see in section 2.3.4 below, this discourse referent is accommodated in the case of a bare plural. In a DP like *two cats*, the lexical properties of the D entail non-atomicity, so the semantic contribution of the plural feature is redundant. In cases such as *the cats,* where the D is unmarked for number, it is not.

The plural feature in this account is similar to a determiner in that it introduces a discourse referent. It is different in that this discourse referent is presupposed. Accordingly, it is subject to stringent binding and interpretive conditions.[20] Accordingly, we propose the following construction rule for plural nouns:

(55) CR_{plN}
         For a plural noun N of the form $[_{Npl}\ N(x)]$ in DRS K,

  (i) introduce a presuppositional box K';

  (ii) introduce into $U_{K'}$ a discourse referent u_x that is coindexed with the thematic argument x of the nominal;

  (iii) introduce into $Con_{K'}$: $plural(u_x)$;

We follow here van der Sandt's treatment of presupposition in DRT but with a slight change in notation. Instead of enclosing presupposed material in a dotted box, we put it in a presuppositional box K' separated from the asserted box K by a double line:

---

[20]Compare Verkuyl and Bende-Farkas (1997) and Kamp and Bende-Farkas (2001) for similar proposals. The crucial difference is that we maintain an overall distinction between the contribution of the plural on N(P)s and the contribution of determiners. The importance of this distinction will become evident in chapter 5, when we deal with incorporated and non-incorporated plurals in Hungarian.

K	K'
assertion	presupposition

FIGURE 9 assertion/presupposition

The construction rule for the plural morphology on a noun N is responsible for introducing a presupposed discourse referent co-indexed with the thematic argument of N of which plurality is predicated. For the plural noun *cats*, the result is spelled out in figure 10:

	u_x
	$plural(u_x)$
$[_N\ cat(x)]$	

$$[_{Npl}\ cat(x)]]$$

FIGURE 10 contribution of plural morphology

Since *pl* is a head feature, it occurs on the head projections of N as well as on the DP and possibly on the D. A question that arises is how to treat the interpretation of such redundant agreement features. If only one instance of such an agreement chain is interpreted, one has to decide which one it is, and what happens to the other features in the chain. The minimal assumption we make in this respect is that the features copied by agreement, and which form an agreement chain are marked as forming such a chain in morphology. For us, this means that all the instances of *pl* in (54), if interpreted, would introduce a discourse referent bearing the index of thematic argument of the nominal. Once this assumption is made, it does not matter which occurrence of *pl* in the chain is interpreted. If all of them are, they all contribute the same information. For simplicity, we assume here that only the lowest feature is interpreted, and that once this is done, the other links in the chain are deleted. Nothing crucial depends on this particular assumption. Our analysis would go through just as well were we to interpret only the highest occurrence of a feature in an agreement chain.

The presupposed discourse referent introduced by the plural feature is coindexed with the thematic argument of the nominal the plural morphology occurs on. In the view of presupposition as anaphora that van der Sandt developed, a presupposition needs to be resolved. Resolution of a presupposition involves the integration of the contents of the presuppositional box K' with the asserted box K. Once the presuppositional box is empty, it is deleted. In the case of the presupposition introduced by *pl,* one has to identify the presupposed discourse referent

u_x with the discourse referent in the asserted box that instantiates the thematic argument x. As we will see in section 2.3.4, the coindexation relation drives the resolution of the presupposition.

2.3.4   Plural DPs

Now that we developed an interpretation of plural nouns, we can flesh out the interpretation of plural DPs, that is, DPs involving a lexical determiner that combines with a plural N (or NP). We leave the case of bare plurals for section 2.3.6. We build the DRS for (56) as an illus-tratation of the general process:

(56) Two cats are asleep.

The input of the semantic interpretation is the syntactic structure given in (57), where all the *pl* features form an agreement chain:

(57) $[_S[_{DPpl} [_{Dpl}$ two$][_{Npl}$ cats$]] [_{VP}$ are asleep$]]$

The starting point of our derivation is the DRS in figure 11, in which the plural noun *cats* has been interpreted according to the construction rule formulated in (56) above, under the assumption that once a *pl* in a chain is interpreted, the remaining links are deleted.

	u_x
	plural(u_x)
$[_S[_{DP} [_D$ two $][_N$ cat(x)$]] [_{VP}$ are asleep(z)$]]$	

two cats are asleep

FIGURE 11   contribution of plural noun

Recall that expressions in D introduce a discourse referent that instantiates the thematic argument of the nominal head by D-Instantiation. The result of interpreting the D here is given in figure 12.

v	u_x
two(v)	plural(u_x)
$[_S[_{DP} [_D$ two $][_N$ cat(x)$]] [_{VP}$ asleep(z)$]]$	

two cats are asleep

FIGURE 12   contribution of determiner

The plural determiner *two* introduces a discourse referent v with the predicate *two(v)* on it in the asserted box. The discourse referent v instantiates the thematic argument x of the plural noun by the process

of D-Instantiation as usual. In figure 13, we subscript the discourse referent with the variable of the thematic argument as stated by the rule for D-Instantiation in section 2.2.3 above.

v_x	u_x
$two(v_x)$	$plural(u_x)$
$[_S[_{DP}\ [_D\ two\ ][_N\ cat(v_x)]\ ]\ [_{VP}\ asleep(z)]]$	

two cats are asleep

FIGURE 13 D-Instantiation

At this point, we can resolve the presupposition. Resolution implies binding of the presupposed discourse referent u_x to the asserted discourse referent v_x, and moving the contents of the presupposed box to the asserted box. Once the presupposed box is empty, it can be deleted. The result is spelled out in the DRS in figure 14.

$$v_x$$
$$two(v_x)$$
$$plural(v_x)$$
$$cat(v_x)$$
$$[_S[_{DP}v_x][_{VP}\ asleep(z)]]$$

two cats are asleep

FIGURE 14 presupposition resolution

The indices on the discourse referent play a role in determining the binder of the presupposition but have no formal status. Formally, the resolution of the presupposition introduced by the plural morphology on the noun is governed by the rule in (58):

(58)　Resolution of the presupposition introduced by the plural morphology on the noun N (first version)

   (i)　In case the plural noun N occurs as part of a DP with a lexical determiner, bind the presupposed discourse referent u_x to the discourse referent v_x that instantiates the thematic argument x of the N (or NP).

  (ii)　Delete the internal syntactic structure of the DP and drop the indices on the discourse referent.

We extend this rule in section 2.3.6 below to cover bare plurals, where there is no D to introduce an appropriate binder for the presupposition.

Once the interpretation of the DP is complete, and the presupposition has been resolved, we delete the internal structure of the DP, and drop the indices, because the DP is now fully interpreted. We proceed with the interpretation of the VP. The thematic argument z on the verb is instantiated by the discourse referent v introduced by the subject by the application of A-Instantiation. The result is spelled out in figure 15.

$$\boxed{\begin{array}{c} v \\[6pt] \text{two}(v) \\ \text{plural}(v) \\ \text{cat}(v) \\ \text{asleep}(v) \end{array}}$$
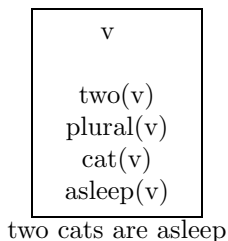
two cats are asleep

FIGURE 15   A-Instantiation, final DRS

The DRS in figure 15 completes the interpretation of the sentence 'Two cats are asleep'. The only difference between this DRS and Kamp and Reyle's representation of 'Two students left' in figure 8 above is that Kamp and Reyle use a capital letter to refer to a plural discourse referent, whereas we spell out the non-atomicity constraint as plurality predicated of the relevant discourse referent. The effect of this condition is to restrict relevant embedding functions to those that assign to v non-atomic values.[21] The result we reached is equivalent to that in Kamp and Reyle (1993), but we have provided here an explicit way of reaching this result by taking into account the details of the contribution of plural morphology in a compositional fashion.

The structure we built for the plural DP can be embedded in a larger structure, as in a sentence like (59):

(59) Mary thinks that two cats left.

In this sentence, the indefinite has free scope as a result of the lack of an interpretive constraint on *two*. This allows the discourse referent introduced by it to be interpreted in the most local box, giving the narrow scope reading of the indefinite relative to the intensional predicate, or in a superordinate box, giving the wide scope reading.

---

[21]A more cautious formulation, to which we will come back in chapter 5 is to characterize the effect of the plurality condition as making groups available as possible values for the relevant discourse referent rather than as imposing a group interpretation.

2.3.5 Singular DPs

Let us now return to the interpretation of singular DPs. As stated above, unlike Kamp and Reyle (1993), we assume that 'singular' is not a morphological feature. A discourse referent u introduced by a DP that does not involve the feature pl simply lacks the constraint *plural(u)*. The atomicity entailment on such a discourse referent comes, we assume, from the fact that by default, embedding functions assign atoms as values to discourse referents:

(60) *Default number interpretation*
By default, embedding functions assign atomic entities to discourse referents.

This default is overridden by conditions incompatible with it. Thus, the presence of the condition *plural(u)* has the effect of overriding the default. The default is also overridden in the case of conjoined DPs when the interpretation of such a DP is a group with two elements or in the presence of lexical information coming from a head noun such as *crowd.* Another possible source of information that overrides the default is lexical specification of the morphemes in D. Consider, for instance, the case of Hungarian, where ordinary plural DPs are marked with the plural morpheme *-(V)k*, which we encountered already in chapter 1. When the DP contains a morpheme in the D area that expresses semantic plurality, such as a numeral or the quantifier *sok* 'many' or *egy pár* 'a couple', the DP is morphologically singular, triggering singular agreement on the verb:

(61) Sok/hat diák   elment.
     many/six student leave.Past
     'Many students left.'

Here the noun *diák* is in the singular, and the verb is in the third person singular as well. Discourse pronouns having such morphologically singular but semantically plural DPs as antecedents are always morphologically plural, showing sensitivity to the semantic nature of the discourse referent rather than the morphology of the antecedent:

(62) Pali látta   őket.
     Pali see.Past.Def them.Acc
     'Pali saw them.'

The form *őket* is the plural accusative version of the third person pronoun *ő*, formed by adding the plural suffix *-k* followed by the accusative suffix *-(V)t*. Had we taken the absence of plural marking to have the semantic weight of requiring the relevant discourse referent to be atomic, we would have to complicate the account of such cases. The presence

of the plural morphology on the N in such nominals in English may be taken as an instance of agreement, since the information it contributes is redundant given the information that comes from the D.

We conclude our account of number interpretation in fully projected DPs by noting that the analysis of number we gave here correctly predicts that morphologically singular DPs will be interpreted as semantically singular even though there is no explicit information to this effect in the DRS, while morphologically plural DPs will be interpreted as semantically plural because of the semantic effect of the plural feature. This constitutes the first half of our account of the contrast we saw in chapter 1 between the number interpretation of full-fledged morphologically singular DPs and incorporated morphologically singular nominals. We have given here an account of the interpretation of singular full-fledged DPs which gives their lack of morphological number marking semantic weight. The second half, namely the account of the number neutrality of morphologically singular incorporated nominals will be given in chapter 3. Before we turn to incorporation, however, we apply the analysis just developed to bare plurals in English.

2.3.6   Existential bare plurals in English

In this subsection we return to the semantic contribution of plural morphology by considering cases of bare plurals in argument position in English. The analysis of the contribution of plural morphology developed above offers an interesting perspective on the semantics of bare plural nominals in full argument position. In English, bare plurals may occur in such positions and may receive an existential or a generic reading. In this subsection we focus on the existential reading, leaving the generic interpretation for chapter 5.

Consider an example like (63):

(63) Cats were playing in the garden.

Here a bare plural occurs in subject position, and is interpreted existentially. Under the simplest syntactic assumptions, according to which what you see is what you get, the subject is a plural NP, for there is no lexical D. The construction rules for the plural NP *cats*, and for the VP, yield figure 16.

There are two related problems we face now. First, note that there is no asserted discourse referent that may act as a binder for the presupposed discourse referent introduced by the plural because of the absence of a determiner. Thus, u_x cannot be connected to x by being bound to some asserted discourse referent subscripted for x. Second, A-Instantiation cannot occur in this configuration. A-Instantiation takes

$$
\begin{array}{|l||l|}
\hline
& \text{u}_x \\
& \\
& \text{plural}(\text{u}_x) \\
[_S [_{NP} [_N \text{ cat(x)}]] [_{VP} \text{ play-in-the-garden(z)}]] & \\
\hline
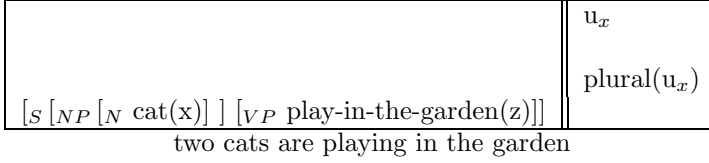\end{array}
$$

two cats are playing in the garden

FIGURE 16 contribution of plural noun

the discourse referent contributed by the nominal and substitutes it for the relevant thematic argument of the VP. But at this level of representation, there is no (asserted) discourse referent that can instantiate the relevant argument position of the verb. However, we expect A-Instantiation to apply, because the bare plural occurs in a regular argument position.

We assume that in languages like English where bare plural arguments are possible, the derivation may proceed because these languages allow accommodation of the presupposed discourse referent thereby overcoming both problems. Accommodation of a presupposition is a process that goes back to proposals made by Lewis (1979). The basic idea is that a presupposed entity that has not been explicitly introduced can be assumed to exist in the common ground. In the DRT analysis of presupposition developed by van der Sandt (1992), accommodation of a presupposed discourse referent involves copying it into the asserted box. Once the discourse referent exists in the universe of the asserted box, we can move the conditions on the discourse referent to the asserted box as well, and delete the presuppositional box. If we apply accommodation along these lines to the DRS in figure 16, we obtain the DRS in figure 17:

$$
\begin{array}{|c|}
\hline
\text{u}_x \\
\\
\text{plural}(\text{u}_x) \\
[_S [_{NPpl} [_{Npl} \text{ cat(x)}]] [_{VP} \text{ play(z)}]] \\
\hline
\end{array}
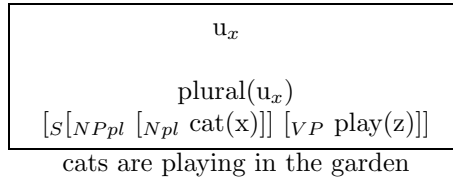$$

cats are playing in the garden

FIGURE 17 presupposition resolution by accommodation

Next, the accommodated discourse referent instantiates the thematic argument of the N (or NP) by a process we call Secondary Instantiation. Secondary Instantiation, unlike D-Instantiation, is driven by the presuppositional semantics of the plural rather than by the lexical input of the syntactic configuration.

(64) *Secondary Instantiation*

Instantiate the thematic argument x of a nominal with a discourse referent a_x that it is co-indexed with.

Unlike D-Instantiation, Secondary Instantiation is not triggered by a reduction rule, and therefore its application is not tied to a particular point in the derivation. It is a last resort strategy that allows a discourse referent contributed by the plural feature to connect to the thematic argument of the nominal in the absence of a proper binder. After application of Secondary Instantiation, we obtain the DRS in figure 18.

$$
\boxed{
\begin{array}{c}
u_x \\
\\
\text{plural}(u_x) \\
\text{cat}(u_x) \\
[_S\ [_{NP}\ u_x][_{VP}\ \text{play(z)]]}
\end{array}
}
$$
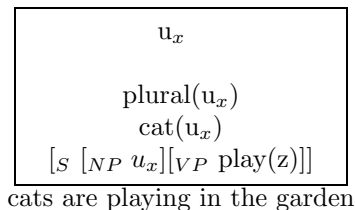cats are playing in the garden

FIGURE 18 Secondary Instantiation

At this point, we can delete the internal syntactic structure of the nominal, and drop the indices, because the interpretation of the nominal argument is complete. The DRS in figure 18 provides the right input for A-Instantiation. Application of A-Instantiation leads to the final DRS in figure 19.
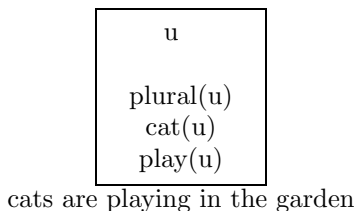
$$
\boxed{
\begin{array}{c}
u \\
\\
\text{plural}(u) \\
\text{cat}(u) \\
\text{play}(u)
\end{array}
}
$$
cats are playing in the garden

FIGURE 19 A-Instantiation (final DRS)

The embedding conditions for this DRS yield an existential interpretation for u. The presence of the condition *plural(u)* ensures that the entity that the embedding function assigns to u is non-atomic.

Recapitulating, we claim that the absence of a lexical determiner has two consequences: (i) it requires the presupposition to be resolved by accommodation of the discourse referent and (ii) it makes the application of Secondary Instantiation necessary, since this is now the

only way the accommodated discourse referent can be integrated into the DRS. Clearly, the two processes are closely related. It is the lack of a determiner that makes it impossible for D-Instantiation to apply, thereby providing a binder for the presupposed discourse referent.

In order to make room for accommodation, we complete the rule for the resolution of the presupposition introduced by the plural morphology on the noun by adding to our previous rule clause (ii) below:

(65)   Resolution of the presupposition introduced by the plural morphology on the noun N (final version)

   (i) If the plural noun N occurs as part of a DP with a lexical determiner, the presupposed discourse referent u_x is bound to the discourse referent that instantiates the thematic argument x of the N (or NP);

  (ii) If the plural noun does not occur as part of a DP with a lexical determiner, the presupposed discourse referent u_x is accommodated in the asserted box; accommodation triggers application of Secondary Instantiation.

 (iii) After application of (i) or (ii), the internal syntactic structure of the nominal is deleted, and the indices are dropped.

The added clause (ii) allows the presupposition introduced by the plural to be accommodated in case no appropriate binder is available, following the insight that binding is to be preferred over accommodation. The presupposition introduced by the plural feature, in this analysis, is like that introduced by the definite determiner and unlike that introduced by *too* and *also* in that it allows accommodation. (Cf. Zeevat (1992) for discussion.) One way of accounting for languages that do not allow bare plurals in argument position is to assume that in those languages, the presupposition introduced by the plural feature cannot be accommodated.

Clause (iii) takes care of the reduction of the syntactic structure of the part of the sentence that has been interpreted. It also deletes the thematic indices, now that the interpretation of the nominal is complete and they are no longer relevant to interpretation. This is a move of convenience; keeping them would have no adverse effect except for complicating representations.

A final issue that we need to address involves the question of where the accommodated discourse referent is interpreted. In the example we worked out above, there was only one asserted box and therefore the question does not arise. However, in a more complex DRS, one may have the choice between 'lower' and 'higher' boxes. Van der Sandt (1992) argues that, in the case of definite descriptions, binding proceeds bottom-

up, whereas accommodation proceeds top-down. Thus, binding is local, but accommodation is global. Local binding accounts for the fact that the existential presupposition introduced in the consequent of a conditional does not survive the conditional when it is bound to the indefinite in the antecedent as in (66a). Global accommodation accounts for the fact that the existential presupposition introduced in the consequent of a conditional survives the conditional if there is no appropriate binder, and the presupposition is accommodated as in (66b):

(66)   a. If John has a son, his son is bald.

       b. If John is rich, his son will inherit a fortune.

However, local accommodation cannot be dispensed with altogether. Bos, Buitelaar and Mineur (1995) argue that intermediate or local accommodation is needed in the case of 'bridging' definites (Clark 1977):

(67) Whenever John goes to a bar, the barkeeper throws him out.

The most natural interpretation of this sentence is one where *the barkeeper* is accommodated within the scope of *whenever* and not in the top box. According to this reading, there is a barkeeper in every bar that John goes to, and each barkeeper throws John out of his own bar. This reading involves local rather than global accommodation, due to the special relation between bars and barkeepers. Obviously, *a bar* does not bind *the barkeeper* but, in the terminology of Clark (1977), there is a 'bridge' between bars and barkeepers. In this case then, the locality of accommodation can be explained by the bridging relation between the presupposing DP and the DP it is related to by bridging (cf. also Asher and Lascarides 1999. Note also that Roberts 1998, following earlier suggestions by McCawley, points to the possibility of treating all instances of accommodation as local.)

In the case of definite descriptions, both local and global accommodation appear to be needed. We suggest that the plural morphology is different in that it only allows local accommodation. This means that the presupposed discourse referent is copied into the asserted box K in which the condition $N(x)$ is interpreted. The local nature of this accommodation process, we suggest, is connected to the fact that the presupposition trigger is a morphological feature rather than a lexical item. The freedom associated with the interpretation of definite descriptions is connected to the fact that they involve an overt determiner D. Expressions in D are special in that they have the power to allow (or even require) the interpretation of the discourse referent they introduce in a superordinate box. Under the assumption that only determiners may cause the discourse referent they introduce to be interpreted in a

superordinate box, accommodation of a discourse referent that is presupposed by plural morphology is expected to be local, rather than global. The locality of the discourse referent introduced by plural morphology (via accommodation) is thus another crucial difference between determiners and the plural feature.[22]

The locality of accommodation of the presupposition of the plural feature entails that bare plurals in argument position will be scopally inert. If the discourse referent scopes with the descriptive content of the nominal, we predict narrow scope existential readings for the bare plural in sentences where there is another scope bearing operator around:

(68) a. Every child read Russian novels.

  b. Mary didn't read Russian novels.

  c. You must read Russian novels.

In all these cases, the bare plural is interpreted within the scope of the scope-bearing operator, as predicted by our analysis. By contrast, in the case of ordinary indefinites, exemplified in (69),

(69) a. Every child read two Russian novels.

  b. Mary didn't read two Russian novels.

  c. You must read two Russian novels.

the discourse referent presupposed by the plural is bound to the discourse referent introduced by *two*. There is no locality requirement associated with this determiner; discourse referents introduced by it may be interpreted within the box they occur in or within any superordinate box accessible to them.

One further issue concerns mass nouns. Mass nouns in English behave like bare plurals in the sense that they can but need not combine with a lexical determiner. Bare mass nouns get an existential or a generic reading, just like bare plurals. It has been argued that mass nouns are inherent plurals (Chierchia 1998a). We can import this insight into our analysis by claiming that the introduction of a presupposed discourse referent that is achieved by plural morphology on count nouns has a counterpart in the lexical entry of mass nouns. Accordingly, mass nouns are presupposition triggers. The presupposed discourse referent they introduce is accommodated in the absence of a determiner, and therefore they do not require the presence of a determiner in full

---

[22]Note that the distinction we maintain between inflectional features such as *pl* and lexical determiners is independent of the overt realizations of the latter. There are languages, such as Romanian and Bulgarian, as well as Danish and Norwegian, where definite determiners may or must be realized as phrasal inflection. The semantic nature of these determiners, however, is the same as in English.

argument position. We predict that mass nouns, just like bare plurals, would have only narrow scope interpretations in examples such as (70):

(70) a. Every child read Russian poetry.

   b. Mary didn't read Russian poetry.

   c. You must read Russian poetry.

We have suggested here one possible way of capturing the similarities between existential bare plurals and mass nouns. Going further into the problems posed by the semantics of mass nouns would, however, take us beyond the scope of this book.

2.3.7   Predictions

We conclude this section by examining some predictions made by the analysis given above. First, note that in the present approach, bare plurals in English may occur in full-fledged argument position, and may combine with their predicate by Instantiation because of the presence of the plural feature. It is the interpretation of this feature as a presupposition trigger that is responsible for the introduction via accommodation of a discourse referent that instantiates the thematic argument of the nominal, and which is then available to instantiate the thematic argument of the predicate the bare plural is a syntactic argument of. It follows from this analysis that bare singulars cannot occur in full-fledged argument position, which is correct for English, Hungarian, and a number of other languages:

(71) *Child is sleeping./*Mary saw child.

We make this prediction because in our analysis morphologically singular nominals do not involve a number feature. Consequently, no discourse referent can be introduced by a bare singular and therefore the bare nominal *child* cannot combine with its predicate by A-Instantiation. The reduction of a full argument nominal, however, requires combination via Instantiation. The derivation of the first example is blocked at the moment at which the S node has to be reduced by A-Instantiation, represented in figure 20.

$$[_S \ [_{NP} \ \text{child(x)}] \ [\text{sleep(z)}]]$$
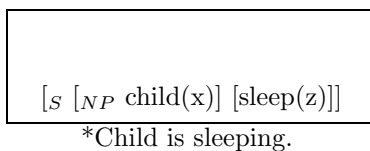*Child is sleeping.

FIGURE 20 After processing of the bare singular NP.

Since the thematic argument of the nominal is not instantiated by a discourse referent, neither A-Instantiation nor Secondary Instantiation my apply to further reduce this structure. Our analysis thus accounts for the absence of bare singulars in argument position in languages such as English, Hungarian and those in the Romance family.

It is well-known, of course, that there are languages that place no such restriction on nominals in argument position. This happens in Hindi (Dayal 1999), languages in the Slavic family, and other languages that may be argued to not have an ordinary indefinite article. Chierchia (1998b) develops a theory relying on type-shifting mechanisms to account for these data. Compare also the work by Dayal (1999). In terms of the framework developed in this book, bare singular nominals in these languages have the potential to introduce a discourse referent on their own, without the need for a determiner or a plural feature.

Note next that we predict that bare plurals have a dynamically potent plural feature and therefore that the discourse referent they introduce must be non-atomic. This is the correct prediction for an example like (72), which entails that Mary read several Russian novels.

(72) Mary read Russian novels this summer.

Continuing the discourse with (73) is anomalous:

(73) She read *War and Peace* and nothing else.

Our account shares with other approaches to existential bare plurals in English the fact that it predicts their local scope. For us locality is a consequence of the discourse referent having been introduced by the plural feature, rather than by a determiner. In accounts based on Carlson's pioneering work, their locality is due to their being bound by an existential operator contributed by the predicate. In Chung and Ladusaw (2003) on the other hand, locality is the result of the way these nominals combine with the predicate. What is special to our account of existential bare plurals is the importance it places on the presence of the plural feature and on the absence of a determiner.

2.3.8 Plurality as a feature of discourse referents

We take it as established that the semantic contribution of plural morphology involves a predicate expressing the property of non-atomicity. In the discussion above, we assumed that plurality is predicated of the discourse referent that instantiates the thematic argument of the lexical head noun. The licensing of such a discourse referent by plural morphology in the absence of a determiner is driven by this assumption. Alternatively, one could assume that the feature *pl* contributes a predicate *plural(x),* where x is the thematic argument of the lexical head.

Given that we saw at the outset of this section that predicates may involve non-atomicity entailments on their thematic argument, this alternative is initially plausible. In this section we provide justification for the view that the argument of the condition *plural* is a discourse referent rather than a thematic argument. More generally, we suggest that only lexical items involve predicates on thematic arguments.

We know that predicates like *gather* and *collect* involve non-atomicity entailments on particular thematic arguments. The non-atomicity entailment on the subject argument of *gather* can be met either by having a plural subject or a non-atomic entity denoting singular subject:

(74) The students/crowd gathered in the square.

There are no predicates whose entailments mention the plural feature. Were we to treat the morphological plural feature as a predicate on thematic arguments, there would be no reason not to expect predicates to require its presence on their arguments. In the approach developed above, the entailment on the predicate is met iff the entity associated with its subject argument is non-atomic. This may happen either because the entity in question is the value of a discourse referent of which plurality is predicated (as in the case of *the students*) or because the discourse referent in question is restricted by a nominal which is lexically non-atomic, such as *the crowd*.

We see that having plurality predicated of discourse referents introduced by morphologically plural nominals may capture non-atomicity entailments on thematic arguments of verbal predicates without leading us to expect that morphological plurality may play a role in verbal entailments. We now consider evidence suggesting that semantic number is relevant at the level of discourse referents and that morphological number has to be seen as independent of thematic arguments. We make both points by considering uses of deictic pronouns. Deictic pronouns like *I, you, we*, as well as deictic uses of third person pronouns like *he, she, they* bear morphological number features. It is fairly uncontroversial to assume that the discourse antecedents of deictic pronouns are contextually present, but have not necessarily been explicitly introduced by linguistic means. Now, the number feature of a deictic pronoun is determined by the characteristics of its antecedent. Thus, if I want you to pass me a (contextually salient) pot, I say *Give me that, please*, while if what I need are some (contextually salient) bell peppers, I would say *Give me those, please*. The predicate *give* does not impose number constraints on its object the way the predicate *collect* does. Thus, the number marking of the deictic pronoun correlates with properties of the discourse referent and is not imposed by the predicate.

A straightforward way of capturing this correlation is to assume that the discourse referent introduced by the pronoun must have the same atomicity status as the contextually present antecedent. 'Agreement' in number between a pronoun and its linguistic or non-linguistic antecedent is captured by having matching atomicity requirements on the discourse referents involved. In the case of the plural pronoun, the non-atomicity requirement comes from its plural feature. Since there is no thematic argument involved either on the side of the antecedent or on the side of the pronoun, we must assume that the plural feature of the pronoun predicates plurality on the discourse referent introduced by it. We conclude that semantic number is relevant at the level of discourse referents and cannot be treated as being introduced solely via predicates on thematic arguments. We also conclude that morphological number occurs on nominals that do not involve a thematic argument but do introduce a discourse referent. Thus, the interpretation of the plural on pronouns must be seen as involving plurality predicated of the discourse referent introduced by the pronoun. A uniform treatment of morphological plurality entails giving it the same analysis when it occurs on descriptive DPs. Thus, the assumption that morphological number marking involves a predicate on a discourse referent is warranted in view of the relevance of semantic number to the level of discourse referents, and in view of the fact that morphological number features occur on pronominal DPs that do not involve thematic arguments.

2.4 Conclusion

In this chapter, we worked out a more elaborate theory of argument structure in DRT. We separated thematic arguments from discourse referents and proposed a general process of combining discourse referents with predicates, called Instantiation, by which the latter replace the former. We suggested that Instantiation accompanies the reduction of the DP node dominating a D and an NP (D-Instantiation), as well as the reduction of a node dominating a predicative expression and one of its syntactic arguments (A-Instantiation).

We also provided an interpretation of the dynamic contribution of number in our version of DRT. We suggested that the morphological plural feature is a presupposition trigger. It presupposes the existence of a non-atomic discourse refent that it predicates plurality of. This presupposed discourse referent is bound to the discourse referent introduced by the lexical determiner if there is one, and it is accommodated in the case of bare plurals. Accommodation is local, because only lex-

ical determiners may allow the interpretation of discourse referents at superordinate levels. Local accommodation leads to local scope of bare plurals in argument position. We explored the predictions this account makes concerning the occurrence of bare plurals, but not bare singulars, in full argument position in English as well as ways in which the analysis can be extended to account for more stringent or more permissive distributional constraints in other languages.

The account of morphological number proposed in this chapter will play an important role in our analysis of incorporation. It will be used to explain why morphologically singular incorporated nominals are semantically number neutral, whereas morphologically plural INs are semantically plural. The dynamic properties of morphologically singular and plural INs will be shown to follow from the combination of the interpretation of morphological plurality presented here with the theory of incorporation we present in chapter 3.
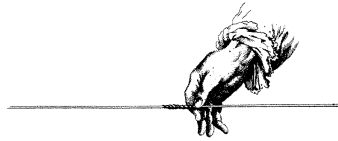
3 Incorporation as Unification of thematic arguments
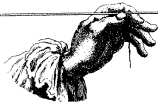
In this chapter we exploit the framework developed so far to give an account of nominal incorporation. We start in the next section by proposing to allow uninstantiated thematic arguments in final DRSs, and give an explicit way of interpreting such representations. To justify this move, we go into a brief discussion of the interpretation of implicit arguments. Against this background, we define in Section 3.2 a new way of combining a nominal argument with its predicate, which we call Unification. Unification involves combining a predicative condition contributed by a nominal with the predicative condition contributed by the main verb of the sentence by substituting a particular thematic argument of the latter with the thematic argument of the former. The result of Unification is a complex predicate, made up of two predicative conditions sharing an uninstantiated thematic argument. In Section 3.3 we formulate our proposal concerning incorporation: incorporated nominals are arguments of a predicate that combine with it by Unification. As a result, incorporated nominals restrict one of the thematic argument of their predicate without instantiating it. We examine the predictions this approach makes, and end with a brief conclusion. In chapters 4 and 5, we offer a detailed analysis of noun incorporation in Hungarian.

3.1 Uninstantiated thematic arguments

The distinction between thematic arguments and discourse referents we proposed in the previous chapter allows a compositional account of both the contribution of the D and NP within a DP and of the way

predicates combine with such DP arguments. So far, thematic arguments appeared only in prefinal DRSs. They have always been eventually instantiated thanks to the application of D-Instantiation and A-Instantiation. This state of affairs could be imposed by assuming the well-formedness condition on DRSs in (75):

(75) *Full Instantiation Requirement*
A DRS with uninstantiated thematic arguments is not proper.

Under the assumption that only proper DRSs can be embedded into the model, the Full Instantiation Requirement would amount to the claim that our modification of DRT only involves adding new details about the internal structure of the semantic composition. In the rest of this section, we argue that the requirement in (75) should *not* be imposed, and then go on to make the necessary changes in verification conditions so as to allow interpretation of DRSs containing uninstantiated thematic arguments. This proposal completes the last stage of the prologue to incorporation we need.

3.1.1 Implicit arguments

An array of data that calls the Full Instantiation Requirement in (75) into question involves implicit arguments, i.e., arguments of a predicate that have semantic presence and yet have no syntactic realization, not even as covert pronouns. Implicit arguments can be divided into two large classes depending on their interpretive properties: context-dependent implicit arguments that get an anaphoric interpretation, and non-anaphoric implicit arguments that get an existential interpretation (Fodor and Fodor 1980; Condoravdi and Gawron 1996). As pointed out by Condoravdi and Gawron, this distinction corresponds to Fillmore's (1986) distinction between indefinite and definite zero anaphora, and Thomas's (1979) distinction between nonrealization and ellipsis. We exemplify context-dependent implicit arguments in (76), with examples from Condoravdi and Gawron (1996):

(76) a. After the talk we all went to a local bar.
b. Luis sold his Vermeer after Mary bought a similar painting.

As their name suggests, the interpretation of context-dependent implicit arguments depends on contextual information, information that is supplied by the context of utterance or by linguistic context (cf. Partee 1989). In (76a), the interpretation of the implicit argument of *local* in this instance is given by the context of utterance: the bar is local relative to the location of the speaker. In (76b), the interpretation of the implicit argument of *similar* is given by the linguistic context: the painting Mary bought is similar to Luis's Vermeer.

Most of the literature on implicit arguments is concerned with anaphoric interpretations. The implicit arguments we are interested in here contrast with those in (76) in that their interpretation does not depend on the context. To exemplify, consider the interpretation of the Agent in an agentless passive such as (77):

(77) The vase was broken.

The Agent here is implicit in the sense that it is not realized in the syntax (though its presence is signaled by the passive verb morphology). The interpretation of this implicit argument is independent of both utterance and linguistic context. Such implicit arguments are non-anaphoric in a way similar to ordinary indefinite DPs. We will call such implicit arguments non-anaphoric, to differentiate them from their context-dependent relatives.

Koenig and Mauner (2000) review evidence showing that the implicit Agent in sentences like (77) is different both from inferred entities and from explicitly realized indefinite arguments. They note that implicit arguments in agentless passives are linguistically active in that they may control the PRO subject of rationale clauses. Thus, (78c) is a normal continuation of (78a) but not of (78b):

(78) a. A ship was sunk.

      b. A ship sank.

      c. . . . to collect settlement money from the insurance company.

The existence of this contrast is used to argue that the passive in (78a) but not the inchoative in (78b) involves an implicit Agent argument.[23] Crucially for us, Koenig and Mauner (2000) show that such non-anaphoric implicit arguments differ in interpretive potential from ordinary indefinite DPs such as the Agent in (79),

(79) The vase was broken by someone.

in that they cannot antecede discourse pronouns. Thus, (80) is a normal continuation of (79), but not of (78a):

(80) He must have been very clumsy.

Based on this evidence, Koenig and Mauner (2000) propose that agentless passives (as well as certain subjects realized by *on* in French) involve what they call 'a-definites', expressions that connect to a variable in an argument position of a predicate, but which do not introduce a

---

[23]See Koenig and Mauner (2000) for an interesting discussion of a further distinction between the implicit Agent in agentless passives and inferred arguments, such as the seller in sentences like *The vase sold immediately*.

discourse referent.[24] Here we use the term non-anaphoric implicit argument for Koenig and Mauner's a-definite.

Our proposal is that implicit arguments are represented by uninstantiated thematic arguments in final DRSs. Accordingly, the DRS below is the final DRS for (77):

$$\boxed{\begin{array}{c} u \\[1em] \text{vase(u)} \\ \text{break(x, u)} \end{array}}$$
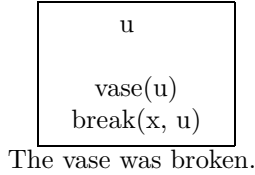
The vase was broken.

FIGURE 21 Uninstantiated thematic argument in final DRS

While both Koenig and Mauner (2000) and Farkas (2001) propose DRSs similar to this one, neither go into the details of how they are to be interpreted. Note that such representations obviously violate the Full Instantiation Requirement mentioned at the beginning of this section. The issue of their interpretation raises conceptual and technical questions concerning the interpretation of uninstantiated thematic arguments. If we want to maintain the insight that implicit arguments involve uninstantiated thematic arguments, and we want to have a version of DRT in which DRSs such as the one in figure 21 are licit, we have to provide explicit verifying conditions for DRSs containing uninstantiated thematic arguments.

3.1.2   Verifying conditions

Given the presence of uninstantiated thematic arguments in final DRSs, we now have, in effect, two types of individual variables, differentiated by their role in the representations and by how they are interpreted. The first step towards legitimizing DRSs that contain uninstantiated thematic arguments is to ensure that these variables count as being bound, for DRSs with free variables cannot be embedded into the model. We therefore propose the condition in (81), where x is a variable over thematic arguments.

(81) A thematic argument x is free, unless it is the argument of a predicate in a condition in Con_K.

---

[24]Kamp and Rossdeutscher (1994) discuss this type of argument and call it a *schematic* discourse referent. Kamp and Rossdeutscher do not differentiate between inferred and implicit arguments as Koenig and Mauner do, however.

According to (81), uninstantiated thematic arguments are licit only as arguments of predicative conditions. Our construction rules generate thematic arguments only as arguments of predicative conditions.

The second step involves changing the definition of truth of a DRS. In standard DRT, truth is a matter of embedding a DRS into the model. A DRS is embeddable into a model iff there is an assignment (or embedding) function f that satisfies it. Embedding functions are functions from discourse referents to elements in the domain of the model. In standard DRT, predicative conditions may only have discourse referents as arguments. Whether an embedding function makes the predicative condition true thus depends on the values that the embedding function assigns to the discourse referents that serve as arguments of the predicate. Now under present assumptions, both uninstantiated thematic arguments and discourse referents may occur as arguments in predicative conditions in final DRSs. Therefore the relevant clause giving the verification requirement on predicative conditions has to be modified.

Let the term 'argument' refer to both thematic arguments and discourse referents, and let a be a variable over arguments. Assume now that we have a predicative condition of the form $P(a_1, \ldots, a_n)$, made up of an n-ary predicate followed by n arguments, and let i be a variable over the elements in $\{1, \ldots, n\}$. The verification requirement imposed by a condition of this form is given in (82):

(82) A function f verifies a condition of the form $P(a_1, \ldots, a_n)$ relative to a model M iff there is a sequence $\langle e_1, \ldots, e_n \rangle \in \mathrm{E}^n$, such that $\langle e_1, \ldots, e_n \rangle \in I(P)$, and if a_i is a discourse referent, $e_i = f(a_i)$, and if a_i is a thematic argument, e_i is some element in E.

Here E is the set of entities in M and $I(P)$ is the interpretation of the predicate P in M. The effect of (82) is to impose predicate (or event) level existential closure of non-anaphoric implicit arguments. Remember that predicates are specified for the number of thematic arguments they have in the lexicon. Which arguments will be visible in the linguistic representation depends on lexical and construction specific rules (e.g. passive formation). A predicate specified for n thematic arguments in the lexicon is assigned a set of n-tuples by the interpretation function I. If all the arguments are visible in the linguistic structure, the predicate has n thematic arguments in the DRS as well. If in the construction process, a thematic argument has been instantiated, a discourse referent appears in its place in the predicative condition. This discourse referent is assigned a value by the embedding function. If, however, a thematic argument remains uninstantiated, it will be associated with an entity in the model only as part of the verification requirement of the

predicative condition in which it occurs. A predicative condition made up of a predicate P and n entities is verified in a model M depending on what n-tuples I assigns to the predicate P in M. The places in the n-tuple filled by discourse referents are occupied by whatever value the embedding function assigns to the discourse referent in question. The places occupied by an uninstantiated thematic argument are not constrained in this way. In the case of a non-anaphoric implicit argument, all that is required is that there be an individual e in E such that e and the values given by the embedding function to the relevant discourse referents form an n-tuple that is an element of $I(P)$. Given a simple DRS K and a function f that embeds it in M, for every discourse referent d in U_K there will be a single entity in E that is the value of d in K, namely $f(d)$. If, however, x is an uninstantiated thematic argument in K, the value of x is not directly determined by f. What individual x is associated with depends on the value I assigns to the predicate that x is the thematic argument of, as well as on what f assigns to those co-arguments of x that are discourse referents. In what follows, DRSs with non-anaphoric uninstantiated thematic arguments are considered proper and interpretable by (82).[25]

In this section we have put to use the thematic arguments introduced in chapter 2 in an account of the interpretation of non-anaphoric implicit arguments. According to this account, final DRSs may contain uninstantiated thematic arguments, that get interpreted as part of the predicative condition in which they occur. We take it that the canonical fate of a thematic argument is instantiation and therefore treat cases where such arguments remain uninstantiated as special. In the next section we further exploit the existence of thematic arguments defining a new way of combining a predicate and an argumental nominal that does not introduce a discourse referent.

3.2 Unification

In chapter 2, we established a distinction between thematic arguments and discourse referents, and went into the details of the default mode of combination of a predicate with its arguments. A-Instantiation replaces the relevant thematic argument of the verb by the discourse referent introduced by its nominal argument. In the first section of this chapter we proposed that uninstantiated thematic arguments may occur

---

[25]This analysis is sufficient for non-anaphoric implicit arguments. Context-dependent implicit arguments impose valuation constraints on the uninstantiated argument they connect to requiring the entity in the relevant position to be the same as the value given to a discourse referent in the utterance or in the linguistic context of the utterance.

as elements of final DRSs. We developed an interpretation of such representations in which uninstantiated thematic arguments are in effect existentially closed at the time the predicative condition in which they occur is interpreted.

Once thematic arguments are in place, and uninstantiated thematic arguments are legal in final DRSs, the possibility arises for a nominal that introduces a predicative condition but no discourse referent to combine with a predicate and modify one of its thematic arguments without instantiating it. Since the nominal does not contribute a discourse referent, it could not combine with the predicate by Instantiation. The aim of this section is to propose a new composition rule that allows nominals to combine with their predicate in just this way.

We call this mode of composition *Unification*, because it involves the identification of two thematic arguments, one contributed by the descriptive content of the nominal, and the other one by the predicate. Unification operates on thematic arguments; it replaces the relevant thematic argument of the verb by the thematic argument contributed by the descriptive content of the nominal. We define it in (83):

(83) *Unification*

Replace the relevant thematic argument y of a verbal predicate with the thematic argument z contributed by a nominal argument of the verb.

We assume that Unification accompanies the reduction of syntactic nodes made up of a verb and a nominal, whose contribution is a predicative condition involving an uninstantiated thematic argument. Since the two predicative conditions share a thematic argument as a result of Unification, they will be said to form a complex predicate. Details of linking theory determine which particular thematic argument of the predicate is affected when the nominal combines with it.

Whether the reduction of a particular syntactic node may or must be accompanied by Unification depends, at least in part, on language specific morpho-syntactic considerations. But it crucially involves a nominal contributing a predicative condition. For illustrative purposes, let us assume that we are reducing a node α dominating a predicative condition $P(x, y)$ and a nominal argument A, and that linking connects A to y. Let us further assume that the semantic contribution of A is a predicative condition $Q(z)$. In the schematic representation of this situation given in figure 22, we take α to be a verbal projection V^n dominating a verb and an NP object, and assume that the subject is a full-fledged argumental DP.

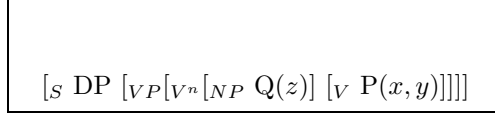The object here is an NP whose contribution is the predicative con-

$$[_S \text{ DP } [_{VP}[_{V^n}[_{NP} \text{ Q}(z)] \ [_V \text{ P}(x,y)]]]]$$

FIGURE 22 Input to Unification

dition $Q(z)$, which is connected by linking theory to the thematic argument y of the predicate. Given that this NP does not introduce a discourse referent, the reduction of V^n may not involve Instantiation. The only mode of composition that can apply to the configuration in figure 22 is Unification. The representation will have z instead of y in the argument list of P. The resulting DRS is given in figure 23.

$$[_S \text{ DP } [_{VP}[_{V^n}[_{NP} \text{ Q}(z)] \ [_V \text{ P}(x,z)]]]]$$
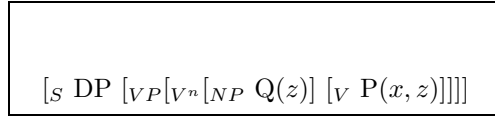
FIGURE 23 After application of Unification.

Assuming that the contribution of the DP subject ends up being a discourse referent u and the condition $R(u)$, the reduction of S must be accompanied by A-Instantiation, whereby the discourse referent contributed by the subject instantiates x. The result is given in figure 24.

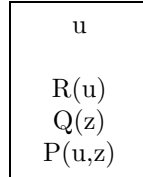$$\boxed{\begin{array}{c} u \\[4pt] R(u) \\ Q(z) \\ P(u,z) \end{array}}$$

FIGURE 24 final DRS

Here, z is a restricted uninstantiated argument. It is uninstantiated, because it has not been instantiated by a discourse referent. It is restricted, because it is an argument not only of the predicative condition $P(u,z)$, but also of the restrictive condition $Q(z)$. If figure 24 is the final DRS for some sentence, the discourse referent u standing for the subject is assigned an individual in the model by the embedding function. The uninstantiated thematic argument z is assigned an individual in the model as a result of the verifying condition on the predicates Q and P in figure 24, which require there to be an individual e such that $\langle f(u), e \rangle \in I(P)$, and $e \in I(Q)$ for every f that embeds the DRS.

Unification and Instantiation are two distinct ways of combining a nominal argument with its predicate, and they are in complementary distribution. If by the time the nominal is combined with the verb, the nominal has introduced a discourse referent, the mode of combination can only be Instantiation. If the nominal does not contribute a discourse referent, Instantiation cannot apply, and the mode of combination can only be Unification. The two operations share the fact that they involve the information contributed by an argument of a predicate affecting a particular thematic argument of the latter. They differ in the nature of the effect.[26]

3.3 Incorporation as Unification

Our claim is that nominal incorporation in the inclusive sense in which we have defined it in chapter 1 involves Unification of thematic arguments. In this section we spell out the proposal; in the next we examine its consequences with respect to the relevant data in the literature.

Incorporating nominals are 'deficient' in that their contribution to semantic structure reduces to that of a nominal core: they do not contribute a discourse referent to U_K, where K is the DRS in which they are interpreted. However, incorporating nominals do combine with a predicate, and affect one of its thematic arguments. In that sense they can be characterized as argumental. The only mode of composition that is open to argumental nominals that do not introduce a discourse referent is Unification. The gist of the proposal is formulated in (84):

(84) Incorporated nominals are special in that they are argumental, and yet their essential contribution to semantic structure is a predicative condition on a thematic argument. As a result, they combine with their predicate by Unification.

When a full-fledged argument combines with its predicate, it instantiates the thematic argument it is linked to. When an incorporated nominal combines with a predicate the thematic argument of the nominal unifies with the relevant argument of the predicate. Both modes of composition affect the relevant thematic argument, but in different ways. Instantiation replaces the thematic argument of the predicate by the discourse referent contributed by the nominal argument. Unification replaces the relevant thematic argument of the verb by the thematic argument of the nominal, and creates a complex predicate.

Incorporation constructions thus share with constructions involving implicit arguments the fact that both result in final DRSs containing

---

[26]Our two modes of combination are close in spirit to Chung and Ladusaw's (2003) Specify and Restrict. See chapter 7 for a comparison of frameworks.

uninstantiated thematic arguments. In the case of incorporation constructions, however, the uninstantiated thematic argument is restricted by the contribution of the incorporated nominal, while in the case of implicit arguments it remains unrestricted.

Given our analysis of determiners in chapter 2, it comes as no surprise that, cross-linguistically, incorporated nominals contrast with non-incorporated ones precisely with respect to what, if anything, occurs under the D node. In languages that use determiners systematically to introduce a discourse referent, we expect a nominal that does not introduce a discourse referent to not come with a D. A language that requires all argumental nominals to be DPs can, in principle, establish an opposition between regular discourse referent introducing determiners, and a marked D that does not introduce a discourse referent. Thus our main claim, namely that the defining property of incorporated nominals is the fact that they are semantic arguments of a predicate and yet their essential contribution is a predicative condition rather than a discourse referent receives initial support from the cross-linguistic morpho-syntactic characteristics of these nominals.

Whether a discourse referent is present or absent is encoded in the properties of the nominal. Particular syntactic nodes may be specified as to whether their reduction may be accompanied by Unification or Instantiation (or both). This results in distributional constraints, since nominals introducing a discourse referent must combine by Instantiation and therefore may occur only in positions that allow this mode of combination, while those that do not must occur in positions that are compatible with Unification. The combination of these factors is at the basis of our account of distributional restrictions on bare nominals in English and Hungarian.

To make our main proposal concerning incorporation concrete, we exemplify with Hindi incorporated bare nominals. The data are from Dayal (1999). In (85),

(85) anu kitaab paRh rahii hai
     Anu book   read-PROG-PR
     'Anu is reading a book.'

kitaab is an incorporated bare nominal. In Hindi, this means that it is not marked for case and occurs in a special preverbal position. Caseless nominals in this position are argumental, but contribute no discourse referent. Under the proposal outlined above, the contribution of this nominal reduces to that of the common noun *kitaab*: the predicative condition, *book(z).* The node dominating the object and the verb there-

fore may only be reduced by Unification.[27] The subject, on the other hand, is a fully projected DP that introduces a discourse referent and a non-predicative restriction requiring it to be given as value the individual named by the proper name *Anu*. The node that has the subject and the VP as sisters is reduced via Instantiation. The final DRS for (85) is given in figure 25.
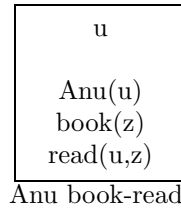
$$\boxed{\begin{array}{c} \text{u} \\[4pt] \text{Anu(u)} \\ \text{book(z)} \\ \text{read(u,z)} \end{array}}$$

Anu book-read

FIGURE 25

This DRS contains an uninstantiated thematic argument, z. This thematic argument is restricted by the condition supplied by the incorporated nominal. This means that the entity that plays the role of z in the eventuality denoted by the predicate must be in the denotation of *book*. The verification conditions we get for this DRS given what was said so far are the following:

(86) A function f verifies the DRS in figure 25 relative to M iff there is a sequence $\langle e_1, e_2 \rangle \in E^2$, such that the following conditions all hold:
 (i) $\langle e_1, e_2 \rangle \in I(read)$
 (ii) $f(u) = e_1$
 (iii) $f(u) = \text{N}(Anu)$
 (iv) $e_2 \in \text{I}(book)$

Here N is a naming function given as part of the model which assigns to every proper name an entity in E.[28] The value f assigns to u must meet all the conditions on u. The entity e_2 must meet all the conditions on z.

---

[27]Hindi also has plural INs. We will come back to them in chapter 5. The situation is further complicated by the fact that Hindi also has bare singulars in full argument position. In Hindi then, whether a nominal introduces a discourse referent or not is not a matter of the presence or absence of a determiner but rather, a matter of where in the clause the nominal occurs, and whether it is marked for case or not.

[28]We follow standard DRS in writing the constraint contributed by proper names as a predication on a discourse referent. The non-predicative nature of this constraint is, however, apparent in the effect it has on the verification conditions. See Farkas (2002a) for discussion.

Our claim is that the analysis of incorporation constructions sketched above is the common core of incorporation phenomena across languages. Thus, common to the boldfaced nominals in the examples below, from West Greenlandic (Sadock 1980), Hungarian (Mithun 1984), and Ponapean, a Micronesian language (Mithun 1984), is that their sole contribution to the semantic interpretation is a predicative condition, and that, as a result, they combine with their predicate by Unification:

(87) Suulut **timmisartu**-lior-p-u-q
Søren.Abs airplane-make-Ind.-IIISg
'Søren made an airplane'

(88) Péter **ujságot** olvas.
Peter newspaper.Acc reads
'Peter newspaper reads'
'Peter is reading a newspaper/newspapers.'

(89) I keng-**winih**-la
I eat-medicine-Comp
'I completed my medicine-taking'

What differs from language to language are details of morphology and syntax. In Hindi, West Greenlandic and Ponapean, the incorporated nominal does not bear morphological case but in Hungarian it does. In some languages (those involving incorporation in Baker's technical sense) the incorporated nominal must be of category N^0, while in others (those involving 'pseudo-incorporation') it may be of category NP or, as we will see below, even DP as long as the D is marked for not introducing a discourse referent. In some languages, the incorporated nominal must occur in a special preverbal position (Hungarian), while in others the special position is post-verbal (Ponapean), and yet in others its syntactic position is not restricted. Thus, we find that the deficiency of incorporated nominals, and the special mode of combination we find in incorporation is morpho-syntactically flagged. A full study of the incorporation construction in a language thus requires a careful analysis of the morphology-syntax-semantics interface.

We return to the issue of how these assumptions constrain the data that fall under the category of incorporation in our inclusive sense, after we survey the predictions our analysis makes concerning the basic semantic properties of incorporated nominals.

3.4 Predictions

Under the analysis just proposed, incorporated nominals affect a particular argument of their predicate without instantiating it, while implicit

arguments involve an unrestricted uninstantiated thematic argument. A series of consequences follow from these proposals, which we explore in this section. We start with predictions concerning static semantics (number interpretation, truth-conditions, scope, argument structure) and then move on to dynamic issues concerning discourse transparency and saliency.

3.4.1   Number

The analysis we propose makes a clear prediction concerning the number interpretation of singular INs. Recall that the number interpretation of uninstantiated thematic arguments depends solely on the semantics of the predicate and on pragmatic inferences. Predicates such as *collect* or *gather*, have entailments concerning the non-atomicity of some of their thematic arguments, but most predicates involve no such entailments. In the absence of predicate imposed entailments, thematic arguments are semantically number neutral. In this respect, they contrast with discourse referents. Under the analysis of number interpretation proposed in chapter 2, discourse referents either have plurality predicated on them or receive a default atomic interpretation. Given that in our account incorporated nominals result in an uninstantiated thematic argument, we predict that singular INs will contrast with morphologically singular full DPs in that the former will be number neutral while the latter will receive an atomic interpretation:

- *Number Neutrality*
  Morphologically singular INs are semantically number neutral.

We thus predict that in the Hindi example (84) above, there is no entailment concerning the number of books Anu might have read. This is the result of the fact that in figure 25, the semantic representation of the sentence, we have an uninstantiated thematic argument z, and the condition *book(z)*. Since neither the predicate nor the nominal brings with it an atomicity entailment, the uninstantiated thematic argument is number neutral. In cases where such entailments or inferences exist, the uninstantiated thematic argument is expected to be compatible with either type of entailment or inference.

Our approach thus predicts the existence of a subtle semantic contrast between singular nominals depending on whether they are incorporated or not. Ordinary, discourse referent introducing singular DPs are interpreted as referring to atomic entities by default. Incorporated singular nominals either lack any entailment as to atomicity, or inherit it from their predicate due to lexical or pragmatic inference.

As noted in chapter 1, semantic number neutrality is a stable cross-linguistic property of singular incorporated nominals. Dayal (1999) makes this point in connection with the Hindi example in (84) above. The number neutrality of singular INs is discussed in detail in Van Geenhoven (1998) for West Greenlandic, and in Chung and Ladusaw (2003) for Chamorro. (See also Mithun (1984) and references therein.) The West Greenlandic examples (90) and (91) are from Van Geenhoven (1998: 187, 190):

(90) Aani   qimmi-qar-p-u-q.   Miki-mik
     A.ABS dog-have-IND-[-tr]-3Sg. M.-inst
     ati-qar-p-u-q
     name-have-IND-[-tr]-3Sg
     'Aani has a dog_i. It_i is called Miki.'

(91) Aani   qimmi-qar-p-u-q.   Kusana-q-a-a-t.
     A.ABS dog-have-IND-[-tr]-3Sg. nice.very-be-IND-[-tr]-3Pl
     'Aani has $dogs_i$. $They_i$ are very nice.'

One and the same incorporated nominal *qimmi* is interpreted as singular in (90), and as plural in (91), as illustrated by the anaphoric reference in the second sentence of each discourse.[29]

It follows from what was said so far that one cannot translate accurately a sentence involving a singular IN into a language such as English, which does not allow incorporation. The original sentence contains a number neutral nominal that has to be translated by a semantically singular or plural DP. Note also that in languages that mark morphological number, morphologically singular nominals that are associated with atomicity entailments cannot be analyzed as incorporated. Therefore an incorporation analysis of ordinary indefinites in English is not open to us.

Our analysis predicts number neutrality for non-anaphoric implicit arguments as well, for they are present in the DRS as uninstantiated thematic arguments. We expect their number interpretation to run parallel to that of singular INs rather than singular full-fledged arguments. The fact that both (92b) and (92c) are good continuations of (92a) shows that this prediction is borne out by the data:

(92) a. The vase was bought yesterday.
     b. The buyer was a rich collector of modern art.
     c. The buyers went out of their way to hide their identity.

---

[29]Plural INs (in languages that allow them) are interpreted as semantically plural, rather than number-neutral. The issue of plural INs will be taken up in chapter 5, where we account for this property.

Under the analysis presented here, the number neutrality of singular INs and of non-anaphoric implicit arguments receives a unitary account.

3.4.2 Scope

As far as scope potential is concerned, the analysis predicts that incorporated nominals will have local scope, i.e., that they scope wherever the predicate of the sentence scopes.

- *Local scope*
  Singular INs scope with their predicate, and therefore take narrow scope with respect to other scope bearing operators in the sentence.

This prediction follows from the fact that singular INs result in uninstantiated thematic arguments, and such arguments are scopally inert. The scopal inertia of uninstantiated thematic arguments, in turn, follows from the fact that they are interpreted by the verification condition associated with their predicate. As a result, they may not scope over any operator that has the predicate in its scope. Recall also that incorporation results in a complex predicate: two predicates sharing a thematic argument. Such predicates, we assume, must be interpreted in the same local DRS structure.

As mentioned in chapter 1, local scope is a stable characteristic of incorporation constructions across languages, as discussed at length for Hindi by Dayal (1999), for West Greenlandic by Van Geenhoven (1998), and for Chamorro by Chung and Ladusaw (2003). We exemplify with data from Hindi (Dayal 1999) showing the relative scope of incorporated nominals and negation:

(93) anu kitaab nahiiN paRhegii
      Anu book   not   read-F
      'Anu won't read any book.'
      not: There is a book Anu won't read

The paraphrases show that the scopal order $\neg > \exists$ is a felicitous reading of the sentence, but the order $\exists > \neg$ is not.

Note that incorporated nominals are not required to occur within the scope of a particular operator. In this respect, they differ from covarying and 'roofed' nominals such as Negative Polarity Items, which are infelicitous unless interpreted within the scope of the right type of operator. Compare (93) with its affirmative counterpart in (87) above. In the latter example, the nominal is interpreted within the main DRS box, i.e., it does not take scope relative to anything. Incorporated nominals are scopally inert: they cannot scope independently of the predicate the thematic argument of which they restrict. They do not need to be licensed by another scope-bearing operator, but if there is one present

in the sentence, they will take narrow scope with respect to it.

The scopal behavior of incorporated nominals follows from their analysis in terms of uninstantiated thematic arguments. The fact that the implicit Agent in the sentences in (94) can only be interpreted as scoping under negation or the modal receives the same explanation as the narrow scope interpretation of incorporated nominals in similar sentences:

(94) a. The vase was not broken.

      b. The vase must be broken.

Our account predicts, correctly, that the implicit Agent may not be interpreted as having scope over the universal in (95a):

(95) a. Mary wants to glue back together every vase that was broken yesterday.

      b. Mary wants to glue back together every vase that was broken yesterday by a child she favors.

In (95b), where the thematic argument is instantiated by an indefinite, a widest scope interpretation for *a child she favors* is possible. This interpretation is not available for (95a). (The examples were chosen in such a way as to avoid having the widest scope interpretation entail the narrowest scope one.) The proposed account predicts that implicit arguments will pattern with incorporated nominals and contrast with co-varying or NPI-like items in not requiring a licensor. The well-formedness of examples such as (92a), where the implicit argument is not in the scope of any predicate or operator, confirms this.

3.4.3   Truth-conditions

The approach to incorporation given here predicts that there will be no truth-conditional difference between incorporated nominals and narrowest scope indefinites, besides the difference in number:

- *Equivalence of incorporated nominals and narrow scope indefinites*
  Modulo semantic number, there is truth-conditional equivalence between a sentence with an incorporated nominal and its counterpart with an unincorporated narrowest scope indefinite.

This prediction follows from our treatment of incorporation as involving uninstantiated thematic arguments and the verification conditions we gave for DRSs containing such arguments, which result in narrowest scope existential closure. Consequently, there cannot be a truth-conditional difference between a sentence containing an incorporated nominal, and its counterpart containing an ordinary indefinite, modulo

the issue of semantic number, and cases where the incorporated construction has acquired idiomatic status. If English would be an incorporation language, we could compare minimal pairs consisting of 'Mary newspaper read' and 'Mary read a newspaper', and conclude that they have the same truth conditions. As noted in chapter 1, this is another cross-linguistically stable property of incorporation constructions.

This prediction extends to pairs of sentences involving an implicit argument and their counterparts with a (narrowest scope) indefinite, as exemplified in (96):

(96) a. The vase was broken.
      b. The vase was broken by someone.

The verification conditions we proposed correctly predict that such pairs of sentences will be true in the same models.

3.4.4   Argument structure

The treatment of incorporated nominals as involving unification of thematic arguments has welcome consequences concerning argument structure, which we explore here. One basic property of incorporated nominals is that they are interpreted together with their predicate and are not capable of introducing an independent discourse referent. It follows from this property that they cannot realize arguments that require an independent interpretation:

- *Predicate dependency*
  Incorporated nominals may affect only arguments that do not have to be interpreted independently of the predicate.

Because incorporation involves thematic argument modification, and thematic arguments are interpreted as part of the predicate in which they occur, if a predicate requires an argument to be interpreted independently, that argument cannot be realized by an incorporated nominal. This, we claim, is behind the cross-linguistically general prohibition against incorporation of subjects of i-level predicates. We follow Ladusaw's (1994) suggestion according to which i-level predicates require their subjects to be independently identified entities. Full-fledged nominal arguments may play the role of such subjects but incorporated arguments may not, because of their interpretive dependence on their predicate.

Other language specific restrictions against incorporated subjects may be explained either by independence requirements or by high saliency or determinacy requirements placed by predicates on their subjects, which render them incompatible with being realized as uninstantiated thematic arguments.

Note that these predictions extend to implicit arguments as well. Various constraints – lexical, syntactic or semantic – may regulate conditions under which a thematic argument may remain uninstantiated. Predicates may require particular arguments to be instantiated, or may bar them from instantiation, resulting in constraints concerning the possibility of those arguments to be implicit. Implicit arguments and incorporated ones are different in that the latter have a realization in the syntax, while the former do not. This difference may correlate with distributional differences as well as subtle differences in saliency and discourse transparency. Under our analysis, however, the two types of arguments are predicted to share the ban against realizing subjects of i-level predicates.

Another consequence of our analysis that is relevant to argument structure concerns doubling. Instantiation is a non-recursive process: once a thematic argument is instantiated by a discourse referent, further applications of Instantiation affecting the same argument are impossible. Unification is different in this respect, for it involves the substitution of one thematic argument by another and therefore the output of the rule is of the same semantic type as the input. A thematic argument that has been affected by Unification may in principle be further affected by Instantiation. Our analysis thus predicts the theoretical possibility of instantiating a thematic argument that has been affected by Unification. This is, we claim, what happens in the phenomenon Mithun (1984) refers to as 'doubling'.

- *Doubling*
  A predicate argument that has been affected by Unification is in principle available for Instantiation.

As mentioned in chapter 1, examples of doubling are discussed in the literature in Mithun (1984), Rosen (1989) and Chung and Ladusaw (2003). (97) and (98) repeat the examples from Caddo (Mithun 1984)

(97) kassi' háh-'ič'á-sswí'-sa'
     bead Prog-eye-string-Prog
     'She is stringing beads'

(98) ka'ás háh-'ič'ah-'í'-sa'
     plum Prog-eye-grow-Prog
     'Plums are growing'

In these examples, the incorporated N root *'ič'ah-* 'eye' (used for any sort of small, round objects when incorporated) is combined via Unification with the predicate. The result is a complex predicate that has one of its arguments restricted by the nominal. This argument is the

further instantiated by a nominal in full argument position. We repeat in (99) an example from Chamorro (Chung and Ladusaw 2003):

(99) Gäi-ga'   un ga'lagu ennao na patgun.
     agr.have-pet a   dog   that L child
     'That child has a pet dog.'

The predicate here is the existential verb *gäi;* the incorporated nominal is *ga'* 'pet'. The doubling DP is *un ga'lagu* 'a dog', occurring in the unmarked morphological case. Chung and Ladusaw argue persuasively that this extra DP is a syntactic adjunct, but a semantic argument. In our analysis, the incorporated nominal *ga'* restricts but does not instantiate the relevant argument of the verb, while the extra DP instantiates it. The special property of Chamorro is that it allows instantiation of a thematic argument by a DP in adjunct position.

To illustrate, we work out the analysis of (99), using the English glosses for simplicity. The contribution of the predicate of the sentence is *have(x,y)*, and that of the incorporated nominal is *pet(z)*. They combine by Unification, yielding figure 26.

$$[_S [_{VP'} [_{VP} [_{V'} [_V \text{have(x,z)}] [_{NP} \text{pet(z)}]]]$$
$$[_{DP} \text{a dog}]] [_{DP} \text{that child}]]$$

Have-pet a dog that child
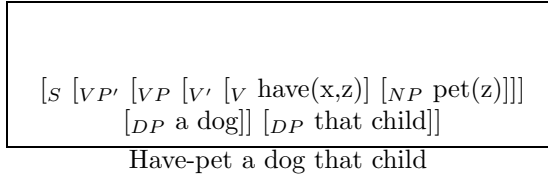
FIGURE 26 After application of Unification.

Assuming now that the DP *a dog* contributes a discourse referent v that instantiates the thematic argument of *dog*, the first DP reduces to v. It may then combine by A-Instantiation with the predicate, yielding the DRS in figure 27.

$$v$$

$$\text{dog(v)}$$
$$[_S [_{VP'} [[_{VP} [_{V'} [_V \text{have(x,v)}] [_{NP} \text{pet(v)}]]]$$
$$[_{DP} \text{v}]] [_{DP} \text{that child}]]$$
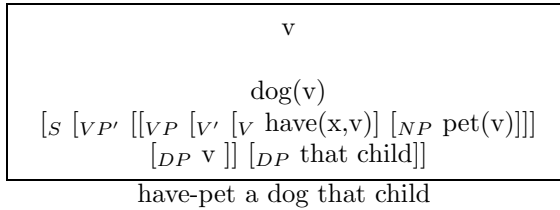
have-pet a dog that child

FIGURE 27 After application of Instantiation of the object.

After building up the subject DP, and applying A-Instantiation again, we obtain the final DRS in figure 28.[30]

$$\boxed{\begin{array}{c} u \quad v \\[4pt] \text{child}(u) \\ \text{dog}(v) \\ \text{pet}(v) \\ \text{have}(u,v) \end{array}}$$
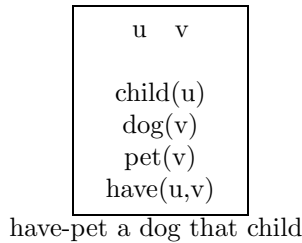
have-pet a dog that child

FIGURE 28 Final DRS.

To sum up, our analysis allows the possibility of doubling because the incorporated nominal restricts, but does not instantiate the relevant thematic argument of the predicate. This argument can in principle be further instantiated by a discourse argument introduced by a DP. We follow Chung and Ladusaw in assuming that whether a language allows doubling or not, and if yes, under what conditions, is a language specific matter that is decided by the morpho-syntactic details of the constructions involved, and of clausal structure.

3.4.5   Discourse transparency

The predictions our analysis of incorporation makes with respect to the discourse transparency of incorporated nominals depend in large part on the assumptions that are made concerning the discourse transparency of uninstantiated thematic arguments. In Kamp and Reyle (1993), discourse referents were the only individual variables present in the DRS, so discourse referents were the only possible anchors for discourse pronouns. Insuch a view, a nominal is discourse transparent if and only if it introduced a discourse referent.[31] Under our assumptions, discourse referents are elements of U_K but uninstantiated thematic arguments are not. If only elements of U_K may serve as anchors to discourse pronouns, we predict that morphologically singular incorporated nominals are discourse opaque:

- *Discourse opacity*
  Singular INs are discourse opaque with respect to pronouns that require a discourse referent as anchor.

---

[30]We ignore the contribution of the demonstrative.

[31]This simple picture is already complicated in Kamp and Rossdeutcher (1994), who assume that schematic discourse referents, unlike their ordinary discourse referent sisters, are discourse opaque. See chapter 6 for more discussion.

We assume the standard view of pronouns in DRT according to which they introduce a discourse referent that has to be bound to a preceding element in the discourse. We call the discourse entity in question the anchor of the pronoun. Before the introduction of thematic arguments, that entity could only be a discourse referent. The situation is more complex once thematic arguments are taken into account, which is why we complicated the prediction by making reference to what anchors the pronoun. The restriction to *singular* INs is motivated by the fact that, as we see in detail in chapter 5, our account of the plural feature combined with our proposals concerning incorporation predicts discourse transparency for plural INs.

   The discourse opacity prediction above is confirmed by data from Hindi discussed in Dayal (1999), as well as by data from Hungarian previewed in chapter 1. The example in (100), from Hindi, shows that singular INs do not license discourse anaphora, and therefore are discourse opaque:

(100) anu kitaab$_i$ paRh rahii hai.   #vo$_i$ bahut acchii hai
      Anu book   read Pr Prog. It   very good be-BE
      'Anu is reading a book$_i$. It$_i$ is very good.'

However, even if we restrict our attention to singular INs, we find cross-linguistic variation with respect to their discourse transparency. Sadock (1980) shows that singular INs in West Greenlandic do not differ in discourse transparency from their non-incorporated sisters. The same is claimed for Chamorro by Chung and Ladusaw (2003). We exemplify with West Greenlandic (Van Geenhoven 1998:10):

(101) a. Aani   qimmi-qar-p-u-q.
           A.ABS dog-have-IND-[-tr]-3Sg.
           'Aani has a dog$_i$.'

       b. Miki-mik ati-qar-p-u-q
           M.-inst   name-have-IND-[-tr]-3Sg
           'It$_i$ is called Miki.'

The contrast between Hindi and Hungarian on the one hand, and West Greenlandic and Chamorro on the other, shows that any analysis of incorporation that makes a categorical prediction concerning the discourse transparency/opacity of incorporated nominals across languages is on the wrong track. Such an analysis either underestimates or overgeneralizes discourse transparency. What is needed is a theory that predicts the possibility of reduced discourse transparency for singular INs without going as far as predicting opacity. In chapter 6 we propose such a view, making use of the presence of uninstantiated the-

matic arguments in final DRSs, and allowing such items to serve as potential anchors for discourse pronouns. Pronouns, we suggest there, may differ with respect to what they allow as possible anchors. In the resulting system, whether a nominal is discourse transparent or not depends both on characteristics of the nominal and on characteristics of the pronoun.

We now turn briefly to implicit arguments. Since they result in uninstantiated, unrestricted thematic arguments, we predict discourse opacity for them, at least under standard assumptions. As already noted in section 3.1.1, implicit arguments are not good antecedents for pronouns. Thus, (102) is infelicitous unless the speaker and the addressee have a suspect in mind already:

(102) A vase was broken yesterday. She confessed only this morning.

This confirms the view that English pronouns need to be anchored to a discourse referent, and cannot take an uninstantiated thematic argument as their antecedent.

Since, under our assumptions, uninstantiated arguments do have a presence in the DRS, we predict that this presence may be felt at the level of the discourse. Indeed, note that while implicit Agents cannot anchor discourse pronouns in English, they anchor definite descriptions (cf. Koenig and Mauner 2000, and Ter Meulen 2003).

(103) A vase was broken yesterday. The person who did it will never confess.

As is well known, anchoring of definite descriptions is fairly liberal, and we certainly do not want to suggest that it can be done only in the presence of uninstantiated arguments. We do claim, however, that the presence of such an argument facilitates the interpretation process. This claim is supported by the fact that the discourse in (104) is somewhat more marked than the one in (103).

(104) A vase broke yesterday. The person who did it will never confess.

A definite that relates to the implicit argument is considered to be a bridging definite. Accordingly, we expect the discourse referent for the definite to be accommodated locally, rather than globally in contexts like (105):

(105) Whenever an Impressionist painting was sold, the seller refused to disclose the identity of the buyer.

The impersonal passive in the *whenever* clause comes with an implicit argument for the seller. The definite *the seller* in the matrix relates to this implicit argument. The result is that we obtain quantification

over sellers: for each Impressionist painting, the seller of that painting refused to disclose the identity of the buyer (of that painting).

We conclude that giving uninstantiated thematic arguments a presence in final DRSs opens the door to refining the issue of discourse transparency. Given the difference between uninstantiated thematic arguments and discourse referents, we can maintain the claim that the latter are more discourse transparent than the former, but a binary distinction between discourse opacity and discourse transparency is no longer the only option we have. We will see in chapter 6 that this is a positive result.

3.4.6 Saliency

Discourse transparency is intuitively connected to the notion of discourse saliency, but the latter is notoriously hard to pin down. We bring it up here because of the informal but persistent observation in the literature concerning the relatively low degree of salience of incorporated nominals across languages. In this section we import into DRT relevant notions from Centering theory in order to account for this fact. We then suggest a way of exploiting these observations in an account of the cross-linguistic preference for Theme/DO incorporation.

In Centering theory (Walker, Joshi and Prince 1998), argumental nominals within an utterance U_i form an ordered set of 'forward looking centers', C_f, the highest element of which becomes the backward looking center (C_b) of the next utterance. We assume that the higher an element is in C_f, the more salient it is.[32]

Various parameters are relevant to the ranking of the elements of C_f, parameters that can be thought of as salience hierarchies. Among the relevant hierarchies is the thematic role hierarchy in (106):

(106) Agent > Experiencer > Theme

Word order factors, properties of the form of the nominal as well as empathy and point of view considerations have been shown to be relevant as well. Cross-linguistic studies in Centering theory have established that languages differ with respect to the relative weight attached to various ranking parameters. Thus, Turan (1998) shows that the crucial factor in ranking the members of C_f in Turkish is the thematic hierarchy in (106) combined with discourse point of view considerations. In this, Turan shows, Turkish is different from English and German where

---

[32]See Beaver (to appear) for an interesting proposal connecting the notions of backward looking center and topic within an O(ptimality) T(heoretic) framework. Note also that it is not clear whether the order of elements in C_f has to be total or may be partial. Nothing crucial hinges on this issue here.

word order is a weightier factor than in Turkish.

Here we assume, together with Roberts (1998), that what is ordered in C_f are not nominals but rather, individual variables present in the DRS, which, for us, are discourse referents and thematic arguments. Furthermore, we assume that the relative position of an individual variable in C_f, and therefore its relative salience, is connected to its discourse visibility: the more salient an individual variable, the more likely it is for it to be a possible anchor of a pronoun in subsequent discourse. We suggest that among the universal hierarchies the ranking of members of C_f is sensitive to is the hierarchy in (107):

(107) discourse referent > thematic argument

Given that discourse referents occur in U_K, as well as in CON_K, whereas thematic arguments only occur in CON_K, it seems natural to assume that discourse referents are inherently more salient than thematic arguments.

The low discourse saliency of singular INs is due to their connection with uninstantiated thematic arguments and the relatively low discourse salience of the latter. Given these assumptions, the treatment of incorporation as Unification makes the following prediction:

- *Low saliency*
  In minimal pairs involving an incorporated and an unincorporated nominal, the incorporated nominal will be less salient than its non-incorporated counterpart.

Within the category of thematic arguments, we can further distinguish between restricted and unrestricted thematic arguments, as in (108), given the intuitive notion that increase in information concerning a discourse entity correlates with increased salience:

(108) restricted thematic argument > unrestricted thematic argument

Accordingly, unrestricted implicit arguments such as the Agent in 'agentless passives' will be less discourse salient than both incorporated INs and full-fledged arguments.

While the hierarchies above are universal, languages may differ both with respect to the weight a particular hierarchy is given, and with respect to the linguistic phenomena that are related to them. Just as in Turkish, scrambling does not have a significant effect on discourse saliency, while in English and German it does, the ordering of the elements in C_f across languages may be more or less sensitive to the hierarchies in (108) and (107). In languages which are not sensitive to them, the difference in discourse salience between singular INs and unincorporated nominals will have no effect. West Greenlandic could

be a language that is not sensitive to the distinction in saliency between incorporated and non-incorporated nominals. In languages that are sensitive to the hierarchy in (107), thematic arguments will be less visible in the discourse than discourse referents. Hungarian is an example of such a language. There is a categorical predication we make, albeit a negative one: in no language will incorporated nominals be more salient than their unincorporated sisters. The proposals made here account for the general tendency of incorporated nominals to be relatively less salient in discourse, leaving open, however, the possibility that in some languages this difference is not manifested.

A line of investigation worth pursuing in future work involves the connection between the approach to incorporation outlined in this chapter and the well-known fact that cross-linguistically, languages show a preference for Theme/DO incorporation. This typological preference is manifested by the fact that there are languages that allow only Theme (or DO) incorporation (such as West Greenlandic for instance), but there is no language which allows incorporation of Agents (or subjects), but which excludes the incorporation of DOs. A promising direction in which to look for an account of this typological preference is the type of OT-based harmonic alignment approach developed for Differential Object Marking in Aissen (2003). We sketch here such an account of the generalization that DO incorporation is less marked, cross-linguistically, than the incorporation of other arguments. We will make the simplifying assumption that DOs and Themes are connected and will refer to thematic roles only. The gist of the account is that the thematic argument hierarchy and the hierarchy placing discourse referents above thematic arguments are aligned. This yields the markedness hierarchy in (109), according to which expressions involving an uninstantiated Agent argument are more marked than those involving an uninstantiated Experiencer argument while those involving an uninstantiated Theme are least marked:

(109) Uninst. Agent > Uninst. Experiencer > Uninst. Theme

In an OT analysis based on Aissen's work, this markedness hierarchy manifests itself as a universally ordered series of constraints. We sketch the account here without going into its full details. First, we assume that the preference for instantiated arguments is captured by positing a set of constraints of the form *X[-Inst] penalizing an uninstantiated argument bearing the thematic role X. Given the markedness hierarchy in (109), these constraints will be ranked as in (110):[33]

---

[33]A separate issue that is outside the scope of our discussion is the interaction of passive constructions with this hierarchy.

(110) *Agent[-Inst] > *Experiencer[-Inst] > *Theme[-Inst]

Let us assume that the existence of incorporated constructions is due to the existence of a *Struc constraint penalizing extra structure. Whether a language allows incorporation or not, and if it does, what thematic role constraints it imposes on incorporation depends on where *Struc is ordered relative to the constraints in (110). Given the ordering in (110), however, it is not possible to have it placed in such a way as to rule in incorporated Agents but rule out incorporated Themes.

The outline of the analysis we gave here is enough, we hope, to establish that it is worth pursuing and we hope that future work will do that. In the next section we turn to issues concerning the interaction of incorporation and morpho-syntax.

3.5   Morpho-syntax

So far we have seen how our account captures the fact that incorporated nominals must be number neutral when morphologically singular, have existential interpretations, be scopally inert, be barred from occurring as subjects of i-level predicates, have reduced discourse salience and possibly reduced discourse visibility as well. We have also seen that our proposal accounts for the significant overlap between interpretive properties of incorporated nominals and free implicit arguments. We consider now the morpho-syntactic implications of our analysis and some analytical decisions it leads us to.

As noted already, the account of incorporation we suggested here, which links incorporation to Unification, predicts that only those nominals contributing predicative conditions may incorporate:

- *Deficient nominals*
  A nominal with a discourse referent introducing D may not incorporate.

In a structure of the form in (111),

(111) $[_\alpha \ [_{DP} \ D \ [_{NP} \ ]] \ [_V \ ...]]$

where D introduces a discourse referent, the reduction of the node α cannot be accompanied by Unification because by the time we get to it, the contribution of the DP reduces to a discourse referent, and therefore it is not of the appropriate type for Unification to apply.

Recall now that we assume here that the canonical role of articles and other morphemes that occur under D is to introduce a discourse referent, and to further place constraints on its interpretation. For languages that use articles, then, whether a nominal introduces a discourse referent or not is canonically encoded by properties of its D node. A

common situation is for nominals that do not introduce a discourse referent to be bare, i.e., not to involve a D.

Since Unification and Instantiation are processes that accompany the reduction of a syntactic node, particular syntactic configurations may be constrained as to whether their reduction involves one or the other of these processes. A common situation across languages is to have ordinary argument positions restricted to composition via Instantiation, and reserve special positions adjacent to the verb for composition via Unification. Putting these two situations together, we expect to find languages where only bare nominals may incorporate (presence of D being connected to the introduction of a discourse referent) and have such nominals restricted to occur in a special, 'incorporated' syntactic position adjacent to the verb. Under the assumption that the reduction of nodes dominating such positions has to be accompanied by Unification, and that the reduction of nodes dominating ordinary argument positions has to be accompanied by Instantiation, we predict that bare nominals and full DPs will have complementary distribution in such languages, the former restricted to 'incorporated' positions, the latter to full argument position. Thus, the fact that the special position in which 'pseudo-incorporated' nominals occur in Niuean, discussed in Massam (2001), is restricted to morphologically singular NPs follows from the fact that the D node in this language, which bears marking for the plural too, necessarily introduces a discourse referent which instantiates the thematic argument of the nominal at the time the DP node is reduced.

In our account, the morpho-syntactic properties of a nominal determine its contribution to semantic interpretation. Syntactic nodes, and therefore syntactic configurations, may encode restrictions concerning mode of composition. The interaction of the two is responsible for distributional constraints on different types of nominals. If bare nominals may only introduce a predicative condition, their occurrence will be restricted to syntactic configurations that can or must be reduced by Unification. If argumental full-fledged DPs must introduce a discourse referent, their occurrence will be restricted to configurations that can or must be reduced by Instantiation.

We expect that there may be cross-linguistic variation concerning the complexity of the incorporated position: it may be restricted to N^0 or allow phrasal NP-level constituents. However, full DPs will be barred from incorporated positions in many languages. The former situation obtains in languages that involve incorporation in Baker's technical sense while the latter is found in languages that involve 'pseudo-incorporation' in Massam's sense.

The assumptions we make close certain analytical options while opening others. An option that is closed to us is to treat ordinary narrow scope indefinites in English as incorporated. Such DPs involve an indefinite article and occur in ordinary argument position. If we were to follow Van Geenhoven's (1998) proposals, and treat them as (semantically) incorporated, we would have to claim that the indefinite article of argumental DPs may or may not introduce a discourse referent, and that nodes dominating ordinary argument positions may be reduced by Unification as well as by Instantiation. Besides introducing an ambiguity in the indefinite article, this line of analysis would render the absence of bare singulars in ordinary argument position in English mysterious. Note that our analysis provides empirical evidence against a semantic incorporation treatment of narrow scope indefinites in languages like English: the fact that these nominals are no more number neutral than their wide scope counterparts strongly suggests that they are not incorporated.[34]

Our analysis does not rule out the possibility of a language that allows nominals in argument position to combine with their predicate by Unification, and therefore we are not constrained to treat as incorporated only nominals that occur in a special syntactic position. Nor do we rule out the existence of a special D signaling that no discourse referent is being introduced. A language having both these properties would allow DPs with this special D in argument position, and these would count as being incorporated in our sense. Such DPs will be predicted to be number neutral, scopally inert, should not occur as subjects of i-level predicates and should be low on the saliency scale. This profile fits exactly Maori *he* nominals, discussed in detail in Chung and Ladusaw (2003) and exemplified in (112).

(112) He tuna no   roto   I   nga   awa a
      A   eel   T.of inside DO the.Pl river and
      'There were eels in the rivers, and'

      he man no   rung I   nga   maunga
      A bird T.of top   DO the.Pl mountain in the ranges
      'birds in the ranges'

According to Chung and Ladusaw, the special D *he* specifies what mode of combination is required. For us, *he* signals the absence of a discourse referent, which in turn renders Unification the only possible mode of combination. *He* nominals in Maori therefore count as incorporated in

---

[34]The only English nominals that are candidates for incorporation in our sense are the bare singulars occurring as objects of prepositions in PPs such as *by train, to market* etc.

our sense of the term. We come back to the different ways in which theoretical assumptions carve up the empirical domain in our comparison of frameworks in chapter 7.

3.6 Conclusion

In this chapter we defended the view that uninstantiated thematic arguments may occur in final DRSs, using data concerning implicit arguments as justification. We proposed an explicit interpretation mechanism for such arguments. This completed the preliminary work required to develop our analysis of incorporation. Once thematic arguments are made visible in the DRS, one can define a new mode of connecting an argument and a predicate, called Unification. Unification may apply only in case the nominal contributes a predicative condition involving a thematic argument, not a discourse referent. Unification identifies this thematic argument with the relevant thematic argument of the verb, building a complex verb. Our main claim concerning incorporation is that incorporated nominals are argumental, and yet do not contribute a discourse referent. As a result, they combine with their predicate by Unification, resulting in a restricted uninstantiated thematic argument. We examined a series of predictions this view makes concerning the semantic properties of incorporated nominals and non-anaphoric implicit arguments as well as matters regarding the morpho-syntax of incorporation.

We have advanced here the core of our proposal concerning incorporation and have shown that it captures a significant array of crosslinguistic properties of incorporated nominals discussed in the literature. In the next two chapters we look in detail at incorporation in Hungarian, starting with singular INs (chapter 4) and continuing with bare plural nominals, whether incorporated or not (chapter 5).
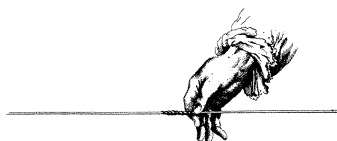
4   Incorporation in Hungarian: the case of bare singulars

With this chapter we begin the investigation of the semantic and discoursal properties of a special class of nominals in Hungarian, which, we will argue, are incorporated. The nominals in question have two distinguishing properties: (i) they must be bare, i.e., they may not be preceded by an article, and (ii) they occur in a special position adjacent to the verb. Morphologically, they are marked for case and number, just like all other nominals in the language. After a brief look at the special syntactic position involved, and at the morphological properties of the nominals that may occur in it, we present a detailed analysis of singular INs in terms of Unification. We then show how the analysis accounts for the contrasts between these nominals and ordinary singular DPs, contrasts which were previewed in chapter 1.

We will proceed as follows. In section 4.1, we introduce a special preverbal position in Hungarian, called 'predicate operator' by Szabolcsi (1997), focusing on the nominals that may occur in it. Section 4.2 works out a Unification-based analysis of morphologically singular nominals in this position. Section 4.3 checks the predictions made by our analysis against the Hungarian data. The analysis of bare plurals in Hungarian is left for chapter 5, where we bring together the approach of plurality developed in chapter 2 with the analysis of incorporation developed in chapter 3 and 4 to account for the semantic, discoursal and distributional properties of morphologically plural bare nominals, whether incorporated or not, thereby completing the analysis of the contrasts we started out with in chapter 1. Further properties of bare singulars involving discourse transparency are taken up in chapter 6.

4.1 The Predicate Operator position in Hungarian

4.1.1 A special syntactic position in Hungarian

A well-known property of Hungarian clausal syntax is that it contains a special V-adjacent position, marked as X in (113):[35]

(113) [V' [X   V]]

We adopt below the terminology in Szabolcsi (1997) in calling the position marked by X Predicate Operator (PredOp). As a syntactic node, PredOp is unusual in that it is host to a heterogeneous class of items: verbal particles, exemplified in (114), the bare nominals we are interested in, exemplified in (115), and, according to some analyses, a focus marked constituent, exemplified in (116).[36]

(114) Mari fel-olvasott   Petinek.
       Mari up-read.Past P.Dative
       'Mari read aloud to Peti.'

(115) Mari verset   olvasott   Petinek.
       Mari poem.Acc read.Past Peti.Dative
       'Mari read poetry to Peti.'

(116) Mari egy VERSET olvasott fel   Petinek.
       Mari a   poem   read   aloud Peti.Dative
       'It was a poem that Mari read aloud to Peti'

The grammar of verbal particles constitutes a large and difficult problem in Hungarian because these items live in the twilight zone between morphology and syntax in the sense that the unit made up of a verbal particle and its verb (V' in the schema above) appears to function as a lexical unit, but the particle in X enjoys (limited) syntactic independence from the V. The verb and its particle are a lexical unit in the many cases in which the semantics of the combination is not compositional, as in *fel-vágni* 'to cut up', which may either mean, compositionally, 'to cut up', or, non-compositionally, 'to boast.' Independently of their semantics, verbal particles may and sometimes have to be separated from their verb. Thus, in the presence of an auxiliary, the order is Particle – Aux V – V, as exemplified in (117).

---

[35]We will not be concerned here with the issue of whether this order is derived from an underlying order in which X occurs in a post-verbal position or not.

[36]In Hungarian orthography, when a preverbal particle precedes a main verb, the two are spelled as one word. We depart from this practice here, and separate them by a dash for clarity's sake.

(117) Mari fel fog olvasni Petinek.
       Mari up will read.Inf P.Dative
       'Mari read aloud to Peti.'

The same order is found in cases of verbs taking infinitival complements, such as *akar* 'want', *próbál* 'try' and many others.

(118) Mari fel akar/próbál olvasni Petinek.
       Mari up wants/tries read.Inf P.Dative
       'Mari wants/tries to read aloud to Peti.'

Whether the particle must or may precede the complement taking predicate depends on the predicate.[37]
    Verbal particles occur after the verb they combine with semantically in the following circumstances:

  i. if the sentence contains a focused constituent, exemplified in (116);

  ii. in the subjunctive (used also in imperatives) or in the conditional, exemplified in (119);

  iii. if the sentence is interpreted as a progressive, exemplified in (120);

  iv. if the verb is negated, as exemplified in (121), and

  v. in the presence of certain pre-verbal adverbs, exemplified in (122):

(119) Olvassál   fel!
       read.Subj.II up
       'Read aloud!'

(120) Mari épp olvasott   fel amikor ...
       Mari just read.Past up when ...
       'Mari was reading aloud when . . . '

(121) Mari nem olvasott   fel Petinek.
       Mari not read.Past up Pati.Dative
       'Mari didn't read aloud to Peti.'

(122) Mari gyakran olvasott   fel Petinek.
       Mari often   read.Past up Peti.Dative
       'Mari often read aloud to Peti.'

Unless they bear special stress, verbal particles cannot occur in other positions. In particular, they may not occur post-verbally under circumstances other than those mentioned above:

---

[37]For a detailed discussion of preverbal in Hungarian see Farkas and Sadock (1989) and references therein. For a recent analysis in a different framework, see Koopman and Szabolcsi (2000).

(123) *Mari olvasott   egy verset   fel Petinek.
       Mari   read.Past a   poem.Acc up Peti.Dative

In the early literature on Hungarian (see Horvath 1981) focused constituents were taken to occur in the same position as verbal particles because of the fact that in the presence of a focused constituent, the order is V-particle rather than particle-V. This analysis is not uncontroversial (see, for instance, Farkas 1986.) Since issues involving focus are not crucial to our present concerns we will not take a stand with respect to this question.[38]

4.1.2   Morpho-syntax of bare nominals in Hungarian

We went into some detail concerning the surface position of verbal particles because the bare nominals that interest us here share the distributional properties of particles. We exemplify with morphologically singular bare nominals. The facts are parallel in the case of morphologically plural ones, except when noted otherwise.

Note first that full DPs in Hungarian generally occur preceded by an article or other type of determiner. DPs in this language are marked for case, which shows up as a suffix on the head noun. Hungarian has a huge inventory of cases, because many relations that are expressed in languages such as English by prepositions are encoded in Hungarian by case morphemes. We will gloss these with the equivalent English preposition. DPs enjoy considerable word order freedom. We exemplify with an indefinite DO, marked by the Accusative morpheme *-(V)t.*

(124) a. Mari látott   egy filmet   a   tegnap.
           Mari see.Past a   movie.Acc the yesterday
           'Mari saw a movie yesterday.'

       b. Mari látott   a   tegnap   egy filmet.
          Mari see.Past the yesterday a   movie.Acc
          'Mari saw a movie yesterday.'

In sentences involving auxiliaries and infinitival complement taking verbs, such DPs normally follow the verb:

(125) Mari fog/akar   olvasni egy verset.
       Mari will/want read.Inf a   poem.Acc
       'Mari will/wants (to) read a poem.'

The class of nominals that interests us here, on the other hand, are necessarily bare and occur in the PredOp position marked by X above. To illustrate the parallel between verbal particles and bare nominals,

---

[38]For an insightful discussion of focus in Hungarian, see Kiss (1998a). For a recent account of focus in Hungarian and Italian, see Szendrői (2001).

note in (126) that the bare nominal precedes auxiliaries and infinitival complement taking verbs:

(126) Mari verset   fog/akar olvasni.
      Mari poem.Acc will/want read.Inf
      'Mari will/wants (to) read a poem/poems/poetry.'

In (127) and (128) we see that the bare nominal follows the verb it is an argument of in case the verb is negated or if it is in the subjunctive:

(127) Mari nem olvas verset.
      Mari not read poem.Acc
      'Mari does not read poem/poems.'

(128) Olvassál   verset!
      read.Subj.II poem.Acc
      'Read a poem/poems/poetry!'

In (129) and (130) we see the V-Nominal order in case the sentence is in the progressive or in case there is a pre-verbal focus.

(129) Mari épp olvasot   verset   amikor . . .
      Mari just read.Past poem.Acc when . . .
      'Mari was reading poetry when . . . '

(130) Mari PETINEK   olvasott   verset.
      Mari Peti.Dative read.Past poem.Acc
      'It is to Peti that Mari read poetry.'

In (131) we see that, just like in the case of verbal particles, a bare nominal cannot occur after the verb in the absence of the factors mentioned above.[39]

(131) *Mari olvasott   tegnap   Petinek   verset.
      Mari   read.Past yesterday Peti.Dative poem.Acc

In (132) we see that in case of co-occurrence of a bare nominal and a particle, the particle occurs after the verb:

(132) Mari lámpá(ka)t   szerelt fel a   plafonra.
      Mari lamp.(Pl).Acc set.Past up the ceiling.on
      'Mari set up a lamp/lamps on the ceiling.'

Henceforth, the position of the particle relative to the verb is used here as a diagnostic for establishing whether a constituent occurs in PredOp position or not. We see in (133) that a non-focused full-fledged

---

[39]It should be noted here that this claim is valid for bare singulars only. We will see below that the distribution of bare plurals is different.

pre-verbal DP does not occur in that position, since the particle must precede the verb:[40]

(133) a. Mari fel-szerelt egy lámpát   a   plafonra.
           Mari up-set.Past a   lamp.Acc the ceiling.on
           'Mari set up a lamp on the ceiling.'

       b. *Mari egy lámpát   szerelt fel a   plafonra.
           Mari a   lamp.Acc set.Past up the ceiling.on

On the basis of this discussion, we conclude that Hungarian has a special class of verbal arguments distinguished by the fact that they are necessarily article-less and by their occurrence in the PredOp position. The surface position of these nominals parallels that of verbal particles. When the two co-occur, the nominal is pre-verbal, while the particle occurs after the verb.

As is already evident from the examples above, bare nominals in Hungarian are marked for case and number, the two morphological features that mark all arguments in a Hungarian sentence. The singular in Hungarian (as well as in other languages) is morphologically unmarked, while plural is marked by the suffix -(V)k. The fact that plural bare nominals occur in the PredOp position, just like their morphologically singular sisters, is shown by the V-particle order in (132). The fact that a full-fledged DP may not occur in this special position is shown by the impossibility of V-particle order in (133b).

So far, all bare nominals were in the Accusative case. In the examples below we see that bare nominals bearing a case marker other than Accusative may occur in this position.[41]

(134) Sánc vette   körül a   kastélyt.
      ditch take.Past around the castle.Acc
      'The castle was surrounded by a ditch.'

(135) Mari csekkel   fizette   ki a   számlát.
      Mari check.with pay.Past out the bill.Acc
      'Mari paid the bill by check'

Finally, note that bare nominals may be modified by adjectives, but not by relative clauses:

(136) Mari kínai   lampion(ok)at   szerelt fel a   plafonra.
      Mari Chinese lantern.(Pl).Acc set   up the ceiling.on
      'Mari set up a Chinese lantern(s) on the ceiling.'

---

[40]Note that (133b) becomes grammatical if interpreted in the progressive or if the DP is focused, as expected (see above).

[41]Nominative is unmarked in Hungarian. The morpheme -val is the commitative suffix. Here, its initial v has assimilated to the preceding consonant.

(137) *Mari lampionokat amik kínaiak voltak szerelt
　　　 Mari latern.Pl.Acc which.Pl Chinese.Pl be.Past.Pl set
　　　 fel a plafonra.
　　　 up the ceiling.on

In sum, we have shown here that Hungarian clausal syntax involves a special position we call PredOp reserved for particles, bare nominals, and, at least according to some analyses, a focus marked constituent. Unfocused nominals in this position contrast with DPs in full argument position in that they may not have an article. In the next section we propose that nominals occurring in this position in the absence of focus stress are incorporated, i.e., that they combine with their predicate by Unification.[42] The predictions the analysis makes are discussed in Section 4.3.

4.2　A Unification-based analysis of bare nominals

The bare nominals we introduced in the previous section have been referred to in the literature as 'incorporated' at least as far back as Mithun (1984), who lists them as examples of her Type I 'incorporation as juxtaposition'. Below we first present some preliminary evidence in support of the view that nominals in the PredOp position should be treated in terms of incorporation and then give a detailed analysis.

4.2.1　Bare nominals in PredOp are incorporated

Mithun (1984) establishes a classification of four types of noun incorporation. Type I incorporation is incorporation as juxtaposition. Type II incorporation involves manipulation of case. Type III incorporation is distinguished on functional grounds from the others: it is the use of type I or type II incorporation in order to background known or incidental information. Type IV incorporation involves what we called doubling in chapter 1. Mithun posits an implicational relationship between the four types: languages that have type IV noun incorporation also have type III, languages that have type III also have type II, and languages that have type II also have type I. Hungarian exemplifies type I noun incorporation in Mithun's classification, so we will ignore the other constructions in the remainder of this chapter.

　　One version of type I noun incorporation is lexical compounding. This is the only type of incorporation found in English, e.g. *berry-picking, mountain-climbing*. Verbal compounds like these are motivated

---

[42]Precursors of our analysis are Szabolcsi (1997), and Farkas (2001). An analysis along compatible lines has been proposed independently in Kamp and Bende-Farkas (2001). Some comparisons with these approaches will be established in chapter 7 below.

by the institutionalized nature of the activity. As a result, the N involved does not refer to any particular individual, and it is not marked for definiteness or number. In *He is off berry-picking*, the word *berry* does not refer to a specific berry, nor to a particular bushful of berries: it qualifies the verb, describing the type of picking in progress.

Another version of type I noun incorporation Mithun proposes is composition by juxtaposition: the verb and its object are juxtaposed to form an especially tight bond. The V and N remain separate words phonologically, but the N loses its syntactic status as an independent argument of the sentence. Mithun gives Hungarian constructions with a direct object in PredOp position as an example of this type of incorporation. She discusses the contrast between a sentence involving such an object, exemplified in (138), and its minimally different counterpart, with a full-fledged indefinite DP, exemplified in (139) noting, correctly, that the objects in these sentences do not refer to specific entities but rather, modify the type of activity under discussion:

(138) Péter verset   olvas
        Peter poem.Acc read
        'Peter is reading a poem/poems/poetry.'

(139) Péter olvas egy verset.
        Peter read a   poem.Acc
        'Peter is reading a poem.'

Mithun's (1984) claim that the Hungarian pre-verbal position involves incorporation as juxtaposition is confirmed by a number of observations we made in section 4.1 above. First, recall that the PredOp position is not a regular argument position: full-fledged DPs that are not focused cannot occur there. Note also that a bare singular nominal may only occur in the PredOp position. Next, recall that nominals in PredOp are syntactically more dependent on the verb than full-fledged arguments. Furthermore, the intuition that the contrast between (138) and (139) involves the non-individuation of the object is confirmed by the fact that the closest translation in English of (138) involves the abstract noun *poetry* rather than *poem.* Although in Hungarian the incorporation construction is freely available, and is not restricted to a set of lexical verbs ('incorporating verbs', like in West Greenlandic for instance), it is mostly used for regular activities, and abstracts away from the particularity of the individual associated with the incorporated argument.

The fact that the nominal in PredOp is case marked shows that this cannot be an instance of lexical compounding: case-marking requires visibility at the level of clausal syntax. Incorporation at the word for-

mation level, such as English *berry-picking* is available in Hungarian as well. Hungarian has compounds made up of a deverbal noun preceded by a bare nominal functioning as the internal argument of the base verb. To exemplify, the compound *vers olvasás* 'poem-reading' is made up of the bare noun *vers* 'poem' and the deverbal noun *olvas-ás* 'reading' made up of the base *olvas* 'read' and the nominalizing derivational suffix *-ás*. This type of example contrasts with nominals in PredOp in that the internal argument (*vers*) cannot be inflected for either case or number. Note also that such forms, unlike those studied here, bear a single primary stress, on the first syllable of the incorporated argument. We assume that these forms are compounds in Hungarian, just as in English. There is a debate about incorporation being a morphological or a syntactic process in polysynthetic languages (cf. Sadock 1980 versus Mithun 1984). This debate is irrelevant for languages like English and Hungarian, where the word level and the clausal level are clearly distinguished. We consider lexical compounding in English and Hungarian as a word formation process. We assume that compounding also involves unification of thematic arguments (or a similar operation), but in the lexicon, rather than at the sentence level. As a result, compounding is not visible at the clausal compositional level, which is the level we are interested in in this book. The case of incorporation we deal with here, involving a case marked nominal in PredOp, by contrast, is relevant to clausal syntax and semantics.

We take it that the absence of an article together with occurrence in PredOp position are morpho-syntactic marks of incorporation in Hungarian. We now turn to an analysis of morphologically singular nominals in PredOp position in terms of unification of thematic arguments.

4.2.2 A Unification-based analysis

In this section, we develop an analysis of singular INs in Hungarian in the terms developed in chapter 3. More specifically, we claim that nominals in PredOp must combine with their V sisters by Unification, independently of whether they are marked for number or not. Recall that we use the term 'incorporation' not to characterize a morphological class of nominals *per se*, but rather, to refer to a particular semantic relation between a predicate and its argument, a relation that obtains when the two combine by Unification, resulting in a complex predicate made up of two predicates that share a thematic argument. In Hungarian, when a V' dominating a V and its NP sister is reduced, the accompanying DRS operation is Unification.

We begin by giving the step by step construction of the DRS induced by (140). Nothing crucial depends here on the order of composition.

(140) Az orvos beteget vizsgált.
    the doctor patient-examined

The definite article *az* of the subject DP contributes a discourse referent u, and the NP the condition *doctor(z')*. The pre-verbal incorporated nominal *beteget*, 'patient.Acc' on the other hand, contains neither an article nor a morphological number feature and therefore its only contribution to semantic representation is the predicative condition contributed by the N, *patient(z)*. The verb *vizsgált* contributes the predicative condition *examine(x,y)*. Given that the subject is a full-fledged DP, it reduces by DP-internal Instantiation, which results in the substitution of u for z'. This leaves us with the DRS in figure 29:

$$\boxed{\begin{array}{c} u \\[4pt] \text{doctor(u)} \\ [_S\ [_{DP}\ u\ ]\ [_{VP}\ [_{V'}[_{NP}\ \text{patient(z)}]\ [_V\ \text{examine(x,y)}]]]] \end{array}}$$

Az   orvos   beteget vizsgált.
The doctor patient-examined.
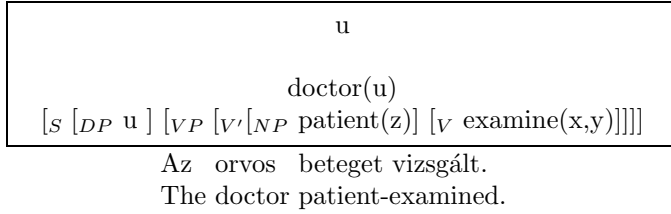
FIGURE 29   DP-internal Instantiation of the subject.

V' must reduce by Unification, resulting in the replacement of the second argument of the predicate *examine* by z, as shown in figure 30.

$$\boxed{\begin{array}{c} u \\[4pt] \text{doctor(u)} \\ [_S\ [_{DP}\ u]\ [_{VP}\ [_{V'}[_{NP}\ \text{patient(z)}]\ [_V\ \text{examine(x,z)}]]]] \end{array}}$$

Az   orvos   beteget vizsgált.
The doctor patient-examined
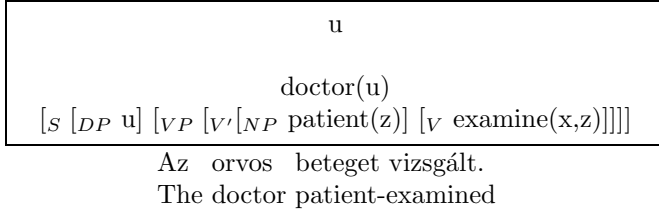
FIGURE 30   Unification.

The nominal *beteget* does not contribute a discourse referent, because it lacks an article. This nominal does not project beyond the NP-level, and therefore no discourse referent can be contributed by it. In Hungarian, such a nominal can only combine with its predicate by Unification. After Unification, the verb and its nominal sister form a complex predicate in the sense that they share a thematic argument z.

The S node is reduced by A-Instantiation resulting in the final DRS in figure 31.

$$
\boxed{
\begin{array}{c}
\text{u} \\[4pt]
\hline \\[-6pt]
\text{doctor(u)} \\
\text{patient(z)} \\
\text{examine(u,z)}
\end{array}
}
$$

Az orvos beteget vizsgált.
The doctor patient-examined
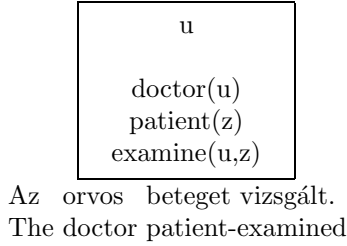
FIGURE 31 Final DRS.

With respect to the subject DP there are two related facts to note: (i) syntactically, it is a full-fledged DP in argument position; (ii) at the DRS-level it contributes a discourse referent and a condition on it. We assume that in Hungarian, full-fledged arguments must combine with their predicate by Instantiation. In the case of the subject in our example, this is possible, for the determiner introduces a discourse referent which can instantiate the relevant thematic argument of the predicate by the time Instantiation must apply, namely at the point of reducing the S-node.

In the case of the object, there are again two related facts: (i) syntactically, it is an NP in PredOp position; (ii) at the DRS-level it contributes a predicative condition. We assume that in Hungarian, nominals in PredOp position must combine with their predicate by Unification. The contribution of the nominal matches this requirement and therefore the derivation proceeds smoothly.

Given what was said in chapter 3, the embedding conditions of the DRS in figure 31 require that $f(u)$ be a doctor and that there be a pair $\langle e_1, e_2 \rangle$ in I($examine$), such that $f(u) = e_1$ and e_2 has the property of being a patient. This verification condition results in the narrow scope existential closure of the uninstantiated thematic argument.

The analysis just presented immediately explains two distributional observations we made about Hungarian, namely that bare singular nominals cannot occur as full-fledged argument positions and that full-fledged DPs cannot occur in the PredOp position. Consider the former observation first. The ungrammaticality of (141), repeated from section 4.1 above,

(141) *Az orvos vizsgált   tegnap   beteget.
       the doctor examine.Past yesterday patient.Acc

follows from the incompatibility of the DRS contribution of *beteget* and its syntactic position. The bare NP contributes a predicative condition and nothing else, but its syntactic position requires combination

via A-Instantiation. Given its DRS contribution, such an NP may only combine via Unification, a mode of composition that is not available given the syntactic position in which the nominal occurs.

Consider now the example in (142), involving a full-fledged unfocused DP in PredOp. (The perfectivizing particle *meg* has been added in post-verbal position as a diagnostic of the fact that the DP occurs in PredOp.)

(142) *Az orvos egy beteget   vizsgált   meg tegnap.
      the doctor a   patient.Acc examine.Past Part. yesterday

In this case the DP constributes a discourse referent, and therefore, by the time the V' node is reduced, the DP may not combine with the predicate via Unification, but only via Instantiation. This mode of combination, however, is not available to nominals in PredOp position.

To sum up, in our analysis, the sole contribution to the DRS of a morphologically singular nominal in Hungarian is the predicative condition brought in by the NP. Such a nominal may only combine with its predicate by Unification. We take it that in Hungarian, the fact that there is no discourse referent introduced by the nominal is a consequence of its lack of D and number marking. We also assume that in this language Unification is tied to the special PredOp position: in Hungarian, all and only nominals in PredOp may combine with the verb via Unification.

In chapter 3, we discussed a number of predictions made by an account of incorporation in terms of unification of thematic arguments. We now check whether these predictions are borne out by the facts in Hungarian involving bare singulars.

4.3 Predictions

4.3.1 Number

The analysis of incorporated morphologically singular nominals given above, combined with the analyis of morphological number proposed in chapter 2 accounts for the contrast in number interpretation between singular INs and singular full-fledged DPs which was part of the puzzle we started out with in chapter 1. Our account predicts that singular INs are semantically number neutral while full-fledged singular DPs involve a default atomicity entailment. The former prediction follows from the fact that in our analysis, singular INs modify uninstantiated thematic arguments, coupled with the assumption that number interpretation for thematic arguments is determined by lexical entailments of the predicate on the argument in question. The latter prediction follows from the assumption that morphological number is realized by a

privative plural feature which is interpreted as a predicate on discourse referents. Discourse referents that do not have plurality predicated on them are interpreted as atomic by default. Below we review data that show that these predictions are correct for Hungarian.

The number neutrality of singular INs is shown by the fact that they are appropriate in the presence of both non-atomicity predicate entailments and atomicity ones. Recall that a singular IN may be connected to the internal argument of *gyűjteni* 'to collect', a predicate that has a non-atomicity entailment on its DO:

(143) Mari bélyeget   gyűjt
       Mari stamp.Acc collect
       'Mary is collecting stamps.'

Singular INs are also appropriate in the presence of contextual atomicity entailments, as in (144):

(144) János feleséget keres.
       János wife.Acc seek
       'Janos is looking for a wife.'

In the absence of atomicity entailments on the relevant argument of the predicate, the use of a singular IN involves no atomicity entailments whatsoever. Thus, (145) is neutral as to whether Mari read one or more poems this afternoon.

(145) Mari verset   olvasott ma   délután.
       Mari poem.Acc read.Past today afternoon
       'Mary read a poem/poems/poetry this afternoon.'

We conclude therefore that morphologically singular INs in Hungarian are semantically number neutral, as predicted by our account. The phrase 'singular INs' describes therefore INs that are semantically number neutral and do not bear a number feature. Recall also that semantic number neutrality of singular INs is a cross-linguistically stable characteristic that our analysis captures.

Our analysis predicts that in Hungarian, just like in other languages that have morphological number, full-fledged morphologically singular DPs involve a default atomicity requirement. We therefore correctly predict that such DPs cannot felicitously instantiate thematic arguments entailed to be non-atomic, and therefore that (146), unlike (143), is anomalous (unless one forces a taxonomic interpretation on the direct object).[43]

---

[43]We come back in the next chapter to cases in Hungarian where singular DPs must, in fact, be used in case the determiner entails non-atomicity. The lack of a 'singular' feature will be crucial in accounting for those cases.

(146) *Mari gyűjt egy bélyeget.
       Mari   collect a   stamp.Acc
       'Mary is collecting a stamp.'

We also predict that in the absence of verbal entailments concerning number, a morphologically singular DP carries an atomicity entailment on its own. Indeed, (147) contrasts with (145) in that it entails that the referent of the DO is a single poem.

(147) Mari olvasott egy verset   ma   délután.
       Mari read.Past a   poem.Acc today afternoon
       'Mary read a poem this afternoon.'

The account of the contrast in number interpretation between incorporated singulars and full-fledged singular DPs is now complete. The contrast in number interpretation we find is rooted, in our account, in the fact that incorporated singulars restrict uninstantiated thematic arguments, while full-fledged singular DPs, just like their plural counterparts, involve the introduction of a discourse referent. The number neutrality of singular INs is therefore predicted to be a cross-linguistically stable feature of incorporation. The observations in the literature show this prediction to be correct. (See for instance Sadock 1980 and Van Geenhoven 1998 on West Greenlandic and Mithun 1984 for many more examples.) As we will see in chapter 7, the number interpretation of INs has not figured prominently in the semantic literature on this phenomenon and has remained unaccounted for in previous analyses. The contrast in number interpretation between incorporated singulars and incorporated plurals will be taken up in chapter 5.

4.3.2   Truth-conditions

The analysis we give correctly predicts the truth-conditional equivalence of minimal pairs such as (148a) and (148b).

(148) a. Az orvos beteget   vizsgált.
           the doctor patient.Acc examine.Past
           'The doctor examined a patient/patients.'

       b. Az orvos   vizsgált   egy beteget.
           the doctor examine.Past a   patient.Acc
           'The doctor examined a patient.

Our account differs from Van Geenhoven (1998) in that it assigns different, though truth-conditionally equivalent, interpretations to minimal pairs involving singular INs and full-fledged narrowest scope singular indefinite DPs. In Van Geenhoven's approach, both the representations and the interpretations are identical. In our account, sentences involv-

ing a singular IN, such as (148a), and sentences involving a narrowest scope indefinite, such as (148b), lead to representations like those in figures 32 and 33. These DRSs differ in that in the case of INs, we have a final representation involving an uninstantiated thematic argument, while no such argument is present in the case of full-fledged DPs.

$$
\boxed{
\begin{array}{c}
\text{u} \quad \text{v} \\[4pt]
\text{doctor(u)} \\
\text{patient(v)} \\
\text{examine(u,v)}
\end{array}
}
$$
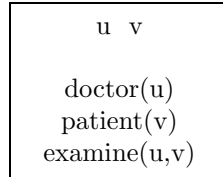
FIGURE 32 A doctor examined a patient

$$
\boxed{
\begin{array}{c}
\text{u} \\
\text{doctor(u)} \\
\text{patient(x)} \\
\text{examine(u,x)}
\end{array}
}
$$
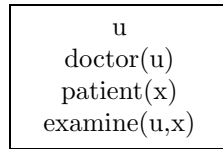
FIGURE 33 A doctor patient-examined

The embeddability conditions of both discourse referents and uninstantiated thematic arguments involve an existential requirement, and therefore both variables are assigned as values an individual in the universe of the model. As a result, the two DRSs are truth-conditionally equivalent: they both require there to be a doctor and a patient such that the former examined the latter.

4.3.3 Scope

Because nominals in PredOp position are analyzed as incorporated, and therefore as restricting uninstantiated thematic arguments, they are predicted to be scopally inert. This means that they need not be in the scope of any operator, but they have to be interpreted together with their predicate, and therefore cannot scope over any operator that has that predicate in its scope. Evidence for the first half of the generalization comes from sentences such as (149), where a bare singular in PredOp is grammatical although not in the scope of any operator.

(149) Mari verset   olvasott ma   délután.
       Mari poem.Acc read.Past today afternoon
       'Mary read a poem/poems/poetry this afternoon.'

The acceptability of such examples shows that these nominals are not like polarity items in that they do not require a licensor; they are also unlike reduplicated indefinites in Hungarian in that they do not require co-variation with another variable. In this respect, they pattern with ordinary indefinites.

Evidence for the second half of the generalization shows that bare singulars contrast with ordinary indefinites in that they must have local scope. We review here relevant examples already discussed in chapter 1. The bare singular, unlike an indefinite DP, cannot scope outside a conditional: sentence (150) must be interpreted with the nominal within the scope of the antecedent:

(150) Ha János olvasna   ujságot   tudná   a híreket.
      if Janos read.Cond newspaper.Acc know.Cond the news.Pl.Acc
      'If Janos read the newspaper he would know the knews.'

In habitual/dispositional sentences like (151), we assume that there is an aspectual operator that has the predicate in its scope.

(151) Mari bélyeget   gyűjt
      Mari stamp.Acc collect.III
      'Mary is collecting stamps.'

The uninstantiated argument must be interpreted within the scope of the aspectual operator, which explains why there is no existential entailment on the direct object argument here. (See Kamp and Bende-Farkas 2001 for discussion.) In fact, the incorporation analysis of nominals in PredOp correctly predicts that such nominals will have to be interpreted within the scope of adverbs of quantification of any sort, which is indeed the case. We exemplify in (152), which can only be interpreted with the bare nominal within the scope of *gyakran* 'often'.

(152) Mari gyakran olvas verset.
      Mari often   read poem.Acc
      'Mari often reads a poem/poems/poetry.'

We see next that, as predicted by the incorporation analysis, nominals in PredOp may not scope over negation.

(153) János nem olvasott   verset.
      János not read.Past poem.Acc
      'János didn't read poetry.'

This sentence is unambiguously interpreted with the incorporated nominal within the scope of negation. Interestingly, the minimally different (154) is not ambiguous either.

(154) János nem olvasott   egy verset.
　　　János not   read.Past a   newspaper.Acc
　　　'János didn't read newspapers.'

the indefinite here must be interpreted outside the scope of negation. One could account for this fact by stipulating that *egy* is a positive polarity item. That this is not the right explanation is shown by the fact that complex indefinite DPs may, in fact, be interpreted within the scope of negation in the presence of *egy*. This is exemplified in (155), where the indefinite must be interpreted within the scope of negation, despite the presence of *egy*:

(155) János nem olvasott   egy olyan verset   ami
　　　János not   read.Past a   such poem.Acc which

　　　tetszett   volna neki.
　　　please.Past Cond. to him

　　　'Janos did not read a poem that he would have liked.'

As mentioned before, complex NPs (i.e., NPs modified by a relative clause) cannot occur in PredOp. Our conjecture is that the apparent restrictions on *egy* are the result of a preference for the incorporated construction over the unincorporated one under the scope of negation rather than a full-blown ban on *egy* indefinites in such contexts. This line of analysis predicts that *egy* indefinites occur within the scope of negation just in case bare nominals may not, which seems to be supported by the data. An account along optimality theoretic lines would hold that, all other things being equal, the incorporated construction is preferred over the non-incorporated one and that other things are not equal in two cases: (i) when the contrast between a foregrounded discourse referent and a backgrounded uninstantiated thematic argument is relevant; (ii) when the nominal contains a relative clause, or other material which makes the presence of the determiner obligatory. Under the assumption that the discourse saliency contrast is neutralized within the scope of negation, we expect that the unmarked structure without *egy* will be used in that context.

　　Our incorporation analysis of bare singulars in PredOp predicts their local scope. Ordinary indefinites on the other hand, scope freely as a result of the lack of special restrictions on discourse referents introduced by the unmarked indefinite article *egy*. Consequently, discourse referents introduced by it can be interpreted in any DRS box accessible to the current box. But not all indefinites are created equal. The special indefinite *egy-egy*, for instance, comes with a co-variation restriction. As a result, DPs involving this article may only occur in environments

where they can receive a co-variation interpretation. (For other types of interpretive restrictions associated with special determiners that affect their scopal behavior, see Farkas 2002b.) We have thus completed our account of the scopal contrasts between bare singular nominals in PredOp and their indefinite sisters.

4.3.4 Argument structure

Treating nominals in PredOp position as incorporated predicts that they will not occur as subjects of i-level predicates. This is so because incorporated subjects, under the present approach, result in uninstantiated arguments, while i-level predicates require their subject to be independently identified. The prediction is correct for Hungarian. Recall that while bare singular nominals in PredOp position may, in some cases, be subjects, this is not a possibility in the case of i-level predicates, under neutral intonation:

(156)   a. *Gyerek okos(ak).
              child   clever(.Pl)

        b *Gerek szereti a   csokoládét.
             child   love.III the chocolate.Acc

Doubling of a nominal in PredOp position (whether singular or plural) is impossible in Hungarian:

(157) *Mari ujságot   olvasott   a New York Times-t.
        Mari   newspaper read.Past the NYT.Acc
        'Mari newspaper read the New York Times.'

The account of incorporation proposed in the previous chapter predicts the possibility of doubling but does not entail it. It turns out that Hungarian clause structure does not have special adjunct positions the reduction of which is accompanied by A-Instantiation. It is the existence of such positions in Caddo and Chamorro that make doubling of an incorporated argument by a non-incorporated full DP possible.

4.3.5 Discourse transparency and saliency

The analysis of bare singulars in PredOp as incorporated predicts that such nominals will be inherently less transparent and less salient in discourse than their unincorporated indefinite sisters. This is so because singular INs modify uninstantiated thematic arguments, which are lower on the saliency scale than discourse referents.

Hungarian is sensitive to the difference between thematic arguments and discourse referents as far as overt pronouns are concerned. Unlike ordinary singular indefinites,bare singulars in PredOp may not act as antecedents to overt pronouns in discourse, as shown in (158):

(158) a. János beteget   vizsgált   a rendelőben.
           J.   patient.Acc examine.Past the office.in
           'Janos patient-examined in the office.'

       b. ??pro Túl sulyosnak találta   **őt**   és
          pro   too severe.Dat find.Past 3.Acc and

          beutaltatta   pro a korházba.
          intern.Cause.Past   pro the hospital.in
          'He found him too sick and sent him to hospital.'

Recall that Hungarian has both covert and overt pronouns. The former are marked by a *pro* in our glosses. The example in (158) shows that the overt singular pronoun *őt* cannot take the incorporated singular as its antecedent. The same fact is noted for Hindi incorporated singulars in Dayal (1999). The infelicity of the discourse in (158) contrasts with both the version with a plural IN and the version with a covert, rather than an overt pronoun. We come back to these cases in chapter 6. Here we note that our analysis correctly accounts for the contrast in discourse transparency between bare singulars in PredOp position and their full-fledged indefinite DP sisters.

We have seen here that the treatment of bare singulars in PredOp as incorporated accounts for both the similarities and the differences we found between such nominals and ordinary indefinite DPs in Hungarian. These results confirm out claim that nominals in PredOp position combine with their predicate by Unification, and that these nominals modify an uninstantiated thematic argument.

4.4   Conclusion

In the account developed here, the crucial feature of singular bare nominals in PredOp position in Hungarian is that their contribution to semantic representation reduces to a predicative condition involving a thematic argument. This property is connected to their lack of a projection beyond NP. As a result, they can only combine with the predicate by Unification. The distributional restrictions on these nominals follows from the assumption that in Hungarian only nominals in the special PredOp position may combine by Unification. Consequently, full-fledged DPs do not show up in PredOp, and singular bare nominals are restricted to occurring only in this position.

We have seen above that the incorporation analysis of singular bare nominals in Hungarian predicts their clausal and discoursal semantic properties as well. We have concentrated here on the contrasts between singular bare nominals and their indefinite full-fledged DP counterparts. It is now time to extend the discussion to bare plurals so as to

complete the task we set out for ourselves in chapter 1, namely the account of the three-way contrast between bare singulars, bare plurals and full-fledged DPs. The analysis of bare plurals in Hungarian, in both incorporated and non-incorporated positions is the topic of chapter 5.
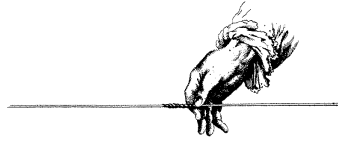
5 Bare plurals

In this chapter we extend the analysis to bare plurals in Hungarian both in incorporated and in full argument positions. In our treatment, the special properties of this class of nominals follow from the absence of a determiner and the presence of plural morphology.

We have seen in chapter 4 that nominals in PredOp in Hungarian may be either morphologically singular or plural. The occurrence of bare plurals in PredOp shows that their interpretation should be compatible with combination via Unification. Unlike bare singulars, however, bare plurals may also occur in full-fledged argument position, suggesting that their interpretation should be compatible with combination by means of Instantiation as well. We show in this chapter that this dual nature of bare plurals in Hungarian follows from the combination of the analysis of number developed in chapter 2 with the analysis of incorporation worked out in chapters 3 and 4.

The analysis of bare plurals in full argument position and in incorporated position to be presented in section 5.1 explains the differences between incorporated plurals and their singular sisters as a result of the contribution of the plural feature. In section 5.2 we examine the predictions our account makes concerning semantic number, scope, argument structure, and discourse transparency. The consequences of our approach to bare plurals with respect to genericity are discussed in section 5.3. In section 5.4 we review the analysis of number that emerges from our discussion thus far. We end by taking stock of what the analysis of incorporation developed since chapter 3 has achieved.

5.1 Interpretation of bare plurals

Bare plurals in Hungarian are unique among nominal types in this language in that they may occur in both incorporated and full argument positions. In this section, we summarize the distributional properties of bare plurals, and then provide an analysis of their dual nature.

5.1.1 Distributional facts

Example (159) shows that bare plurals may occur in the PredOp position that we have identified as the position for incorporated nominals in this language:

(159) Az orvos   recepteket   nézett   át.
      the doctor prescriptions.Pl.Acc examine.Past Part
      'The doctor looked through some prescriptions.'

(We chose a verb with a verbal particle, because we use the post-verbal position of the particle as a test that the PredOp position is filled.) Typologically speaking, this is not unusual though by no means general. In chapter 1, we saw that bare plurals incorporate in Hindi as well (cf. Dayal 1999) but that in West Greenlandic and many other languages, incorporation is restricted to nominals that are unmarked for number. There is, however, no language where bare plurals may incorporate but bare singulars may not.

Just like in English and in other Germanic languages, bare plurals in Hungarian also show up in regular argument position. In (160), the bare plural does not occur as sister of V under V':[44]

(160) Benéztem   az ablakon   és láttam   egy asztalnál
      in.look.Past.I the window.on and see.Past.I a   table.at
      szépen   felöltözött gyerekeket amint kakaót
      beautifully dressed   child.Pl.Acc as   cocoa.Acc
      ittak.
      drink.Past.Pl
      'I looked through the window and saw at a table well-dressed children drinking cocoa.'

As discussed in the previous chapter, our analysis predicts that a morphologically singular bare nominal in Hungarian cannot occur in this position. Nominals in ordinary argument position must combine with the predicate by Instantiation, an operation that involves a discourse referent introduced by the nominal. But in Hungarian, a nominal with-

---

[44]There are complex restrictions on when a bare plural may occur in a full-fledged DP position which we do not fully understand at present, and therefore will not go into here.

out a determiner and without a plural feature cannot introduce a discourse referent. As predicted, changing the bare plural to a bare singular in (160) results in ungrammaticality:

(161) *Benéztem   az   ablakon   és   láttam   egy   asztalnál
        in.look.Past.I the window.on and see.Past.I a   table.at
        szépen   felöltözött gyereket   amint   kakaót
        beautifully dressed   child.Acc as   cocoa.Acc
        ivott.
        drink.Past
        'I looked through the window and saw at a table well-dressed child drinking cocoa.'

Our analysis of plural morphology as a feature with dynamic potential is the key to understanding the contrasts in the distribution and dynamic behavior between bare plurals and bare singulars.

5.1.2 Bare plurals in full argument position

As discussed in chapter 2, the analysis of plural morphology developed there predicts the possibility of having a bare plural in full argument position. Our account of the interpretation of bare plurals in full argument position in Hungarian parallels the account of existential bare plurals in English given in chapter 2.

The bare noun in (160) carries the plural morphological feature, which percolates up to the highest level of the nominal. The DRS in figure 34 is thus the starting point of the interpretation process.

$$[_S [_{DP} \text{ I }][[_{VP} \text{saw(x,y)}] [_{NPpl} [_{Npl} \text{child(z)}]]]]$$

Benéztem az ablakon és láttam egy asztalnál szépen
felöltözött gyerekeket amint kakaót ittak.
I [looked in through the window and] saw [at the table
well-dressed] children [drinking cocoa]
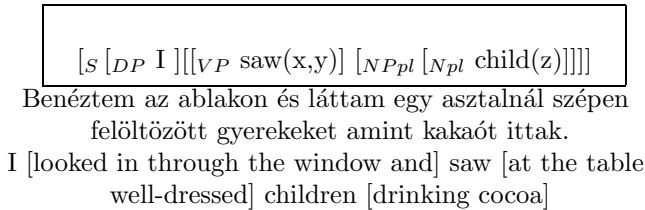
FIGURE 34 Contribution of the bare plural; first step.

In the case of nominals in full argument position, reduction of the VP is accompanied by the semantic rule of A-Instantiation. A-Instantiation can apply only after the nominal has been fully reduced to a discourse referent. In the case of full DPs, this discourse referent is introduced by the determiner. In the absence of a determiner, it is the plural feature that is responsible for the presence of the discourse referent, via accommodation of the presupposition.

The core semantics of nominal plural morphology is the introduction of a presupposed discourse referent u_x, co-indexed with the thematic argument of the head noun, as well as the condition *plural(u_x)*. When the plural NP is part of a DP with a lexical D, the presupposed discourse referent u_x is bound to the discourse referent introduced by D. In the absence of a lexical determiner, the presupposition cannot be bound. In languages like English and Hungarian, which allow bare plurals in argument position, we proposed that the presupposition introduced by the plural morphology can be accommodated. The accommodated discourse referent is integrated into the DRS by Secondary Instantiation, which involves instantiation of the thematic argument x by a discourse referent that is coindexed with it. The details of the interpretation of bare plurals in full argument position in Hungarian which we illustrate here parallel those given for English in chapter 2.

Spelling out the plural feature on an N involves the steps given in chapter 2, repeated here as (162):

(162) CR_{plN}
For a plural noun N of the form $[_{NPpl}$ pl $[N(x)]]$ in DRS K,

  (i) introduce a presuppositional box K';

  (ii) introduce into $U_{K'}$ a discourse referent u_x that is coindexed with the thematic argument x of the nominal;

  (iii) introduce into $Con_{K'}$: *plural(u_x)*;

We assume here that the instance of the plural feature that is interpreted is the first link in a plural agreement chain and that its interpretation triggers the deletion of the other links.

After the interpretation of the plural feature we have the representation in figure 35:

$[_S [_{DP}$ I $][[_{VP}$ saw(x,y)$]$ $[_{NP} [_N$ child(z)$]]]$	u_z
	plural(u_z)

Benéztem az ablakon és láttam egy asztalnál szépen
felöltözött gyerekeket amint kakaót ittak.
I [looked in through the window and] saw [at the
table well-dressed] children [drinking cocoa]

FIGURE 35 Interpretation of the plural feature.

In the absence of a lexical D, there is no proper binder for u_z. Just like in the case of English existential bare plurals, the derivation can proceed nonetheless because Hungarian allows the presupposition to be

accommodated if it is not bound. The result of accommodation is the DRS in figure 36.

$$
\boxed{
\begin{array}{c}
u_z \\[4pt]
\mathrm{plural}(u_z) \\
[_S\ [_{DP}\ \mathrm{I}\ ][[_{VP}\ \mathrm{saw(x,y)}]\ [_{NP}\ [_N\ \mathrm{child(z)}]]]]
\end{array}
}
$$

Benéztem az ablakon és láttam egy asztalnál szépen
felöltözött gyerekeket amint kakaót ittak.
I [looked in through the window and] saw [at the
table well-dressed] children [drinking cocoa]
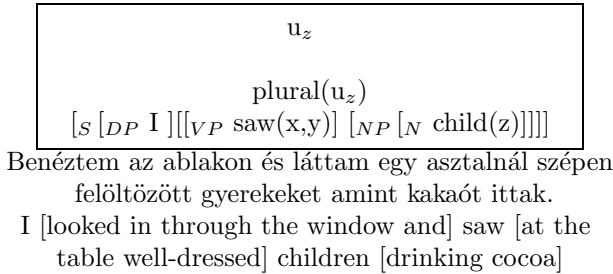
FIGURE 36   Accommodation

The next step is the application of Secondary Instantiation, which replaces a thematic argument by a discourse referent that it is co-indexed with. The resulting final DRS is shown in figure 37:

$$
\boxed{
\begin{array}{c}
u \quad v \\[4pt]
\mathrm{plural}(u) \\
\mathrm{child}(u) \\
\mathrm{see}(v,u)
\end{array}
}
$$

Benéztem az ablakon és láttam egy asztalnál szépen
felöltözött gyerekeket amint kakaót ittak.
I [looked in through the window and] saw [at the
table well-dressed] children [drinking cocoa]
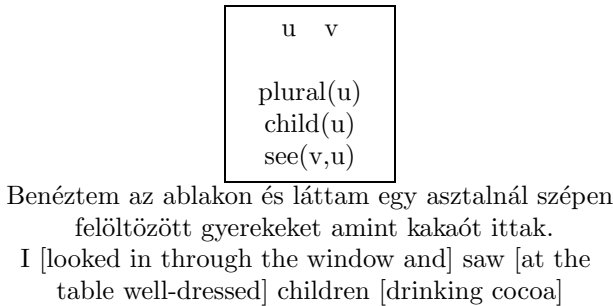
FIGURE 37   A-Instantiation (final DRS)

The final DRS contains no uninstantiated thematic arguments, as expected for the combination of a predicate and an argument in a non-incorporated position. It yields an existential interpretation upon embedding in the model. Because of the presence of the condition *plural(u)*, the embedding function may assign to u non-atomic values. Consequently, bare plurals in full argument position in Hungarian, just like their English counterparts, are correctly predicted to be semantically plural. Given that they introduce a discourse referent via the back door of accommodating the presupposition contributed by an inflectional feature, they are also predicted, correctly, to be scopally inert.

So far, we have seen how our analysis of morphological plurality predicts that there may be languages like English or Hungarian, where a

bare plural, but not a bare singular may occur in full argument position. The next challenge is to preserve the general analysis of the bare plural while at the same time accounting for its interpretation in incorporated position. This is the issue we turn to next.

5.1.3 Incorporated incorporation of bare plurals

In this subsection we show how incorporation of bare plurals in Hungarian is accounted for in our framework. We illustrate the general process with a step-by-step construction of the DRS for example (163):

(163) Az orvos betegeket vizsgált.
     the doctor patient.Pl.Acc examine.Past
     'The doctor examined patients.'

In (163), we have a structure involving a bare plural occurring in the preverbal PredOP position that we have identified as a syntactic construction requiring reduction by Unification. This raises the question of how our analysis of plurals interacts with our analysis of incorporation. Our account is based on the fact that in the asserted DRS, the contribution of the bare plural is just a predicative condition on a thematic argument. At this point, the bare plural may combine with its predicate by Unification. The derivation then proceeds with the resolution of the presupposition, which involves the accommodation of the presupposed discourse referent followed by Secondary Instantiation.

    We give the details of the derivation below, adopting a bottom-up approach. The interpretation of the plural feature yields the DRS in figure 38.

	u_z
$[_S [_{DP} [_D$ the $] [_{NP}$ doctor$(z')]]]$ $[_{VP} [_{V'} [_{Npl}$ patient$(z)] [_V$ examined$(x,y)]]]]$	plural(u_z)

Az orvos betegeket vizsgált.
the doctor patient.Pl.Acc examined

FIGURE 38 Introduction of a presupposed discourse referent by the plural.

The plural morphology contributes the material in the presupposed box. Since there is no D, the nominal argument is now fully reduced. Recall that the bare plural here occurs in PredOp position and therefore requires combination by Unification. Given that the nominal is fully reduced and given that its contribution to the asserted structure amounts to a predicative condition only, Unification may apply. The result is given in figure 39.

$[_S [_{DP} [_D \text{ the }] [_{NP} \text{ doctor}(z')]]]$ $[_{VP} [_{V'}[_{Npl} \text{ patient}(z)] [_V \text{ examined}(x, z)]]]]$	u_z $\text{plural}(u_z)$

Az orvos betegeket vizsgált.
the doctor patient.Pl.Acc examined

FIGURE 39   Unification

Unification has replaced the relevant thematic argument of the verb by the thematic argument of the nominal. We can continue to build the DRS for the rest of the sentence, carrying the presupposition introduced by the plural morphology along. We proceed with the interpretation of the full DP in subject position. After D-Instantiation and A-Instantiation of the subject, we obtain the DRS in figure 40.

v $\text{doctor}(v)$ $[_S [_{DP}v][_{VP} [_{V'} [_{Npl} \text{ patient}(z)] [_V \text{ examined}(v, z)]]]]$	u_z $\text{plural}(u_z)$

Az orvos betegeket vizsgált.
the doctor patient.Pl.Acc examined

FIGURE 40   D- and A-Instantiation of the subject

No other construction rules apply to this configuration. In order to complete the interpretation, we resolve the presupposition introduced by the plural morphology on the object. The discourse referent v is not an appropriate binder for the presupposed discourse referent u_z, because it is not coindexed with z, and does not instantiate the thematic argument of the object. In the absence of a proper binder for the presupposed discourse referent, the presupposition is resolved by accommodation. Accommodation triggers Secondary Instantiation as before. After the indices have been dropped, the final DRS in figure 41 is the result. Secondary Instantiation affects the predicative condition contributed by the verb as well as the condition on the nominal. Instantiation replaces all occurrences of the targeted thematic argument by a discourse referent. In this DRS, we find no more uninstantiated thematic arguments, even though the sentence involved an incorporation construction.

Under this analysis, incorporation of bare plurals is possible because the contribution of the plural morphology is presupposed rather than asserted. The contribution of the bare plural to the asserted structure

$$\boxed{\begin{array}{c} \text{v} \quad \text{u} \\ \text{plural(u)} \\ \text{doctor(v)} \\ \text{patient(u)} \\ \text{examine (v, u)} \end{array}}$$

Az orvos betegeket vizsgált.
the doctor patient.Pl.Acc examined
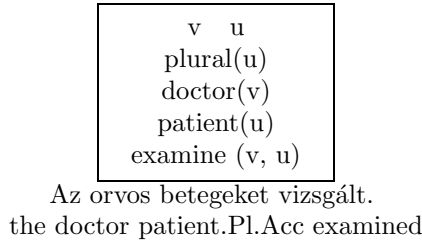
FIGURE 41 Final DRS

is a predicative condition on a thematic argument. When the bare plural occurs in PredOp position, combination by Unification is possible before the resolution of the presupposition. When the bare plural occurs in full argument position, it has to combine with the predicate by A-Instantiation. This not possible until the presupposition has been resolved. The analysis thus relies on the fact that the resolution of the presupposition contributed by the plural morphology may occur after Unification but before A-Instantiation. We assume here that presuppositions introduced by morphological features have to be resolved by the time the minimal clause in which the nominal bearing them occurs is interpreted. Thus we do not move on to the interpretation of higher clauses until the predicate-argument structure of the lower clause has been completely interpreted. Note that even if the minimal S involves other DPs, the discourse referents introduced by the determiners in these DPs do not qualify as binders for the presupposed discourse referent, because they are not coindexed with the thematic argument of the N that the plural morphology occurs on.

We conclude that our account of incorporation combined with our proposals concerning the semantics of plural morphology predicts the possibility of incorporated bare plurals, a welcome result given the facts of Hungarian and Hindi. We by no means predict, however, that languages that allow incorporation will necessarily allow the incorporation of plurals. There may be various reasons why a plural N(P) does not incorporate in a language that allows incorporation of morphologically unmarked N(P)s. The language in question may mark plurality only on Ds and not on nouns, as is the case in Niuean. In such a language plural morphology is interpreted only after a discourse referent has been introduced by the D. But the presence of such a discourse referent renders incorporation impossible. Alternatively, a language could restrict incorporation morpho-syntactically to 'Baker style' incorporation of bare nominal stems. This situation is exemplified in West Greenlandic, where

neither inflection nor adjectival modification is possible on an incorporated nominal. Finally, a language may disallow the accommodation of the presupposed discourse referent introduced by the plural morphology thereby ruling out both the incorporation of bare plurals and their occurrence in full-fledged argument positions.

The approach to incorporation of plurals presented here makes the following conditional prediction:

- If a language allows plurals to incorporate, it will allow singulars as well but not necessarily the other way around.

We make this prediction, because morpho-syntactically, plurals are more complex than singulars. In addition, the semantic mechanism needed for incorporation of plurals is more complex than that needed fo incorporation of singulars: besides combination by Unification, incorporation of plurals requires the accommodation of the presupposition contributed by the plural feature. There are no counterexamples to this prediction in the literature on incorporation and therefore accounting for it is a welcome result of our approach.

Note that we maintain the earlier prediction, according to which DPs involving a discourse referent introducing determiner will not incorporate in any language. The discourse referent introduced by the determiner instantiates the thematic argument of the lexical head. Thus, such DPs cannot combine with their predicate by Unification.

The DRS in figure 41 is identical to the final representation of a sentence that involves a bare plural in full argument position (e.g. figure 37 above); what differs is the way the final DRSs were obtained. In both cases, however, the relevant discourse referent is introduced via the back door of accommodation of a presupposed discourse referent introduced by the plural feature rather than via the front door of a determiner. We predict therefore that there will be no significant differences between minimal pairs involving an incorporated and an unincorporated bare plural, a prediction that is true as far as we can tell.

In the next section, we examine the consequences that follow from our treatment of argumental and incorporated bare plurals concerning their static and dynamic properties.

5.2 Predictions

The dual nature of bare plurals has been explained as a result of the interaction of the semantics of incorporation with the interpretation of number inflection. We now examine the predictions the analysis makes concerning the static and dynamic properties of bare plurals.

5.2.1 Number

Recall that the analysis of incorporated singulars developed in chapters 3 and 4 accounted for their being semantically number neutral. Since a morphologically singular (i.e., non-plural) incorporated nominal bears no morphological number feature in our analysis, and since it restricts an uninstantiated thematic argument rather than a discourse referent, its number interpretation is dictated by whatever entailments the predicate imposes on the relevant thematic argument or whatever entailments the discourse context brings.

In this chapter we have argued that bare plurals in PredOp are incorporated as well. As a consequence of the presence of the morphological plural marking, these nominals trigger the introduction of a discourse referent that is predicated to be plural. We therefore predict that plural INs, unlike their singular sisters, are semantically plural. This prediction is correct, as previewed already in chapter 1. Thus, example (164) entails that Janos is looking for several wives.

(164) János feleségeket keres.
János wife.Pl.Acc seek
'Janos is looking for wives.'

Since bare plurals in full argument position do not differ in number marking from incorporated plurals, we predict that the former will also be semantically plural. This prediction is borne out too. Sentence (161) above, for instance, entails that there were several children drinking cacao. Our analysis therefore correctly accounts for the fact that bare plurals pattern with plural full-fledged arguments rather than with singular INs with respect to the semantic import of their number feature. Parallel facts are reported for Hindi in Dayal (1999).

5.2.2 Scope

Our analysis predicts that incorporated and non-incorporated bare plurals pattern with incorporated singulars rather than with ordinary full-fledged DPs with respect to scope. This is due to the fact that bare plurals just like bare singulars, are bare, i.e., have no determiner. We are assuming here that only determiners have the potential of introducing a discourse referent that scopes freely. The discourse referent that the plural feature introduces in the absence of a determiner is locally accommodated within the minimal DRS box in which its descriptive content occurs. The prediction about local scope of incorporated plurals is correct for both Hungarian and Hindi. We exemplify in (165) for incorporated bare plurals in Hungarian with sentences involving a universal quantifier, sentential negation and a conditional.

(165) a. Minden vendég ujságokat   olvasott.
           every   guest   newspaper.Pl.Acc read.Past
           'Every guest read newspapers.'

    b. János nem olvasott   ujságokat.
        János not   read.Past newspaper.Pl.Acc
        'János didn't read newspapers.'

    c. Ha János ujságokat   olvasna   tudná   a
        if   Janos newspaper.Pl.Acc read.Cond   know.Cond the
        híreket.
        news.Pl.Acc
        'If Janos read the newspaper he would know the knews.'

The sentences in (165) must be interpreted with the nominal having narrow scope with respect to the relevant scope bearing operator.

The observations extend to bare plurals in full argument position in Hungarian and English. The discourse referent introduced by the plural feature is locally accommodated, and therefore local scope is predicted. Since the analysis of Hungarian and English bare plurals in full argument position is identical, their parallel behavior is predicted.

5.2.3   Argument structure

In discussing incorporated nominals in chapters 3 and 4, we argued that they are barred from occurring as subjects of i-level predicates because such predicates must be interpreted as predicating of an independently introduced subject. Singular incorporated nominals may not act as subjects of i-level predicates because of their dependence on the predicate. Plural INs cannot be subjects of i-level predicates either, given our analysis, because the process of incorporation involves building a complex predicate by Unification of the thematic arguments of the NP and the verb. Even though a discourse referent is introduced after Unification has applied, it does not qualify as an independently established subject, because instantiation affects the thematic argument of the NP and the argument of the verb at the same time. This explains the ungrammaticality of (166), mentioned in chapter 4.

(166) *Gyerekek okos(ak).
        child.Pl   clever(.Pl)

If Hungarian were like English in allowing bare plurals in argument position to be interpreted generically, we would expect (166) to be acceptable. The fact that the sentence is not felicitous shows that Hungarian is like Greek and Romance languages in that it resists a generic interpretation of bare plurals.

Our analysis makes an interesting prediction concerning doubling of the incorporated nominal by an independent DP. Our account implies that doubling of incorporated morphologically plural nominals is impossible even in languages which otherwise allow doubling. This is so because the accommodated discourse referent contributed by a morphological plural nominal ends up instantiating the thematic argument restricted by the nominal. Because Instantiation is not recursive, the argument position is thereby saturated, and not available for further instantiation. This blocks doubling of the incorporated plural nominal. This is a prediction our analysis makes, and which it does not share with other approaches to incorporation. Since there are no counterexamples to it in the literature on doubling, this is another positive result.

5.2.4   Discourse transparency

Our analysis, together with standard assumptions concerning discourse transparency, predicts that bare plurals in full argument position as well as incorporated bare plurals, contrast with incorporated singulars in that they are fully discourse transparent. This is so because bare plurals, whether incorporated or not, have dynamic force and involve the introduction of a discourse referent. Incorporated singulars, on the other hand, modify an uninstantiated thematic argument. Data confirming this prediction is discussed for Hindi in Dayal (1999). Recall that in Hindi bare morphologically singular nominals are discourse opaque. We see in (167), taken from Dayal (1999), that their plural counterparts, however, are discourse transparent, exactly as predicted by our analysis:

(167)   a. anu apne bete ke liye laRkiyaaN dekh rahii hai.
          'Anu is seeing girls for her son.'

    b. vo unkaa/la RkiyoN-kaa swabhaav jaannaa caahtii hai.
         'She wants to find out their/the girls' temperament.'

The prediction is confirmed by data from Hungarian as well. We know that incorporated singulars may not serve as antecedents to overt pronouns. Incorporated bare plurals contrast with their singular counterparts in this respect: in example (168) the incorporated plural is the antecedent of the overt pronoun (in bold face). The corresponding sentence with a singular incorporated nominal, repeated here as (169), is infelicitous (compare chapter 4 for discussion):

(168)   a. János betegeket   vizsgált   a rendelőben.
      J.   patient.Pl.Acc. examine.Past the office.in
      'Janos patients-examined in the office.'

b. pro Túl sulyosnak találta **őket**   és
   pro too severe.Dat find.Past 3.Pl.Acc and

beutaltatta   pro a korházba.
intern.Cause.Past pro the hospital.in

'He found them too sick and sent them to hospital.'

(169) a. János beteget   vizsgált   a rendelöben.
    J.   patient.Acc examine.Past the office.in
    'Janos patient-examined in the office.'

b. ??pro Túl sulyosnak találta **őt**   és
    pro too severe.Dat find.Past 3.Acc and

beutaltatta   pro a korházba.
intern.Cause.Past pro the hospital.in

'He found him too sick and sent him to hospital.'

We conclude that the analysis we have developed correctly predicts that with respect to discourse transparency, bare plurals, whether incorporated or not, pattern with full arguments and contrast with incorporated singulars.

We have completed now the analysis of the three way contrast in Hungarian that we set out to accomplish. We have an account for why bare singulars in this language can occur only in incorporated positions, must get a number neutral interpretation, have local scope and have reduced discourse transparency. We have also explained why bare plurals may occur either as full-fledged arguments or in incorporated position. The analysis we proposed predicts, correctly, that bare plurals, whether incorporated or not pattern with their singular sisters with respect to scope but pattern with plural DPs in that they are fully discourse transparent and are interpreted as semantically plural. Given the account developed here, we also predict that full DPs contrast with bare nominals in that they may only occur in argumental position and are not necessarily restricted to local scope. With respect to number interpretation, we predict that full DPs are not number neutral; unlike bare singulars, they are semantically singular if unmarked for number, and like bare plurals, they are semantically plural if marked as plural.

Argumental bare plurals in Hungarian parallel existential bare plurals in English. The special properties of these nominals in both languages are connected, in our account, to their being bare and to their being plural. Note, however, that English differs from Hungarian in that it allows argumental bare plurals to be interpreted generically. In the next section, we show how the possibility of a generic interpretation of bare plurals arises in our framework in a natural way.

5.3 Bare plurals and genericity

Incorporated nominals, whether singular or plural, get an existential interpretation in West Greenlandic, Hindi, Hungarian, and any other incorporation language that we are aware of. An existential interpretation is also cross-linguistically available for bare plurals in full argument position. The analysis developed so far accounts for this possibility. The picture is complicated by the fact that there are languages, such as English and Hindi, where bare plurals in full argument position may get a generic reading besides an existential interpretation. Our analysis faces the following two questions: (i) how can it explain the possibility of a generic reading for bare plurals in argument position? (ii) how can it explain the unavailability of this reading for incorporated bare plurals? We now turn to answering these questions.

We start with a cautionary note. One should avoid predicting that the generic reading will generally be available for bare plurals in full argument position, for there is cross-linguistic variation on this point. Thus, Hungarian is like Greek and Romance languages, and unlike English and Hindi, in that bare plurals even in full argument position are restricted to an existential interpretation and disallow generic readings. Generic statements in Hungarian, Greek and Romance languages must involve either a definite (singular or plural) or an indefinite singular. Thus, in these languages, neither bare singulars nor bare plurals can be used as the subject of generic statements or in the object position of verbs like *love, hate,* or *like.* For bare singulars, this is not surprising since, in Hungarian at least, they do not occur in free argument position but for bare plurals a different explanation must be found. The data below exemplify the situation in Hungarian.

(170) A   medve okos./   A   medvék okosak.
      the bear   intelligent./ the bear.Pl intelligent.Pl
      'The bear is intelligent./ The bears are intelligent'

(171) Egy medve ideges   mikor éhes.
      a   bear   nervous when hungry
      'A bear is nervous when he is hungry.'

(172) *Medve okos./   *Medvék okosak.
       bear   intelligent./ Bear.Pl   intelligent.Pl

(173) *Medve/medvék elterjedtek.
       bear/bears   widespread.Pl
       'Bears are widespread.

(174) Szeretem a   medvéket.
      love.I   the bear.Pl.Ac
      'I love bears.'

(175) *Szeretem medvéket.
      love.I   bear.Pl.Ac

These facts contrast with the well-formed English sentences in (176), which show that bare plurals are felicitous in generic contexts:

(176) a. Bears are intelligent.
       b. Dogs (generally) bark.
       c. Bears are widespread.
       d. I love bears

Following Krifka et al. (1995) and É Kiss (1998b), we assume that the generic definite plural is semantically non-distinct from a generic bare plural. However, the question remains why bare plurals in some languages can get a generic interpretation, but not in others. The cross-linguistic variation concerning the availability of a generic reading for bare plurals, we believe, depends less on properties of the bare plural than on the interaction of genericity with syntax and topic-focus articulation in the language at hand. In this section, we account for the possibility of a generic interpretation for bare plurals in examples like (176a,b). We will not deal here with sentences like (176c), which involve direct reference to kinds, and might relate to a different notion of genericity (cf. Krifka et al. for discussion). As to the analysis of generic objects, exemplified in (176d), matters are more complex, but not essentially different from our analysis of generic subjects. Because the issue is independent of our immediate concerns, we will not discuss this question here, and restrict ourselves to the kind of generic generalization expressed by sentences like (176a) and (b).

   Recall that in sentences that do not involve scope bearing operators, existential readings of bare plurals in incorporated and non-incorporated positions are due to existential closure of the discourse referent introduced by the plural feature. If there is another scope bearing operator around, the bare plural necessarily takes narrow scope with respect to this operator, because the discourse referent involved is introduced by an inflectional feature rather than by a determiner. Such discourse referents must be interpreted in the minimal DRS in which they and their descriptive content occur.

   We turn now to showing how our analysis accounts for the possibility of generic readings for bare plurals in full argument position in English. Recall that for us, bare plurals in argument position are dis-

course referent introducing nominals that combine with their predicate by A-Instantiation. Their only special property is that the discourse referent they contribute is introduced by an inflectional feature rather than a determiner. As a result they cannot scope over any operator in their sentence. Crucially, however, since they are not incorporated, they do not involve complex predicate formation. Consequently, they do not need to be interpreted within the same minimal DRS box as their predicate. It is exactly this limited freedom, we believe, that is exploited in generic sentences. In our analysis, the bare plural in sentences such as (176b) get their generic reading as a result of being interpreted in the restrictor of the generic operator, while the predicate they combine with occurs in the nuclear scope. This is not the place to go into a detailed discussion of genericity. Below we we will only give the main outline of an analysis that is compatible with insights from recent literature.

According to Krifka et al. (1995), generic sentences like (176b) express generic generalizations involving a tripartite operator that induces unselective, quasi-universal quantification over the variable(s) bound in the restrictor.[45] Deciding what part of the sentence maps onto the restrictor and what part maps onto the nuclear scope of the generic operator is partly dependent on the syntax (Diesing 1992, Kratzer 1995), and partly dependent on topic-focus articulation (Rooth 1992, 1995, É Kiss 1998b).[46] Thus, subjects and backgrounded information typically end up in the restrictor, whereas objects and focused information typically end up in the nuclear scope. The availability of a generic reading for indefinites and bare plurals therefore depends on the syntactic structure and the topic-focus articulation of the language at hand.

We assume here the analysis of tripartite operators developed by Kamp and Reyle (1993), where the generic operator introduces a box splitting operation. Roughly, the presence of a generic operator in a box K_0 triggers the introduction of two embedded boxes, K_1 and K_2, where the content of K_1 makes up the restrictor, while the content of K_2 makes up the nuclear scope. The two boxes are related by the genericity operator, which we interpret as quasi-universal quantification, and write as

---

[45]In an alternative analysis in which the generic operator ranges over situations, rather than individuals, the variable introduced by the bare plural ends up being bound indirectly. This analysis leads to the same truth-conditions, as argued by de Swart (1991, 1995). For the issues we are dealing with here, the differences between the two analyses are immaterial.

[46]Compare de Hoop and de Swart (1995) for a discussion of sentences involving generic objects, such as (176d), that makes it clear that a strict syntax-semantics mapping does not work, and we need to appeal to focus. Note that this issue does not affect our treatment of incorporated objects, because they always scope with the predicate.

$\Rightarrow_G$. Under a neutral intonation, generic sentences like (176b) split up in such a way that the bare plural subject ends up in the the restrictor, while the VP ends up in the nuclear scope. Given that the predicative condition on the NP is interpreted in the left-embedded box, the discourse referent licensed by the bare plural is interpreted locally in the restrictor on the generic operator, rather than in the right-embedded box (where the verb is interpreted). Schematically, (176b) then gets the representation in figure 42.

Dogs bark.
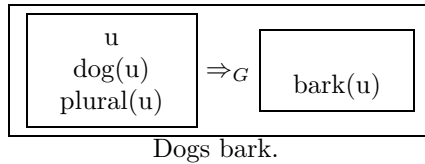
FIGURE 42 Generic bare plural

Discourse referents contained in the right embedded box get an existential interpretation in the nuclear scope of the generic operator. But in this representation the bare plural does not get an existential interpretation because it is bound by the generic quantifier. Note that the representation in figure 42 obeys the requirement on local scope of the bare plural. The bare plural takes local scope, because it scopes with the descriptive condition of the NP, and it may not scope outside the generic operator. But because the bare plural is not incorporated, it need not be interpreted together with the predicate. As a result, it may in principle function as the topic of a generic generalization in the sense of de Swart (1995). It is this limited freedom, we claim, that makes it possible for a bare plural to get a generic interpretation.

The unavailability of generic readings for bare plurals in argument position in languages such as those in the Romance group, Hungarian or Greek, is due, in our account, to constraints on the box-splitting operation accompanying the generic operators as well as to the way the division of labor is done between various types of nominals that may express genericity. De Swart (1995) claims that generic readings require the indefinite to be the topic of a generic generalization. She argues that this restricts the possibility for French indefinite plurals of the form *des* N to show up in generic sentences. One possible way of extending this view is to assume that bare plurals in Hungarian, just like indefinite plurals in French, cannot be topics, and therefore cannot be the topic of a generic generalization. (Cf. É Kiss (1998b) for a comparable approach.) Working out the details of the interaction of

topic-focus articulation, nominal type and genericity must be left for future work, though.

As far as incorporated bare plurals are concerned, our account correctly predicts that they will never have generic readings. Incorporated bare plurals combine with the predicate by Unification, which leads to complex predicate formation. As a result, the bare plural must be interpreted within the same minimal DRS box as its predicate. A configuration like the one in figure 42 cannot arise if the bare plural is incorporated because there the nominal and the predicate do not share the same minimal DRS, and therefore they could not have been combined via Unification. Whether an incorporated plural occurs in the restrictor or the nuclear scope of a tripartite structure depends on where its predicate occurs. Examples where the predicate and the bare plural occur in the restrictor of a quantificational structure were given above and are repeated here.

(177) a. Minden vendég ujságokat olvasott.
    every guest newspaper.Pl.Acc read.Past
    'Every guest read newspapers.'

   b. Ha János ujságokat olvasna tudná a
    if Janos newspaper.Pl.Acc read.Cond know.Cond the
    híreket.
    news.Pl.Acc
    'If Janos read the newspaper he would know the knews.'

In (177a), the determiner *every* maps the information from the common noun onto the restrictor, and the VP onto the nuclear scope. For the conditional construction in (177c), the *if* clause determines the restrictor, and the main clause the nuclear scope. We see that in (177a), the incorporated nominal ends up in the nuclear scope, whereas in (177c), it ends up in the restrictor. However, in both cases, it scopes with the verb, which is interpreted in the same minimal DRS. The incorporated nominal maintains its existential interpretation, because it is not bound by the quantifier. In (177a), the universal quantifier binds the variable from the head noun *guest*, and the incorporated nominal gets an existential interpretation in the right minimal DRS. In (177c), we quantify over situations in which Janos reads the newspaper, rather than over newspapers simpliciter, because the incorporated nominal and the verb form a complex predicate. The strong tie between the incorporated nominal and the verb thus triggers an existential interpretation, whether the incorporation construction is interpreted in the restrictor or in the nuclear scope of a tripartite operator.

The analysis developed here accounts for the possibility of a generic reading for bare plurals in full argument position and for the impossibility of such a reading for incorporated bare plurals. As far as bare plurals are concerned, generic sentences provide the only context in which narrow scope and scoping with the verb can be separated. We conclude that the generic reading of bare plurals in languages like English does not only fit into our analysis, but provides independent evidence for it.

5.4 Markedness and number

There are several issues connected to the semantics of number that we glossed over in our discussion so far. It is time to tie these loose ends now that all the pieces of our analysis of number are in place.

Recall that in the view developed here, morphologically singular nominals are semantically unmarked for number. Their number interpretation falls under the default atomic case when a discourse referent is introduced by a determiner, and remains number neutral when that does not happen. This captures the cross-linguistically stable generalization that singular is the unmarked morphological form in languages with a singular/plural contrast. Morphologically plural nominals are both semantically and morphologically marked. The privative feature *pl* is responsible for the introduction of a presupposition $plural(u_x)$, that predicates plurality of a discourse referent. This condition overrides the default atomic interpretation, and renders the non-atomic part of the lattice structure available for possible values for u_x. Treating singular forms as unmarked for number allows a simple analysis of cases in Hungarian, Turkish and Korean, where singular forms are used when the determiner entails non-atomicity. As mentioned already in chapter 2, the Hungarian DPs *két szék* 'two chair', *sok szék* 'many chair', *néhány szék* 'a few chair' are all morphologically singular, as their glosses show. However, their interpretation clearly involves plural reference. In our account, the default atomicity requirement on discourse referents is overridden by the contribution of the determiner.

The first question that arises is how to reconcile this view with the frequently made claim in the literature according to which it is the plural form, rather than the singular, which is semantically unmarked. Thus, Ojeda (1993), following earlier claims made by McCawley (1968), notes that the question in (178),

(178) Do you have children?

can be answered affirmatively even if one has a single child.

We first note that plurals are not number neutral in the sense in which singular INs in Hungarian and elsewhere are. Thus, a plural nom-

inal is incompatible with contextual or lexical atomicity entailments, as shown by the oddness of (179) in a monogamous society:

(179) Do you have wives?

Recall that by contrast, singular INs are compatible with both atomicity and non-atomicity entailments, shown by their occurrence as objects of verbs like *seek* (in the context of 'seek (a) wife') and of verbs like *collect* (in the context of 'collect stamps'). We took that to be evidence for a truly number neutral interpretation of incorporated singulars. The pragmatic oddness of (179) strongly suggests that plurals are not number neutral in our sense.

Our account captures the contrast between incorporated singulars and regular plurals in a natural way. The semantic effect of the plural condition contributed by the feature *pl* is to override the default atomicity condition on discourse referents. The domain from which a discourse referent introduced by a morphologically plural nominal may take its values *must* comprise groups. This explains why such nominals may be used when the issue of the atomicity of the discourse referent is open (as in 178), but not when groups are excluded, as in (179) above.[47]

By contrast singular INs under our account restrict but do not instantiate a thematic argument of the predicate. Thematic arguments are not given values by embedding functions. Consequently, they are not subject to the atomicity default governing discourse referents. Compatibility with group reference entailments coming from the predicate or the context is therefore predicted. In (180) we give further examples of singular INs in Hungarian occurring in a context where non-atomicity entailments hold. Thus, assuming that the speaker has normal reading/grading/gardening competence, it should be the case that there were several poems/homeworks/flowers that were read/graded/planted respectively.

(180) Egész nap verset/leckét/virágot
      all   day poem.Acc/homework.Acc/flower.Acc
      olvastam/javítottam/ültettem.
      read.Past.I/correct.Past.I/plant.Past.I
      'All day I read/corrected/planted poem/homework/flower'.

---

[47]The contrast between the last two examples could be accounted for under an alternative view mentioned in Schlenker (2003) and attributed to Heim, according to which singular forms are semantically marked in that they presuppose atomicity while the plural forms are the 'elsewhere' case. Under this proposal, however, the use of the singular form with non-atomicity entailing determiners in Hungarian examples such as *két szék* 'two chair' remains unexplained. The number neutrality of singular INs becomes problematic as well. Finally, the morphologically unmarked status of singular nominals across languages remains surprising.

Using a singular DP here would lead to infelicity because such a DP would fall under the default atomicity entailment characterizing discourse referent introducing DPs.

To summarize now, our analysis of number we have put forward here is based on the following claims: (i) singular nominals are unmarked for number; their interpretation as atomic when introducing a discourse referent is due to the existence of a default requiring embedding functions to assign atoms as values to discourse referents; (ii) the plural feature is responsible for the introduction of a presupposition that overrides this default thus making groups possible values for the discourse referent instantiating the nominal thematic argument; (iii) the presuppositional nature of the contribution of the plural morpheme is responsible for a significant number of the distributional and interpretive properties of bare plurals across languages.

5.5 Conclusion

In this chapter we have provided a detailed analysis of the semantic properties of bare plurals in Hungarian, focusing on the similarities and differences between bare plurals and bare singulars. We have thereby completed the account of the three way contrast we set out with, between bare singulars and full arguments on the one hand, and bare singulars and bare plurals on the other.

We found that bare plurals have in common with bare singulars the fact that they may occur in PredOp and therefore may be incorporated. This, in our analysis, is due to their lack of a determiner. We also found that unlike bare singulars, even if incorporated, bare plurals are semantically plural and discourse transparent. These properties follow from their being morphologically plural.

Our analysis of morphological plurality also explains why Hungarian bare plurals, but not bare singulars, may occur in full argument position. In Hungarian, full arguments must combine with the predicate via Instantiation. Bare singulars in this language do not contribute a discourse referent and therefore may not occur in full argument position. Because of the presence of the plural feature, however, a discourse referent is introduced in the presuppositional structure by bare plurals. By allowing the local accommodation of this presupposition, such nominals make the application of Instantiation possible.

We have also explored above the cross-linguistic predictions the analysis developed so far makes. We noted that the incorporation of bare plurals can be blocked in particular languages in a number of ways and therefore that the prediction we make is a conditional one: incorpo-

ration of plurals is possible in a strict subset of languages that allow incorporation of singulars. Our proposal does not rule out the possibility of bare singulars in argument position in languages with a weaker determiner system, in which nominals can introduce a discourse referent even in the absence of a determiner (Hindi, Slavic languages). We also leave open the possibility that languages may be stricter than English or Hungarian and require fully projected DPs in argument position, ruling out the possibility of bare plurals occurring there (French). Thus we predict that if a language allows bare singulars in argument position, it will also allow bare plurals, but not the other way around. We closed the analysis of English bare plurals by accounting for the possibility of their being interpreted generically. Since with this chapter we conclude our analysis of the semantics of the plural feature we devoted the last section to a brief discussion of the main features of our proposal.

In the next chapter we tie two loose ends involving discourse transparency: (i) the issue of the transparency of morphologically singular INs in languages like West Greenlandic and Chamorro, and (ii) the difference between overt and covert pronouns and their possible antecedents in Hungarian. In the process, we revisit standard assumptions concerning discourse transparency in the light of the new details that were added to DRT in chapter 2.
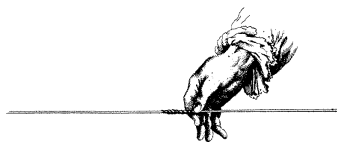
6 Shades of discourse transparency
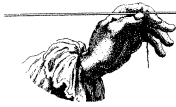
$\mathbf{T}$his chapter is concerned with two outstanding empirical issues having to do with the discourse status of singular INs. The first involves a contrast between overt and covert pronouns in Hungarian with respect to whether or not they can be anteceded by singular INs. The second concerns the cross-linguistic variation with respect to the discourse transparency of these nominals.

The analysis of incorporation proposed in the previous chapters combined with standard assumptions concerning discourse transparency predicts that singular INs will be discourse opaque, while plurals INs will be discourse transparent. The two standard assumptions involved here are: (i) discourse transparency is a binary distinction and (ii) discourse transparency characterizes all and only discourse referent introducing nominals. As mentioned already at the end of chapter 3, while the discourse transparency predictions made under these assumptions hold for some languages, they do not for others. Thus, while singular INs are discourse opaque in Hindi and Hungarian, they are discourse transparent in West Greenlandic and Chamorro. Second, we see in this chapter that at least for some speakers of Hungarian, the discourse status of singular INs is ambiguous: while they are opaque as far as overt pronouns are concerned they are transparent with respect to null (or covert) pronouns. Thus, such nominals may not serve as antecedents to overt pronouns, but may antecede covert ones. Because these nominals are less transparent than full-fledged DPs, but are not completely opaque either, we will call them *discourse translucent*. In order to provide an account for cross- and intra-linguistic variation concerning the discourse transparency of singular INs, we revisit the standard assumptions concerning discourse transparency in the light of the new DRT

details that we added in chapters 2 and 3. We start by reviewing the distinction between discourse referents and thematic arguments in section 6.1 in relation to discourse anaphora. In section 6.2 we discuss data that call into question the two assumptions mentioned above. The account of these data is presented in section 6.3. Section 6.4 concludes with a look back at what has been achieved in this chapter and in the five previous ones.

6.1 Discourse referents, thematic arguments and discourse anaphora

The first move of our journey was to introduce (in chapters 2 and 3) a distinction between two components of intermediate as well as final DRSs: discourse referents and thematic arguments. In this section, we review this distinction, concentrating on the need for maintaining it, and on repercussions the distinction has on views of discourse transparency.

Recall that in our proposal, discourse referents are elements of the universe of a DRS, just like in standard DRT, while thematic arguments are introduced as part of the predicative conditions contributed by lexical predicates. The fundamental common denominator of discourse referents and uninstantiated thematic arguments is that they are both individual variables. The process of interpretation eventually connects both to some entity in E, the universe of the model. They both give rise to an existential commitment, unless they are within the scope of a modal or aspectual operator that affects it. Although the result of the interpretation is the same, the way it is reached is different: discourse referents are within the domain of embedding functions while thematic arguments are interpreted as part of the predicate they are arguments of. Discourse referents instantiating the thematic argument of a main predicate are independent of the predicate in question. The interpretation of an uninstantiated thematic argument of a predicate P on the other hand, is part of the interpretation of the predicative condition introduced by P.

We have also assumed that, all other things being equal, uninstantiated thematic arguments are less salient than discourse referents. But both discourse referents and thematic arguments appear in final DRSs. This raises the question of how they behave relative to discourse transparency.

6.2 Discourse translucency

So far we have operated under the standard, simplest, assumptions concerning discourse transparency, listed in (181):

(181)   *Discourse transparency: the simplest view*

    (i) All and only discourse referents may serve as antecedents to discourse pronouns.

   (ii) Discourse transparency is a binary distinction: a nominal is either discourse transparent or discourse opaque.

It follows from (181) that all and only discourse referent introducing nominals will be discourse transparent. If we adopt assumption (ii) we do not expect pronouns to differ with respect to what type of nominal they may be anteceded by. If we adopt assumption (i) we expect uninstantiated thematic arguments not to be visible to discourse anaphora. Note, however, that neither assumption is immutable. There is no intrinsic reason to expect uninstantiated thematic arguments to be entirely invisible to discourse anaphora. Second, there is no intrinsic reason to expect all anaphoric elements to behave alike with respect to what sort of individual variable may serve as their antecedent. In fact, we argue below that this simplest view is simplistic and needs to be refined so as to remove exactly these two consequences.

6.2.1 Cross-linguistic variation

If we limit our attention to the facts of Hindi discussed in Dayal (1999), we have no reason to doubt the simplest view of discourse transparency. That view, together with our account of incorporation, predicts that singular INs are discourse opaque, because they do not involve a discourse referent, but an uninstantiated thematic argument. We also predict that plural INs are transparent, due to the dynamic contribution of the plural morpheme. Both predictions are correct for Hindi and for Hungarian as well, at least as far as the data we looked at are concerned. We have noted however, that in other languages, such as West Greenlandic and Chamorro, singular INs are discourse transparent, as exemplified in (182) and (183) with data from West Greenlandic, taken from Van Geenhoven (1998: 187, 190).

(182) Aani   qimmi-qar-p-u-q.   Miki-mik
      A.ABS   dog-have-IND-[-tr]-3Sg. M.-inst
      ati-qar-p-u-q
      name-have-IND-[-tr]-3Sg
      'Aani has a dog$_i$. It$_i$ is called Miki.'

(183) Aani   qimmi-qar-p-u-q.   Kusana-q-a-a-t.
      A.ABS dog-have-IND-[-tr]-3SG. nice.very-be-IND-[-tr]-3Pl
      'Aani has dogs$_i$. They$_i$ are very nice.'

The second sentence of each of these examples involves a pronominal having the incorporated nominal *qimmi* 'dog' as its antecedent. In (184) we give an example showing that an incorporated nominal in Chamorro, *kareta*, can antecede a (covert) donkey pronoun (Chung and Ladusaw 2003: example (85)a):

(184) Käda taotao ni   gäi-**kareta**$_i$ ha-diséseha
      each   person Comp WHnom.agr-have-car agr.wish.Prog
      na   siña ha-bendi pro$_i$
      Comp can agr.sell   pro$_i$
      'Each person who owns a car$_i$ wishes that he could sell it$_i$'

The nominals in West Greenlandic and Chamorro exemplified here exhibit all the other symptoms of incorporation. The analysis of incorporation we developed above coupled with the simplest view of discourse anaphora predicts discourse opacity for singular INs and therefore predicts the facts in Hindi and in Hungarian but not those in West Greenlandic and Chamorro. The accounts of incorporation developed by Van Geenhoven and Chung and Ladusaw on the other hand predict no difference in dynamic potential between incorporated nominals and full indefinites or between singular and plural incorporated nominals. These approaches account for languages like West Greenlandic and Chamorro but leave unexplained the singular/plural contrast in discourse transparency of INs found in languages like Hindi and Hungarian. The analysis we developed so far in this book is too restrictive, and the proposals made by Van Geenhoven and Chung and Ladusaw are too permissive as far as discourse anaphora are concerned.

One potential way out would be to assume that languages differ with respect to whether their incorporated nominals introduce discourse referents, (in which case they are transparent,) or involve uninstantiated thematic arguments, (in which case they are discourse opaque.) Such a solution would tolerate cross-linguistic variation. We cannot adopt it, however, because it does not allow for variation within one language. We have seen, however, that in Hindi and Hungarian, singular INs are opaque, while plural INs are transparent. In the next section we see further evidence from Hungarian that shows that such a solution is untenable. After surveying the relevant facts, we argue for an approach that distinguishes 'shades' of discourse transparency. The proposal we work out here correctly predicts that singular INs contrast with full

DPs and plural INs in that they have lower discourse visibility, without, however, predicting that all anaphoric relations will be sensitive to this difference.

6.2.2 Intra-linguistic variation

The analysis of incorporation developed in the previous chapters combined with the simplest view of discourse transparency summarized in the previous section predicts that plural INs are discourse transparent while singular INs are discourse opaque. The examples confirming this prediction in Hungarian, based on ability to antecede overt pronouns in discourse are repeated here as (185) through (187):

(185) a. János$_i$ beteget$_j$ vizsgált   a rendelőben.
       J.   patient.Acc$_j$ examine.Past the office.in
       'Janos patient-examined in the office.'

      b. ??pro$_i$ Túl sulyosnak   találta   **őt**$_j$ és
         pro$_i$ too severe.Dat find.Past he.Acc$_j$ and
         beutaltatta   pro$_j$ a korházba.
         intern.Cause.Past pro$_j$ the hospital.in
         'He found him too sick and sent him to hospital.'

(186) a. János$_i$ betegeket$_j$ vizsgált   a rendelőben.
       J$_i$.   patient.Pl.Acc$_j$ examine.Past the office.in
       'Janos patients-examined in the office.'

      b. pro$_i$ Túl sulyosnak   találta   **őket**$_j$ és
         pro$_i$ too severe.Dat find.Past he.Pl.Acc$_j$ and
         beutaltatta   pro$_j$ a korházba.
         intern.Cause.Past pro$_j$ the hospital.in
         'He found them too sick and sent them to hospital.'

(187) a. János$_i$ egy beteget$_j$ vizsgált   a rendelőben.
       J.$_i$ a   patient.Acc$_j$ examine.Past the office.in
       'Janos examined a patient in the office.

      b. pro$_i$ Túl sulyosnak   találta   **őt**$_j$ és
         pro$_i$ too severe.Dat find.Past he.Acc$_j$ and
         beutaltatta   pro$_j$ a korházba.
         intern.Cause.Past pro$_j$ the hospital.in
         'He found him too sick and sent him to hospital.'

In (185), the singular IN does not anchor an overt pronoun in subsequent discourse (in boldface), while the plural IN in (186) and the indefinite DP in (187) do.

The picture is complicated, however, by the fact that there are speakers for whom the contrast between singular and plural INs exemplified in (185)-(187) disappears in examples where the overt pronoun is replaced by a covert pronoun. If the overt pronoun in (185) is replaced by a covert *pro* the sentence is judged better by all speakers consulted, and some pronounce it acceptable.

(188) a. János$_i$ beteget$_j$ vizsgált   a rendelőben.
          J$_i$.   patient.Acc$_j$ examine.Past the office.in
          'Janos patient-examined in the office.'

     b. pro$_i$ Túl sulyosnak találta   **pro$_j$** és
        pro$_i$ too severe.Dat find.Past pro$_i$ and

        beutaltatta   pro$_j$ a korházba.
        intern.Cause.Past pro$_j$ the hospital.in

        'He found him too sick and sent him to hospital.'

In (189) and (190), we show that both full DPs and plural INs may antecede covert pronouns:

(189) a. János$_i$ egy beteget$_j$ vizsgált   a rendelőben.
          J$_i$.   a   patient.Acc$_j$ examine.Past the office.in
          'Janos examined a patient in the office.'

     b. pro$_i$ Túl sulyosnak találta   **pro$_j$** és
        pro$_i$ too severe.Dat find.Past pro$_j$ and

        beutaltatta $_j$pro a korházba.
        intern.Cause.Past pro$_j$ the hospital.in

        'He found him too sick and sent him to hospital.'

(190) a. János$_i$ betegeket$_j$ vizsgált   a rendelőben.
          J$_i$.   patient.Pl.Acc$_j$ examine.Past the office.in
          'Janos patients-examined in the office.'

     b. pro$_j$ Rossz állapotban voltak.
        pro$_j$ bad   shape.in   be.Past.Pl
        'They were in bad shape.'

We digress briefly to explain why we switched in (190) to an example where a plural IN in DO position serves as the antecedent to a subject rather than an object covert pronoun. This switch is necessary because Hungarian does not allow plural covert pronouns in object position, independently of whether they are anteceded by an incorporated or an unincorporated nominal. We exemplify with the plural DP in (191):

(191) a. János$_i$ vizsgált   valami betegeket$_j$.
          J.$_i$ examined some   patient.Pl.Acc$_j$
          'Janos examined some patients.'

    b. *pro_i Túl sulyosnak   találta pro_j
       pro_i too severe.Dat. find.Past pro_j
       'He found them too sick.'

The problem here is that pro_j is a DO pronoun whose antecedent is a plural nominal. Changing the antecedent to the singular DP *egy beteget* 'a patient' would remove the ungrammaticality. The prohibition against plural covert pronouns in DO position is independent of incorporation and is independent of discourse transparency effects. The ban concerns the recoverability of the ϕ features of covert pronouns. It is well known from the literature on covert pronouns that in languages where morphological agreement is operative, covert pronouns may occur only in environments which allow at least some of their ϕ features to be recoverable from the morphological shape of the verb. In Hungarian, the relevant features are *participant/non-participant* and number. The former are recoverable from the verb form for both subjects and objects. The latter are recoverable only for subjects, via subject-verb agreement in number. The plural feature of DOs, however, is not recoverable from verbal morphology. The ban on plural covert pronouns in DO position, we suggest, is due to this fact. A covert pronoun whose antecedent refers to a non-atomic entity has to be plural too, but this feature is not recoverable from the verb form. Recall that under our analysis, singular pronouns and DPs are not marked for number. Given that singular DO pronouns do not involve a number feature, they do not violate the ban on the recoverability of this feature. Crucial for current purposes is that this ban is insensitive to the nature of the antecedent and therefore does not interact with the issue of differentiated discourse transparency that we deal with here. End of digression.

    As far as discourse transparency is concerned, the more complex data presented here show that, at least for some speakers, singular INs are not completely discourse opaque, though they are less transparent than plural INs and full arguments: the latter support both overt and covert pronouns, while the former support only covert ones. The generalization is formulated in (192):

(192)   *Overt and covert pronouns in Hungarian*
    (i) Plural INs are fully discourse transparent: they may anchor both overt and covert pronouns.
    (ii) Singular INs have reduced discourse transparency: for some speakers, they are opaque; for others, they may anchor covert pronouns, but not overt ones.

These facts show that discourse transparency is not a binary distinction, and that pronouns may differ with respect to what may serve as

their antecedent. Because singular INs in Hungarian are neither fully transparent (since they are invisible as far as overt pronouns are concerned), nor fully opaque (since they are seen by covert pronouns, at least for some speakers) we refer to them as *discourse translucent.*

The causes of variation in speakers' judgments with respect to the relevant data are not clear to us at present. All speakers agree that plural INs and full DPs are fully transparent. There is also a general agreement that covert pronouns are more acceptable than overt ones when anteceded by singular INs. The variation comes in with respect to how acceptable singular INs are as antecedents for covert pronouns. It is interesting to note that judgments become more uniform in examples where using the incorporated construction is the only choice the language offers. Thus, there are situations where the singular IN construction is quasi-idiomatic and has to be chosen over the non-incorporated full DP version. Such examples are *szemüveget viselni* 'wear glasses', or *gyereket várni* 'expect a child' in the sense of being pregnant. This last example contrasts with the non-incorporated version *várni egy gyereket,* which means to be waiting for a child. A similar contrast is found between *beteget ápolni* 'to patient-care for' and *ápolni egy beteget*: the former is used to express an occupation, while the latter is used to express an episodic situation. There are speakers who normally do not accept a singular IN as the antecedent of covert pronouns, but find it acceptable (or in any case, better) in examples involving these quasi-idiomatic incorporation constructions. Some examples are given below.

(193) Sajnos   pro$_j$ szemüveget$_i$ viselek és   mivel gyakran
         unfortunately pro$_j$ glasses.Acc   wear.I and since often
         pro$_j$ veszítem el **pro$_i$**   gyakran kell ujat   vennem.
         pro$_j$ lose.I.Def away pro$_i$ often   must new.Acc buy.I.Def
         'Unfortunately I wear glasses and since I often lose them I
         often have to buy new ones.'

(194) Én most beteget$_i$ ápolok. A   város másik végében
         I   now patient.Acc nurse.I The town other end.in
         pro$_i$ lakik   és   rengeteg időt   veszítek az   úton.
         pro$_i$ live.III and   enormous time.Acc waste.I   the road.on
         'I am now nursing a patient. He lives on the other side of town
         and I waste a lot of time on the road.'

(195) Mari gyereket$_i$ vár.   **pro$_i$** Májusban fog megszületni.
         Mari child.Acc expect pro   May.in   will be-born
         'Mari is expecting a child. It will be born in May.'

In each of these examples, the antecedent of the bold-faced covert pronoun is the singular IN, as indicated by the subscripts. The shift in judgments could be explained as follows. All things being equal, it is bad discourse planning to start out with an incorporation construction which involves backgrounding of the referent, only to go on right away and talk about the referent of the backgrounded material. This affects the felicity of the discourse in (188), where speakers have a choice between incorporating the object or using a full DP. In examples (193) - (195), the use of a non-incorporated construction would affect the meaning, so things are no longer equal, and the discourses are judged to be better.

In order to show that the covert pronouns in question are actually there, we digress again into the relevant morphological issues. As already mentioned, Hungarian covert pronouns may be subjects or objects. The presence of a covert pronoun DO can be detected by the morphological shape of the verb the pronoun is a direct object of. It is this property that allows the recoverability of the participant feature of a direct object *pro* thereby licensing *pro* in this position. To make a long story as short as is relevant, Hungarian verbs have two conjugations, one, often called 'definite' used in the presence of a definite DO, and the other used elsewhere. We exemplify with the verb *veszít* 'to lose' in (196). The definite conjugation is marked in the glosses by Def., while the elsewhere conjugation is left unglossed:

(196) a. Én el-veszítem   a   szemüvegemet.
           I   Part-loose.I.Def the glasses.my.Pos.Acc
           'I lose my glasses.'

       b. Én elveszítek egy szemüveget.
           I   lose   a   glasses.Acc
           'I lose a pair of glasses.'

       c. Én veszítek de nem találok.
           I   lose.I   but not find.I
           'I lose but do not find.'

The definite conjugation is used in the presence of a definite DO, as in (196a). If the DO is indefinite, as in (196b), or remains uninstantiated, as in (196c), the 'elsewhere' conjugation is used. The 'elsewhere' conjugation is also used in case the verb is intransitive.

The relevant contrast is between (196c) and (194). The elsewhere conjugation form *veszítek* 'to lose' in (196c) involves an existentially closed implicit argument. Using the definite conjugation in this case is not possible. The definite form *veszítem* in (194) shows that in this example we have a definite rather than an implicit argument as DO.

The form of the verbal conjugation therefore can be used as a probe to detect the presence of a DO *pro* in Hungarian. The presence of such a direct DO, just like the presence of an overt pronoun or a definite full DP, triggers the use of the definite conjugation. As predicted by what we said so far, (194) is interpreted as my losing the glasses I am wearing, and not (indefinite) things in general.

In (195) the relevant covert pronoun is a subject. Hungarian is a pro-drop language, so the subject does not need to be overt. When it is not, it is typically interpreted anaphorically, rather than existentially. Thus, in (195), it is the patient I nurse who is understood to live in the other end of town.[48]

We know that judgments differ with respect to examples in which singular INs antecede covert pronouns, but there are speakers who find them impeccable. For speakers who do not allow singular IN to antecede covert pronouns, the theory developed so far is sufficient. For the version of Hungarian in which discourses like (190), (194)-(196) are acceptable, we need to develop a more fine-grained analysis. In the next section, we will focus on an analysis of the Hungarian data, because the fine-grained distinctions this language establishes between different kinds of incorporated nominals and different kinds of anaphoric pronouns should help us to set the right criteria for a cross-linguistic analysis.

6.3 An account of discourse translucency

Singular INs in Hungarian are discourse translucent: they are not fully opaque (because they antecede covert pronouns), but they are not fully transparent either (because they cannot antecede overt pronouns). Discourse translucency shows that our simplest assumptions concerning discourse transparency cannot be right. Allowing uninstantiated thematic arguments into final DRSs brings up the natural possibility of allowing them to play a role in dynamic semantics, but as weaker antecedents than discourse referents.

6.3.1 Assumptions concerning discourse transparency

With respect to implicit arguments, we pointed out that the uninstantiated argument cannot be picked up by an anaphoric pronoun, but it can be related to a definite description. The following example is from Ter Meulen (2003), but similar remarks have been made by Koenig and Mauner (2000):

---

[48]Recall also from our previous digression that covert pronouns may be either singular or plural when in subject position, but only singular when they are direct objects.

(197) a. John had his car washed.

  b. *He did a good job.

  b' The guy did a good job.

The implicit argument that is part of the passive construction in (197) refers to the person who cut John's hair. In our analysis, it is represented by means of an uninstantiated thematic argument. Because uninstantiated thematic arguments do not have discourse referential status, the anaphoric pronoun in (197b) is not a good continuation of (197a), but the definite description in (197b) is. According to van der Sandt(1992), the main difference between anaphoric pronouns and definite descriptions is that the latter can accommodate their antecedent, but the former cannot. However, (197b') is not simply a case of accommodation. Rather, the discourse referent introduced by the definite description is somehow linked to the uninstantiated thematic argument in (197a). In that sense, the implicit argument functions as the antecedent of the definite description, and the relation between the two expressions is a version of binding, rather than accommodation.

   We propose to extend this idea to discourse anaphoric pronouns. We maintain van der Sandt's view that pronouns cannot accommodate their antecedent, but open the possibility that binding can be either to a discourse referent or to an uninstantiated thematic argument. Pronouns differ with respect to whether they require a discourse referent as antecedent or whether an uninstantiated thematic argument may do as well. The new assumptions are formulated in (198):

(198)   *Assumptions concerning discourse transparency*

   (i) Uninstantiated thematic arguments may serve as antecedents to (certain) discourse pronouns. They are less visible in discourse than discourse referents, because of their reduced saliency.

   (ii) Pronouns may be marked for what sort of individual variable they can bind to.

The first assumption confers discourse visibility on uninstantiated thematic arguments, while at the same time maintaining the distinction between them and discourse referents. It exploits both the fact that such items are present in final DRSs and the fact that they are distinct from discourse referents. The reduced discourse visibility of uninstantiated thematic arguments is connected to their low saliency. The second assumption follows naturally from the first: once we have several types of individual variables, distinguished as to how visible they are, it may well happen that some anaphoric elements may only 'see' the most

salient antecedents, namely discourse referents, while others may 'see' besides discourse referents, the less salient uninstantiated thematic arguments as well. We turn now to an account of the Hungarian facts presented above based on these new assumptions.

6.3.2 Constraints on anaphoric pronouns

The facts in the permissive dialect of Hungarian that we are accounting for here can be captured under the assumption that covert and overt pronouns differ with respect to the saliency requirements they impose on their antecedent. Overt pronouns, we suggest, may only be anteceded by discourse referents while covert pronouns have a weaker saliency requirement allowing both discourse referents and thematic arguments as antecedents.[49] Given our analysis of incorporation and of number interpretation, singular INs in the permissive dialect can be picked up by a covert pronoun, but not by an overt pronoun, while full DPs and plural INs will be discourse transparent with respect to both types of pronouns across dialects. Under this account, we also predict the impossibility of a dialect in which the facts are reversed. This would be a dialect in which singular INs would be fully transparent, while plural INs and full DPs would be partially or totally opaque. Indeed, such a version of Hungarian does not exist.

Formally, we propose that overt and covert pronouns in Hungarian involve slightly different construction rules. As far as overt pronouns are concerned, we can keep the standard construction rules of DRT. That is, the pronoun introduces a discourse referent v, and comes with the requirement to seek an accessible and 'suitable' discourse referent u as its antecedent, yielding the condition $v = u$. In order to be accessible, the discourse referent v needs to be in the same box K as u, or in a box K' such that K is subordinate to K'. Since accessibility is not at issue for the problem at hand, we can stick with the standard definition. What counts as a 'suitable' antecedent remains relatively vague in Kamp and Reyle (1993), and we will not go into the details involved.[50]

Covert pronouns, we suggest, may be anteceded not only by discourse referents but by uninstantiated thematic arguments as well. The construction rule for covert pronouns introduces a new discourse referent v. Just like any pronoun, the discourse referent v must be bound to an antecedent. The binding relation ensures that predications on v and

---

[49]The choosier nature of overt pronouns also manifests itself in the fact that singular overt pronouns may only refer to human (or at least animate) entities.

[50]The analysis we propose here is perfectly consistent with a presuppositional treatment of pronouns as well. Nothing crucial hinges on our choice of the more traditional view of pronouns.

the predications on the antecedent will involve the same individual in the model. Just like their over counterparts, covert pronouns may seek a suitable and accessible discourse referent u that they identify with, yielding a condition of the form $v = u$. Special to covert pronouns is the option that they may also seek an accessible and suitable uninstantiated thematic argument as their antecedent, which yields a condition of the form $v \simeq x_i$. The relation of squiggle identity is a relation between a discourse referent and an uninstantiated thematic argument that is an accessible and suitable antecedent, because it is part of a predicative condition in the set of conditions Con_K of the DRS K, or in the set of conditions $\text{Con}_{K'}$ of some DRS K' such that K' is superordinate to K. The verification requirements imposed by a condition of the form $v \simeq x_i$, where x_i is a thematic argument in a predicative condition of the form $P(x_1, \ldots x_i, \ldots x_n)$ require the embedding function to assign to the discourse referent v the entity e_i that is the i-th element of the n-tuple $\langle e_1, \ldots, e_i, \ldots, e_n \rangle$ that verifies the condition $P(x_1, \ldots, x_i, \ldots, x_n)$. The fact that the anaphoric discourse pronoun and the incorporated nominal that provides its antecedent relate to the same individual in the model justifies the claim that squiggle identity involves a version of binding, rather than accommodation.[51] Following these intuitions, we suggest that overt and covert pronouns in Hungarian involve the following construction rules, where *pronoun* stands for an overt pronoun, and *pro* for a covert one:

- Construction rule for overt pronouns, marked for number (CR$pronoun$)

  a. triggering configuration $[_{DP}$ *ő*$]$ or $[_{DPpl}$ *ők*$]$.

  b. Introduce a new discourse referent **v** into the universe of the DRS K.

  c. Substitute **v** for the triggering configuration in Con_K.

  d. Add a condition of the form **v** = **u**, where **u** is accessible and is a 'suitable' discourse referent chosen from the universe of the DRS K or a DRS K' superordinate to K.

  e. Add the condition *plural(v)* in case the plural feature is present.

- Construction rule for covert pronouns (CRpro)

  a. triggering configuration $[_{DP}$ pro$]$.

---

[51]For readers familiar with Farkas and de Swart (2001), it is important to note that the analysis presented there is different from the one adopted in the present work. In the earlier proposal we allowed covert pronouns to accommodate a discourse referent based on the presence of the uninstantiated thematic argument. Here we wish to maintain van der Sandt's (1992) insight that anaphoric pronouns, unlike descriptions, do not normally allow accommodation of their antecedents.

b. Introduce a new discourse referent **v** into the universe of the DRS K.

c. Substitute **v** for the triggering configuration in Con_K.

d. Add a condition of the form **v** = **u**, where **u** is accessible, and is a 'suitable' discourse referent chosen from the universe of the DRS K or a DRS K' superordinate to K.

e. If an accessible and suitable discourse referent **u** cannot be found, add a condition of the form $\mathbf{v} \simeq \mathbf{x}_i$, where $\mathbf{x}_i$ is an accessible and suitable uninstantiated thematic argument that is part of a condition $P(x_1, \ldots x_i, \ldots x_n)$ in Con_K or $\text{Con}_{K'}$ of some K' that is superordinate to K.

With respect to morphological number, we assume that covert pronouns are like their overt counterparts: either unmarked for number, or marked as plural in which case they contribute a plural condition. In the latter case, this information must be recoverable from the verb form. We also assume that the atomicity entailment of overt and covert pronouns must be compatible with the entailments of their antecedents.

The construction rules force overt pronouns to bind to a discourse referent, and allow covert pronouns to bind to an uninstantiated thematic argument if this is the only available antecedent. In the case of a plural overt pronoun, the plural feature will contribute the condition *plural(v)* on the discourse referent v introduced by the pronoun. Suitability requirements on the antecedent of such a pronoun involve a non-atomicity entailment, i.e., u must either have plurality predicated on it or have non-atomicity entailed on it. In the case of singular overt pronouns, suitability requirements involve atomicity entailments.

The relation between identity and squiggle identity is reflected in the following verification conditions for the relevant clauses:

- Verification clauses for = and $\simeq$

  a. A function f verifies a condition of the form $v = u$, where v and u are discourse referents, relative to a model M iff f maps v and u onto the same element of E.

  b. A function f verifies a condition of the form $v \simeq x_i$, where v is a discourse referent and x_i is an uninstantiated thematic argument that shows up in the i-th position of a predicative condition of the form $P(x_1, \ldots, x_i, \ldots, x_n)$, iff f maps v onto the individual e_i that is the i-th element of the n-tuple $\langle e_1, \ldots, e_i, \ldots, e_n \rangle$ that verifies the condition $P(x_1, \ldots, x_i, \ldots, x_n)$.

We exemplify by working out the interpretation of the covert pronouns in (193) above. We start with the DRS in figure 43 as the output of the first sentence, and the input to the second sentence.

$$\boxed{\begin{array}{c} \text{u} \\[4pt] \text{doctor(u)} \\ \text{patient(z)} \\ \text{examine(u,z)} \end{array}}$$

The doctor$_i$ patient$_j$-examined. pro$_i$ found
pro$_j$ too sick and sent pro$_j$ to hospital.
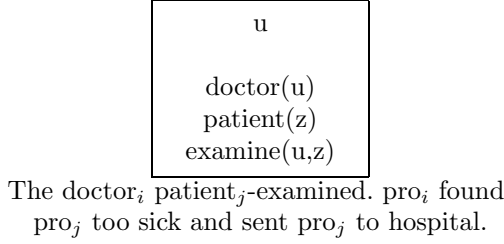
FIGURE 43 First sentence.

Here u is the discourse referent introduced by the subject DP *the doctor,*
and z is the uninstantiated thematic argument that arose via Unifica-
tion of the contribution of the singular IN *patient* with its predicate,
examine. The two covert pronouns in the second sentence introduce
two new discourse referent v and w respectively. The discourse referent
v introduced by the subject binds to u, so that the doctor who does the
examining also does the sending to the hospital. The discourse referent
w introduced by the object cannot be bound to a discourse referent
that is already present in the sentence, for the intended antecedent is
not u (the doctor), but z (the patient). Thus w binds to the restricted
thematic argument z of the incorporation construction. This leads to
the DRS in figure 44 (where irrelevant details have been omitted).

$$\boxed{\begin{array}{c} \text{u v w} \\[4pt] \text{doctor(u)} \\ \text{patient(z)} \\ \text{examine(u,z)} \\ \text{v} = \text{u} \\ \text{w} \simeq \text{z} \\ \text{send(v,w)} \end{array}}$$

The doctor$_i$ patient$_j$-examined. pro$_i$ found
pro$_j$ too sick and sent pro$_j$ to hospital.
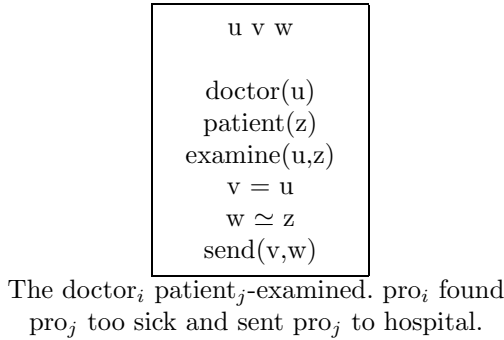
FIGURE 44 Final DRS.

Binding the covert pronoun to the restricted thematic argument z re-
sults in the condition $w \simeq z$. The truth-conditions of the DRS in fig-
ure 44 require the individuals that the embedding function f assigns
to v and w to be the same. Furthermore, the individual that the em-
bedding function f assigns to v must be the same individual e_z in the
model that is a patient examined by the doctor u.

In terms of truth-conditions, there is no difference between a condition of identity between two discourse referents and a relation of squiggle identity between a discourse referent and a thematic argument. In both cases, the antecedent and the anaphor relate to the same individual in the model. This is what justifies the claim that overt and covert pronouns both involve binding. In this sense, pronouns are different from definite descriptions, which allow either binding or accommodation. There is a difference in dynamic potential between overt and covert pronouns, though. Overt pronouns require an existing discourse referent, so they do not make the universe of discourse of the DRS any richer than it already was. Covert pronouns have the power to promote a thematic argument to discourse referential status.

6.3.3   Predictions

Our analysis makes two predictions. If covert pronouns really update the universe of discourse of the DRS in the sense that they promote an uninstantiated thematic argument to discourse referential status, we predict that we can, in principle, continue our discourse either with a covert or with an overt pronoun. The default choice is for a covert pronoun to antecede a covert rather than an overt pronoun but continuation with an overt pronoun is not excluded:

(199) Mari gyereket vár.   pro$_i$ Azt reméli, hogy pro $_j$ fiú lesz,
     Mari child.Acc expect. pro$_i$ that hopes   that pro$_j$ boy be
     és   hogy majd   **ő**$_j$ fogja átvenni   az üzletet.
     and that Future **he**$_j$ will   take over the business
     'Mari is expecting a child. She hopes that it will be a boy and
     that he will take over the business in the future.'

The singular IN *gyereket* 'child.Acc' restricts an uninstantiated thematic argument, which may not serve as the antecedent to an overt pronoun. But it may serve as the antecedent to a covert pronoun. This happens in the embedded clause of the first conjunct in the second sentence, where the incorporated nominal *gyereket* provides the antecedent for *pro$_j$*. Given that covert pronouns introduce a discourse referent, there is now a discourse referent that relates to the relevant uninstantiated thematic argument. This discourse referent may serve as the antecedent to an overt pronoun, which it does in the second conjunct. The overt pronoun *ő* picks up the covert pronoun *pro$_j$*.

The second prediction our analysis makes is that uninstantiated thematic arguments should be translucent as well, and therefore one should find cases where they act as antecedents to covert pronouns in Hungarian. An occurring example is given in (200):

(200) Folyton pro$_i$ írt   de   aztán el-tépte   **pro**$_j$
        kept   pro$_i$ write but then   up-tear.Def pro$_j$
        'He/she kept writing but then he/she tore it up.'

Here the verb *írni* 'to write' has an implicit DO. As such, it is used in the 'elsewhere' conjugation appropriate for intransitives or transitive verbs with indefinite objects, or with uninstantiated thematic arguments. The verb *el-tépni* 'to tear up' on the other hand, is in the definite conjugation, which signals the presence of a covert DO pronoun. Indeed, the interpretation of this sentence is that she tore up whatever she wrote.

Note that it is more marked to have implicit arguments act as antecedents to covert pronouns than incorporated ones, which conforms to the saliency hierarchy we posited in chapter 3. We suggested there that the more information the discourse contains about an uninstantiated thematic argument, the more salient it will be. Under the natural assumption that saliency and discourse visibility are connected, the higher in salience a discourse entity is, the easier it can function as the antecedent of a discourse pronoun.

6.4   Generalization to other languages

In this section we suggest an extension of the analysis of shades of discourse transparency developed for Hungarian to the cases of the discourse transparent singular INs mentioned in section 6.2.2 above. Recall that Sadock (1980), and Van Geenhoven (1998) provided strong evidence in favor of the claim that incorporated nominals in West Greenlandic are discourse transparent. We repeat the examples in (201) and (202) (cf. Van Geenhoven 1998: 187, 190).

(201) Aani   qimmi-qar-p-u-q.   Miki-mik
       A.ABS   dog-have-IND-[-tr]-3Sg.   M.-inst

       ati-qar-p-u-q
       name-have-IND-[-tr]-3Sg

       'Aani has a dog$_i$. It$_i$ is called Miki.'

(202) Aani   qimmi-qar-p-u-q.   Kusana-q-a-a-t.
       A.ABS dog-have-IND-[-tr]-3SG. nice.very-be-IND-[-tr]-3Pl

       'Aani has dogs$_i$. They$_i$ are very nice.'

According to Van Geenhoven, the number of the discourse referent introduced by an incorporating verb remains unspecified until the pronominal element enters the scene. Examples from Chamorro, taken from Chung and Ladusaw (2003) show that singular INs in these languages may serve as antecedents to discourse pronouns as well. We can now account for such cases by shifting the emphasis from properties

of the antecedent to properties of the anaphoric expression. In other words, the difference between these languages and Hindi, for instance, where singular INs are discourse opaque, does not involve a difference in the contribution of the incorporated nominal but rather, a difference in the properties of the anaphoric expressions in the two types of language.

In fact, Mithun (1984) has already suggested an approach along these lines. To our knowledge, she was the first to draw attention to the possibility that the pronominal system of polysynthetic languages is different from that of languages like English. She claims that the example in (203) is fully acceptable to Mohawk speakers, even though there is no antecedent for the overt pronoun:

(203) K-atenún-hah-kwe. Áh tsi   yehétkv.
      I-watch-HAB-PAST ah how she.ugly
      'I was baby-sitting. Boy, is she ugly!'

The pronoun *ye-* 'she' is perfectly appropriate, yet its antecedent is not even incorporated, it is not present at all, according to Mithun. The verb *katenúnhahkwe* contains no incorporated nominal, nor any pronominal reference to a theme. The referent of the pronominal prefix *ye-* is determined pragmatically, not lexically, according to Mithun.[52]

The crucial point for us is that cross-linguistic differences in the discourse transparency of INs can be accounted for not by positing differences in the analysis of the IN themselves, but rather, by looking for differences in the constraints on anaphoric expressions. We suggest that in languages where singular INs are discourse transparent, the pronominals that can have such INs as antecedents (whether overt or covert) are associated with construction rules parallel to those of Hungarian covert pronouns. Nothing rules out, in fact, a language that has only pronouns of the Hungarian covert pronoun type, or only pronouns of the Hungarian overt pronoun type. In the former type of language, the difference in discourse transparency between full DPs and singular INs is neutralized, and they would both seem fully transparent. This is the case in West Greenlandic and Chamorro, for instance. In the latter kind of language, singular INs will be fully opaque. A language of this type is Hindi.

We have suggested here a more fine-grained view of discourse transparency than hitherto assumed. The combination of these proposals allowed us to account for the fact that singular INs appear to be transpar-

---

[52]It is not quite clear whether this claim is correct or whether we have, in our terminology, an unmodified implicit argument associated with the verb *katenúnhahkwe*. Still, the point Mithun is making is clear.

ent in some languages, while in others they are translucent or opaque. The account still makes a prediction concerning the transparency of singular INs, however. The theory we presented predicts that there will be no language where singular INs are more transparent than plural ones or than DPs in full argument position. In other words, pronouns that can bind to thematic arguments also bind to discourse referents, but not vice versa. If we compare languages with respect to the constraints they impose on anaphora, Hungarian is in between English-type languages that allow binding of pronouns to discourse referents only, and languages such as West Greenlandic that allow binding to thematic arguments for pronouns in general, because Hungarian allows a contrast between two types of pronouns, depending on the requirement the pronoun imposes on its antecedent. Thus our analysis has important consequences for a cross-linguistic theory of anaphora.

6.5   Conclusion

In this chapter we looked at data that point to the need for shades of discourse transparency, and then suggested a way of changing standard assumptions about discourse visibility in order to account for the facts. The data we considered involved both cross-linguistic and intra-linguistic variation in the discourse transparency of incorporated nominals. The analysis we worked out capitalizes on the proposals laid out in chapters 2 and 3, and more specifically, on our proposal that final DRSs may involve two types of individual variables, discourse referents and uninstantiated thematic arguments. This opens up the possibility of having both types of variables visible in the discourse, but with differentiated visibility. We exploited this possibility in our account of the discourse translucency of singular INs in Hungarian and suggested a way of extending our proposals to languages in which singular INs are fully discourse transparent, without, at the same time, losing the prediction that such nominals may be translucent or even opaque in other languages. The proposals we made here have important consequences for a semantic typology of anaphors and for theories of discourse prominence and saliency, consequences that we hope will be explored in future work.

Looking back over the road covered so far in this book, we note that the distinction between thematic arguments and discourse referents led us to three main proposals which we wove together in our account of incorporation. Once the distinction between thematic arguments and discourse referents was in place, we could go into the details of DP interpretation as well as the details of the way a predicate combines

with its arguments. This led us to positing the two basic reduction rules, Instantiation and Unification and to proposing the latter as the common denominator of incorporation constructions.

Within the DP, the distinction between thematic arguments and discourse referents required a rethinking of the contribution of plural morphology. In our proposal, the plural feature contributes a presupposed discourse referent and a plurality condition on it. Consequently, the presence of this feature has the dynamic potential of introducing a discourse referent that instantiates the relevant thematic argument of the head noun if and only if no determiner is present to do so. In the rest of the book, we exploited the consequences of these proposals in accounting for the complex facts of incorporation in Hungarian and for the interpretation of bare plurals in English. Our account of the distribution and interpretation of bare nominals in Hungarian and English capitalizes on two obvious properties: the absence of a determiner and number marking.

In the present chapter, we exploited the distinction between thematic arguments and discourse referents in order to account for effects that require shades of discourse transparency. In the next (and last) chapter, we return to the discussion of previous semantic accounts of incorporation mentioned briefly in chapter 1, and compare them to the approach developed here.
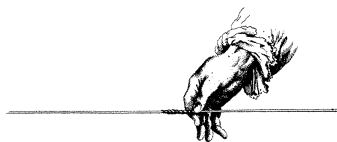
7 Comparisons with previous approaches
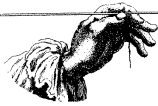
In this chapter, we review the main insights of previous semantic approaches to the phenomenon of incorporation, and compare them with our own. The analysis developed in this book is close in spirit to Szabolcsi's (1997) suggestions concerning nominals in PredOp position. It also relates to the proposals on indefinites and specificity advanced by Kamp and Bende-Farkas (2001). We will discuss these relations in section 7.1. In section 7.2, we compare our proposals to analyses of incorporation that use notions of flexible type theory, in particular Van Geenhoven (1998), Dayal (1999) and Chung and Ladusaw (2003). We conclude that a DRT framework improves over these alternatives especially with respect to the interpretation of number and the phenomenon of 'shades' of discourse transparency.

7.1 Incorporation as predicate modification

The gist of Szabolcsi's (1997) remarks is that these nominals do not introduce a discourse referent, which explains their inability to act as subjects of i-level predicates. A nominal in this position "does not contribute an entity to the interpretation of the sentence and does not serve as logical subject of predication." (p. 122) In the previous chapters we have developed an explicit theory of what the contribution of nominals in PredOp is and how they combine with their predicate, and we have explored its consequences and predictions, connecting the Hungarian data to incorporation elsewhere. The contrast between singular and plural INs, and the question of shades of discourse transparency have been discussed at lenth. These issues are not taken up in Szabolcsi

(1997), whose interest in incorporated nominals is peripheral. The general program pursued in Szabolcsi (1997) is one where the scope of a nominal is a consequence of its syntactic position. Our approach differs fundamentally here, since we argue that the scopal behavior of the nominals we are concerned with follows from their semantics. In particular, the scopal properties of INs follow from their semantic nature, namely their inability to introduce a discourse referent. As a consequence, they combine with the predicate by Unification rather than Instantiation, and Unification leads to local scope.

Our views are quite close to the proposals made by Kamp and Bende-Farkas (2001). Their analysis is also cast in DRT, so the general framework is the same. They establish a distinction between discourse referents and 'placeholders', which is very similar to the distinction between discourse referents and thematic arguments we have developed here. Bare singular nominals in the special preverbal position in Hungarian provide a place holder variable only, and do not come with a discourse referent (p. 134). The place holder variable is assumed to be underspecified for number (p. 135). It combines with the verb by means of a mechanism of unification, which is similar to our notion of unification of thematic arguments. According to Kamp and Bende-Farkas, unification in incorporation constructions is the same mechanism that is used for existential constructions. From the point of view of variable management, the main difference between incorporation and existential sentences is that bare nominals do not introduce a discourse referent, so they do not yield an accessible discourse referent of the kind that is contributed by a weak determiner. As a result, weak DPs in existential constructions are discourse transparent, whereas singular INs are discourse opaque. So far, the proposals are remarkably similar. The differences are in the details.

Kamp and Bende-Farkas take the plural to be the marked option in Hungarian, which leaves the placeholder variable that corresponds with the singular bare nominals underspecified for number. We argued instead that plurality is predicated of discourse referents. In their treatment, the plural morpheme behaves like a determiner. This contrast with our proposal in which plural morphology contributes a presupposed discourse referent and a predicate on it. Although there is not much of a difference between the two analyses for bare plurals in full argument position, the analysis of incorporation constructions runs differently. Kamp and Bende-Farkas hold the plural morpheme responsible for the introduction of a discourse referent, even in incorporation constructions, and so do we. However, we crucially rely on a presuppositional analysis of the plural feature to make it possible to incorporate

bare plurals, whereas Kamp and Bende-Farkas rely on the interpretation of number as a determiner. But if we treat number like a determiner, we cannot explain why bare plurals occur in the PredOp position in Hungarian, but DPs with overt, even weak determiners do not. This problem extends to languages like Hindi, where we made similar observations. Since these issues are not central to the discussion in Kamp and Bende-Farkas (2001), not all the relevant examples are discussed in detail. We conclude that the exact nature of the relation between incorporation and existential constructions remains to be clarified. The question of the contrast between overt and covert pronouns in Hungarian is not addressed either, and thus, the issue of shades of discourse transparency does not arise in their work.

We conclude that the two analyses are very close, but mostly complementary, given that they focus on different aspects of the problem of indefinites. Kamp and Bende-Farkas discuss intensionality, specificity, and the definiteness effect in existential constructions, and treat incorporation somewhat tangentially. The emphasis in this book is on incorporation as fundamentally different from other constructions involving weak determiners, including existential contexts.

Kamp and Bende-Farkas (2001) provide the only treatment of incorporation in DRT that we are aware of. Most other recent analyses of incorporation that we are familiar with are cast in a flexible type-theoretical framework. In the next section, we will discuss three of these: Van Geenhoven (1998), Dayal (1999) and Chung and Ladusaw (2003). They exploit the three possibilities that we have for giving an analysis of incorporation in type-theory, namely semantic type (Van Geenhoven), type-shifting (Dayal), and combinatorics (Chung and Ladusaw).

7.2 Type-theoretical perspectives

7.2.1 A property-based analysis of incorporation

Van Geenhoven (1998) offers a detailed semantic account of incorporation based on data from West Greenlandic. In this language, a group of lexically specified verbs incorporate their internal argument. The incorporated argument is fully discourse transparent. Van Geenhoven's account of this phenomenon rests on the following two assumptions:

(i) incorporated nominals are property denoting, and

(ii) the discourse transparency of incorporated nominals is due to the incorporating verb, which contributes a dynamic existential quantifier binding its internal argument.

The first assumption is responsible for the obligatory narrow scope of incorporated nominals, while the second accounts for their discourse

transparency. In this account, verbs that may occur both with incorporated and unincorporated arguments are lexically ambiguous: when used in a non-incorporating construction, the verb denotes a relation between two individuals; when used in an incorporating construction, the verb denotes a relation between an individual and a property. Below we give an example of a sentence involving incorporation and the skeleton of Van Geenhoven's interpretation rules.

(204) Amajaraq ipill-tur-p-u-q
    A.ABS   apple-ate-INDtr.3sg
    'Amajaraq ate an apple/apples.'

(205) a. $\lambda y\, \lambda x\, [\mathrm{Verb}(x, y)]$

    b. $\lambda P\, \lambda x\, \exists y\, [\mathrm{Verb}(x, y)\ \wedge\ P(y)]$

In (205a), we have the standard denotation of a transitive verb. In (205b), we have the schema proposed for incorporation constructions. Instead of taking an individual argument, the verb takes a property argument. Semantic incorporation involves predicating the descriptive content of the incorporated nominal of the internal argument of the verb and simultaneously binding the relevant variable by existential closure. Thus, an incorporated verb will have to combine with a property denoting argument. The property denoted by this argument will be predicated of the variable bound by the existential quantifier contributed by the verb.

    Whether the argument in question is discourse transparent or not depends on whether this existential quantifier is dynamic or not. In West Greenlandic the incorporated argument is discourse transparent, and therefore the existential quantifier must be dynamic.

    With respect to number, Van Geenhoven notes that the incorporated nominal is number neutral in West Greenlandic. If there are stranded modifiers, number is determined by the singular/plural information on the modifier in instrumental case, but in the absence of such modifiers, incorporated nominals can anchor either a singular or a plural pronoun later in the discourse, the choice being determined by pragmatic factors. This is illustrated below. (VG p.187, 190):

(206) Aani   qimmi-qar-p-u-q.   Miki-mik
    A.ABS   dog-have-IND-[-tr]-3Sg.   M.-inst
    ati-qar-p-u-q
    name-have-IND-[-tr]-3Sg
    'Aani has a dog$_i$. It$_i$ is called Miki.'

(207) Aani   qimmi-qar-p-u-q.   Kusana-q-a-a-t.
      A.ABS dog-have-IND-[-tr]-3Sg. nice.very-be-IND-[-tr]-3Pl
      'Aani has dogs$_i$. They$_i$ are very nice.'

According to Van Geenhoven, the number of the discourse referent
introduced by an incorporating verb remains unspecified until the
pronominal element enters the scene. However, the analysis does not
include an explicit account of number and number neutrality.

As a second movement of the analysis, Van Geenhoven connects
her account of incorporation in West Greenlandic to properties of bare
plurals in Germanic languages and to the semantics of narrow scope
indefinites in general. The proposal is that all narrow scope readings
of weak noun phrases are the result of semantic incorporation involv-
ing a property denoting nominal that occurs within the scope of an
existential closure operator contributed by the predicate. McNally and
Van Geenhoven (1997) further extend the account to existential *there*-
constructions.

There are a number of important differences between the account
Van Geenhoven defends and the proposals developed in this book. We
will discuss three issues that are related to the range of languages and
empirical phenomena taken up in the two analyses. From there, we
will move on to some fundamental objections against the claim that
semantic incorporation covers both incorporation constructions proper
and all kinds of constructions involving weak noun phrases.

In West Greenlandic and Chamorro, the class of verbs that occur
with both incorporated and non-incorporated arguments is fairly small.
An immediate problem we encounter when we try to extend the anal-
ysis of incorporation proposed by Van Geenhoven to languages like
Hungarian or Hindi is that we have to assume a large scale ambigu-
ity within the verbal lexicon, because the number of verbs that can
(but need not) incorporate is quite large. Each member of this class of
verbs would have to be assumed to be lexically ambiguous between a
predicate requiring an $\langle e, t \rangle$ type argument and one requiring an e type
argument. Dayal (1999) raises similar objections.

Now, the analysis we proposed in this book is not incompatible with
a restriction of incorporation constructions to particular verb classes.
Particular verbs may impose restrictions concerning the nature of their
arguments and the way they may or must combine with them. These
restrictions may be morpho-syntactic in nature in a language where
the morpho-syntax of incorporation concerns morphologically deficient
verbs that may not occur as free morphemes. We assume this type
of restriction on verb classes is appropriately treated in the lexicon-

morphology-syntax interface of the language. The focus of this book has been on the semantic mechanisms that determine the interpretation of constructions made available by the language.

A second problem that arises when we try to extend Van Geenhoven's account to other languages concerns the contrast between INs that differ in number marking. West Greenlandic does not allow plural morphology on incorporated nominals, but languages like Hungarian and Hindi do. In these languages, we observe that singular INs are discourse opaque (or translucent), whereas plural INs (as well as bare plurals in full-fledged argument position) are fully transparent. A property-based analysis where the existential quantifier binding the incorporated argument is contributed by the predicate (or by any other mechanism that is not sensitive to the characteristics of the nominal) has trouble capturing the effect of plural marking on discourse transparency. The existential quantifier contributed by the predicate could be assumed to be dynamic in one language and static in another; one could also have variation depending on the verb, but having the dynamic nature of the quantifier determined by the properties of the incorporated argument is rather problematic. Kamp and Bende-Farkas (2001: 117) formulate the same criticism, but as we already pointed out, their analysis does not include a full account of the singular/plural contrast either. By contrast, in the analysis proposed here, the discourse transparency of plural INs and bare plurals in argument position is the result of the semantics of plural morphology. We consider this a welcome result. A further point of divergence is that the present proposal predicts number neutrality of incorporated singulars on the basis of the semantic interpretation, whereas Van Geenhoven does not include the observations she makes about number neutrality in her analysis.

Finally, as noted by Chung and Ladusaw (2003), in the absence of an enriched theory of composition, a property-based approach cannot predict the possibility of doubling the incorporated nominal with a full DP. Note that the analysis of stranded modifiers already causes serious complications for Van Geenhoven's theory (compare Bittner 1994).

The issues discussed so far (lexical restrictions, number marking and doubling) raise problems for the extension of Van Geenhoven's analysis to other languages, which is what led us to pursue a different route. Further issues concern the foundations of semantic incorporation. Van Geenhoven relates incorporation to narrow scope. But the generalization of semantic incorporation to all narrow scope weak indefinites and existential constructions does not allow us to establish the distinctions that are needed for a full theory of the morpho-syntax of incorporation, and for a semantic typology of noun phrases (NPs and DPs). As

Kamp and Bende-Farkas (2001: 119) put it, bare nominals and full DPs become indistinguishable when they are both treated as property denoting expressions. We do, however, need to distinguish between these two types of nominals, a claim we formulate as follows:

- All bare nominals are weak, but not all weak indefinites are bare.

More precisely, if ordinary indefinites may have property denotations, (which is the denotation they have when having narrow scope or when showing up in existential constructions) and if this property were what is essential to incorporation, the fact that such indefinites do not occur in PredOp in Hungarian becomes either a mystery or an accident of morpho-syntax. Since in this view, the semantics of the two sentences in (208) is identical, one cannot use it to differentiate between the two types of nominals they exemplify.

(208) a. Minden gyerek olvas egy verset.
          Every child read a poem.Acc
          'Every child is reading a poem.'

    b. Minden gyerek verset   olvas.
       'Every child poem.Acc read.'

In Van Geenhoven's analysis, we cannot explain why (208a) would be ungrammatical with a bare singular nominal, while (208b) would be ungrammatical with a full DP, and why bare plurals are acceptable in the context of both (208a) and (208b).[53] The property-based account of incorporation paints with too wide a brush and thus does not allow us to characterize morpho-syntactically incorporated nominals as a separate natural class on semantic grounds. We call this the problem of overgeneration because the semantic incorporation approach predicts that all weak, type $\langle e, t \rangle$ denoting nominals occur in the same contexts, whereas this is clearly not the case. The problem of overgeneration cannot be solved in Van Geenhoven's account, because we either loose the explanation of narrow scope/existential constructions or the account of incorporation proper. The only conclusion we can draw is that semantic incorporation should not include both phenomena.

In our approach, the problem of overgeneration does not arise because the two examples in (208) have different semantic representations. The narrow scope reading of the indefinite is the result of the interpretation of the discourse referent in the same DRS as the predicate. The

---

[53]A further difficulty concerns the differentiation of reduplicated indefinites from ordinary indefinites on the one hand and incorporated ones on the other, but this could be solved by imposing a syntactic or semantic licensing condition on reduplicated indefinites.

wide scope reading involves the interpretation of the discourse referent in the main box. The incorporated nominal, on the other hand, does not introduce a discourse referent, but unifies with the relevant thematic argument of the predicate. The result is a final DRS that differs from the previous one in that the internal argument remains uninstantiated. Consequently, the contribution of the nominal is interpreted together with that of the predicate. The two representations are truth-conditionally equivalent, but lead to differences in number interpretation and discourse transparency. Given the rules for the introduction of discourse referents and the semantics of the plural morpheme, we can explain why full DPs like *egy verset* can take narrow scope, but do not occur in the special position reserved for incorporated nominals, why bare singulars do not show up in full argument position, and why bare plurals are felicitous both in incorporated and in full argument position.

Van Geenhoven focuses on existential readings of bare nominals and other weak noun phrases. Her analysis has nothing to say about generic readings of bare nominals in languages like English. As far as regular indefinites are concerned, Van Geenhoven assumes that their weak reading involves semantic incorporation, whereas their strong (specific, partitive, proportional, ...) reading involves a generalized quantifier interpretation (cf. de Swart 2001 for extensive discussion of the weak/strong distinction, and the different interpretations of indefinites). It is well known that bare plurals in English do not have such quantificational strong readings, so Van Geenhoven assumes that they only combine via semantic incorporation. But semantic incorporation leads to an existential interpretation, so the generic reading remains unaccounted for. The general observations are then the following:

- Bare nominals are weaker than other weak indefinites. They do not have strong, quantificational readings, but only a generic reading (and this only in some positions, in some languages).
- Incorporated bare nominals always get an existential reading, never a generic one. Bare nominals in full argument position may get a generic interpretation.

The approach to genericity outlined in chapter 5 explains why genericity and incorporation are incompatible. The complex predicate formation involved in incorporation is incompatible with the limited independence required for a generic interpretation. The existential and generic readings of bare plurals in full argument position in languages like English are two aspects of one and the same semantics in our approach, whereas they remain entirely unrelated in Van Geenhoven's account.

In our analysis, the generic reading respects the local scope requirement on the bare plural, so we do not predict strong, quantificational readings to arise.

7.2.2 A kind-based analysis of incorporation

Dayal (1999) presents an analysis of incorporated bare nominals in Hindi in the neo-Carlsonian framework of Chierchia (1998), that is based on type-shifting operations relating the various denotations of nominals in the flexible type-theoretic framework developed by Partee (1987). Hindi does not have a lexical definite determiner. Dayal observes that bare singulars and bare plurals in Hindi can have existential, definite and generic interpretations.

Dayal confirms a number of well-known observations about bare nominals for Hindi. Bare singulars as well as bare plurals take narrow scope with respect to negation and other scope bearing operators. For bare singulars, the existential reading is restricted to noun incorporation contexts, and in these contexts, the bare nominal is not a good antecedent for an overt discourse pronoun. Moreover, the morphologically singular bare nominal is semantically number neutral in incorporation contexts. Bare plurals can have existential readings in the subject position of stage-level predicates, they are always semantically plural, and they are always discourse transparent.

Based on these data, Dayal concludes that Hindi bare nominals are ambiguous between definite and kind-denoting terms. Given that bare nominals in Hungarian do not have definite interpretations, we will focus the comparison on bare nominals as kind-denoting terms. According to Dayal, Hindi bare nominals are not indefinites but rather, their existential reading is dependent on kind reference. Singular kinds require the kind term to be atomic. This blocks access to individual instantiations of the singular kind, but not of the plural kind. The aim is then to use the kind-based approach to drive a wedge between noun phrases based on number marking.

Dayal's (1999) analysis relies heavily on the type-shifting operations proposed by Chierchia (1998). In her account, bare plurals have definite and kind-denoting interpretations. The existential interpretation (in regular argument position or in incorporation constructions) is obtained via derived kind predication. Bare singulars are either definite, or denote a singular kind. Following Chierchia (1998b), she assumes that derived kind predication is not available for singular kinds. This explains why bare singulars do not occur in regular argument position. However, they do occur in incorporation contexts, with an existential interpretation which suggests that the kind interpretation is not suit-

able in this context. According to Dayal, incorporation of singulars involves a process of 'theme suppression'. This process triggers the re-analysis of a two-place predicate as a complex property. The necessary condition for this reanalysis is the existence of a well-established inter-pretive counterpart where the theme argument is realized by the corre-sponding predicate, and is existentially quantified. According to Dayal, theme suppression explains the key features of incorporation of bare singulars. First, the theme argument does not introduce a discourse referent, since it gets suppressed. Consequently, there is no antecedent available for a discourse pronoun. Second, the interpretation of an in-corporated bare singular is not restricted to atoms, because there is no existential quantifier that could be the source of such implicatures.

We share with Dayal the concern for distinguishing between bare singulars and bare plurals in a way that connects their differences to number marking. The consequence of this differentiation for Dayal, however, is that a unified analysis of incorporation is lost. In her view, incorporation of bare singulars involves theme suppression, while incor-poration of bare plurals involves derived kind reference. Our approach maintains a unified analysis of incorporated singulars and plurals while at the same time explaining the contrasts between them based on the contribution of the plural feature. We think this is an advantage.

Throughout this book, we focused on the similarities between Hindi and Hungarian in relation to the singular/plural contrast. However, if we were to extend Dayal's analysis of incorporation in Hindi to our Hungarian data, we would run into a basic problem. As pointed out in chapter 5 above, Hungarian bare nominals, whether singular or plural, do not get a kind-level interpretation, as illustrated in the examples in (209) and (210):

(209) *Medve okos./   *Medvék okosak.
        bear   intelligent./ Bear.Pl   intelligent.Pl

(210) *Szeretem medvéket.
        love.I   bear.Pl.Acc

Technically, it may not be impossible to implement a kind-based analy-sis for incorporation in Hungarian, even in the absence of a kind reading for bare singulars or plurals. However, such an account is not partic-ularly appealing in the absence of positive evidence for it. Given the inability of bare plurals to refer to kinds in Hungarian, we did not attempt to force a kind-based analysis of plural INs in this language. Our approach predicts the possibility of generic readings of bare plurals without making the prediction that every language must have them.

7.2.3 An analysis based on mode of composition

Just like Van Geenhoven, Chung and Ladusaw (2003) use a flexible type-theoretic framework to develop an analysis of incorporation. They focus on two important questions: the difference between the combination of the verb with weak, property-denoting nominals on the one hand, and with incorporated nominals on the other, and the possibility of doubling the incorporated argument with a full DP in regular argument position. Crucial to the account is the introduction of a new mode of predicate-argument composition, called Restrict, besides the regular mode of composition for indefinites, called Specify. The special feature of Restrict is that while it affects one of the arguments of the predicate, it does not saturate it and therefore the argument in question is available for further composition, which is what happens in doubling cases. We summarize this treatment of incorporation in enough detail to be able to compare its predictions with those of the present proposal.

In Chung and Ladusaw's approach, the essential difference between incorporated nominals and ordinary indefinites is the mode of composition with the predicate. Both ordinary indefinites and incorporated nominals are property denoting. When they combine with a predicate, there is a type mismatch in that an $\langle e,t \rangle$ type nominal has to combine with a predicate which is looking for an argument of type e. In the case of regular indefinites, the mismatch is resolved by a type-shifting mechanism called Specify, while in the case of incorporated nominals, the composition rule is Restrict. Specify is a compound mode of composition involving "[T]he combination of the application of a choice function followed by function application" (p. 20), illustrated in (211) (p. 20, example 30):[54]

(211) FA(λxλe [bark'(x)(e)]), CF([dog'(y)]))
     = $\exists$f$\exists$e [bark'(f(dog')(e))]])

Here CF stands for 'choice function' and FA for function argument application. The final interpretation is arrived at after the event variable and the functional variable have been existentially closed. Crucial to the analysis is that combination by Specify is assumed to saturate the affected argument of the predicate; after the function application part of Specify, the relevant lambda prefix is gone and the targeted argument of the predicate is not available for further composition.

Restrict is a new mode of composition allowing a function that is looking for an individual argument (type e) to combine with a property argument (type $\langle e, t \rangle$). The result is that the relevant variable of the

---

[54]The quotations are from the unpublished version of the ms.

predicate is now restricted by the property in question, without a concomitant saturation of the predicate on that variable. Accordingly, the affected variable is still bound by a lambda, although there is a shift in position of the relevant lambda operator to signal that the argument has been targeted by a composition operation without, however, being saturated. In a later move, the lambda operator is eliminated by an existential quantifier that binds the variable in question. To illustrate, assume that *dog* is a property-denoting noun phrase that is composed via Restrict with the predicate *feed'*, while *John* is an individual-denoting expression composing by function-argument application. The semantic interpretation of (212a) is given in (212b) (p. 13, example 25):

(212) a. John dog-fed.

   b. FA(Restrict ($\lambda y\ \lambda x\ \lambda e$ [feed'(y)(x)(e)], dog'), j)
   = FA($\lambda x\ \lambda y\ \lambda e$ [feed'(y)(x)(e) $\wedge$ dog'(y)], j)
   = $\lambda y \lambda e$[feed'(y)(j)(e) $\wedge$ dog'(y)]

After Restrict applies, λy is still present in the lambda prefix of the resulting expression. However, it is now demoted to the first lambda before the event argument. Thus, Restrict is truly a new kind of operation not only in that a predicate combines with an argument that is not of the right semantic type, but also in that the operation affects the lambda prefix in an unprecedented way.

Crucially, in the final line, the argument targeted by Restrict, y, is still available for further composition. At this point, existential closure may apply twice and saturate the predicate on y, as well as on e, yielding (213) (p. 13, example 26):

(213) EC(EC($\lambda y\ \lambda e$[feed'(y)(j)(e) $\wedge$ dog'(y)]))
   = $\exists e \exists y$[feed'(y)(j)(e) $\wedge$ dog'(y)]

The difference between ordinary and incorporated indefinites in this account is that the former compose via Specify while the latter compose via Restrict. This is an irreducible difference that may be encoded as a special restriction on determiners. In this view, determiners may select for a particular mode of composition for the resulting DP. With respect to Maori, the claim is that "*[H]e* signals that the indefinite is composed via the nonsaturating mode Restrict; *tētahi* signals that the indefinite is composed via the type-shifing mode Specify. In other words, these two articles serve as morphological flags for the modes of composition available to semantically incomplete DPs."(p. 60)

Going beyond Maori and Chamorro, Chung and Ladusaw generalize their account to other 'local scope only' indefinites, such as existential bare plurals in English: "We claim that in English, bare plurals must

compose via the nonsaturating mode Restrict. [...] More generally, in recognizing Restrict as a distinct mode of composition, our theory provides one way of accounting for language-specific indefinites that must have narrow scope." (p. 91). Whether this approach extends to necessarily co-varying indefinites such as *egy-egy* indefinites in Hungarian or to 'roofed' indefinites such as Negative Polarity Items is a question Chung and Ladusaw do not address.

The account of the contrast in scope possibilities between ordinary indefinites and incorporated ones depends crucially on the details of the existential closure operations needed. In this account, ordinary indefinites scope freely because of the stipulated special binding properties of choice functional variables (cf. Reinhart 1997, Matthewson 1999, Chierchia 2001 and Chung and Ladusaw for extensive discussion of choice functions, closure and scope). The local scope of incorporated nominals follows from the assumption that by the time the event variable is reached in composition, all unsaturated arguments of the predicate must be existentially closed (see Principle 27, p. 14). This version of existential closure is assumed to come in to bind and saturate unsaturated variables, i.e. variables composed by Restrict. This must happen below the event level variable, which itself is bound (and saturated) by another version of existential closure, which applies before the event variable is folded into the interpretation. Nominals introduced by Restrict are bound by this 'below-the-event' version of existential closure and therefore will have narrow scope only.

In order to prevent 'below-the-event' existential closure to necessarily bind choice functional variables as well, one has to assume that they are not unsaturated. We end up with two types of free variables and two types of existential closure. On the one hand we have choice functional variables, introduced as part of Specify, bound by freely inserted long-distance binding existential operators. This type of existential closure is not a saturating device, since choice functional variables have to count as saturated before they are bound. On the other hand, we have unsaturated variables that have been composed by Restrict. These are bound by 'below-the-event' existential closure, which is a saturating device. As a result, the account is technically rather complex.

The Restrict view of incorporation, unlike Van Geenhoven's proposal, predicts the possibility of doubling: recall that Restrict was defined in such a way as to leave the affected argument unsaturated, i.e., still bound by a lambda operator after composition. This argument is therefore available for further composition by Specify involving a 'doubling' DP, provided that the latter composes with the predicate below the event variable, and therefore before below-the-event existential clo-

sure saturates the relevant argument.

We turn now to a brief comparison between the Restrict analysis of incorporation summarized above and the DRT-based, dynamic approach developed in this book. The major similarity is that in both approaches, incorporated nominals contrast with non-incorporated ones in mode of composition, rather than in semantic type. Incorporated nominals compose via Restrict for Chung and Ladusaw, and via Unification for us, while non-incorporated indefinites involve Specify in one analysis and Instantiation in the other. Setting aside the differences in formal details and framework, which are significant, combination by Instantiation, just like combination by Specify, 'saturates' the argument of a predicate, while combination by Unification, just like combination via Restrict, does not. Both analyses therefore predict the possibility of doubling, and leave the question of whether this possibility is realized or not to the details of the morpho-syntax of particular languages. The two analyses also recognize the differences between incorporation proper and the combination of a verb with an indefinite, although Chung and Ladusaw seem to want to weaken this claim when they extend their approach to bare plurals in English. Both approaches predict, of course, the local scope of incorporated nominals although again, the mechanisms are quite different.

Although Chung and Ladusaw (2003) observe that incorporated nominals that are unmarked for number get a number-neutral interpretation, they do not go into the details of how this property is captured by their account. In the dynamic approach we developed in this book, accounting for the details of number interpretation was a high priority. The dual nature of bare plurals in Hungarian in our account follows from the presuppositional semantics of plural inflection and from their lack of determiner. It is not clear to us how this split nature of bare plurals in languages like Hungarian can be accounted for in the framework developed by Chung and Ladusaw (2003), especially if we follow their suggestion and extend the use of Restrict to bare plurals in full argument position. Note also that under such an approach it is no longer possible to provide a unitary account for the existential and the generic readings of English bare plurals (cf. our criticism of Van Geenhoven's analysis in section 7.2.1 above). An advantage of our approach is that, besides accounting for the semantic number neutrality of singular INs, we achieved a unified analysis of bare plurals in languages like English and Hungarian.

With respect to discourse transparency, Chung and Ladusaw stress that their account predicts full discourse transparency for incorporated nominals. Indeed, in this view there is no reason to expect there to be

any difference between nominals composed via Specify and nominals composed via Restrict as far as discourse transparency is concerned (or saliency or specificity for that matter). Because of this property, the extension of the Restrict analysis of incorporation to languages like Hindi and Hungarian is problematic. The dynamic approach, on the other hand, predicts full discourse transparency for plural INs and the possibility of reduced transparency for singular INs, leaving the issue of whether and how this possibility is realized to language specific differences in anaphoric systems. This view accounts for the details of incorporation in languages like Hindi and Hungarian, without ruling out the possibility of languages like West Greenlandic and Chamorro. It is not clear how an approach based on Restrict could be extended to account for finer shades of discourse transparency so as to capture the full range of relevant facts.

With respect to incorporation, the dynamic approach worked out in this book has wider empirical coverage than the type-theoretic proposals summarized here in that it provides an explicit account of the semantic role of number as well as of the complex discourse transparency issues that arise in connection with the singular/plural contrast in incorporation constructions.

7.3 Conclusion

Looking back on the discussion in this chapter, we see that the type-theoretic kit offers three tools to handle the difference between incorporated and non-incorporated nominals: semantic type, type-shifting, and mode of composition. Van Geenhoven's (1998) analysis is based on semantic type, and runs into the overgeneration problem. Dayal uses type-shifting, and runs into the problem that incorporated nominals do not get a generic interpretation, and that generic interpretations of bare nominals are not always available. Chung and Ladusaw (2003) start from the assumption that indefinites and incorporated nominals are of the same semantic type, but differ in mode of composition. Each require a special type of composition that goes beyond overcoming the type mismatch. The empirical problems this approach faces involve a proper account of the singular/plural contrast and an account of the various shades of discourse transparency.

In our view, incorporation and the problems it raises have to do with the way reference is construed in discourse. The semantics of number is not related to types, and neither is the dynamic potential of a nominal. In our view, flexible type theory, type-shifting and special modes of composition are useful tools in the description of a wide

range of constructions involving weak indefinites, including existential *there*-constructions, *have/be*, intensional contexts, etc. (cf. de Swart 1999, 2001 for proposals along these lines). But they are insufficient to set incorporation constructions apart from other constructions involving weak indefinites that have various derived denotations, including a property denotation, and that may combine via other mechanisms than function application. The proposals advanced by Van Geenhoven, Dayal and Chung and Ladusaw show that there is something inherently special about incorporation constructions, and which requires a semantics different from that associated with other types of indefinites. The separation between thematic arguments and discourse referents, a move that we also see in the work by Kamp and Bende-Farkas, and the treatment of plural morphology as a predicate on a presupposed discourse referent constitute the first steps towards a better understanding of the relation between static, truth-conditional semantics and dynamic, discourse level semantics found in incorporation constructions.
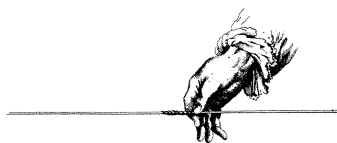
References

Aissen, J. 2003. Differential object marking: iconicity vs. economy. *Natural Language and Linguistic Theory* 21:435–483.

Baker, M. 1988. *Incorporation: a theory of grammatical function changing*. Chicago: Chicago University Press.

Barwise, J. and R. Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4:159–219.

Beaver, D. to appear. The optimization of discourse anaphora. *Linguistics and Philosopy* .

Bittner, M. 1994. Cross-linguistic semantics. *Linguistics and Philosophy* 17:53–108.

Bossong, G. 1995. *Differentielle Objektmarkierung in den neuiranischen Sprachen*. Tübingen: Günter Narr Verlag.

Bresnan, J and S. Mchombo. 1987. Topic, pronoun and agreement in Chichewâ. *Language* 63:741–782.

Carlson, G. 1977. *Reference to kinds in English*. Ph.D. thesis, University of Massachusetts, Amherst. Published 1980 New York: Garland.

Chierchia, G. 1992. Anaphora and dynamic binding. *Linguistics and Philosophy* 15:111–183.

Chierchia, G. 1995. *Dynamics of meaning*. Chicago: University of Chicago Press.

Chierchia, G. 1998a. Plurality of mass nouns and the notion of 'semantic parameter'. In S. Rothstein, ed., *Events and grammar*, pages 53-103. Dordrecht: Kluwer.

Chierchia, G. 1998b. Reference to kinds across languages. *Natural Language Semantics* 6:339–405.

Chierchia, G. 2001. A puzzle about indefinites. In C. Cecchetto, G. Chierchia, and M. Guasti, eds., *Semantic Interfaces*, pages 51–90. Stanford, CA: CSLI publications.

Chierchia, G. and F. Pelletier. 1995. *The generic book*. Chicago: Chicago University Press.

Chung, S. and W.A. Ladusaw 2003. *Restriction and Saturation*. Cambridge, MA: MIT Press. In press.

Condoravdi, C. and M. Gawron. 1996. The context-dependency of implicit arguments. In M. Kanazawa, C. Piñon, and H. de Swart, eds., *Quantifiers, Deduction, and Context*, pages 1–32. Stanford, CA: CSLI publications.

Corblin, F. 2002. *Représentation du discours et sémantique formelle*. Paris: Presses Universitaires de France.

Dayal, V. 1999. Bare NPs, reference to kinds and incorporation. In *SALT*, vol. 9. Ithaca, NY: Cornell University Press.

Di Sciullio, A.M. and E. Williams. 1987. *On the definition of word*. Cambridge, MA: MIT Press.

Diesing, M. 1992. *Indefinites*. Cambridge MA: MIT Press.

Dowty, D. 1991. Thematic proto-roles, argument selection, and lexical semantic defaults. *Language* 67:547–619.

van Eijck, J. and H. Kamp. 1998. Representing discourse in context. In J. van Benthem and A. ter Meulen, eds., *Handbook of Logic and Language*. Amsterdam: Elsevier.

Farkas, D.F. 1981. Quantifier scope and syntactic islands. In *CLS*, vol. 17, pages 59–66.

Farkas, D.F. 1986. The syntactic position of focus in Hungarian. *Natural Language and Linguistic Theory* 4:77–96.

Farkas, D.F. 1997a. Dependent indefinites. In F. Corblin, D. Godard, and J. Marandin, eds., *Empirical issues in formal syntax and semantics*, pages 243–268. Berlin: Peter Lang.

Farkas, D.F. 1997b. Evaluation indices and scope. In A. Szabolcsi, ed., *Ways of scope taking*, pages 183–215. Dordrecht: Kluwer Academic Publishers.

Farkas, D.F. 2001. Vers une typologie sémantique des syntagmes nominaux. In G. Kleiber, B. Laca, and L. Tasmowski, eds., *Typologie des groupes nominaux*, pages 17–46. Rennes, France: Presses Universitaires Rennes.

Farkas, D.F. 2002a. Specificity distinctions. *Journal of Semantics* 19:1–31.

Farkas, D.F. 2002b. Varieties of indefinites. In *SALT*, vol. 12. Ithaca, NY: Cornell University Press.

Farkas, D.F. and H. de Swart. 2001. Bare nominals in the typology of indefinites. Lecture notes of the 13th ESSLLI summerschool in Helsinki, ms. Santa Cruz/Utrecht.

Farkas, D.F. and J. Sadock. 1989. Preverb climbing in Hungarian. *Language* 65:318–338.

Fillmore, C. 1986. Pragmatically controlled zero anaphora. In *BLS*, vol. 12, pages 95–107. Berkeley, CA.

Fodor, A., J. and J. Fodor. 1980. Functional structure, quantifiers and meaning postulates. *Linguistic Inquiry* 11:759–770.

Grimshaw, J. 2000. Extended projection and locality. In P. Coopmans, M. Everaert, and J. Grimshaw, eds., *Lexical specification and insertion*, pages 115–133. Amsterdam: John Benjamins.

Hale, K. 1987. Agreement in Athabaskan and in general. ms. MIT.

Heim, I. 1982. *The semantics of definite and indefinite NPs*. Ph.D. thesis, University of Massachusetts, Amherst.

Heim, I. 1990. E-type pronouns and donkey anaphora. *Linguistics and Philosophy* 13:137–178.

Higginbotham, J. 1985. On semantics. *Linguistic Inquiry* 16:547–593.

de Hoop, H. 1992. *Case configuration and noun phrase interpretation*. Ph.D. thesis, University of Groningen, Groningen.

de Hoop, H. and H. de Swart. 1990. Indefinite objects. In R. Bok-Bennema and P. Coopmans, eds., *Linguistics in the Netherlands 1990*, pages 91–100. Dordrecht: Foris.

Horvath, J. 1981. *Aspects of Hungarian syntax and the theory of grammar*. Ph.D. thesis, UCLA.

Kadmon, N. 1990. Uniqueness. *Linguistics and Philosophy* 13:273–324.

Kamp, H. 1981. A theory of truth and semantic representation. In J. Groenendijk, T. Janssen, and M. Stokhof, eds., *Formal methods in the study of language*. Amsterdam: Mathematisch Centrum. reprinted in J. Groenendijk, T. Janssen and M. Stokhof (eds.) (1984). *Truth, interpretation and information*, pages 1–41, Dordrecht: Foris.

Kamp, H. and A. Bende-Farkas. 2001. Indefinites and binding: from specificity to incorporation. Lecture notes from the 13th ESSLLI summer school in Helsinki, ms. Stuttgart University.

Kamp, H. and U. Reyle. 1993. *From discourse to logic*. Dordrecht: Kluwer.

Kamp, H. and A. Rossdeutscher. 1994. Remarks on lexical structure and DRS construction. *Theoretical Linguistics* 20:97–164.

Karttunen, L. 1976. Discourse referents. In J. McCawley, ed., *Syntax and Semantics vol. 7*, pages 363–385. New York: Academic Press.

Kiss, K. É. 1998a. Identification focus versus information focus. *Language* 74(2):245–273.

Kiss, K. 1998b. On generic and existential bare plurals and th classification of predicates. In S. Rothstein, ed., *Events and Grammar*, pages 145–162. Dordrecht: Kluwer Academic Publishers.

Koenig, J-P. and G. Mauner. 2000. A-definites and the discourse status of implicit arguments. *Journal of Semantics* 16:207–236.

Koopman, H. and A. Szabolcsi. 2000. *Verbal complexes*. Cambridge: MIT Press.

Kratzer, A. 1995. Stage-level and individual-level predicates. In G. Carlson and F. Pelletier, eds., *The generic book*, pages 125–175. Chicago: University of Chicago Press.

Kratzer, A. 1998. Scope or pseudoscope? Are there wide-scope indefinites? In S. Rothstein, ed., *Events and grammar*, pages 163–196. Dordrecht: Kluwer Academic Publishers.

Krifka, M. 1995. Focus and the interpretation of generic sentences. In G. Carlson and F. Pelletier, eds., *The generic book*, pages 238–264. Chicago: University of Chicago Press.

Krifka, M., F. Pelletier, G. Carlson, A. ter Meulen, G. Chierchia, and G. Link. 1995. Genericity: and introduction. In G. Carlson and F. Pelletier, eds., *The generic book*, pages 1–124. Chicago: University of Chicago Press.

Ladusaw, W. 1994. Thetic and categorical, stage and individual, weak and strong. In *SALT*, vol. 4, pages 220–229.

Longobardi, G. 1994. Reference and proper names. *Linguistic Inquiry* 25:609–665.

Massam, D. 2001. Pseudo noun incorporation in Niuean. *Natural Language and Linguistic Theory* 19:153–197.

Matthewson, L. 1999. On the interpretation of wide scope indefinites. *Natural Language Semantics* 7:79–134.

Mauner, G., M. Tanenhaus, and G. Carlson. 1995. Implicit arguments in sentence processing. *Journal of Memory and Language* 34:357–382.

McCawley, J. 1968. Review of *Current trends in linguistics* 3. *Language* 44:556–593.

McNally, L. 1998. Existential sentences without existential quantification. *Linguistics and Philosophy* 21:353–392.

McNally, L. and V. Van Geenhoven. 1997. Redefining the weak/strong distinction. Paper presented at the Paris conference on Syntax and Semantics, ms. Barcelona/Nijmegen.

ter Meulen, A. 2003. Dynamic definite descriptions, implicit arguments and familiarity. In M. Reimer and A. Bezuidenhout, eds., *Descriptions*. Oxford: Oxford University Press.

Milsark, G. 1977. Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis* 3:1–29.

Mithun, M. 1984. The evolution of noun incorporation. *Language* 60:847–894.

Mithun, M. 1986. On the nature of noun incorporation. *Language* 62:32–37.

Mohanan, T. 1995. Wordhood and lexicality: noun incorporation in Hindi. *Natural Language and Linguistic Theory* 13:75–134.

Ojeda, A. 1993. *Linguistic individuals*. Stanford (CA): CSLI Publications.

Partee, B. 1987. Noun phrase interpretation and type-shifting principles. In J. Groenendijk, D. de Jongh, and M. Stokhof, eds., *Studies in Discourse Representation Theory and the theory of generalized quantifiers*, pages 302–323. Dordrecht: Foris.

Partee, B. 1989. Binding implicit variables in quantified contexts. In *CLS*, vol. 25, pages 342–365. Chicago, IL.

Postal, P. 1969. On so-called pronouns in English. In D. Reibel and S. Schane, eds., *Modern studies in English*, pages 371–388. New York: Academic Press.

Prince, E. 1981. On the inferencing of indefinite-THIS NPs. In A. Joshi, B. Webber, and I. Sag, eds., *Elements of discourse understanding*, pages 231–250. Cambridge: Cambridge University Press.

Reinhart, T. 1997. Quantifier scope: how labor is divided between QR and choice functions. *Linguistics and Philosophy* 20:335–397.

Roberts, C. 1998. The place of centering in a general theory of anaphora resolution. In M. Walker, A. Joshi, and E. Prince, eds., *Centering theory in discourse*, pages 359–399. Clarendon Press.

Rooth, M. 1985. *Association with focus*. Ph.D. thesis, University of Massachusetts at Amherst.

Rooth, M. 1995. Indefinites, adverbs of quantification and focus semantics. In G. Carlson and F. Pelletier, eds., *The generic book*, pages 265–299. Chicago: University of Chicago Press.

Rosen, S.T. 1989. Two types of noun incorporation: a lexical analysis. *Language* 65:294–317.

Ruys, E. 1992. *The scope of indefinites*. Ph.D. thesis, Utrecht University.

Sadock, J. 1980. Noun incorporation in Greenlandic: a case of syntactic word formation. *Language* 56:300–319.

Sadock, J. 1985. Autolexical syntax: a proposal for the treatment of noun incorporation and similar phenomena. *Natural Language and Linguistic theory* 3:379–439.

Sadock, J. 1986. Some notes on noun incorporation. *Language* 62:19–31.

van der Sandt, R. 1992. Presupposition projection as anaphora resolution. *Journal of Semantics* 9:333–377.

Schlenker, P. 2003. A plea for monsters. *Linguistics and Philosophy* 26:29–120.

de Swart, H. 1991. *Adverbs of quantification: a generalized quantifier approach*. Ph.D. thesis, University of Groningen. Published 1993 New York: Garland.

de Swart, H. 1996. (In)definites and genericity. In M. Kanazawa, C. Piñón, and H. de Swart, eds., *Quantifiers, deduction and context*, pages 171–194. Stanford, CA: CSLI publications.

de Swart, H. 1998. Aspect shift and coercion. *Natural Language and Linguistic Theory* 16:347–85.

de Swart, H. 1999. Indefinites between reference and predication. In *SALT*, vol. 9, pages 273–297. Ithaca NY: Cornell University Press.

de Swart, H. 2001. Weak readings of indefinites: type-shifting and closure. *The Linguistic Review* 18:69–96.

Szabolcsi, A. 1997a. Background notions in lattice theory and generalized quantifiers. In A. Szabolcsi, ed., *Ways of scope taking*, pages 1–27. Dordrecht: Kluwer Academic Publishers.

Szabolcsi, A. 1997b. Strategies for scope taking. In A. Szabolcsi, ed., *Ways of scope taking*, pages 109–154. Dordrecht: Kluwer Academic Publishers.

Szendröi, K. 2002. A stress-based approach to the syntax of Hungarian focus. *The linguistic review* to appear.

Thomas, A. 1979. Ellipsis: the interplay of sentence structure and context. *Lingua* 47:43–68.

Turan, Ü. 1998. Ranking forward looking centers in Turkish: Universal and languages specific properties. In M. Walker, A. Joshi, and E. Prince, eds., *Centering theory in discourse*, pages 139–160. Oxford, England: Clarendon Press.

Van Geenhoven, V. 1998. *Semantic incorporation and indefinite descriptions*. Stanford, CA: CSLI publications.

Walker, M., A. Joshi, and E. Prince (eds.). 1998. *Centering theory in discourse*. Oxford, England: Clarendon Press.

Zeevat, H. 1992. Presupposition and accomodation in update semantics. *Journal of Semantics* 9:379–412.

Subject Index

Name Index