From NP to DP
Volume 1: The syntax and semantics of noun phrases

Edited by
Martine Coene
Yves D’hulst
From NP to DP
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**Volume 55**

*From NP to DP: Volume 1: The syntax and semantics of noun phrases*

Edited by Martine Coene and Yves D’hulst
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Volume 1: The syntax and semantics of noun phrases

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Introduction: The syntax and semantics of noun phrases

Theoretical background

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1. From NP to DP

1.1 D as the head of the Noun Phrase

In a traditional Principles and Parameters framework (cf. Chomsky 1981), noun phrases were commonly seen as maximal projections of a lexical head N0. Applying the X’-format to the noun phrase, the lexical head N0 was said to combine with a complement (e.g. a PP) forming the N’-level, and the intermediate N’-level with an adjunct (e.g. an AP or PP). The topmost N’-level combined with the specifier (e.g. a determiner or a prenominal genitive phrase) yielding the maximal level NP.

(1) a. The translation of the book.

As obvious in example (1) and its configuration, the determiner was treated on a par with the prenominal genitive phrase. This is a very unattractive position, since the same Spec,NP position was occupied by a closed class of functional heads (e.g. determiners), as well as full phrases (e.g. genitive phrases). The identical categorial status of determiners, adjectives and genitive
phrases was basically argued for because of their identical prenominal position (at least in English).

One of the earliest proposals arguing in favor of a functional head in the Noun Phrase can be found in Brame (1982:321), who specifically states the following: “. . . I think it is a mistake to think of N as the head of an NP. One should think in terms of DPs, i.e. determiner phrases, not in terms of NPs.” According to him, D(ET) is the head-selector of NP, just as P is the head-selector of PP, infinitival to of VP and COMP of S. One of the main conclusions of Brame’s head-selector theory is the following:

I would go even farther to suggest that linguists’ shorthand in terms of NP is misleading. Since DET is the head-selector of DET(N), or to use more traditional terminology, since DET is the head of NP, and not N as customarily supposed, it would be better to abbreviate DET(N) as DP, not as NP, and to speak of determiner phrases, rather than noun phrases. Brame (1982:325)

1.2 D parallels I

Abney (1986) is generally said to be one of the first to further develop the hypothesis that the noun phrase is headed by a functional element, identified with the determiner (D). According to him, a semantic projection is made up of a lexical maximal projection and the various functional maximal projections above it without intervening other lexical head. The lexical head is called the semantic head of the projection — the functional head the categorial head.

Determiner and Infl(ection) are said to have similar semantic functions, the determiner specifying the reference of a noun phrase by picking out a particular member of the noun’s extension, Inflection doing the same with the verb. Concerning Saxon genitives, the prenominal genitive phrase is taken to be the subject of the noun phrase and the possessive morpheme (’s) to be the determiner. This way, genitive case is assigned to the subject in the noun phrase in exactly the same way Infl assigns nominative case to the verbal subject:

(2)
The parallelism between D and I is basically followed by Fukui and Speas (1986). They furthermore postulate movement of the subject, base-generated in the specifier position of the lexical projection (NP), to the specifier position of its functional projection (DP). The parallelism between IP and DP still holds, since the subject of the verb phrase will move out of Spec,VP to Spec,IP and the subject of the noun phrase will move out of Spec,NP to Spec,DP:

The previous proposals are slightly modified in Abney (1987), where he no longer takes $D^0$ to contain the possessive ‘s morpheme, but a null AGR morpheme assigning genitive case to the possessor DP (indicated by the ‘s morpheme):
The fact that $D^0$ now hosts an agreement marker and that the genitive DP as a whole is base-generated in Spec, DP is mainly based on the fact that in numerous languages, the noun phrase acts very much like a sentence with respect to agreement and case-assignment: (i) the possessed noun agrees with its subject the same way the verb agrees with its subject; and (ii) the possessor has the same case as the subject of the sentence. This is typically illustrated by languages in which AGR is overtly expressed. Abney therefore concludes that the minimal assumption must be that the Infl-like position in the noun phrase is occupied by AGR (1987:37).

1.3 D parallels C

Szabolcsi (1983) argues that in Hungarian, the noun phrase is sentence-like in that it has an INFL and a peripheral position. This claim is based on the parallelism between the possessive morpheme of NPs and the tense/mood morpheme in sentences: sentences like (5a) are ungrammatical without the tense morpheme ($t$), just as noun phrases like (5b) are ungrammatical without the possessive morpheme ($e$):

(5)  

Mary-nom sleep-PAST-3SG  
'Mary slept.'

the Mary-nom guest-POSSESS-3SG  
'Mary’s guest.'

Szabolcsi therefore concludes that
it is reasonable to suppose that NP in Hungarian has its own INFL, which under similar conditions as INFL of a configurational S, governs the subject and assigns its nominative Case. Szabolcsi (1983:90)

The difference between nominal and verbal INFL consists in its feature matrix: in NPs, INFL is set for \([\pm \text{poss}]\), whereas verbal INFL is \([\pm \text{tense}]\). The same idea about two types of Infl nodes is further developed in Szabolcsi (1986) and successively in Szabolcsi (1987, 1989, 1990, 1994). The nominal Infl [Poss] corresponds to Abney’s nominal functional category D, whereas Infl [Tense] corresponds to Abney’s verbal functional category Infl. In the inflected noun phrase, the possessive agreement on the noun licenses nominative case and pro-drop for the possessor, just as does the tense agreement on verbs with nominative case and pro-drop for the subject (examples from Szabolcsi (1994:188).

(6) a. a mi kalap-unk (Hungarian)
   the we.NOM hat-poss.1PL
   'OUR hats'

b. a kalap-unk
   the hat-poss.1PL
   'our hats'

In a similar way, Horrocks and Stavrou (1985) argue in favor of a Comp position in the Greek noun phrase. They discuss movement of a wh-constituent base-generated postnominally into a pre-nominal position, from which extraction into the sentence is possible. This is illustrated in (7) (7a=Horrocks and Stavrou’s examples (13a–b) and (14c)):

(7) a. to vivlio tinos (Greek)
   the book who.gen
   'whose book'
   tinos to vivlio
   who.gen the book
   'whose book'
   Tinos mu ipes pos dhiavases to vivlio?
   who.gen me.gen said.2sg that read.2sg the book
   'Whose book did you tell me you read?'

The same holds for noun phrase internal elements like the AP to kokino 'the red' in (7b), which can be moved to a prenominal position and, in a second stage, into the sentence:
(7) b. to forema to kokino
    the red the dress
    ‘the red dress’
    to kokino to forema
    the red the dress
    ‘the RED dress’
To kokino mu ipes pos aghorases to forema.
the red me.Gen said.2sg that bought.2sg the dress
‘You told me that you bought the RED dress.’

1.4 Features on D

If we follow the hypothesis that D and C are analogous in that both are functional categories whose Spec position is a designated landing site for operators and an escape hatch for movement, one of the main questions to be answered concerns the content of these two functional categories, i.e. ‘what is the role of both D and C with respect to resp. the noun phrase and the verb phrase they are heading?’

Szabolcsi (1994:214), following some ideas developed in her earlier work, suggests the following:

(i) only phrases in the canonical argument format can function as arguments of θ-role assigning heads;
(ii) both the complementizer and the article are subordinators in the sense that they enable the clause or noun phrase to act as arguments.

In other words, in clauses, the lexical content of C turns the proposition into an argument, just as the lexical content of D does with NPs, i.e. it turns the noun phrase into an argument. We will label this the ‘argument conversion hypothesis’.

The fact that arguments come with a so-called subordinator is confirmed by categories which, by standard assumptions, are assigned thematic roles, hence have a subordinator. This is exemplified for the VP by e.g. finite and infinitival clauses with an overt or phonetically null C (see example (8a)). On the other hand, categories which may not function as arguments, like e.g. matrix clauses, disallow the complementizer (see (8b)).

(8) a. I know [CP (that) he will come.]
    b. *[CPThat he will come.]
In the domain of the noun phrase, arguments of a predicate must be headed by D. This seems to be motivated by the fact that in some languages or dialects in which proper names in argument position may be preceded by a definite article, these proper names appear articleless in non-argument positions. This is illustrated by the vocative case of masculine proper nouns in Flemish dialects, as in (9b), but can be found in other Germanic and Romance languages and dialects as well:

(9)  
   a. De Jef komt morgen.  
       the Jef comes tomorrow  
   b. (*De) Jef, kom morgen!  
       (*the) Jef, come tomorrow!

Szabolcsi assumes that in a complete parallelism with the presence of an empty C in matrix clauses, D remains empty in vocative constructions.

A different proposal is put forward by Longobardi (1994), who takes the basic function of D to be the conversion of the predicative category N into referential expressions; in vocatives, such a D-position is not projected in syntax.

Coene, D’Hulst and Tasmowski (1999) argue against Szabolcsi’s ‘argument conversion hypothesis’ and Longobardi’s ‘referentiality conversion hypothesis’ showing that both face theoretical problems. The problem with the first relates to the empty nature of D⁰: as is well known, empty D⁰s often give rise to existential and generic interpretations — which clearly is not the case in vocatives — and are syntactically confined to certain (governed) positions in Romance languages, presumably not including the position vocatives appear in. The second one, on the other hand, fails to account for the referential character of vocatives. Alternatively, it is argued that vocatives are full DPs which exhibit N-to-D movement, as shown in the derivations for (9a–b), given in (10a–b):

(10)  
   a. [dp[D de . . . [np [n Jef ]]]]  
   b. [dp[D Jefi . . . [np [n t ]]]]

Underlining the parallelism between C and D, Siloni (1990) applies Rizzi’s (1990) feature-based typology for complementizers to D, showing on the basis of modern Hebrew semi-relative constructions that C and D differ with respect to respectively the absence or presence of a [wh]-feature, but that they share the feature [±pred] which marks the clause as respectively predicative or declarative. If the [pred] feature on D is specified positively, it takes as a
complement a modifying phrase whose presence depends on the presence of the nominal article as shown in (11a); if it is specified negatively, it takes as a complement an adjective, verb or a finite clause and turns them into arguments (see (11b)):

(11) a. ha-’ish ha-shamen  
    the-man the-fat 
    ‘the fat man’

b. ha-shamen 
    the-fat 
    ‘the fat one’

Siloni further assumes that an additional nominal Agr feature — not a separate Agr category — can be realized in D. This assumption is based on the fact that Agr can also be realized in C (morphologically, as in West Flemish, see Haegeman (1992) or as abstract agreement).

2. From DP to KP and FP

Giusti (1993) proposes that the DP has an extended functional projection, labeled KP and is thus headed by K(ase). The fact that K has to be considered the highest functional head of the noun phrase is argued for in the following way: (i) K bears the selectional features of the lexical syntactic category immediately above it; or (ii) it bears the agreement features of another syntactic category. Since only arguments may receive case, KP thus functions as a link between the selected nominal and its syntactic legitimacy (1993:42).

This claim is mainly based on the fact that all languages generate a case projection, even the ones for which most nominals show no overt case marking. For these languages, the postulation of a case projection is motivated by analogy with the presence of morphological case on particular nominal categories like e.g. pronouns.

As for the level of insertion of this functional head ‘Kase’ in the nominal structure, Giusti observes that morphological case marking always appears on the article. K must therefore be higher than D in order for D to be able to incorporate into it in syntax or LF. The configuration proposed for languages like German is given in (12):
Assuming with Giusti (1993) that D only hosts articles, but no quantifiers, demonstratives or possessives, the generation of a DP in e.g. languages without articles becomes questionable. She therefore argues in favor of the existence of a functional projection FP that replaces the KP and assimilates DP, bearing the case assigned by the syntactic legitimator and realizing the argumental properties of the noun phrase. In languages with overt article, F₀ is realized by means of the article; in languages with morphological case, F₀ is realized by the case suffix which percolates to the noun or which attracts the noun to F₀. The new configuration proposed is given in (13) (see Giusti 1993:43):

3. On the categorial status of Q

In the literature, several proposals have been made with respect to the status of the quantifier in the noun phrase (see also Giusti 1993:86–8): (i) quantifiers are modifiers of the noun (Szabolcsi 1987; Abney 1987); (ii) quantifiers are adjoined to the noun (Sportiche 1988); or (iii) quantifiers are heads of the noun phrase (Cardinaletti and Giusti 1989; Shlonsky 1991).

The first hypothesis does not include quantifiers in the class of D elements, but considers them to be a specific kind of adjectives, modifying the noun phrase and appearing in Spec, NP, receiving a θ-role of measurement from the noun, as illustrated in (14).

(14) the many men
    the honest men
The second hypothesis is represented by Sportiche’s (1988) study on floating quantifiers. One of the main characteristics of these quantifiers is that they can be found in a ‘floating’ position with respect to the noun, i.e. they can appear between the auxiliary and the main verb, whereas the rest of the NP has moved in front of the auxiliary. This is illustrated in (15b) where the canonical Q-NP order has been broken down with respect to (15a):

(15)  a. Tous les étudiants sont venus. (French)
     ‘All the students have come.’
   b. Les étudiants sont tous venus.
     ‘The students have all come.’

It is assumed that the Q–NP sequence is base generated VP-internally where it is assigned its thematic role, and that either the entire sequence moves to Spec,IP, or only the NP, leaving the quantifier behind. In both cases the NP is assigned nominative case in Spec,IP. As for the status of Q, it has to be observed that in the pre-DP framework in which Sportiche is working, the determiner is base generated in Spec,NP and the quantifier can be found in a position adjoined to the NP. The relevant derivations are given in (16).
The third option is to consider the quantifier as a nominal head, on a par with $D^0$. Shlonsky (1991) analyzes the phenomenon of floating quantifiers in Hebrew in a DP framework. Since universal quantifiers are seen as the head of the noun phrase, quantifier float then consists of moving a DP-subject leftwards, leaving behind the quantifier: the NP (DP), originally generated as the complement of $Q^0$, first moves to the specifier position of $QP$ and further up into the verbal structure, reaching Spec, $AgrSP$. Shlonsky assumes a configuration like the one given in (17):

Evidence for the hypothesis that quantifiers are $X^0$s, not specifiers or adjuncts, comes from the morphological agreement between $Q$ and $DP$, which is seen as regular Spec–Head agreement after movement of the DP into Spec, $QP$. The
fact that quantifiers are heads, provides a straightforward explanation for the
fact that in Hebrew, quantifiers can host clitics, which must be seen as the
spell-out of the agreement features between Q and DP.

Cardinaletti and Giusti (1989) and Giusti (1991) analyze quantifiers in so-
called ne-cliticization contexts in Italian in the same way: the NP moves out of
QP into the sentence and leaves the quantifier behind, as illustrated in (18) (=
Giusti’s (1993:89) example (9)):

\begin{enumerate}
\item \textit{Ho visto tre ragazzi.} (Italian)
\begin{itemize}
\item have.1sg seen three boys
\item ‘I have seen three boys.’
\end{itemize}
\item \textit{Ne ho visti tre.}
\begin{itemize}
\item clit have.1sg seen three
\item ‘I have seen three of them.’
\end{itemize}
\end{enumerate}

\begin{figure}[h]
\begin{center}
\begin{tikzpicture}
\node (root) {QP};
\node (Spec) at (root -| 0,0) [above] {Spec};
\node (N0) at (Spec -| 0,0) [below] {Q};
\node (NP) at (N0 -| 0,0) [below] {NP};
\node (Q0) at (Spec -| 0,0) [below] {\textit{ne}, \textit{tre}};
\node (NP1) at (NP -| 0,0) [below] {\textit{ragazzi}};
\node (Q1) at (Spec -| 0,0) [below] {\textit{tre}};
\node (Q2) at (Spec -| 0,0) [below] {\textit{t}};
\end{tikzpicture}
\end{center}
\end{figure}

As for the status of quantifiers in general, they make a clear distinction
between quantifiers that are heads of noun phrases and those that function as
modifiers of the noun. Q0’s always precede all other nominal elements, whereas
modifiers of the noun can appear in a relatively free order with respect to
other nominal modifiers. Contrary to Abney (1987), quantifiers that are not
preceded by a determiner are considered heads of the noun phrase and take an
NP or a DP-complement. They can be indefinite (19) or definite (20):
Apart from their canonical categorial status as head of the noun, a certain number of indefinite quantifiers can also function as modifiers of the noun (XPs). This is the case whenever the quantifier is preceded by a lexical determiner. Contrary to Abney (1987), *molti* ‘many’ in (21) is not analyzed as a nominal modifier preceded by an empty D^0, but as the head of the noun. In (22) however, the same quantifier appears in one of the specifier positions of the noun:
4. Between D and N: Noun Phrase Internal Categories

Several studies have argued in favor of the existence of a number of functional projections between the functional heads D, K (or F) and Q and the lexical head N. In the literature, there is much controversy as to how much of these functional projections are actually needed. We will briefly comment on what has been largely accepted in current research on the internal structure of the noun phrase.

4.1 A Num(ber) Phrase

Based on the analysis of two types of genitive constructions in Modern Hebrew, Ritter (1988) and especially Ritter (1991) argue for a DP-internal functional projection labeled Num(ber)P, which is the complement of D₀, and the maximal projection of a non-lexical category which bears the number features (singular or plural) of the noun phrase. The first of these genitive constructions, the construct state, refers to a type of noun phrase in which the possessor-subject is adjacent to strictly N-initial bare possessed noun (23a). Insertion of the definite article breaks up the N-initial context and leads to ungrammaticality (23b):

(23) a. beyt ha-mora (Hebrew)
    house the-teacher
    ‘the teacher’s house’
In contexts in which an additional object is inserted, only the NSO order will yield a grammatical result. The possessor-subject, which Ritter refers to as the ‘genitive’ argument, is not overtly case-marked. Assuming that Hebrew construct states contain a phonologically null determiner assigning genitive case to a noun phrase on its right, Ritter argues that simple construct state noun phrases are derived by movement of the head noun to the determiner position: movement of N to D serves to identify the functional head of the noun phrase, invisible otherwise (Ritter 1991:40):

(24) Axilat Dan et ha-tapuax. (Hebrew)
    eating Dan ACC the-apple
    ‘Dan’s eating of the apple.’

The second genitive construction is the free genitive construction, in which the ‘genitive’ phrase, in fact a prepositional phrase introduced by the dummy case marker šel, is preceded by the head noun, preceded in its turn by a determiner:

(25) Ha-axila šel Dan et ha-tapuax.
    the-eating of Dan ACC the-apple
    ‘Dan’s eating of the apple.’

This free state construction with both a subject and an object argument cannot be accounted for by the derivation given in (24): N cannot be raised to $D^0$, this position already being occupied by the overt definite determiner. Furthermore, the presence of the overt case marker šel suggests that genitive case is not assigned by means of the null determiner. If movement has to obey the head...
movement constraint of Travis (1984), only the postulation of another head position between DP and NP can derive noun phrases like the one in (25). This intermediate category is labeled \( \text{Num} \), the locus of the number specification of the noun phrase. Based on the assumption that inflectional affixes are attached to the lexical stem in syntax as a consequence of head movement, Ritter argues that in free state genitive constructions, the noun moves to and subsequently amalgamates with \( \text{Num}^0 \) in a way similar to the affixation of tense and agreement on verbs. In the case of a singular noun phrase, the noun raises to an empty category in the head of \( \text{NumP} \) in order to license the null head, which yields a singular interpretation by default. The postulation of an intermediate \( \text{NumP} \) straightforwardly accounts for the different word order in construct state and free genitive state constructions. The derivation for (25) is given in (25').

(25')

It cannot be the case, however, that only free state genitive phrases contain a \( \text{NumP} \). Based on the order of adjectives with respect to the head noun and its arguments, Ritter shows that all Hebrew noun phrases contain a \( \text{NumP} \) projection.

The same idea about a DP-internal \( \text{NumP} \) hosting the number features of the DP, is put forward by Carstens' (1991) analysis of singular, plural and trial words in Yapese. According to Dryer (1989), Yapese, an Austronesian language, has specific words which indicate if the noun is singular, plural, dual or trial:
The relative order of the number word and the head noun mirrors that of verbs and their complements: VO languages will have a Number-N order, whereas OV languages have a N-Number order. Num⁰, the head of NumP, takes an NP-complement which can precede or follow its head. Since number always occurs between the determiner and the head noun, Carstens takes NumP to be the complement of D⁰.

Yet another approach to the syntactic configuration of Number is taken by Delfitto and Schroten. In their (1991) paper, they argue — mainly by evidence from existential bare plurals — that noun phrases have a D-structure representation in which D⁰ takes a NumP complement whose head is filled by a plural affix. The lexical noun, base generated in N⁰, is incorporated into Num in a process that can be defined as ‘selected incorporation’ (1991:163), meaning that the number affix is associated in the lexicon with a specific morphological subcategorization frame selecting the incorporee-noun. Following Roberts (1991) and Guasti (1991), number affixes are treated as X⁻¹ elements, i.e. elements that are inserted at a level below X⁰. At the syntactic level, this implies the creation of an empty position as a sister to X⁻¹. Applying this mechanism to Num, Delfitto and Schroten take the number affix to be generated in Num⁻¹ and the noun head to move to the empty syntactic slot morphologically selected by Num⁻¹, at S-structure. This approach thus considers the syntactic derivation of inflected nouns as a substitution, moving the noun to a base-generated position, and takes the number affix and the noun to fill two distinct syntactic positions. The Num⁰-complex is formed by the number affix and the noun, the latter being only ‘superficially’ incorporated:

(26) a. ea rea kaarroo neey (Yapese)
    so car this
    ‘this car’
b. ea gal kaarroo neey
    dual car this
    ‘these two cars’
Based on morphological evidence from Spanish and Italian, Delfitto and Schroten state that number affixes are to be considered word markers in the sense of Harris (1991). Contrary to Ritter (1991), Picallo (1991) and Bernstein (1993), they take derivational and inflectional rules to apply uniformly to N⁻¹ elements, i.e. bound morphemes of the type libr-, the stem of the Spanish or Italian noun libro. The analysis is straightforward for Italian Ns: the ‘substitutional’ plural suggests that there are pairs of word markers which have to be interpreted as number affixes (e.g. libro ‘book (sg)’–libri ‘books (pl)’; casa ‘house (sg)’–case ‘houses. (pl)’). A more controversial consequence of this approach is that sigmatic plurals in Spanish are no longer considered the result of the addition of the plural affix -s to free morphemes, but reinterpreted as a purely syntactic operation in which the nominal stem incorporates into the number affixes -o, -a, and -e, the plural counterparts of the singular number affixes -o, -a, and -e. The advantage of the Delfitto and Schroten approach is the unified account of Spanish and Italian plural formation in syntax, as is illustrated below:

(27) a. libri (Italian)
    b. libros (Spanish)

books.mpl
The three previously sketched approaches to the expression of Number all agree on the idea that Number is generated in syntax as a DP-internal functional head. Nevertheless, they also show that the realization of the number features in a Num⁰-head can vary across languages. As such, Num⁰ can host:

(i) an empty category: N moves to Num⁰, which yields a singular interpretation (e.g. Ritter’s analysis for Hebrew singular Ns)
(ii) a number morpheme: N moves to Num⁰ and amalgamates with the suffix (e.g. Hebrew plural Ns)
(iii) a number word referring to the number of the N (e.g. Yapese singular, dual, trial words)
(iv) the complex [N-Num⁻¹] (e.g. Delfitto and Schroten’s analysis of Italian and Spanish inflectional Ns)

4.2 A GenP or WMP?

Based on data coming from Catalan nominals, Picallo (1991) postulates the existence of a GenP in addition to NumP. The basic motivation for the existence of a GenP is the fact that in Catalan, all nominals belong to a particular gender, which can — but doesn’t have to — have semantic content:

(28) a. el gos, la gossa
    the.MSG dog.MSG the.FSG dog.FSG
b. la discussió
    the.FSG discussion.FSG
Since Gender is always overtly expressed on the corresponding determiner and triggers grammatical agreement with the modifying adjectives, Picallo proposes that it projects into a syntactic functional category in all Catalan nominals, even when it does not have semantic content (1991:282). GenP is taken to be the complement of Num0, and has a [+N] subcategorization, which means that it takes an NP-complement which is either [+FEM] or [−FEM]. Successive cyclic movement of N to the functional categories Gen0 and Num0 results in the affixation of respectively gender- and number morphemes: the first movement adjoins N to Gen0 and the second one adjoins the complex [N0+Gen0] to Num0. The derivation for the plural feminine noun phrase *les gats* (‘the cats’) is given below:

(29)

In the same spirit, Bernstein (1993) claims that word markers, i.e. terminal vowels on Spanish and Italian nouns correspond to syntactic heads of a functional projection. Evidence in favor of such a W(ord) M(arker) P(hrase) comes from constructions in which WM0 licenses null NP-projections via head government. Contrary to Picallo (1991), Bernstein (1993) — based on Harris’ (1991) remarks on gender in Spanish — argues that the declension class of Spanish nouns does not necessarily represent gender. The distinction between gender and declension class is supported by the fact that agreement involves
gender, not declension class (cfr. la mano derecha, 'the right hand') and that gender is a property of nouns, while word markers are found on adverbs also (cfr. dentro ‘inside’, fuera ‘outside’).

Gender and declension class can converge in so-called ‘inner core’ nouns like hijo ('the boy') and hija ('the girl'). According to Harris (1991), the noun stem of masculine ‘inner core’ nouns is not specified for gender and declension class and gets the masculine gender and the word marker -o by default. The noun stem of its feminine counterpart is marked in the lexicon as [+FEM] and gets the default word marker -a. If gender and declension class do not converge, both are marked in the lexicon (e.g. programa 'program'). Bernstein (1993) therefore claims that word markers are syntactic elements projecting into a WMP. Since she also assumes the existence of a functional projection NumP, she takes WMP to be the complement of Num, so that the noun stem is base generated in N₀ and moves to WMP and to Num respectively, picking up its inflectional affixes as is illustrated in (30):

(30) un libro
    a book

```
DP
  Spec
  D'
    D₀
      Spec
      NumP
        Num'
          Num'
            WMP
              Spec
              WM'
                WM₀
                  NP
                    Spec
                    N'
                      N₀
```

```
4.3 A Poss(essive)P(hrase)

Following Sportiche’s (1990) proposal about the structure of VP in a Larsonian (1988) framework, Valois (1991) claims that the internal structure of the noun phrase is a layered structure in which the arguments of the θ-marking noun are generated in one of its phrasal projections: the external θ-role is generated in Spec, N* and the internal one as a sister to N. Head movement of N to N* takes place in order to license the external θ-role of the noun. N* is not projected if the noun does not assign an external θ-role. In French, these internal and external θ-roles can be combined with an additional possessor (examples from Valois 1991:20):

(31) a. la photo de ce photographe du Louvre
    the photo of this photographer.AGENT of the Louvre.THEME

b. la photo de ce photographe de ce collectionneur
    the photo of this photographer.AGENT of this collector.POSS

Valois assumes a structure in which the possessor is projected outside of the argument structure of the noun in a PossP, generated as the complement of D. The complement of the head of this PossP is the shell NP as is illustrated in (32):

(32) DP
    Spec D'
    D' PossP
    Spec Poss'
    Spec Poss
    Spec N''
    Spec N' N*0
    Spec N N
    Spec DP
    POSS AGENT THEME
The above structure can be considered the syntactic reflection of Giorgi and Longobardi’s (1991) Thematic Hierarchy which stipulates that possessors have a thematically higher position than external and internal arguments. Moreover, it automatically accounts for the asymmetric c-command between arguments in DP and likewise implements Cinque’s (1980) restriction on extraction out of DP: since the possessor is higher in the structure than the agent argument, the latter in its turn higher than the theme argument, a bound pronoun reading between two noun complements will only obtain if the pronoun is c-commanded by the DP containing the quantifier phrase (33 vs 34, examples from Valois 1991):

(33) a. le portrait de chaque collectionneur, de son artiste favori
   ‘the portrait of each collector (poss) of his favorite artist (agent)’
   b. la photo de chaque partisan, des Canadiens de son joueur favori
   ‘the photo of each Canadians fan (poss) of his favorite player (theme)’

(34) a. *le portrait de son, mécène de chaque artiste, favori
   ‘the portrait of his benefactor (poss) of each favorite artiste (agent)’
   b. *la photo de son, instructeur de chaque joueur, favori
   ‘the photo of his coach.poss of each favorite player (theme)’

Likewise, in DPs with two argumental complements, only extraction of the higher one is allowed (35 vs. 36):

(35) a. le collectionneur dont je connais la photo de ce photographe
   ‘the collector (poss) of whom I know the picture of this photogra-
   pher (agent)’
   b. le collectionneur dont je connais la photo du Louvre
   ‘the collector (poss) of whom I know the picture of the Louvre
   (theme)’

(36) a. *le photographe dont je connais la photo de ce collectionneur
   ‘the photographer (agent) of whom I know the picture of this
   collector (poss)’
   b. *le musée dont je connais la photo de ce photographe
   ‘the museum (theme) of whom I know the picture of this collector
   (poss)’

Other arguments in favor of the existence of a PossP can be found in Delfitto and D’Hulst (1995), where the the traditionally called ‘possessive anaphor’ proprio (‘own’) in Italian, is reanalyzed as the head of a functional projection
which can contain an empty or lexical possessor. Word order facts, agreement patterns, distribution, polite forms and predicative contexts show that *proprio* behaves differently from ‘ordinary’ possessives. The hypothesis put forward is that this difference in behavior depends on the different syntactic position filled by *proprio* with respect to pronominal possessives. Following Bernstein (1993) who suggests that certain adjectives may be heads of a higher functional DP-internal projection, Delfitto and D’Hulst claim that *proprio* heads the Poss(essive) Phrase, a projection immediately selected by D. The possessive pronoun fills the specifier of the same functional projection, yielding constructions like (37a). In cases where a lexical possessive is missing, they assume that there is an empty possesessive in Spec,PossP, corresponding to the syntactic realization of the possessor role and licensed by *proprio* (37b):

(37) a. la sua *propria* macchina
    the his.own.fsg car.fsg
    ‘his own car’

b. Gianni ha venduto la *propria* casa.
    John has sold the.own.fsg house.fsg
    ‘John has sold his own house.’

```
DP
   Spec D'
      D^D PossP
         Spec Poss'
            Poss^0 NP
                 Spec N'
                     N^0
                la sua *propria* macchina
                la e *propria* casa
```
4.4 Functional Projections hosting APs

Crisma (1990 and 1993) observes that the distribution of adjectives in the noun phrase shows regularities comparable to the distribution of adverbs in the VP. To capture the idea, current in the 70s, that adverbs and adjectives are contextual variants of the same abstract category, she proposes that APs should be treated in exactly the same way as adverbs, i.e. APs must be divided in a number of different subcategories on the basis of their interpretation and will be assigned to fixed positions inside the X'-structure of DPs. Each subcategory will be able to appear only in the Spec of a particular functional projection.

Following Crisma (1990), Cinque (1990 and 1993) shows that subject oriented APs preceding the noun can be preceded by a speaker-oriented AP, in its turn followed by a agentive adjective ('thematic' adjective in Cinque 1993) or an adjective denoting manner. Such a serialization closely resembles the serialization of adverbs in the sentence:

(38) a. la probabile goffa reazione immediata alla tua lettera (Italian)
   the.f.sg probable.sg clumsy.f.sg reaction.f.sg immediate.f.sg to you letter

b. Probabilmente avranno goffamente reagito subito alla tua lettera
   probably will.3pl have clumsily reacted immediately to you letter

According to Crisma (1990) and Giusti (1992, 1993), up to seven adjective phrases can be combined with a single NP:

(39) le sue due altre probabili goffe reazioni
    the.f.pl his.f.pl two other.f.pl probable.pl clumsy.f.pl reactions.f.pl
    immediate alla tua lettera
    immediate to your letter

Cinque (1993) comments on two possible solutions as to which position DP-internal APs are generated in: either they are adjoined to a maximal projection, as proposed in Piccallo (1991), Valois (1991), Bernstein (1993), Carstens (1991), a.o.; either the APs are generated in distinct specifier positions of a functional projection between D and N. Crisma (1993) and Cinque (1990, 1993) show that the latter analysis is preferable, even if it leads to the postulation of a higher number of functional projections between D and N.
Arguments against the adjunction hypothesis are: (i) the existence of specific unmarked serializations of different classes of APs with event nominals (40a) or object-denoting Ns (40b), while the ordering of adjoined elements is generally said to be free:

(40) a. poss > cardinal > ordinal > speaker oriented > subject oriented > manner > thematic
    b. poss > cardinal > ordinal > quality > size > shape > color > nationality

(ii) the clear limit on the number of attributive APs within DP (at most seven) whereas adjunction positions would be unlimited; and (iii) if APs are generated in the specifier position of a DP-internal functional projection, their appearance to the left of the head-noun must not be stipulated, since it follows from the location of specifiers (to the left of the head). If it is indeed the case that each class of adjectives is generated in the specifier position of a particular functional projection, an articulated structure as the one in (41) must be postulated. Similar observations are made by Giusti (1993), where the intermediate functional projections hosting APs are labeled Agr(eement)Ps, because of the number and gender agreement between the noun and the APs generated in the specifier positions of the DP-internal functional projections.
4.5 Case and Case Agreement Projections

Within a P&P-framework, it is generally assumed that in DPs, the genitive subject is base generated in the Spec, NP position where it is θ-marked by the noun and that the object genitive is base generated as a sister to the θ-marking head. Following Cornilescu (1993, 1994), in Romanian, the subject argument is not assigned genitive case in its base position, but in some lower agreement position, which she labels Agr(eement)Gen(itive) P(hrase). The idea that there
might be a relation between agreement and case was first suggested by Kayne (1989) who showed that in French, past participle agreement only occurs with structurally case-marked objects. Likewise, Valois (1991) claims that there is a close relation between structural case and agreement positions in DP. Cornilescu (1993) therefore argues that Romanian genitive is a structural case assigned in an agreement projection. The postulation of such an AgrGenP is motivated by the following facts: (i) in DPs with internal object and a purpose clause, the object of the noun phrase can control the PRO subject of the infinitival purpose clause; if the object stays in its base position (sister of N₀), it is not in a c-commanding position with respect to the purpose clause; in case of an AgrGenP, the object moves to Spec,AgrGenP where it is in a c-commanding position with respect to the subject of the purpose clause. Movement of the object to Spec,AgrGenP is only allowed if no lexical subject argument is present in Spec, NP, in order to avoid minimality effects (42):

(42) angajarea oportună PRO a acestui actor, pentru a interpreta PRO, rolul lui Hamlet (Romanian)

hiring-the timely of this actor in order to perform role-the of Hamlet
(ii) in a comparison with specific referential objects in Hindi, which can be assigned case in Spec,AgrOP (Mahajan 1990), Cornilescu argues that in Romanian, only specific DPs get structural case in Spec,AgrGenP. Non referential bare plurals for instance, are not found in the genitive case, but in the accusative (partitive) case, assigned by the dummy preposition de:

(43) Acordarea de bursă elevilor silitori. (Romanian)
    granting-the de scholarships.N/A pupils-the.PL.DAT hardworking.PL
    'The granting of scholarships to hardworking pupils.'

Several proposals have been made as to how many Case and/or CaseAgreement Projections must be postulated inside the DP:

(i) Valois (1991) claims there is one CaseP with its related agreement projection NumP;
(ii) Giusti (1993) does not mention a CaseP, but only a higher agreement projection hosting DP-internal arguments — Cornilescu (1994, 1995) postulates the existence of the same higher agreement phrase (NumP) and an additional lower case agreement phrase (AgrGenP)
(iii) Parodi (1994) argues in favor of a case agreement phrase and a separate case phrase (PossP)
(iv) D’Hulst, Coene and Tasmowski (2000) claim that DP internal functional categories contain a Case Projection and two Case Agreement Projections, NumP and CaseP

Valois (1991) assumes an internal DP-structure with one case position in addition to an agreement projection hosting the number features of the head noun. This NumP must be considered the nominal counterpart of the verbal AgrP, whereas CaseP is the counterpart of clausal TP. Their relation is shown in the following configuration:

(44) a. [DP [NumP Num [CaseP Case [NP N]]]]
    b. [CP [AgrP Agr [TP [VP V]]]]

Other proposals which postulate the existence of one single case position inside DP, can be found in Cornilescu (1993, 1994) and Giusti (1993). In particular Cornilescu (1993:126) claims that the ungrammaticality of DPs with two arguments can be explained by the fact that both arguments that must get case compete for the same case assignment position:
However, the same language allows constructions with two arguments if the highest one is pronominal and preceded by an articulated adjective. In order to deal with this type of constructions, the proposals alluded to crucially assume that the thematically higher argument is generated in the specifier position of the highest agreement phrase (NumP in Cornilescu (1995) and AgrPn in Giusti (1993)) and gets case from the determiner.

In the framework of Chomsky (1992), agreement in sentences is seen as a local relation in the checking domain of an element, i.e. the minimal residue of this element including its specifier and anything adjoined to the head or the specifier. Lexical elements must check their Case and Agreement features in the appropriate functional projections. Within this framework, Parodi (1994) postulates the existence of an agreement phrase below D, with the article base generated in Spec, AgrP and adjoining to D as a result of head movement after checking agreement with the noun head. For Spanish, she proposes possessors to be generated in the specifier position of PossP (see also Valois (1991), Delfitto and D’Hulst (1995), supra): the noun raises as high as Agr and checks agreement with the possessive. If no determiner is present in D, the possessive cliticizes to D and is spelled out in its weak form (su). In case a determiner is present, the possessive remains in situ and is spelled out in its strong form (suya). A possessive adjective representing the internal or external θ-role of the noun, must be base generated in an NP internal position in order to have its θ-role checked by the noun, after which movement of the argument to the specifier of PossP takes place:

(46) a. su casa (Spanish)
   her house.fsg

b. la casa suya
   the.fsg house.fsg her.fsg
Summarizing, it has been shown that the following agreement and case positions have been postulated with respect to the licensing of case on DP-internal arguments:

(i) the existence of one of the lowest agreement projections (labeled AgrGenP), taking NP as its complement (Cornilesescu (1993))

(ii) the existence of a higher agreement projection generated as a complement to D⁰ (NumP in Valois (1991) and Cornilesescu (1995), AgrP¹ in Giusti (1993))

(iii) the existence of a CaseP in one of the higher layers of the noun phrase generated as a complement to the AgrCaseP (CaseP in Valois (1991) and PossP in Parodi (1994), Delfitto and D’Hulst (1995)).

Analyzing the Hungarian examples of Szabolcsi (1994) in the light of these Case projections, we see that an agreement phrase above the highest case projection has to be postulated as well. In (47), for instance, possession is expressed by the agreement morpheme -ja on the possessee noun. In a parallelism with AgrSP in clauses, a second agreement case position that could be labeled AgrPossP is therefore in order. If the possessee noun then moves to the head of this agreement projection and the genitive phrase to its specifier,
the agreement morpheme on the noun can be considered the result of regular Spec–Head agreement:

(47) a Peter kalapja (Hungarian)

the Peter hat.poss

‘Peter’s hat’

Evidence in favor of the fact that AgrPossP and NumP is not a mere labeling question for one single projection but are different projections in the sense of Parodi (1994), can be found in the same Hungarian NPs: since the possessee noun bears distinct morphemes for number and possessive agreement, we must assume that they are checked in different functional projections. Consider example (48):

(48) a te kalap-ja-i-d

the you.nom hat-poss-pl-2sg

‘your hats’
5. Parallelism between the internal structure of VP and NP

Combining all arguments concerning the existence of DP-internal functional categories, the internal structure of noun phrases can be said to closely resemble the internal structure of clauses as assumed in Webelhuth (1995): the higher AgrPossP and PossP projection where Genitive case is checked in the noun phrase mirror the high AgrSP projection for nominative case in the sentence, and the lower AgrOP for accusative in the noun phrase mirrors the lower AgrOP for accusative in the sentence:

(49) a. \[ \text{DP} \rightarrow \text{AgrPossP} \rightarrow \text{PossP} \rightarrow \text{AgrOP} [\text{NP \ldots}] \]
   b. \[ \text{CP} \rightarrow \text{AgrOP} \rightarrow \text{TP} \rightarrow \text{AgrOP} [\text{NP \ldots}] \]

In addition to the structure given in (49a), two projections which are the locus for the checking of number and gender (or word marker) features of the noun must be assumed, which makes the complete internal functional structure of the noun phrase look as follows:

(50) \[ \text{DP} \rightarrow \text{AgrPossP} \rightarrow \text{PossP} \rightarrow \text{NumP} \rightarrow \text{GenP (WMP)} \rightarrow \text{AgrOP} [\text{NP \ldots}] \]
Case studies

1. On the internal syntax of the DP

1.1 From KP to DP

In his diachronic study of French Determiner Phrases, Paul Boucher discusses the emergence and subsequent evolution of the determiner system in French, which he claims not to be uniquely due to the loss of Latin case morphology, as is generally argued for in the literature (see a.o. Vincent 1997). In particular, it is shown that the erosion of case combined with the increasing attachment of deictic pronouns to the NP lead to a reanalysis of KaseP as DP, with demonstratives in Spec, DP and articles in D⁰. Old French, just like Latin or the Old Germanic Languages, is said to have a rich case and number morphology licensing so-called ‘det-drop’, i.e. they do not need overt determiners to express definiteness. Languages with a rich case system are thus taken to project a functional case structure KP indicating definiteness. Those with a weak case morphology, on the other hand, need an overt morphological head (the determiner) in D⁰. In this way, the reanalysis of KP as DP in the evolution from Latin to Modern French is explained as the consequence of the weakening of case morphology. Stressing the parallelism between the clause and the noun phrase, the loss of case morphology is said to lead to the loss of both the pro-drop and det-drop character of Latin and Old French. At a certain point in the evolution of French, D⁰ had to be filled by an overt determiner in order to bind the referential variable in NP. A second phase of reorganization in the DP is explained as the result of the loss of semantic content in demonstratives and articles, the first being reanalysed as an article under D and the second becoming a pro-clitic affix of number and gender agreement and at the same time a marker of definiteness. This shift in the DP-system is ascribed to both the erosion of case and number-gender morphology and the change in the prosodic organization of French.
1.2 DP-internal movement

Norbert Cover analyses two apparently identical constructions, namely quantity denoting NPs with a so-called ‘concrete pattern’ (e.g. *drie meter zijde* ‘three meters of silk’) and those with an ‘abstract pattern’ (e.g. *drie dagen vakantie* ‘three days vacation’). Both types of NPs differ in at least two respects: (i) the first cannot be followed by an approximative phrase while the latter can, and (ii) extraction of the measure constituent is only allowed in combinations with an abstract noun. It is shown that in spite of this different syntactic behaviour, both the concrete and the abstract pattern must be considered as complex nominal constructions of which the abstract or concrete noun is the semantic and the measure noun the syntactic nucleus. In both constructions, the semantic nucleus functions as the subject of the syntactic nucleus, i.e. the nominal predicate. The basic word order is said to be *subject-predicate*, the surface order is taken to be the result of movement of the predicate as nominal head to a complex functional nominal head in the case of the concrete pattern and as an NP to Spec,DP in the case of the abstract pattern. Based on evidence coming from the so-called *N van een N* (‘N of an N’) construction, Corver argues in favor of a third type of movement within the noun phrase, namely A-movement. He further discusses the reasons why the abstract pattern shows movement of the A*-type whereas the concrete pattern shows head movement. A cross-linguistic study of Hebrew, Dutch and English examples shows that there is no necessary connection between the type of pattern (abstract vs concrete) and the type of movement (head vs. A*) and that languages differ in the way the abstract pattern is expressed formally.

1.3 Not all pronouns are DPs

Rose-Marie Déchaine and Martina Wiltschko argue that there is no such thing as a ‘pronoun’ with a uniform syntactic structure. They show that at least 3 different types of pro-forms must be distinguished: (i) pro-DPs are independent pronouns with a morpho-syntactically complex structure; (ii) so-called pro-φPs have neither the syntax of determiners nor that of nouns but simply spell out φi-features, and (iii) pro-NPs have the same syntax as lexical nouns. Pro-DPs contain φP and NP as subconstituents. These different pronoun-types and their different phrase structure not only determine their distribution but also their semantic status and binding-theoretic status: pro-DPs are R-expression and thus subject to Condition C of the Binding Theory; pro-φPs
pro-\(\varphi\)Ps are variables, they can function both as predicates and as arguments and can hence act like Condition B pronouns, allowing to be bound outside their local domain; and pro-NPs have the syntax of nouns, as they are constants, they are undefined for their binding-theoretic status and do not show Condition C effects. These three different categories of pro-forms are represented by respectively Halkomelem independent pronouns, Shuswap independent pronouns and Japanese \textit{kare}. The pronominal inventory of English shows that a similar tripartition can be made with first- and second-person pronouns functioning as pro-DPs, third-person pronouns as pro-\(\varphi\)Ps and \textit{one} as pro-NP.

1.4 No Adj-movement

Mila Dimitrova-Vulchanova shows that explaining the variation in the order modifier-noun as the result of the nominal head or/and APs raising to a functional head/specifier for either licensing or for information structure reasons as proposed in Cinque (1994), is confronted to a number of problems: the N-movement approach cannot account for differences in interpretation between pre- and postnominal modifiers in languages which allow for both, nor can it account for the so-called ‘mirror’-order of post-nominal adjectives in French with respect to their pre-nominal English equivalents. An alternative account is found in the so-called compositional syntax/semantics isomorphy approach in Bouchard (1998) in which the combination of modifier and noun is the result of a merge operation combining two categories together. In such an approach, pre-N adjectives are said to be heads and sisters to N, whereas post-N adjectives are in a phrasal relation to N. Based on data coming from Bulgarian, Romanian and Albanian, the compositional merger account is shown to have a number of advantages over an N-movement approach: differences in the interpretation of the adjective are taken to be the result of differences in syntactic structure, the mirror-effect or fluctuations within the same language in the ordering of modifiers.

1.5 Noun ellipsis

Petra Sleeman adresses some problems with respect to the well-known subject-object asymmetries in French noun ellipsis, arguing against a purely syntactic account. Instead, she proposes a pragmatic/semantic account in which empty nouns can qualify as a topic, i.e. they cannot be newly introduced individuals but must have been previously introduced in the domain of discourse. Ellipsis
is said to occur if the whole DP is a topic as well as in the case of subordinate topics, this is with a quantifier functioning as the subordinate focus. The fact that in stylistic inversion patterns indefinite subjects are not allowed, is taken to be directly related to the focus status of postverbal subjects. Quantitative en, as a lexical variant of the empty pronominal pro, is said to be another device to create a subordinate topic. The same does not hold for its genitive counterpart, which merely marks the relation with the context. The differences in subject/object asymmetries between quantitative and genitive en are thus said not to be the result of structural differences, but to follow from their ability (resp. disability) to create a subordinate topic.

1.6 Number ambiguity in the DP

Based on evidence coming from Sakha, Kaan and Vinokurova propose to take the DP as a separate domain for processing. The particular construction they are concerned with is a noun phrase expressing possession in which the possesee is compatible with both the singular and plural interpretation (kiniler at-tar-a ‘their horse(s)’). The core idea is that the human parser resolves such ambiguities by taking the simplest structural analysis, i.e. it prefers the singular reading over the plural one. Singulars are said to be structurally simpler than plurals in that they lack a Number projection; a singular reading then results from the interaction of syntactic, lexical and pragmatic factors. It is argued that this is not the result of some universal semantic principle which prefers singulars over plurals: in similar data coming from Turkish, a plural interpretation is preferred over a singular one, suggesting that the resolution of the number ambiguity relies on language specific syntactic properties. However, in both cases, the preferred interpretation may later turn out to be incorrect. The second part of the chapter is concerned with the revision of the analysis: interpreting the ambiguous Sakha constructions as plurals instead of singulars is explained as the result of the so-called Extended Semantic Cost Principle, according to which revision is hard if the decision is semantically interpreted, together with the fact that the DP is a processing domain, closed off by the first word that does not belong to it. By closing off the DP, its referent will be established and the syntactic structure is no longer accessible. As a consequence, reanalysis of the ambiguity is more difficult if the disambiguating element comes in after DP-closure.
1.7 TFRs as a special instance of SFRs

Alexander Grosu studies the so-called Transparent Free Relatives (TFR) arguing against previous analyses in taking them to be configurationally identical to Standard Free Relatives (SFR). It is shown that the variety of transparency effects of TFRs, traditionally viewed as supporting an analysis of the semantic nucleus as the external head of the TFR, are comparable to those of SFRs. Following this line of thinking, it is proposed that TFRs are a special instance of SFRs, both being analyzed as having null material in external head position, their overt material being internal to the relative CP. In both cases, the *wh*-phrase is in some Spec position of the COMP-area; TFRs are a subclass of SFRs for which the semantic nucleus is in the predicate position of an embedded small clause. The subject of this small clause is bound by the *wh*-element. A number of arguments are given in favor of the hypothesis that TFRs and SFRs share their configurational properties, morpho-syntax and typing interpretable properties.

2. The syntax and semantics of bare nouns and indefinites

2.1 Weak indefinites

In his study of *Weak Indefinites*, Greg Carlson considers the ambiguous reading of bare plurals, confronting Diesing’s (1992) Mapping Hypothesis according to which bare plurals are interpreted existentially if appearing within the VP but generically if appearing in the IP, to his own framework which could be defined as a combination of event semantics and propositional semantics. In particular, he addresses the question why only weak indefinites may appear within the VP. Examining the nature of some constructions that must occur within the VP, and in particular of incorporation and incorporation-like structures, he argues that these give rise to a denotation that is within the denotation-type of verbs themselves and which is qualitatively different from the denotation-type of sentences in semantic type and in the parameters of semantic evaluation. As the result of their preserved lattice structure of eventualities and their ability to be defined without reference to context, weak indefinites are the only arguments types that do not need to be moved out of the VP. The fact that there is existential closure at the VP-level only is attributed to the existence of an existential quantifier
as the consequence of the projection of eventualities into the domain of propositions. The existence of two argument positions, a ‘higher’ and a ‘lower’ one, would follow from the fact that argument information is needed for both the event and propositional semantics.

2.2 Determinerless nouns

Based on comparative material in the Romance-Germanic domain, Giuseppe Longobardi investigates the Syntax–Semantics mapping in the nominal system and in particular that of bare common nouns, which show a cross-linguistic constant syntax but have a variable semantics. It is shown that Italian bare nouns interpretively pattern with overt indefinites in achieving a generic reading through an external operator of generality which can be stage- or individual-level predicates with habitual aspect or adverbs of generalizing quantification. For all cases in which a generic reading is not possible for a bare noun, it can be replaced by the corresponding overtly definite DP. These generalizations lead to the hypothesis that in Italian, and more generally in Romance languages, bare nouns are indefinites, i.e. existentially or generically bound quantificational variables. With respect to the formal expression of genericity in Romance, two different types are distinguished: referential generics expressed as definite DPs and quantificational generics expressed through various sorts of indefinite DPs bound by external operators of generality. In combination with an external operator of generality, English generic bare nouns differ from their Italian counterparts in that they are not quantificational indefinites but kind-referring expressions. The descriptive semantic parametrization following from this assumption is that Romance bare nouns are only existentially or generically bound quantificational expressions whereas English bare nouns are potentially ambiguous between a referential and a quantificational interpretation. This semantic parametrization is extended to the syntax of object referring nouns and more specifically that of proper names: in Romance languages, but not in English, such object referring nouns are obligatorily preceded by either an expletive article or an adjective. Relating the two types of determinerless nominals (bare common nouns and bare proper nouns), a cross-linguistic typological generalization is proposed stating that proper nouns may occur without a phonetically filled DP iff generic nouns may freely do so. It is further argued that there is a parametrical relation between the syntactic differences w.r.t. proper nouns and the semantic differences w.r.t. bare nouns in English and in the Romance
languages. Cross-linguistically, two different parametric strategies can be found: either referential status can be assigned to nominals without overtly expressed D as in English, either reference depends on an overtly expressed D-position, as in Romance. Such a very close mapping theory between syntax and semantics thus allows for one and the same parameter to account for the syntax of proper nouns and the semantics of bare nouns.

2.3 Indefinites

Fred Landman confronts two theories of arguments and predicates, the Montague–Partee approach, consisting of Partee’s 1987 theory of predication combined with the generalized quantifier theory of determiners and the so-called Adjectival theory of determiners based on an unpublished debate between Partee and Link in the eighties. Crucial to the Montague–Partee approach is that all noun phrase interpretations are born at argument types; predicate interpretations are derived from argument interpretations with type lowering operation BE, which takes a generalized quantifier and maps it onto the set of individuals for which the property of being that individual is in that generalized quantifier. The adjectival theory, on the other hand, takes indefinite noun phrases to be born at the predicate type and argument interpretations to be derived from predicative interpretations through type lifting with existential closure. In a ‘competition’ between both approaches, the author shows that the Generalized Quantifier analysis wins out on the set/property analysis of indefinites in the adjectival theory due to the failure of the latter to have an account for the downward entailing cases. With respect to the derived interpretations, both theories loose the match since a more complex operation is needed integrating maximalization effects for scopal and non-scopal readings of arguments of relations. It is argued that predicates are formally DPs and not NPs, whereas at the same time they have a set interpretation, illustrating a particular mismatch between syntax and semantics.

3. On the expression of measurement in the noun phrase

3.1 Measure Nouns

Almerindo Ojeda sketches two major approaches to the semantics of measure nouns: the first takes them to denote sets of abstract measures, independent
from the entities that exhibit them whereas the second rejects the independency theory and interprets measure nouns as relations denoting a measure function. It is shown that the second approach runs into several problems. Alternatively, based on a Russellian model for the interpretation of numerals as sets of numerically equivalent entities, measure nouns are interpreted as sets of metrically equivalent entities. The model $M$ has a metric domain $D$, consisting of a set of elements that are measurable, and of isometries, i.e. subsets with the same measurement. Isometries can be closed under the operation of discrete addition of $M$ as a function that assigns to each nonempty set of pairwise disjoint elements of $M$, the least upper bound for that set. The central claim of the chapter makes use of these notions, taking “the reference of the root of any measure noun relative to $M$ to be the closure of an isometry of $M$ relative to $D$ under the operation of discrete addition of $M.” In the same spirit, the reference of the singular/plural inflection is defined as a function that assigns to each atomistic subset of $M$ the set of atoms resp. nonatoms of that subset. Assigning first-order interpretations to measure nouns, the advanced proposal takes them to denote sets of independently motivated elements of the model. It is further shown that the proposal extends to the interpretation of non-natural measures.

3.2 Quantitative and qualitative constructions

Jenny Doetjes and Johan Rooryck argue in favor of a parallelism between qualitative and quantitative constructions with the syntactic structure $N_1$ $de$ $N_2$. Both types show two agreement patterns, correlating with the interpretive nature of the quantitative element: if in comparative constructions, the quantifying or qualifying noun retains some of its lexical meaning, it will determine agreement; if, on the other hand, it has become a pure degree expression, agreement will occur with the nominal element following $de$. The analysis put forward takes the difference in agreement to be the result of a structural difference. In particular, in comparative constructions the quantifying or qualifying noun is said to be extracted from a clausal projection introduced by $de$ (in a Kayne 1994 approach), whereas pure degree constructions do not involve a similar predicate inversion, but have a syntactic structure containing an adverbial functional projection expressing Evaluation in the sense of Cinque (1999). It is further shown that agreement inside the qualificational constructions depends on the nature of the qualifier.
3.3 Pseudo-partitive constructions

The pseudo-partitive constructions discussed by Melita Stavrou correspond to what has been labeled by Doetjes and Rooryck as quantitative constructions expressing pure degree. The proposal put forward is that these pseudo-partitive constructions are a single nominal projection with a single referent. The core idea is that the quantifying nominal element is semantically and syntactically similar to simple quantifiers, behaving like a QP in the extended nominal structure. The quantifying element is further said to be semi-lexical, heading its own category and selecting a lexical NP as its complement. Grammatical categories are thus said to include semi-functional categories alongside functional and lexical ones. In a parallelism with simple quantifiers, the pseudo-partitive construction is treated as a QP with argumental properties, selecting a Classifier or Measure Phrase as its functional complement, the latter hosting the quantity denoting noun. Such an analysis crucially differs from the one proposed by Doetjes and Rooryck in that no DP is involved and that Measure Phrase is a semi lexical/functional category which is part of the extended structure of the noun. The author further proposes to reduce the difference between the quantity reading of pseudo-partitive constructions and the so-called container-reading to the different type of grammatical category instantiated by the quantifying nominal element which can be semi-functional or lexical in nature.

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Chapter 1

Determiner Phrases
in Old and Modern French

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Université de Nantes

0. Introduction

The presence of determiner categories in French is attested in the earliest texts extant. Thus in La Cantilene de Sainte Eulalie we find examples of definite articles, demonstratives and possessives.

(1) li Deo inimi  ‘the enemies of God’
(2) les mals conselliers  ‘the bad counselors’
(3) la polle  ‘the girl’
(4) sa virginité  ‘her virginity’
(5) celle kose  ‘that argument’

There is an abundant literature on the emergence of determiners in Romance in which it is often argued that the loss of morphological case in Latin lead to the rise of articles. So Tekavčić (1980: §452) writes: “The article emerges therefore in step with the loss of noun inflection as one of the substitutes for it”. Abraham (1997) has shown how the morphological case system in Old Germanic could express definiteness, as in Modern Russian and Polish, through the choice of different m-cases for the object of a verb. As the case system was lost, he argues, an alternative means had to be found to signal
definiteness and the article emerged. However, Vincent (1997) claims that the situation in Romance was somewhat different. Although Latin had case and did not have articles and its daughter languages have articles but do not have case, the path of evolution was not quite the same as in Germanic, since case did not have quantificational functions in Latin. The relatively free word order of Latin meant that objects needed to be identified as such and m-case served that function. As case eroded, unstressed pronouns took over. Romance clitic pronouns developed from these. Discourse status was also identified by the former deictic elements *ipse* and *ille* attached to the nouns. It is from these that the articles of modern Romance developed.  

In this chapter I will argue that the emergence and the subsequent evolution of the determiner system in French was due to a number of interdependent factors, including but not limited to case morphology. In section one, I will examine the pertinent OF data and sketch out the main lines of my analysis. I will show that the erosion of case and the increasing attachment of deictic pronouns to NP for discursive reasons in Proto-Romance lead to a reanalysis of KaseP as DP, with demonstratives (optionally) in Spec,DP and articles (optionally) in D0. The optional nature of determiners in referential NPs in Old as opposed to Modern French, I claim, is directly linked to the robust number morphology on nouns and adjectives in Old French. Conversely, the ability of all OF determiners to be used pronominally is due to their complex (in the sense of Chomsky 1995) semantic makeup. Finally, I will argue that the pre-nominal position of predicative adjectives in OF and the collocation of determiners and possessives are proof of the existence of an independent Agr projection under DP.

In section two I will formalize the analysis presented in section one. In section three, I will discuss Modern French DPs. I will argue that changes in the use of determiners and the position of adjectives in Modern French are due to a number of converging factors:

— the loss of tonic word stress (Marchello-Nizia 1995);
— the subsequent loss of internal semantic structure in determiners;
— the loss of agreement morphology.

I claim that the gradual extension of the definite article to include generic reference, coupled with the loss of phonologically active number morphology on nouns and adjectives, has lead to a reanalysis of the D and Agr projections in Modern French. Crucially, definite and indefinite articles can now be
claimed to have ‘lowered’ to the Agr position, while demonstrative determiners have been reanalyzed as articles and now occupy the D position. These converging forces also explain the shift in the canonic position of predicative adjectives from the pre-N to the post-N position.

1. Old French DPs

1.1 Case agreement

Old French was one of the few Romance languages, along with Old Occitan and Romanian, to have preserved traces of the Latin case system (Marchello-Nizia, 1995: 66). However, it kept only two cases, nominative or ‘cas sujet’, and accusative or ‘cas régime’ and then only for DPs headed by masculine nouns. Moreover, the only overt mark of case was a final -s suffix which was confusing in that while masculine plurals carried final -s in the object form, they had zero inflection in the subject form, although feminine DPs ended in -s in both functions. I thus claim that while agreement inflection appeared on determiners and adjectives and was phonologically active in Old French, it was relatively weak, in comparison with Latin or Old Germanic.

Table 1. Case, Number and Gender agreement in OF DPs with definite articles

<table>
<thead>
<tr>
<th>Cas sujet</th>
<th>Cas régime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSG</strong> li biaus chevaliers</td>
<td>li biauz tchevaliez</td>
</tr>
<tr>
<td><strong>MPL</strong> li biau chevalier</td>
<td>li biauz tchevalierz</td>
</tr>
<tr>
<td><strong>FSG</strong> la belle dame</td>
<td>la belle dame</td>
</tr>
<tr>
<td><strong>FPL</strong> les belles dames</td>
<td>les belles dames</td>
</tr>
</tbody>
</table>

Table 2. Case, Number and Gender agreement in OF DPs with indefinite articles

<table>
<thead>
<tr>
<th>Cas sujet</th>
<th>Cas régime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSG</strong> uns biaus chevaliers</td>
<td>[iz biauz . .]</td>
</tr>
<tr>
<td><strong>MPL</strong> un biau chevalier</td>
<td></td>
</tr>
<tr>
<td><strong>FSG</strong> une belle dame</td>
<td>une belle dame</td>
</tr>
<tr>
<td><strong>FPL</strong> unes belles dames</td>
<td>unes belles dames</td>
</tr>
</tbody>
</table>
1.2 Determiners

1.2.1 Demonstratives

One of the major differences between the Old and the Modern French determiner systems is the fact that OF could use all of its determiners, whether definite or indefinite articles, possessives or demonstratives, as bare pronouns in referential A-positions. Thus, for instance, while Modern French opposes a set of definite articles (le, la, les) to a set of clitic pronouns (le, la, lui, leur, etc.), as well as a set of demonstrative determiners (ce, cet, cette, ces) to a set of demonstrative pronouns (celui, celle, ceux, celles), Old French used the same sets of words for both determiner and pronominal functions.

Three distinct demonstrative systems co-existed in OF, the ‘-l forms’ expressing distal orientation relative to the speaker (Table 3), the ‘-st forms’, expressing proximity relative to the speaker (Table 4) and the ‘ce forms’, which though they were neutral in terms of deictic orientation, were still contextually marked and could only be used if their NP or antecedent corresponded to a previous (‘anaphoric’) or subsequent (‘cataphoric’) mention (see Epstein 1995, Kleiber 1990, Foulet 1977, and Marchello-Nizia 1995 among many others for discussion).

Table 3. Case, Number and Gender agreement in OF DPs with distal demonstratives (‘-l forms’)

<table>
<thead>
<tr>
<th>Cas sujet</th>
<th>Cas régime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSG</strong></td>
<td><strong>MPL</strong></td>
</tr>
<tr>
<td>cil biaus chevaliers [tsil]</td>
<td>celui bel chevalier [tsel/tsely]</td>
</tr>
<tr>
<td>cil biau chevalier</td>
<td>cels/ceus’ biaus chevaliers [tsel/tselu]</td>
</tr>
<tr>
<td><strong>FSG</strong></td>
<td><strong>FPL</strong></td>
</tr>
<tr>
<td>cele belle dame</td>
<td>celle belles dames</td>
</tr>
<tr>
<td>[tsx]</td>
<td>[tsx]</td>
</tr>
</tbody>
</table>

Table 4. Case, Number and Gender agreement in OF DPs with proximal demonstratives (‘-st forms’)

<table>
<thead>
<tr>
<th>Cas sujet</th>
<th>Cas régime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSG</strong></td>
<td><strong>MPL</strong></td>
</tr>
<tr>
<td>cist biaus chevaliers [tsist]</td>
<td>ceste/cestui bel chevalier [tsetst]</td>
</tr>
<tr>
<td>cist biau chevalier</td>
<td>cez biaus chevaliers [tses]</td>
</tr>
<tr>
<td><strong>FSG</strong></td>
<td><strong>FPL</strong></td>
</tr>
<tr>
<td>ceste belle dame</td>
<td>ceste belles dames</td>
</tr>
<tr>
<td>[tses]</td>
<td>[tsest]</td>
</tr>
<tr>
<td>cez belles dames</td>
<td>cez belles dames</td>
</tr>
</tbody>
</table>
Determiner Phrases in Old and Modern French

(6) Et je panrai cel bon destrier quernu / Toutes ces armes et cel pezant escu / Droit a Paris m’en irai a vertu (M-N, 127), MnF: ce bon destrier-là, ces armes-ci, ce lourd bouclier-là ‘And I’ll take that horse with a long mane, all these arms and that heavy shield, and go to Paris for sure.’

(7) En cheste vile / En ai jou bien plus de deux mile (F, 168), MnF: cette ville-ci ‘I have well over two thousand of them in this town.’

(8) Chestes ont chent diavles ou cors . . . (F, 1977), MnF: Ces *(femmes) ont cent diables au corps . . . ‘These (women) have a hundred devils in them.’

(9) Ha! Fine amor! Et qui penssast/Que cist feist vers moi desroi/Qui disoit . . . (F,170 ), MnF: celui-ci ‘Oh love! Who would have thought that he (previously mentioned knight) would act so desperately towards me, he who used to say . . .’

(10) En ce lay du Vair Palefroi / orrez le sens Huon le Roi. (F, 169), MnF: ce lai-ci ‘In this (cataphoric) lay of the dapple-grey palefrey, listen to the meaning, Huon the King’,

(11) Dieus! Tant escot de sols et maille! / Quant avrai jou tout ce gasté? (F, 167), MnF : tout cela ‘My God! So much silver and coins! When will I have spent all that (anaphoric).’

(12) Quant la fille le duc vit ce, si en fu mout corociee. (F, 168), MnF: a vu ceci ‘When the Duke’s daughter saw that (anaphoric), she got very angry.’

Contrary to Modern French, OF demonstratives were ‘complex’ in Chomsky’s (1995) sense of the term, in that they had internal structure and did not cliticize. I will note their semantic features as follows: [+Deictic, ±Proximal] for the two deictically oriented series and [−Deictic, ±Cataphoric] for the ce series. I will represent this complexity in the form of a branching morphological structure adapted from Kerstens (1993), assuming that the interpretable features of a word belong to its root node (x), while its un-interpretable grammatical features (Case, Number, Gender) are complements of the root node (y).
Furthermore, given the phonologically active, that is 'strong' nature of agreement morphology in OF, I will argue that determiners could project independent DP structures. Each determiner raised to the head position, thus binding their trace, which can be thought to correspond to a referential variable in the sense of Higginbotham (1986). This structure accounts for the ability of bare D’s to refer in OF.

Extending Philippi’s (1997) analysis of Old Germanic determiners to Old French, I will claim that demonstrative determiners occupied the Spec,DP position of the extended nominal projection. They were only used when the situation called for anaphoric or cataphoric reference, thematisation or discursive marking of some sort. I will thus consider that their complex semantic content made operators of them. Moreover, according to Marchello-Nizia (1995:168), they could be stressed and were systematically stressed when carrying the deictic prefix i-.8

1.2.2 Definite articles
While all referential NPs in Modern French must be accompanied by a determiner, Old French only used articles when the situation called for it, that is, when the NP was either definite or at least, as concerns the indefinite article, specific. Generic, indefinite or abstract NPs systematically used bare nouns, including countable singulars. Conversely, indefinite as well as definite articles could stand alone as pronouns. As seen above, masculine articles agreed in case, number and gender with their nouns, while feminine articles agreed only in number and gender. We’ll tentatively note the semantic content of definite articles in Old French as [+Definite], meaning by this that they can only be used in a context where the NP corresponds to an entity whose existence has previously been established in the discourse.9 The formal representation of demonstratives presented above (12, 13) can be straightforwardly applied to definite and indefinite articles by simply replacing the deictic root features by a [+Definite] feature.
The loss of deictic content lead to the loss of operator status. As a functional head word, the article must now head-join to the weak Kase affix under D.

(16)  \[Li \text{ palefroi enselé furent} / Et tuit \text{ li ancién qui durent} / Adestrer cele \text{ damoisele furent monté}. \] (F, 50), MnF: les palefrois, les anciens

‘The palefries were saddled, and all the elders who were to accompany that damsel had mounted.’

(17)  \[Issir ne \text{ li puet a nul fuer} / \text{ La grant pesance de son cuer},/ \text{ Ne la dolor ne la grant paine} . . . \] (F, 50), MnF: le grand poids, la douleur, la grande peine

‘He can confide to no one the great weight on his heart, nor the sadness, nor the great pain.’

(18)  \[Il \text{ abati ton cheval et le Perceval ensemble} \] (F, 53), MnF: Il abattit ton cheval et celui/*le de Perceval ensemble.

‘He knocked down your horse and Perceval’s (literally ‘the of Perceval’) together.’

(19)  \[Fole ne \text{ suis ne n’ay seigneur}/Ne \text{ poursuite de compaignon} / \text{ Se la de Dieu le puissant non}. \] (F, 52), MnF: sinon celle de Dieu

‘I’m neither mad, nor have I a master, nor any friends pursuing me, unless it be that of God Almighty.’

1.2.3  *Bare NPs*

OF allowed bare NPs to occupy referential A-positions in generic use or with abstract meaning, or in general whenever the individual referred to was not specifically mentioned in previous or succeeding discourse. This use of bare NPs in referential positions included not only uncountables (20) and plural count nouns (21), but also singular countable nouns (22, 23).

(20)  \[Mirre \text{ e timonie i firent alumer} \] (Epstein 1995), MnF: Ils brûlèrent de la myrrhe et de l’ encens

‘They burned myrrhe and incense.’

(21)  \[Galois \text{ sont tuit par nature} / \text{ plus fol que bestes an pasture} \] (F, 51), MnF: les Galois, des bêtes

‘(The) Gauls are all naturally mad / crazier than animals let out to pasture.’
(22)  *Hom* ki traisit autre, nen est dreiz qu’il s’en vant.(ibid), MnF: *(Tout)*
    homme qui trahit son semblable. . .
    ‘It is normal that a man who betrays his fellows should not boast of it.’

(23)  *Uns clers si pert se frankise/ Par espousier en sainct eglise/ Femme* ki ot
    *autre baron*, MnF: une femme, un autre homme
    ‘A cleric loses his privileges when he marries a woman who has already
    had another husband.’ *(F, 56)*

Extending Philippi’s (1997) claim that case inflection can mark NPs as
(in)definite in languages without overt determiners, I will consider that the
phonologically active number and case morphology of Old French was
sufficient to bind the referential argument position in NP. Use of definite or
indefinite articles corresponded to marked discursive situations when either a
specific individual is referred to, or a particular, non-specific but previously
mentioned individual or individuals are referred to. The same formal mecha-
nisms used for determiners can be applied to bare nouns. The complement
node carries the number, gender and case features, which will project an
agreement phrase to which the lexical head word raises, thus binding a trace-
variable and ensuring referentiality. Given the fact that singular as well as
plural nouns, count or uncount, carried agreement morphology, we find
instances of all of these nouns being used alone in referential positions.

2. Analysis of Old French

2.1 Case and definiteness

I will begin by drawing a parallel between clause structure and noun phrase
structure, from a referential point of view. Let us first assume, following
Higginbotham (1986), that the NP acts semantically as a predicate and that
this predicate, in addition to lexically fixed theta-arguments, has at least one
referential argument. Secondly, extending Philippi’s (1997) analysis, I would
like to claim that languages like Latin, Finnish or the Old Germanic languages,
which have strong case morphology, are ‘det-drop’ in that they do not need
overt determiner words to express definiteness. Thus I claim that case and
number morphology is to determiners what tense and agreement morphology
is to subjects in so-called ‘pro-drop’ languages. In both cases, strong inflec-
tional morphology may licence an empty functional head position, *T* or *Agr*.
in the latter case, D₀ in the former, without the need for an overt operator in Specifier position to check the features of this F₀. It is certainly not a coincidence that most pro-drop languages are also det-drop, nor that the loss of pro-drop status for Old French coincided historically with the loss of det-drop status.

I will therefore posit first of all that Latin NPs projected a functional case structure, KP, which indicated definiteness.¹¹

\[
\text{(24)} \quad \begin{array}{c}
\text{KP} \\
\text{Spec} \\
\text{K'} \\
\text{NP} \\
\text{montes}
\end{array}
\]

2.2 The definiteness cycle

It has frequently been noted (Dees 1971; Harris 1977; Marchello-Nizia 1995; Abraham, Philippi, and Vincent 1997; Lyons 1999) that the modern French and English determiner systems emerged from older demonstrative pronoun systems which themselves developed out of deictic spatial pronouns. Hence, French definite articles, demonstratives and clitic pronouns evolved from the OF demonstrative articles and pronouns, which in turn developed from Latin deictic pronouns.

Latin had no articles and expressed definiteness through its case system and through the use of deictic pronouns. It had a rich demonstrative system, expressing not only three-way person-based deictic contrast, but also deictic neutrality.

\[
\text{(25)} \quad \begin{array}{l}
\text{General: is, ea, id} \\
a. \quad \text{hic, haec, hoc} \\
b. \quad \text{iste, ista, istud} \\
c. \quad \text{ille, illa, illud}
\end{array}
\]

In Classical Latin instances of ‘demonstratives’ being used as anaphoric pronouns are attested (Serbat 1980: 95) and in Vulgar Latin former demonstratives are frequently used as simple pronouns or as anaphoric determiners (Marchello-Nizia 1995: 119). As the demonstrative force of Latin deictic pronouns weakened, they began to be used in NPs as markers of
emphasis, anaphora or thematisation. Let us hypothesise that they could optionally occupy the Spec, KP position, the head of which was occupied by the appropriate case feature.

(26) \[ KP \\
\quad \text{Spec} \\
\quad \text{K}' \\
\quad \text{NP} \]

As the demonstratives began simultaneously to lose some of their semantic content and to be attached more and more frequently to NPs (or KPs), Latin was forced to create a new, reinforced system by pre-fixing the deictic adverb *ecce, ecce-*ille etc.

(27) Ubinamst is homo gentium? — Eccillum uideo.
     'where then is this man? — this one that I see.'
     Plautus, Mercator, 3rd century BC. (Marchello-Nizia 1995: 120)

OF demonstratives developed out of these compound forms: *ecce+ille* → *cil, cel, celui, etc.; ecce+iste* → *cist, ceste, etc.* (M-N 1995: 120). Definite articles and clitic pronouns developed from the *ille* series, in OF as in the other Romance languages. This difference in origin explains in part the difference in semantic content of articles and demonstratives in Old French, the former issued from (weakened) demonstratives, which were being used more and more often as anaphoric determiners, and the latter from reinforced demonstrative pronouns, from which they took their deictic force.

The significant weakening of case morphology in the transition from Latin to Old French lead to the use of overt articles to express definiteness. Once adjunction of an overt morphological head to D* became necessary in order to license the weak and intermittent case markers (*s/O*) of OF, we can assume that KP was reanalyzed as DP.

(28) \[ DP \\
\quad \text{Spec} \\
\quad \text{D'} \\
\quad \text{D} \\
\quad \text{NP} \]

\[ li/uns \\
\quad \text{[K]} \\
\quad \text{chevaliers} \]
Extending Philippi’s analysis of demonstrative determiners in Old Germanic to Old French, we can assume that these demonstratives were generated in Spec,DP, whence they could bind the referential argument position of NP through C-command.

That definite articles did indeed occupy the D⁰ position in Old French while demonstratives occupied the Specifier position is attested by the Preposition-Determiner contraction which can be found in the earliest texts. Demonstratives however never contracted with preceding prepositions nor with following nouns.

The Head-Movement Constraint does not allow a maximal projection specifier to cliticize to a head. Only heads may raise to the next highest head position. It is therefore to be expected that definite articles under D should cliticize to P while demonstratives under Spec,DP should not.

OF can thus be said to have had the following determiner system at the time of La Chanson de Roland (1100):

— NP projects a DP;
— specific definiteness is indicated by the presence of an overt definite article in D;
— non-specific definiteness may be indicated by the presence of an overt indefinite article in D;
— demonstrative determiners can occupy Spec,DP to express anaphoric, cataphoric, thematic or emphatic reference;
— all determiners can stand alone, that is, all determiners can project independent DP structures.

Moreover, the collocation of definite articles and possessives (31, 32) and the location of the majority of predicative adjectives in pre-N positions in OF (33)–(36), suggests the presence of an agreement projection below D.
(31)  la nostre police française (M–N 1997 :307)
MnF: notre police ‘our French police force’

(32)  en un son chastiel (idem), MnF: en son
‘in a castle of his’

(33)  Li cuens aime droite justice / Et loiauté et sainte yglise, MnF: la justice
droite, la loyauté et l’église sainte, (Graal, 25–6)
‘The count likes true justice, loyalty and the holy Church.’

(34)  Par la fresche erbe verdoient, / Et cil qui bien lancier savoit (Graal,
92–3), MnF: à travers l’herbe fraîche qui verdoyait, en homme qui
savait bien lancer ‘across the bright green grass/(came) the one who
could throw his spear with skill’

(35)  Est che nient une à unes vers dras, / Roïïés d’une vermeille roïe?, MnF:
des vêtements verts, une raie rouge
‘Isn’t that one (a person) with green clothes with a red stripe?’ (F, 62)

(36)  Il acate mort pisson. MnF: il achète du poisson mort.
‘He buys dead fish.’

(37)

On the other hand, the robust number morphology of Old French sufficed to
ensure referentiality when the NP was neither definite nor specific, since N
was forced to raise to Agr⁰ and thus to bind the referential variable. In addi-
tion, demonstrative determiners were used to express deictic orientation.

2.3 Subjects and Determiners

Pursuing the clause/noun phrase parallel, I will extend to NP the traditional analysis (Foulet 1977) of the rise of overt subjects in French as being due to the loss of case morphology on the arguments of the verb. Just as French ceased to be a pro-drop language at some point during the Middle French period, so it ceased to be a det-drop language at about the same time. Assuming that the loss of agreement morphology led to the Spec, TP position having to be filled by an overt subject in order to bind an event variable in VP, so the loss of case and number morphology lead to D0 having to be filled by an overt determiner in order to bind the referential variable in NP. Moreover, the loss of semantic content in demonstratives and articles triggered a second phase of reorganization under DP, with ce being reanalyzed as an article under D and le gradually becoming a pro-clitic affix of number and gender agreement, as well as a marker of (extended) definiteness. This shift is not due solely to erosion of case and number-gender morphology, but also to a change in the prosodic organization of French.

2.4 Tonic stress

Marchello-Nizia (1995:170–2) argues that pronominal use of demonstratives in OF, such as (12), renumbered as (38), is only possible if the item in question receives tonic word stress.

(38) Quant la fille le duc vit ce, si en fu mout corociee.

She reasons as follows. We know that Latin had independent word stress. We also know that Modern French does not. It is characterized by so-called ‘oxytonic’ stress. Words receive stress in French only if used alone, and then only on the final ‘masculine’ (i.e. not silent -e) syllable. In a phrase, final stress falls at the end of the phrase. Likewise for a clause or sentence. There is no longer any independent word stress in French. We can therefore hypothesize that somewhere in the transition from Vulgar Latin, to Proto-Romance, to Old French, to Modern French, tonic word stress was lost. Since Old French opposed a series of stressed personal pronouns to a series of atonal pronouns

(39) gie/je, lui/le, moi/me, etc.
it is reasonable to suppose that it used tonic stress contrastively, opposing stressed and unstressed words and syllables. If OF had word stress and MnF does not, then the transition must have taken place during the MF period. Based on the gradual disappearance of pronominal demonstratives and the first recorded occurrences of the deictic suffixes -ci and -là, M-N reasons that the transition took place around the 15th century. In the following examples, ci takes over the function of cist and la that of cil:

(40) Mais en ce debat cy nous sommes . . . (Villon, Testament, v. 1467)  
‘But we are engaged in this debate.’

(41) . . . de ce temps la peux tu avoir remembrance . . . (Cartier, Quadrilogue invectif, p. 26)  
‘Can you remember that period of time’

(42) Si ne peurent passer oultre par ce pas la . . . (Froissart, Chroniques, I, p. 384)  
‘If they cannot get out that way.’

As stress in French moved towards phrase-final position, the item carrying the deictic orientation feature moved from initial to final position as well. Thus ices tui chevalier or icle table (with stress on the bold syllables) evolved towards ce chevalier-ci, and cette table-là. Thus the theory of the ‘determiner cycle’, based on the loss of semantic content by demonstrative pronouns and their reanalysis as definite articles, can be linked to the loss of tonic word stress, in French at least. In English, where word stress was not lost, definite articles did not evolve towards becoming simple markers of ‘specificity’, as they did in French and demonstratives maintained their deictic orientation features, and so we reason here, their ability to be used either as demonstrative pronouns or as nominal determiners.15

2.5 Adjective Positions

This reorganisation of the French DP also affected adjective positions. Before turning to an analysis of Modern French DPs, we’ll look briefly at OF adjective distribution. There seems to have been much greater freedom of movement for OF adjectives than for their modern counterparts. Nonetheless, the canonic position for predicative adjectives seems to have been the pre-N position.

Out of 174 DPs taken from Le conte du Graal of Chrétien de Troyes (c.1175) and the Lais of Marie de France (c.1170), 100 show A–N order while 74 have N–A order. Often the same adjectives are found in both constructions:
However, N–A order seems to correspond to a number of regular factors:
— 'heavy' DPs, that is which are coordinated, or contain modifiers which themselves are modified;
— participial or PP modifiers;
— expressive constructions;
— adjectives rhyming with the previous or following line:

(44) **Coordination structures**:
Les hiaumes clerc et luisanz; Sa mere dolant et noir; Oevre laide et vilaine; Une toaille blanche et noeve; Un chastel fort et bien seant.

(45) **Participial modifiers**:
Les haberz fremienz; Les terres arees; la fame correciee; Pucele desconseilliee; Chauces taintes en bresil; Une aigle dorée; Fole provee; Un pont tormez; Un chamberlenc mal vezie.

(46) **PP modifiers**:
Frere debonaire (de bon aire); Un dras de soie inde; Une tour de marbre bis.

(47) **Rhyming**:
— Li cuens est tex qu’il n’escoute
Vilain gap ne parole estoute
— Qui soit contez en cort reial
Ce est lo contes do greal
— Se ele a poir, n’est merveille;
tute en fu sa face vermeille,
— El li respunt: 'Bels sire chiers,
Cunseil vus durrai volentiers.'

(48) ‘Expressive’ constructions:
La gaste forest soutaine; La grant forest oscure; Une grant roiche naïve; Malvais chien cour, felun; Un vielz prestre blanc e floriz; Molt esteoient fors et beles.

It seems therefore that predicative adjectives as well as possessive determiners and most quantifiers in OF occupied a Spec,Agr position above NP, where
they could check the case, number and gender features of the noun, located in Agr⁰, by Spec–Head agreement. However, the weakness of these features seems to have allowed checking to take place alternatively by attraction of grammatical features to Agr⁰ from post-N positions. This could occasionally apply to possessives or quantifiers, as well as to adjectives.

(49) Si ne trouverent adventure *aulcune que a compter face . . .
    if (they) not find adventure none . . .
    MnF: aucune aventure
    ‘If they found no adventure . . .’

(50) ne mengierent . . . li cheval . . . de avaine *nulle ne de fourage
    not eat the horses oats none nor hay
    MnF: nul avoine
    ‘the horses ate no oats, nor any hay’

(51) Ce fut maleoit gré *mien
    this was despite will mien
    MnF: contre mon gré
    ‘This took place against my will.’

3. Modern French

3.1 Determiners

As opposed to OF which, as we have seen, used the same set of items indifferently as determiners or pronouns, MnF has four distinct series of definiteness markers: two series of determiners (definite articles le, la les; demonstrative determiners ce, cet, cette, ces) and two series of pronouns (clitic pronouns le, la, les, lui, leur, etc.; demonstrative pronouns celui, celle, ceux, celles). Neither the articles nor the demonstratives have kept the strong deictic and/or contextual features of their OF homologues and even so-called demonstratives cannot stand alone, but must be reinforced by the adverbial suffixes -ci/-là, unless followed by a prepositional complement of a relative clause.

(52) *Je veux celui, celle, le, la, etc.

Modern French has taken the determiner cycle one step further than English, which also developed a definite article out of a former demonstrative. While the latter uses the definite article only to indicate definiteness, the former also uses it to express genericity. Lyons (1999) classes Western European languages
in four sub-classes according to the semantic extension of the definite article:

(53)  a. English: simple definites e.g. the Second World War
    b. French: simple definites and generics e.g. la guerre et la paix
    c. Italian: simple definites, generics and possessives e.g. il mio libro
    d. Greek: simple definites, generics, possessives and proper nouns. e.g. ho Georgos

He claims that this illustrates what he calls the ‘definiteness cycle’, on a par with Jespersen’s (1917) ‘negative cycle’. The final stage of the process would theoretically be bound affixal determiners such as those found in Romanian, or Scandinavian.

(54)  Icelandic: hestarinn: the horse (lit. ‘horse-the’)
    Danish: huset: the house (lit. ‘house-the’)
    Romanian: prietenul meu: my friend (lit. ‘friend-the me’)

As noted earlier, Modern French referential NPs must contain an article, whether definite, indefinite or partitive. A number of people (Delfitto and Schroten 1991; Schmitt and Munn 2000; Bouchard 1998) have recently argued that the obligatory presence of an overt determiner word in DP is linked to the absence of phonologically active number morphology in Modern French. The loss of, first case, then number inflection, which had ceased to be pronounced by the 17th century (Gugenheim 1974:57), seems therefore to have lead to a situation where number inflection could no longer guarantee referentiality and the referential argument position in NP had to be bound from outside, that is by D.

I claim moreover that the loss of tonic word stress in French lead to the erosion of deictic features on demonstratives and of the definiteness feature on definite articles, and that this has lead to the reanalysis of determiners, hence also of DP. Definiteness in Modern French can now only be unambiguously expressed by a ‘demonstrative-article’ like ce. The definite articles can now be said to be evolving towards the status of proclitic markers of agreement as well as definiteness.16

I will therefore hypothesize that the definiteness cycle, which, according to Lyons (1999), moves determiner words from specifier-positions to head-positions as their semantic content weakens and eventually disappears17, first moved definite articles into the D⁰ position in Old French, then further moved them down to Spec, Agr’ in Modern French. My reasoning is as follows: just as the weakened, sporadic case markers of Old French needed reinforcement by adjunction of an overt definiteness marker, resulting in the increasing use of
definite articles to express definiteness, so the weakened and sporadic number-gender inflection of Modern French needs reinforcement by adjunction of an overt agreement marker. The position formerly occupied by the definite article, that is the $D^0$ position, which $C$-commands $NP$ and assures that its referential argument position will be bound, I argue, is now occupied by $ce$, which, having lost all deictic content, is left with a simple contextual feature, making it quite similar to a definite article in Germanic.

Co-occurrence of $ce$ and $le$ does not occur simply because the agreement features cannot be checked twice, nor the referential argument position in $NP$ be bound twice. The change in the status of $ce$ is evidenced by the fact that it now shows signs of cliticization with $N$, essentially through liaison structures: $cet homme$, whereas no such liaison effects are found in Old French.

The reanalysis of DP is a direct consequence of the converging forces mentioned earlier: the loss of word stress, the resulting erosion of the semantic content of determiners, as well as the loss of active agreement morphology. We can therefore analyze Modern French determiners as follows.

(56) a. $ce$: $[d \{d +\text{Definite}, \pm\text{Cataphoric} \{agr \pm\text{Fem}, \pm\text{Pl}\}\}]$

b. $le$: $[d \{d \pm\text{Definite} \{agr \pm\text{Fem}, \pm\text{Pl}\}\}]$

Moreover, the weakness of the complement-node agreement features means that the adjective-noun complex can now remain in situ and satisfy checking requirements through attraction.

3.2 Adjectives

The reorganization of the French DP affected adjective positions as well as determiners. I have claimed above that adjectives were ‘weakly’ generated in
Spec,Agr, between D and NP. I say weakly because, as we have seen, it seems
to have been fairly easy to move them into post-N positions for any one of the
reasons listed earlier. In their pre-N positions they could check their fairly
weak agreement inflection (compared for instance to Old English) against the
head of their projection. But simple attraction of their features to this head
position from a lower position appears to have been sufficient in one case out
of two. I see no reason or motivation for positing an N-raising mechanism à
la Cinque (1995) to explain the occasional sandwiching of a noun in Old
French between two or more adjectives. I see even less reason for positing one
in Modern French, since most of the agreement morphology of Old French
had already disappeared before the modern era, which leaves us no viable
trigger for raising. I will therefore opt for a modified version of Bouchard’s
(1998) Integral Merger Theory to account for word order in Modern French
NPs. French nouns have extended agreement projections, since nouns,
determiners and adjectives do agree in number and gender, though in phono-
logical terms this is mostly limited to the determiner. Definite articles occupy
Spec, Agr¹ to reinforce the agreement features and bind a referential argument
position under NP. Adjectives are directly mapped into NP for semantic
reasons, as Bouchard proposes. Agreement inflection in Modern French is too
weak to trigger raising, so the complex functor projected around N remains in
situ, with predicative, intersective adjectives on the right, and non-predicative
or non-intersective adjectives on the left. Again, we can resort to a predication
analysis to achieve this result. Predicative adjectives project semantic structures
in which theta-roles are assigned. The N saturates the external theta role of
these adjectives. Pre-N adjectives function like operators, binding an internal
variable within N, as Bouchard claims. In future research I hope to be able to
show that an analysis along the lines of Deising’s (1992) Mapping Hypothesis,
added to my analysis of the French DP, are sufficient to account for adjective
distribution in Modern French.

4. Conclusion

In this chapter I have attempted to show how the syntax of the Modern French
DP developed in a regular way from that of Old French DPs. We first saw how
the increasing use of Latin deictic pronouns attached to NPs eventually lead to
de-stressing, then to loss of semantic content and finally to their reanalysis as
definite articles. This evolution triggered a reanalysis of the extended nominal
projection. The KP of Latin had already become a DP by the ninth century, the period of the earliest extant Old French texts, where we see the ancestors of all the Modern French determiners already in use. In addition to the loss of case morphology, which is traditionally thought to lead to the rise of determiner systems, I have shown, following Marchello-Nizia, that changes in stress placement affected not only semantic content, but also word order in DP. This has lead to a reanalysis of both definite articles and demonstratives in Modern French. We now have a set of semi-affixal articles which must accompany all referential NPs. This I argue is due to their reanalysis as agreement specifiers. Their adjunction to Agr is due to the loss of phonologically active number morphology in Modern French. I hope therefore to have shed some light, not only on the process of language change, but also on the complex, interdependent factors which explain the syntax of Modern French DP.

Notes

4. See the introduction to Kemenade and Vincent (1997) for discussion.
5. Except as concerns demonstratives, see Table 2 and footnote 7 below.
6. Modern inflection (le msg, la fsg, and les pl) thus resulted from analogy with the masculine system conforming to the feminine system.
7. In Kersten’s notation system, lower case letters represent morphological, or word structures, while upper case letters correspond to syntactic or phrase structures. The complement node of the word structure projects the agreement or determiner projection. The lexical word then raises from the head word node to the head phrase node.
8. All of the deictically marked demonstratives could be preceded by the prefix i-, which corresponded to emphatic or thematic marking, according to M-N. The unprefixed demonstratives and the neutral ce demonstratives were stressed when used pronominally and could be stressed as determiners (Marchello-Nizia 1995; Foulet 1977). M-N cites P. Skårup (1993:43–4): “On peut supposer que les articles démonstratifs ont l’accent pro-tonique de même que les autres articles” (we can assume that the demonstrative articles had pro-tonic stress, just like the other articles) and “On peut supposer que les pronoms démonstratifs ont la même accentuation que les autres mots non-clitiques” (we can assume that the demonstrative pronouns were stressed just like the other non-clitic words).
9. Epstein (1995) and Kleiber (1990) have shown that definite and demonstrative articles and pronouns could also be used in contexts which corresponded either to certain pre-defined activities or settings, such as tournaments, springtime scenes, etc. (le démonstratif de 'notoriété', Kleiber) or to a subjective 'appropriation' of the referent by the speaker (la reference 'subjective', Epstein).

10. See also Abraham 1997 and Lyons 1999 for a similar analysis.

11. More accurately, this tree should indicate head-adjunction of N to K: \([[[\text{montes}, - [K]]_k [t]_n], [\text{Spec}]]_k\).


13. Accusative for +definite object NPs, and genitive for — definite object P, according to Philippi.

14. Taken from an example in Vincent (1997:156): \(\ldots ubi se tamen montes illi, inter quos ibamus, aperiebant et faciebant infinitam ingens \ldots 'where in the meantime the mountains, between which we were going, opened out and formed an endless valley \ldots' from Peregrinato Aegeriae c.380 AD.

15. M-N suggests the following chronological steps for the transition:
- late 12th century: the demonstrative systems begin to be used as definite determiners; the atonal, semantically and later gender neutral, masculine plural *ces* first appears;
- around 1200: the corresponding singular form *ce* appears; more frequent use of demonstrative determiners;
- early 13th century: the masculine singular subject form *cis* is invented, resulting in two distinct atonal, semantically neutral paradigms: the masculine determiners *li/le/les* and the demonstrative determiners *cis/ce/ces*;
- late 13th–early 14th centuries: *cist* disappears, though *cil* is maintained, mostly as a pronoun, by analogy with the personal pronoun system (*il*);
- late 14th century: loss of word stress; correlative *il* becomes atonal and clitic; this leads to the rapid demise of *cil*;
- late 14th–early 15th centuries: the stressed, pre-fixed forms of the demonstratives (*icelui, icil, icist*, etc.) gradually disappear and are replaced by the suffixed forms: *celui-ci, celle-là*, etc.
- 15th–16th centuries: the two parallel systems of MnF are now in place: *le/lal/les* on the one hand; *ce/cette/ces* on the other.
- 17th century: all of the old pronominal demonstratives have completely disappeared; the surviving forms can all be analysed as 'neutral demonstrative + tonic personal pronoun': *ce-lui, c(e)-elle(s), c(e)-eux*; demonstrative pronouns are now obligatorily suffixed by -*ci/-là* unless followed by a prepositional complement or a relative clause. The modern system has been attained.

16. Giusti (1992) argues that the enclitic definite affixes of Roumanian can be analysed as case markers, which would tend to confirm Lyons' definiteness cycle theory and suggest that Romanian has reached the end of the cycle and is now beginning to resemble the initial stage, that is Latin.
17. As independently argued by Zanuttini (1989) for the negation cycle.

References


Chapter 2

On pro-nouns and other “pronouns”*

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1. The proposal: pro-NP, pro-ϕP, pro-DP

In this chapter, we argue that “pronoun” does not correspond to a uniform syntactic object. We propose that (at least) three different pronoun types can be distinguished: pro-DP, pro-ϕP and pro-NP. Each of these pronoun-types is associated with a different phrase structure as shown below:

(1) a. DP
     Spec ϕP
     ϕ NP
     N

The phrase structure associated with each of the pronouns predicts that they crucially differ in their internal and external syntax. In other words, we argue that the categorical status of a pro-form determines its distribution in a predictable way (cf. Wiltschko 1998a).

In addition to their syntax, we propose that the categorical status of a given pro-form also determines its semantic status and its binding-theoretic status. This is summarized in Table 1.

A pro-DP is predicted to have the syntax of a determiner (phrase). Also, we claim that pro-DPs will always contain ϕP and NP as subconstituents. Given their external category as DPs, we further predict that they will be restricted to argument position. As for their semantics, DPs are demonstrably definite and so by definition they are R-expressions (i.e. R-expression=def DP; cf. Longobardi 1994).

Pro-ϕPs are predicted to have neither the syntax of determiners nor that of nouns. We further claim that there is no restriction on their distribution,
Table 1. Pro-form typology

<table>
<thead>
<tr>
<th>Category</th>
<th>pro-DP</th>
<th>pro-ϕP</th>
<th>pro-NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal syntax</td>
<td>D-syntax</td>
<td>Neither D nor N</td>
<td>N-syntax</td>
</tr>
<tr>
<td></td>
<td>Morphologically complex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td>Argument</td>
<td>Argument or predicate</td>
<td>Predicate</td>
</tr>
<tr>
<td>Semantics</td>
<td>Definite</td>
<td>Variable</td>
<td></td>
</tr>
<tr>
<td>Binding-theoretic</td>
<td>R-expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>status</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

that is they can function either as predicates or as arguments. We argue that they lack inherent semantics, i.e. they simply spell out phi-features. Their binding-theoretic status is that of a variable. As such they are the standard “Condition B pronouns”.

Finally, pro-NPs have the same syntax as lexical nouns, and as NPs we predict that they will occur in predicate position. We argue that they are undefined with respect to binding theory; rather their binding properties follow from their inherent semantics as constants in a predictable way.

It is important to note that analyses which claim that pronouns are uniformly of category DP (Abney 1987) fail to capture these regularities. This is also true for theories that argue for structural differences internal to DP (Cardinaletti 1994; Ritter 1995; Noguchi 1997). Under these proposals it is not clear how syntax can see “inside” a pronoun and thus differentiate among pronoun types in a predictable way. Our analysis captures this by saying that it is the category (and consequently the external constituency) that differs among different pronoun types.

In the remainder of this chapter we present evidence for this proposal. Section 2 introduces Halkomelem pro-DPs, Section 3 discusses Shuswap pro-ϕPs and Section 4 discusses Japanese *kare* as an instance of pro-NP. In Section 5 we show how English pronouns are to be analyzed within the present proposal.

2. Pro-DPs: Halkomelem independent pronouns

Halkomelem is a Central Coast Salish language, spoken in British Columbia. Like other Salish languages, it is predicate-initial and of the head-marking type: arguments are obligatorily marked with clitics or pronominal affixes on
On pro-nouns and other “pronouns”

the predicate and full DPs are optional.

In addition to clitics and pronominal affixes, Halkomelem has a set of independent (emphatic) pronouns. They have roughly the same distribution as full DPs. Part of the independent pronoun paradigm is given in Table 2.

Table 2. (Part of) the Halkomelem independent pronoun paradigm (Galloway 1993: 403)

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>te’elthe</td>
<td>telhlimelh</td>
</tr>
<tr>
<td>2</td>
<td>te’ewe</td>
<td>telhwelep</td>
</tr>
<tr>
<td>3</td>
<td>tuu’o</td>
<td>tuu’o:lem</td>
</tr>
</tbody>
</table>

Following Wiltschko (1998b, 2002), we argue that Halkomelem independent pronouns are to be analyzed as DPs with the following structure:

(2) pro-DP structure

\[
\begin{array}{c}
D \\
\text{te/}tu \\
\phi \\
t’o \\
NP \\
N \\
\phi \\
\end{array}
\]

The structure in (2) implies that independent pronouns are morpho-syntactically complex. The pronoun is made up of a determiner te/tu, which is syntactically visible. The rest of the pronoun (for example third-person t’o) is identified as pro-\(\phi\)P (see Wiltschko 1998b, 2002, for evidence).

The structure in (2) further predicts that independent pronouns contain an NP position. This NP position can be either covert, which results in the “pronominal” use of the pronoun, or else it can be overt:

(3) Tl’ó-cha-l-su qwemćiwe-t [thú-t’o q’ami]ARG.

then-fut-1sg.s-so hug-trans det.fem-3.indep girl

‘Then I’m going to hug that girl.’ (Galloway 1993: 174)

This means that the independent pronoun can function like an article.

This analysis straightforwardly explains why Halkomelem independent pronouns have the same syntactic distribution as full DPs. Given their categorical status as DP, we predict that independent pronouns are restricted to argument position. This prediction is borne out:
Independent pronouns occur only in argument position (4a). In (4b) the independent pronoun appears in predicate position and the result is ungrammatical. Note however, that “pronominal” forms are not excluded from predicate position per se. Rather, a φP has to be used, so that in predicate position we find the independent pronoun without the determiner element, (4c).

We proposed above that R-expressions are to be defined as DPs. Consequently, we predict that Halkomelem independent pronouns, as DPs, are subject to Condition C. This prediction is borne out:

(5) *Súq’-t-es \[te swíyeqe\], \te\ kopú-s \[tútl’ò],
search\-TRANS\-3S DET\ man \ det\ coat\-3S.POSS\ det\-3 INDEP
‘The man was looking for his coat.’ (Wiltschko 1998b:444)

By the same reasoning we further predict that independent pronouns (as R-expressions) cannot function as bound variables. Again, this prediction is borne out:

(6) *\[Mékw’ ye swíyeqe\], kw’ákw’áts-et-es te stóles \[tú-tl’ò-lem\],
every \ det.PL\ man \ looking\-TRANS\-3S DET\ wife \ det\-3.INDEP-PL
‘All men are looking at their wives.’ (Wiltschko 1998b:445)

To sum up, Halkomelem independent pronouns show all the properties of full DPs. This is explained by the hypothesis that they are pro-DPs.

3. **Pro-φPs: Shuswap independent pronouns**

Shuswap is a Northern Interior Salish language. Like Halkomelem it is predicate-initial and of the head-marking type. Again we find a set of independent (emphatic) pronouns; these are given in Table 3.
Table 3. (Part of) the independent pronoun paradigm (Kuipers 1974)

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n-tsets-we7</td>
<td>wll-enwi7-kt</td>
</tr>
<tr>
<td>2</td>
<td>7-enwi7</td>
<td>wll-enwi7-mp</td>
</tr>
<tr>
<td>3</td>
<td>newi7-s</td>
<td>wll-enwi7-s</td>
</tr>
</tbody>
</table>

We will see that Shuswap independent pronouns differ strikingly from their Halkomelem counterparts. We suggest that this difference is a reflex of a categorical difference. Thus we propose that Shuswap independent pronouns are of category $\varphi$P:

(7) pro-$\varphi$P structure $\varphi^P$

Evidence for this analysis comes from the following considerations. First, as shown in Lai (1998), independent pronouns do not have NP-syntax. This can be witnessed below. Davis, Lai, and Matthewson (1997) argue that complex nominal predicates as in (8) must be of category $\Lambda$:

(8) $[\text{Yiri7 te sqélemcw}]$ l wí.w.k-t-sem-s.

‘That’s the man that saw me.’

Crucially, as observed by Lai (1998), independent pronouns cannot appear as part of a complex nominal predicate:

(9) *$[\text{Yiri7 te newi7-s}]$ wí.w.k-t-sem-s.

‘That’s HIM that saw me.’ (Lai 1998:41, (39b))

We thus conclude that independent pronouns are not of category $\Lambda$.

Furthermore, Lai (1998) shows that independent pronouns do not have DP-syntax. Evidence comes from the fact that they can be preceded by a determiner:

(10) $[\text{Wí.w.k-t-Ø-en}]_{\text{pred}}$ re $\text{n-tsetswe7}\_\text{arg}$

see(redup)-trans-3sg.o-1sg.s det 1sg.indep

If independent pronouns were themselves DPs, we would not expect that they can be preceded by a determiner.

Since they are neither DPs nor NPs, we argue that Shuswap independent pronouns are to be analyzed as \(\varphi\)Ps. This analysis is also consistent with their external distribution.

Shuswap independent pronouns can occur in predicate position (which is excluded for DPs as we saw in Halkomelem):

\[\text{Newí7-s} \mid \text{PRED} \mid \text{re wík-t-∅-m-es} \mid \text{ARG} \]
\[\text{3SG.INDEP} \quad \text{DET} \text{SEE-TRANS-3SG.O-PAST-3SG.CONJ} \]

‘It is HIM that saw him/her.’ (Lai 1998: 28, (13a))

Furthermore, Shuswap independent pronouns can also function as arguments:

\[\text{wi.w.k-t-∅-en} \mid \text{PRED} \quad [\text{newí7-s}] \mid \text{ARG} \]
\[\text{see(redup)-TRANS-3SG.O-1SG.S 3SG.INDEP} \]

‘I saw HIM.’ (Lai 1998: 60, (74a))

This syntactic flexibility is a crucial property of \(\varphi\)Ps: they can function both as predicates and as arguments.

Finally, the binding-theoretic properties of Shuswap independent pronouns crucially differ from their Halkomelem counterparts, in a way that is predictable from their category. Thus, as \(\varphi\)Ps, Shuswap independent pronouns act like “Condition B pronouns”, in that they can be bound outside their local domain:

\[\text{Tsut-∅, m qwetséts-∅, [newí7-s]i.} \]
\[\text{say-3S PAST leave-3S 3SG.INDEP} \]

‘He, said that HEi left.’ (Lai 1998: 31, (20))

Secondly, unlike their Halkomelem counterparts, Shuswap independent pronouns can function as bound variables:

\[\text{Xwexwéyt, re swet xwis-t-∅-ēs [newí7-s], re qé7tse-s, all DET who like-TRANS-3SG.O-3S 3SG.INDEP DET father-3POSS} \]

‘Everyone likes HIS father.’ (Lai 1998: 32, (21b))

We propose that the differences between Halkomelem and Shuswap independent pronouns follow from their different categories: Halkomelem independent pronouns are pro-DPs whereas Shuswap independent pronouns are pro-\(\varphi\)Ps.
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4. Pro-NP: Japanese *kare*

Finally, let us turn to the last type of pro-form, namely pro-NP (i.e. the only true pro-*noun*). We argue that Japanese *kare* instantiates this type and that it has the following structure:

(15) pro-NP structure \[ \begin{array}{c}
\text{NP} \\
\text{N} \vline
\end{array} \]

Pro-NPs are predicted to have the syntax of nouns. This is indeed the case. *Kare* can be preceded by an adjective, by a possessive or a demonstrative pronoun (Kuroda 1965:105; Noguchi 1997:777):

(16) a. *tisai* *kare* b. *watsi-no* *kare* c. *kono* *kare*

small he 1-gen he this he
‘he who is small’ ‘my boyfriend’ ‘this guy here’

As for its binding properties, recall that a pro-NP is undefined for its binding-theoretic status. We argue that its properties follow from its inherent semantics. With this in mind, let us first turn to the bound variable properties of *kare*.

Because they are *nouns*, pro-NPs are inherently constants. Constants cannot function as bound variables and consequently, *kare* cannot function as a bound variable:

(17) a. *Daremo i-ga kare-i-no hahaoya-o aisite-iru.*

everyone-nom he-gen mother-acc love-pres
‘Everyone loves his mother.’ (Noguchi 1997:770, (1a))


every woman-also she-nom genius-cop comp think-pres
‘Every woman thinks that she is a genius.’ (Noguchi 1997:770 (1b))

Let us now turn to the coreference properties of *kare*. *Kare* connotes the features [*male*] and [*marriageable age*] (Sugamoto 1989:270, as cited in Baggaley 1998:49), and so has some referential properties, which are a prerequisite for coreference. It is for this reason that *kare* can support coreference, and consequently does not show Condition C effects:


John-nom he-gen mother-acc love-pres
‘John, loves his, mother.’ (Noguchi 1997:770, (2a))
b. Mary, ga [kanozo, ga tensai-da to] omotte-iru
   Mary-nom she-nom genius-cop comp think-pres
   ‘Mary, thinks that she, is a genius.’ (Noguchi 1997:770, (2b))

Before turning to the pronominal inventory of English, let us briefly summarize the results so far. We have argued that different pronoun types are best analyzed as belonging to different syntactic categories: pro-DPs, pro-φPs and pro-NPs. We have further argued that these different categories correspond to differences in the internal as well as the external syntax of pro-forms. In addition, we have claimed that binding theory is sensitive to categories, in that DPs are R-expressions (that is nominal expressions subject to Condition C) and φPs are variables (that is nominal expressions that are subject to Condition B). NPs are undefined with respect to binding theory. Their behavior is determined by their inherent semantics as constants. This is summarized in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Examples of pro-forms and their properties</th>
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<tr>
<td><strong>Example</strong></td>
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</tbody>
</table>

As for the distinction between predicates and arguments, we depart from Longobardi’s (1994) claim that all argument-expressions are DPs. Rather, we claim that (i) a DP must be an argument and (ii) an NP must be a predicate (this is still in accord with Longobardi 1994). However we also claim, that (iii) a φP is type-flexible: it can be a predicate or an argument. Consequently, not all argument-expressions are DPs and not all nominal predicates are NPs.

5. The pronominal inventory of English

In this last section of the chapter we turn to the pronominal inventory of English and see how different pronouns in English are to be analyzed within the present proposal. We identify one as a pro-NP and argue that the English
person pronoun inventory consists of pro-DPs (=first/second-person pro-nouns) and pro-QPs.

5.1 One = pro-NP

We argue (following Postal 1966) that English one is a true pro-noun and as such, is to be analyzed as a pro-NP:

\[
\text{(19) NP structure} \quad \text{NP} \\
\quad \text{N} \quad \text{one}
\]

This claim is supported by a number of considerations. First, pro-NPs are expected to have the syntax of nouns. Consistent with this is the fact that one may follow a determiner, a quantifier or a modifier. This is illustrated below:

(20) a. the one
    b. someone
    c. the real one

Secondly, there is cross-linguistic evidence for treating one as a pro-NP. In contexts where languages such as French allow a null elliptical noun, English requires an overt pro-form in the form of one:

(21) a. La voiture [N rouge], est plus chère que la jaune [∅].
    b. La grande [N fille], ne peut pas supporter la petite [∅].

(22) a. The red [NP car], is more expensive than the yellow [one].
    b. The large [NP girl], can’t stand the small [one]. (Postal 1966: 202, (2))

Let us now turn to the binding properties of one. Recall that pro-NPs are undefined for binding theory and that their properties follow from their inherent semantics. With this in mind, consider the status of one with respect to bound variable anaphora. The inherent semantics of a pro-NP is that of a constant. Constants cannot function as bound variables and consequently, one (like Japanese kare) cannot function as a bound variable:

(23) a. *[Everybody], thinks [one], is a genius
    \( \neg \forall x, x \text{ thinks that } x \text{ is a genius} \)
    b. *[Everybody], loves [one]'s mother.
    \( \neg \forall x, x \text{ loves } x' \text{'s mother} \)
Even though as pro-NPs, English *one* and Japanese *kare* are both defined as constants, these two instances of pro-NP differ in their referential properties. We have seen above that *kare* has residual referential content and therefore it is able to support coreference. English *one* differs from Japanese *kare* in this respect. In particular, English *one* is a mere spell out of N, and so has no referential content. Given that referential content is a prerequisite for coreference, it follows that *one* cannot support coreference, and so cannot be bound by an antecedent. This results in apparent Condition C effects, as shown below:

(24)  
a. *Mary thinks [one], is a genius.
b. *[Mary], loves [one],’s mother.

Having established that English *one* is analyzable as a pro-NP, we now turn to the properties of English personal pronouns. We will argue that they instantiate pro-DP and pro-\textit{\textphi}P.

5.2 Personal pronouns: DPs and \textit{\textphi}Ps

It is a well-known fact that English personal pronouns are not a syntactically homogeneous group (see Ritter 1995 among others). One example of this heterogeneity is the fact that while first- and second-person pronouns can function as determiners (i.e. precede nouns), third-person pronouns cannot (see Postal 1966):

(25)  
a. *we linguists us linguists*
b. *you linguists you linguists*
c. *they linguists them linguists*

We propose that the contrast in (25) is a reflex of the different category (and thus structure) associated with each of these pro-forms (see also Ritter 1995 for a similar approach). In particular, we argue that first- and second-person pronouns instantiate DPs and third-person pronouns instantiate \textit{\textphi}Ps, as shown in (26).
These structures immediately predict the contrast in (25): pro-DPs (first- and second-person pronouns) make an NP subconstituent available, but pro-φPs do not.

5.3 Third-person pronouns can be predicates

We predict that, as pro-φPs, third-person pronouns can be used either as arguments or as predicates. The example in (27) establishes that third-person pronouns can function as arguments:

(27) [He]$_{arg}$ saw [her]$_{arg}$.

Furthermore, the examples in (28) show that third-person pronouns can also function as predicates:

(28) a. That’s [ her ]$_{PRED}$.
    b. Those aren’t [ he’s ]$_{PRED}$; those are [ she’s ]$_{PRED}$ (Noguchi 1997:779, (35b))

Crucially, it can be shown that the above examples are not equative. If they were, we would expect that the two nominal expressions could switch their position without a change in grammaticality. However, this is not so, as shown below:

(29) a. *She’s [ that ]$_{PRED}$.
    b. *He’s aren’t [ those ]$_{PRED}$; she’s are [ those ]$_{PRED}$.

Rather, the sentences in (29) are ungrammatical. The source of the ungrammaticality is that we have attempted to put a DP (that, those) in predicate position, which is of course not possible. This suggests that the personal pronouns in (28) are themselves in predicate position. Consequently, the contrast between (28) and (29) supports the present analysis. If personal pronouns were DPs they would be restricted to argument position, but they
are not. In the present proposal, third-person pronouns are analyzed as $\varphi$Ps and $\varphi$Ps are type-flexible: they can function as predicates or as arguments.

5.4 Binding properties of personal pronouns

In this section we turn to the binding properties of personal pronouns.

5.4.1 Third-person pronouns

Let us start by considering the binding properties of third-person pronouns. Since $\varphi$Ps are defined as variables, we predict that they will participate in bound variable anaphora, which is indeed the case:

\[(30) \text{ [Every candidate], thinks that [he], will win.}\]

In addition, third-person pronouns support coreference, in that they may be bound outside their local domain:

\[(31) \text{ John, thinks that [he], will win.}\]

It is the intersection of these two properties — the ability to function as a bound variable and the ability to support coreference — which corresponds to the classical “Condition B pronoun”.

5.4.2 First- and second-person pronouns

As discussed above, distributional evidence suggests that first- and second-person pronouns are pro-DPs. If so, and if DPs are defined as R-expressions, this predicts i) that first/second-person pronouns cannot function as bound variables and ii) that first/second-person pronouns are subject to Condition C. The first prediction is borne out. Consider the following sentence and its potential interpretations:

\[(32) \text{ I know that John saw [me], and Mary does too.}\]

\[\begin{align*}
(i) & = \text{ I know that John saw me, and Mary knows that John saw me.} \\
(ii) & \neq \text{ I know that John saw me, and Mary knows that John saw her.}
\end{align*}\]

The sentence in (32) involving VP-ellipsis can receive a strict identity reading (i), but not a sloppy identity reading (ii). This indicates that the first-person pronoun (me) cannot be construed as a bound variable, as predicted by the present analysis.

If we turn to the second prediction — namely that first/second-person pronouns will be subject to Condition C — we immediately face a problem.
The following examples show that first- and second-person pronouns can be (non-locally) bound:

(33) a. I, said that John saw me,
b. You, said that John saw you.

We are facing a serious problem: if first- and second-person pronouns are DPs, and if DPs are defined as R-expressions, then why do they differ from names?

(34) *She, said that John saw Mary.

If we adopt a standard binding theory, where R-expressions are subject to Condition C, then first- and second-person pronouns (as R-expressions) should be ungrammatical in sentences like (33), contrary to fact.

Note that this problem does not disappear if we assume Reinhart’s 1986 version of binding theory. She argues that there is no Condition C and that apparent “condition C effects” are to be ruled out by pragmatics: if a speaker intends to corefer s/he will use a pronoun; if a name is selected, then coreference is not intended. Accepting that both names and first- and second-person pronouns are DPs, this approach fails to account for the contrast between (33) and (34). In addition, a pragmatically-based analysis also fails to account for cross-linguistic differences between pro-forms that do not support coreference (e.g. the Halkomelem pro-DPs that showed condition C effects) and pro-forms that do support coreference (e.g. the English first- and second person pro-DPs that do not show standard condition C effects).

In the next section, we show that this problem is not an artefact of the present analysis, but rather it appears elsewhere.

5.4.3 The Condition C problem with “full DPs” (Demirdache 1997)
The problem that we have identified for English first- and second-person pronouns has also been identified for full DPs by Demirdache 1997. She shows that full DPs in Lilooet, a Northern Interior Salish language, have the following properties. First, they cannot function as bound variables:

(35) Swat, ku zwát-en-as*i j kw-s xwey-s-as k-Wany.
   who LINK know-trans-3s DET-nm love-trans-3s DET-Wany
(i) "Who, does he, know t, loves Wany?"
(ii) "Who, does he, know t, loves Wany?" (adapted from Demirdache 1997:60, (15))
(35) shows a standard Strong Cross Over (SCO) violation and thus establishes that full DPs cannot function as bound variables.

A second property of Lillooet DPs is that they do not seem to obey Condition C. They can be (non-locally) bound as shown below:

(36) Sqwál’en-as, s-Bucky kw-s nilh s-Wany, ta qwatsáts-a.
    say-trans-3s NM-B DET-NM FOC NM-W DET-leave-DET

'She told Bucky that it’s Wany that left.' (Demirdache 1997: 54, (6))

Demirdache’s 1997 analysis of the Lillooet binding facts is as follows. She argues (following Reinhart 1986) that grammar only regulates bound variable anaphora. In addition, she assumes that English DPs are quantificational and consequently they undergo quantifier raising (QR). As a result, classical Condition C effects are analyzed as SCO violations:

(37) a. *I know he loves Oscar.
    b. LF: *[Oscar], [I know he, loves t]}

In contrast to English DPs, Lillooet DPs are not quantificational (Matthewson 1998) and so do not undergo QR. Demirdache argues that it is the non-quantificational status of Lillooet DPs which is responsible for the apparent Condition C violations: Lillooet DPs never undergo QR, so they never induce SCO violations.

5.4.4 The analysis of first- and second-person pronouns

We can now extend Demirdache’s analysis to first- and second-person pronouns in English. Assume that like Lillooet full DPs, first- and second-person pronouns are non-quantificational. As a consequence, first- and second person pro-DPs do not undergo QR and therefore do not induce SCO violations.

(38) a. I said that you saw [me].
    b. LF: I said that you saw [me].

This immediately accounts for the lack of Condition C effects with first- and second-person pronouns, and allows us to maintain the claim that they are pro-DPs (which is motivated by distributional evidence; see Déchaine and Wiltschko 2000 for more detailed discussion).
5.5 Summary of binding properties of pro-forms

Let us briefly summarize the binding properties of the pro-forms discussed in this paper. First, the present proposal supports the hypothesis that bound variable anaphora is the core of binding theory (Reinhart 1986).

Second, the present proposal supports a “universalist” view of binding theory. That is, we have argued that different binding properties of pro-forms are not a matter of parametrization within binding theory. Rather, differences in binding properties reflect differences in categorical identity. On independent grounds, such an approach has been advocated for anaphors by Safir (1996) and for R-expressions by Demirdache (1997). The present analysis extends this view to pronouns (see also Wiltschko 1999, 2002).

We argued that binding properties are determined by the categorical status of a given nominal expression in the following way:

(39) i. DPs are R-expressions (Condition C);
    ii. φPs are variables (classical Condition B pronouns);
    iii. pro-NPs are undefined with respect to binding theory; binding theoretic-status reflects their inherent semantics as constants.

On this view, the (in)ability of different pro-forms to function as bound variables follows without further assumptions. This is summarized in Table 5.

<table>
<thead>
<tr>
<th>Table 5. Bound variable anaphora and pronoun types</th>
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<td>Binding-theoretic status</td>
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<tr>
<td>Bound variable anaphora</td>
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<tr>
<td>Example</td>
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Both Halkomelem independent pronouns and English first- and second-person pronouns are analyzed as pro-DPs. As such, they are R-expressions and cannot function as bound variables. Shuswap independent pronouns and English third-person pronouns are analyzed as pro-φPs, which are defined as variables. Consequently, such pro-forms can function as bound variables. Finally, pro-NPs, which are defined as constants, cannot function as bound
variables. This was instantiated by Japanese *kare* and English *one*.

As for the coreference properties of pro-forms, we have seen that some refinements were required. In particular, pro-DPs and pro-NPs had to be separated into two distinct classes.

For pro-DPs, following Demirdache (1997), we argued that they subdivide into two groups:

1. Quantificational DPs (=English full DPs). They undergo QR and induce SCO violations in Condition C environments. Thus Condition C is a by-product of bound variable anaphora.
2. Non-quantificational DPs (Lillooet full DPs; English first/second-person pronouns). They do not undergo QR and consequently they do not induce Condition C effects.

As for pro-NPs, we argued that they are undefined for binding theory and that their ability to support coreference reflects their inherent semantics. We proposed that pro-NPs divide into two subgroups according to their referential properties:

1. Pro-NPs with no referential content (English *one*). Since referential properties are a prerequisite for coreference, it follows that *one* does not support coreference. This results in apparent condition C effects.
2. Pro-NPs with some (residual) referential content (Japanese *kare*). Since these NPs have some referential content, coreference is possible.

6. Conclusion

We have argued that the notion “pronoun” is not a primitive. Rather, it is necessary to distinguish between (at least) three types of pro-forms: pro-DP, pro-DP, pro-NP. These three pro-forms stand in a transparent morphological relation to each other in that pro-DPs may include pro-NPs and/or pro-NPs as subconstituents. Recognizing that pronoun-types are categorically distinct automatically accounts for the fact that their external syntax differs. This is an advantage over theories which claim that all pronouns are DPs.⁶
Notes

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Abbreviations used: 1=first person; 2=second person; 3=third person; acc=accusative; arg=argument; comp=complementizer; conj=conjunctive; cop=copula; deic=deictic; det=determiner; fem=feminine; foc=focus; fut=future; gen=genitive; indep=independent pronoun; link=linker; nm=nominalizer; nom=nominative; o=object; obl=oblique; pl=plural; poss=possessor; pred=predicate; pres=present; redup=reduplicative; s=subject; sg=singular; trans=transitivizer.

1. By constant we mean that the nominal expression has a “constant” interpretation, as distinct from expressions whose interpretation varies under different assignments (i.e. “variables”).

2. For a different approach which also distinguishes pronouns in terms of categories see Cardinaletti and Starke 1999.

3. For further information on Salish see individual reference grammars: Galloway (1993); Kuipers (1967, 1974); van Eijk (1997).

4. Note that Shuswap independent pronouns are morphologically complex. However, Lai 1998 argues that they are syntactic atoms.

5. In this chapter, English is the only language for which we show that all three pro-forms are instantiated. In principle, Universal Grammar makes available all pro-forms, and language-specific properties will determine whether or not a given pro-form is instantiated overtly or covertly or not at all.

6. Note that this proposal is consistent with the fact that deictic DPs are non-quantificational as well.

7. This proposal also generalizes to cases that remain problematic for standard binding theory, including logophoricity, switch-reference and obviation (see Déchaine and Wiltschko 2000, 2001).

References


Chapter 3

Modification in the Balkan nominal expression

An account of the (A)NA : AN(*A) order contrast

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1. The issue

The well-known variation in the order modifier-noun has been attested both crosslinguistically, that is, some languages display only the AN pattern (e.g. Norwegian, English), while others display exclusively the NA pattern (e.g., Indonesian, Thai), and can also be found in a single language with both (A)NA and AN linear orders available.1 The latter pattern is displayed most notably by Romance languages, such as French, Italian, and in some of the Balkan languages, such as Albanian and Romanian, the latter being an intersection of Romance and Balkan.2 The examples in (1) and (2) provide an illustration of the choices languages make between (A) NA and A N (*A).

(1) a. une nouvelle proposition intéressante (French, Bouchard 1998)
   a new proposition interesting
b. gazetën e vjetër (Albanian; Kallulli 1999)
   newspaper-the AGR old

(2) a possible (new) solution (*new) (English)

1.1 Accounts

The popular view (following Cinque 1994; for Romanian cf. Dobrovie-Sorin 1987, Grosu 1988, and Cornilăescu 1995; for Balkan languages cf. Dimitrova-Vulchanova and Giusti 1998) accounts for the variation in the order modifier-head in terms of the availability of N-movement (partial/N-to-D'). The N-movement approach (as proposed by Cinque 1994) also assumes that the
modifiers of the noun appear only on a left branch and are found in the specifiers of functional projections between N and D. On this view the nominal head or/and APs need to raise to a functional head/specifier for either licensing or for information structure reasons (cf. the topicalized APs in Romanian and the focused APs in Albanian discussed in Dimitrova-Vulchanova and Giusti 1998). There are a number of reasons why N-to-D raising should be kept apart from the mechanisms explaining the overt linear ordering of modifiers with respect to the nominal head. To mention one, not all languages that display partial N-movement necessarily have raising all the way to D. In addition, the “distance” of partial N-movement may vary considerably across languages, e.g., compare Italian, Romanian and Albanian (cf. Dimitrova-Vulchanova and Giusti 1998; Giusti 1995; Cornilescu 1995), whereas raising to D is either present or absent (i.e., there are no “degrees” there). Moreover, the languages that display partial N-movement do so both in definite and indefinite noun phrases, i.e. irrespective of raising to D for structural reasons (cf. the Balkan data in 5. below). For more arguments against overt N-to-D raising accounts see Dimitrova-Vulchanova and Giusti (1998), and for a minimalist analysis not relying on N-to-D movement see Dobrovie-Sorin (1999).

1.2 Problems with the N-movement approach

The partial N-movement approach fails to account for:
— The (sometimes subtle) differences in interpretation between pre-N and post-N modifiers in the languages which allow for this variation. Moreover partial N-movement has to be stipulated, its motivation remaining somewhat obscure.
— The mirror effect, as exemplified in (3) below.

(3) a. *un tissu anglais cher* (French; Bouchard 1998)
   a’. an *expensive English fabric* (English)
   b. *les lignes parallèles colorées*
   b’. the *coloured parallel lines*

In (3a–b) the order of the post-nominal adjectives in French represents the mirror order of their English equivalents in (3a’–b’). On the N-movement approach this should not be the case.4

A similar phenomenon is observed in Albanian, where the ordering of modifiers may contradict the natural serialization of adjectives on which the
hierarchy of AgrPs is based. Thus, in the example in (4) below a non-evaluative (colour/shape) adjective, dokumentar/bardh-e-zı precedes a quality adjective, tragjik. Assuming that upon moving, the head noun skips the modifiers in specifier positions, when movement is completed, the adjectives are expected to show in their base order (i.e. N-movement does not affect the ordering among the modifiers themselves). The phrases in (4) clearly contradict this assumption.

(4) a. një film dokumentar/bardh-e-zı tragjik (Albanian)
   a film documentary/white-and-black tragic
   a’. film-i dokumentar/ bardh-e-zı tragjik
      film-the (masc) documentary/white-and-black tragic

— The fluctuation in position of pre-N modifiers. This is instantiated by the Bulgarian example in (5) below, whereby the same adjective, respectively Penkin and vuzmožen in (5a–a’) and tvoja and stara in (5b–b’), varies in its occurrence in the linear string.

(5) a. Penkinijat vuzmožen otgovor (Bulgarian)
   Penka’s likely answer
   a’. vuzmožnijat Penkin otgovor
      likely.the Penka’s answer
      ‘The possibility/likelihood that P. might answer.’
   b. edna tvoja stara nadežda / tvojata stara nadežda
      a your old hope / your-the old hope
   b’. edna stara tvoja nadežda / starata tvoja nadežda
      an old your hope / old-the your hope

In view of the data in (4)–(5) and trying to preserve the idea of a strict functional organisation of the field between N and D, one has to assume that either the same adjective corresponds to two distinct lexical entries or that some “type shift” has occurred. Alternatively one may have to give up the strict hierarchy of Agreement projections between N and D in whose specifiers modifiers are assumed to occur. Recall that one of the main motivations for postulating the existence of functional projections is the natural serialization of modifiers of the type “poss > cardinal > ordinal > quality > size > shape > colour > nation” discussed in the seminal work by Sproat and Shih 1990. As suggested by the examples in (4)–(5) above and as will become clear in the discussion below, this hierarchy, most likely has the status of a default rule.
In addition to displaying modifier fluctuation, the Bulgarian examples in (5) above exhibit a phenomenon also found in Romanian, namely instances when minimality constraints are not observed. The example in (6a¹) below attests the possibility of a “lower” adjective, *frumoasă*, raising to Spec,DP across a “higher” adjective, *mea*. Again, the N-to-D raising example, as given in (6a), is taken to represent the base order.

(6) a. fata mea frumoasă (Romanian; Avram and Coene 2002)
   girl.the my beautiful
   a¹. frumoasa mea fată
   beautiful.the my girl
b. senzaționala ta nouă idee
   sensational your new idea
b¹. noua ta idee senzațională
   new your idea sensational

Further problems in Romanian arise when trying to account for nominal phrases which display both partial N-movement and AP movement (to Spec,DP), as shown in (6b–b¹). Any movement analysis should explain why both types of movement should obtain simultaneously and also define exactly in which order the respective constituents move.

Furthermore, the N-movement approach cannot handle
— Scopal effects when the modifiers appear on both sides of the noun (cf. (7a)).

Observe that on the N-movement analysis a post-N adjective cannot have scope over an (pre-N) adjective to its left for reasons of c-command.

(7) a. un jeune homme obstiné
   an obstinate young man

   — Grammaticality/acceptability contrasts of the type in (8)

(8) a. gazetë tjë vjetër / gazetën e vjetër (Albanian, newspaper AGR old / newspaper.the AGR old Kallulli 1999)
   a¹. *tjë vjetër gazetë / tjë vjetrën gazetë
      AGR old newspaper / AGR old.the newspaper
b. libër shumë i bukur / shumë libër i bukur
   book very AGR good / very book AGR good
b¹. libri shumë i bukur / *shumë libri i bukur
   book.the very AGR good / very book.the AGR good
It is not clear why definite expressions allow for both NA and AN orders, while bare expressions do not. Strangely enough, N-movement appears to be obligatory in the case of bare nominals, but not in definite expressions (cf. the contrast in (8a’)). This result is surprising, when bare nominals are generally assumed to have less functional structure (and, possibly, no D-layer at all).

1.3 A competitive account

An account which does not employ movement at all and which relies exclusively on a merging operation is the compositional, “syntax/semantics isomorphy” approach advocated by Bouchard (1998). Here the mode of combining modifier-noun corresponds to an (different) application of the merge operation described as “an associative function that combines two categories together”, cf. Bouchard (1998). Since the only primitives in the system are the categories in the lexicon and the associative function, the combined category which results after, say α and β merge is either α or β, depending on which of the two has functor status (i.e. is the head in more traditional X-bar terms). Of the two items merging it is the functor category that projects. Thus, the labels of intermediate projections have no theoretical status, inasmuch as they are redundant (and predictable) and can be traced by the hierarchy of the tree and the content/category of the daughter nodes. The merge of α and β is governed by selectional properties and restrictions along the lines of semantic composition, the primary function of language being to communicate meaningful information by combining smaller units into larger ones. Thus, if α and β are incompatible content-wise the resulting merge is meaningless and hence ruled out.

2. A minimal case: The contrast French–English

French and English form a minimal pair in terms of the linearization patterns available in the nominal expression. Thus, whereas French employs the order (A)NA, English shows a preference for AN(*A). This contrast is discussed at length in Bouchard (1998) and the following claim is made concerning French:

— pre-N adjectives are heads and sisters to N (modify something internal to N, e.g., the denotation assignment function $f$, the interval of time $i$ at which the denotation assignment function holds, possible world $w$
(cf. 10b) or define how to apply the characteristic function (cf. (11a));
— post-N adjectives are in a phrasal relation to N (modify N as a whole, as a closed off category).

This claim is based on the contrast observed between pre-N adjectives and post-N adjectives in French, whereby one and the same adjective may give rise to different interpretations depending on its position in the linear string, as suggested by the glosses in (9)–(11).

(9) a. un chef bon (Bouchard 1998)
   (good on a broader scale, as a human being)
   b. un bon chef
   (a good chef, good at cooking)

(10) a. des pianos faux
   (pianos out of tune)
   b. des faux pianos
   (false, fake pianos)

(11) a. des fleurs parfaïtes (parfait: a property assigned to the set of entities determined by fleurs)
   b. de parfaits imbéciles (the characteristic function applies “perfectly”)

Thus, in (10a) faux modifies N as a referent, assigning a specific property, that of being out of tune. The interpretation in this case would be the intersection of the set of pianos and the set of objects out of tune, while in (10b) the focus is on a component of the denotation of N, namely possible world w, thus yielding an interpretation along the lines of “objects that resemble pianos, but are not real pianos”. Quite often, a pre-N adjective translates as an adverbial modifier to the application of the denotation function, e.g. the example in (11b), whereby the property of being an idiot applies perfectly to the referents at hand. Note also that a similar pre-N–post-N contrast effect is proposed to obtain in Romance in general in the case of possessives. For instance, Cardinaletti 1998 has proposed that there is a weak vs. strong syntactic and semantic contrast between pre-N and post-N possessives in Italian and other Romance languages.

2.1 The case of English

English allows only for pre-N modifiers (i.e. the (A)NA pattern is absent).
Modification in the Balkan Nominal Expression

Apparently, the French situation cannot be carried over automatically to English, as there is no difference in terms of the linear position of a modifier with respect to the noun, that is, all adjectives precede N. However, a closer inspection reveals that, even in English, some of the modifiers are head-like (the innermost one), while others are phrasal. Observe the minimal pairs in (12) below, whereby the modifier closest to the noun, respectively *Italian* in (12a’) and *tall* in (12b’) cannot be modified by an adverb. This is an indication that these constituents have head rather than phrasal status.

(12)  
\[ \begin{align*}  
\text{a.} & \quad \text{a tall Italian chap/person} \\
\text{a’}. & \quad ??\text{a tall truly Italian person} \\
\text{a’’}. & \quad \text{a very tall Italian person} \\
\text{b.} & \quad \text{an Italian tall story} \\
\text{b’}. & \quad *\text{an Italian truly/very tall story} \\
\text{b’’}. & \quad \text{a truly Italian tall story} 
\end{align*} \]

Note that the illicit adverbial modification in the examples in (12) above is not related to the type of adjective *per se*, but rather to the syntactic structure they occur in. Thus, both *Italian* and *tall* can be modified by *truly* when they occur outside the “inner NP-shell”, i.e., when they are not heads (cf. Stavrou 1998 and Alexiadou and Stavrou 1998 for a similar proposal for Greek adjectives which occur closest to N and thus form a compound-like structure with the nominal head). Sadler and Arnold 1994 provide numerous and well-attested instances of the constraints which obtain on pre-N modifiers in English, arguing that prenominal adjectives are syntactic “small” constructions that form “small” constructions with the noun they modify, a small construction being defined as “an X° construction with X° daughters”.

Further evidence in English comes from compounds/compound-like items and complex nominal head modification, suggesting multiple (free) composition options governed by semantic selection, where all constituents are at the X°-level.

(13)  
\[ \begin{align*}  
\text{a.} & \quad \text{a gun shot (wound)} \\
\text{b.} & \quad \text{a shotgun} \\
\text{c.} & \quad \text{security-breath command procedure} \\
\text{d.} & \quad \text{jet-ski} \\
\text{e.} & \quad \text{a ski-jet} 
\end{align*} \]

A parallel situation obtains in Norwegian, where some modifiers form a compound with the nominal head, judged by spelling, stress pattern and
sandhi effects, thus giving rise to idiomatic interpretations of the type observed in French. Consider the compounds in (14) below.

(14) a. smågodt
   small sweets
   ‘assorted sweets’
b. valgallmøte
   election-all-meeting
   ‘general election meeting’
c. frikort
   free-card (a card which gives one access to services free of charge)
c’. fritt kort
   free-AGR (NEUT) card (NEUT)
   ‘free card’

The examples in (14a–c) are all associated with idiomatic interpretations, much along the lines of the “internal” modification in French in the cases discussed above, when the modifier occurs in pre-nominal position. Note that this type of modification is discussed already in Jespersen (1937) and analysed as “irregular junction” and “implied predicatives”. Jespersen’s classification is syntactic (e.g. the modification structures are analysed as nested structures, very much along the lines of the current approach) and based on the underlying relationship between the head and the modifier concept rather than as arising from any special meanings of the modifiers.

3. Basic assumptions in the compositional account

3.1 The mechanism

On the compositional approach, components combine by (integral) merger, merger being triggered by selectional properties, which are semantic in nature. That is, potential merge operations are judged on the basis of what content needs to be expressed, e.g. in the case of nominal modification what property is to be attributed to the referent of N, and whether it is a component of N that should be modified (cf. the internal modification pattern of pre-N adjectives in French and the category created through compounding in English) or N is to be modified as a closed off category (e.g. the post-N pattern in French). Along these lines, different possible interpretations of adjective —
noun pairs can be reduced to a difference in syntactic structure, thus eliminating the need to postulate different “types” of adjectives or “type shifts”. Consider the representations of (7a) and (3b–b¹ƒ) given in (15)–(16) below.

(15) The representation of (7a)

(16) a. The representation of (3b)

b. The representation of (3b¹ƒ)

In the case of (15) both *jeune* and *homme* combine as $X^0$ categories, the result of merger remaining an $X^0$, since the category *jeune* combines with is smaller than N (i.e. it is a component in the semantic structure of N). The merged category combines next with the article to form a complex functor category, the latter finally merging with an XP constituent, *obstiné*. Similarly in (16), the article and *lignes* merge first to form a complex functor, and then successively with the two phrasal categories, *parallèles* and *colorées*.

In minimizing structure and assuming only visible and necessary operations (e.g. a category projects if and only if it combines with another category, and as many times as necessary), Bouchard’s compositional approach shares a
lot of similarities with current assumptions about bare phrase structure (Chomsky 1995) and the mechanisms operative in the combination of constituents (e.g., cf. Stabler’s 1999 interpretation of bare phrase structure, and Dobrovie-Sorin’s 1999 minimalist DP/NP structure assumptions). In arguing for compositionality, the integral merge approach is in line with current assumptions on conceptual combination (cf. Wisniewski and Gentner 1991; Wisniewski 1996, 1997; Costello and Keane 2000, 2001) and linguistic analyses of the type offered in Pitt and Katz (2000) who argue for a compositional component in the generation/processing of compounds of the type plastic flower.

3.2 Cross-linguistic variation

Differences across languages in the linearization of modifier–noun arise from the setting of the functor/saturator linearization parameter. English and French are instances of the setting “functor precedes saturator/modifier” (i.e. head precedes complement). In addition, each language allows for the so-called Elsewhere applications, that is, a reversal in the order functor-saturator in certain circumstances. Such reversals are driven by semantic reasons and may obtain in the cases when the relation between the two combining constituents is too “tight” or when the relationship is split (i.e. too loose). Thus, a tight relationship is exemplified by the instances of internal modification in French discussed in (9)–(11) above whereby the adjective modifies only an internal component of N and the modifier and noun relate to each other as heads, a situation more readily observed with noun-noun compounds. Any realization of the linearization parameter, as well as Elsewhere applications depend on the encoding of Number in the nominal phrase. The latter requirement applies to the encoding of Number for semantic interpretation and is not to be conflated with number agreement in the noun phrase. Thus, for instance, in French Number is encoded on the determiner, whereas in English it is on N. Essentially, Number coding can be checked by using the following tests/indications:

(i) Obligatoriness of Number marking on Det
(ii) Det ellipsis (e.g. bare plurals/bare singulars)
(iii) Noun ellipsis
(iv) Co-ordination (the reference of a single Det with two N projections, cf. Longobardi 1994 for treating Det as a referential index)
(v) Conjoined determiners
(vi) Compounding: whether [V–N] compounds can be used as nouns or not

Number encoding is seen as essential in determining the ordering possibilities inside the nominal phrase, since Number bears a relation to the extensity of the expression, whereas other features which also find grammatical expression in noun phrases (e.g., gender) do not. The relevance of Number is phrased in the following condition

(17) The Number Scope Condition

The element that codes Number in a nominal expression must have scope over the elements that determine the extensity of the expression.

Thus, if a modifier is to be included in the extensity of the expression, it ought to occur in a place in the phrase within the scope of Number. In English the only viable position is the pre-nominal position, as Number is expressed on N and a phrase-final head only has scope to its left (Williams 1981). For this reason English cannot employ the default setting of the Linearization Parameter. In contrast, in French two positions are available, both relying on the complex functor category formed by the merger of Det and the nominal head. The pre-nominal position is a licit Elsewhere application of the Linearization Parameter with the adjective being part of the complex functor category and thus, under the scope of Number on Det. The post-nominal position is a regular application of the Linearization Parameter, whereby the complex functor formed by Det and the noun has scope to its right, thus including the post-nominal adjective. French also demonstrates the rationale behind complex functors. In the languages with Number coded on Det, there arises the need for Det to be somehow included in the nominal functor category. This is usually made available through cliticization, as e.g. in French, which allows only clitic Dets (cf. the article, prenominal genitives) and the Balkan languages (cf. (5)–(7) below). In contrast, in English Det is a syntactic head which projects a specifier (cf. phrasal genitives).

4. Support for/advantages of Bouchard’s compositional approach

There exists independent diachronic support for the contrast French/English. Historically French and English have taken diverging paths and, from diverging starting points (cf. Lightfoot 1979) and the contrast has always been there. Thus, English had the NA pattern as late as the Middle English period, even
with a slight increase in the frequency of post-nominal modifiers at this stage. However, in the same period French employed overwhelmingly pre-nominal modifiers (cf. the data quoted in Lightfoot 1979 based on a comparison of compatible French and English texts from the same period). The subsequent evolvement of the nominal system in English led to the loss of the NA pattern (with the exception of cases mentioned in n. 7), whereas in French there was a move in the direction of establishing the NA pattern as the default one accompanied by an increase in its frequency. So, if English and French in the course of their history consistently showed different preferences for specific modification patterns, clearly, the availability of the specific modification patterns in both the earlier stages and in the contemporary languages must be the result of some parameter-setting (not exactly conflatable with the head-setting parameter).

The relevance of the language-specific parameter setting coupled to Elsewhere applications is independently corroborated by work in cognitive science. Recent research indicates that occasional reversals in the functor/saturator linearization may obtain (cf. Costello and Keane 2000, 2001) when computing the interpretation of a novel noun-noun compound in a native language (i.e., when the parameter is supposed to be set in the case of adults). Thus for instance, a bed-pencil has been interpreted by subjects as a doll bed shaped like a pencil. Such cases are also known as focus reversals and, although rare, have been reported in the literature (cf. Gerrig and Murphy 1992; Wisniewski and Gentner 1991).

The relevance of selectional criteria as the main constraint on the merge function finds ample support in cognitive research, whereby criteria, such as diagnosticity, plausibility and informativeness have been demonstrated to obtain both in the production and comprehension of combined concepts (cf. Costello and Keane 2000, 2001). The criterion of feature diagnosticity is of paramount importance when selecting properties for transfer from the modifier concept to the head concept and thus influences the choice of categories to be combined. In addition, relational factors, such as the mode of combination and the underlying semantic relation between the modifier and the head noun (e.g. Bouchard’s internal modification with pre-nominal adjectives in French) influences the processing of other instances of the same relation observed as relational priming effects (cf. Gagné 2001).

The compositional approach accounts for the fact that different linear positions (e.g., pre-N vs. post-N) are associated with different interpretations, a situation otherwise unexplained on the N-movement approach.
The compositional approach captures the observation that some modifiers behave like heads, while others are more like phrases (cf. Sadler and Arnold 1994; Stavrou 1998; Alexiadou and Stavrou 1998 for Greek; Carnie 1995 for Irish indefinite nominals).

The compositional approach correctly predicts why adjectives may, but need not, merge with the article in Romanian and Albanian, as merger is selectionally governed (N-movement accounts have postulated additional functional projections with information structure correlates).

Data from both Albanian and Romanian confirm that pre-N adjectives are part of what Bouchard labels a complex functor category, which is the result of merging either N or the adjective with Det. This situation is predicted by Bouchard’s approach, however in French, there is no overt evidence to support the claim, as both pre- and post-N adjectives have the same morphological shape. In Albanian, the fact that a pre-N adjective is a head and part of the complex functor category is demonstrated by the data in (18) below. Thus, a pre-nominal adjective bears all the case, agreement and definiteness morphology of the noun phrase, whereas the head noun appears in a bare form, as shown in (18a). In contrast, in the default linear order ((18b)), the noun bears all the inflectional morphology of the phrase.

(18) a. i dashuri mik  
   \text{AGR dear (NOM, DEF) friend} 
   a’. e dashurin mik  
   \text{AGR dear (ACC, DEF) friend} 
   b. miku i dashur  
   \text{friend (NOM, DEF) AGR dear} 
   b’. mikun e dashur  
   \text{friend (ACC, DEF) AGR dear}

Romanian behaves in a similar way with pre-nominal modifiers taking over all the grammatical morphology of the phrase, including morphological case, as demonstrated in (19b) below.

(19) a. domnului acestuia  
   \text{mister (GEN, DEF) this (GEN)} 
   b. acestui domn  
   \text{this (GEN) mister (NOM/bare)}
5. How are the Balkan languages accommodated within the compositional account?

The basic data from the Balkan languages conform with the compositional approach discussed above. The Balkan patterns of modification are given in (20) below. The important observation is that these orders obtain irrespective of the nature of the nominal expression, e.g., whether definite or indefinite (counter an (overt) N-to-D raising account).

(20)

a. A A N  Bg/Rom/Alb./Greek
b. (A) N A (*)Bg/(*).Greek
   Rom/Alb OK

Note that the order in (20a) is marked in Romanian, where pre-nominal modifiers have sometimes been referred to as “topicalized” APs (cf. Cornilescu 1995). This order is also marked in Albanian, however the term used in connection with this language has been “focused” APs (cf. Dimitrova-Vulchanova and Giusti 1998). Below some of the data from these languages are discussed and given new interpretation within the compositional account.

As for the order in (20b), the asterisks for Bulgarian and Greek mean that the N A pattern is generally excluded in both languages, however it may occur in Bulgarian in poetic language (cf. the discussion in 6 below). In Greek permutations are allowed under special circumstances, often called “determiner spread” (cf. Alexiadou and Wilder 1998; Androutsopoulou 1995). For reasons of space the latter will be left out of the present discussion.

5.1 Linear position signals a difference in interpretation

Romanian provides evidence that, in most cases, the same adjective gives rise to two subtle, yet distinct interpretations depending on whether it occurs in pre-nominal or post-nominal position. Consider the examples in (21).

(21) Romanian
   a. o femeie singură (cf. French une femme seule)
      a woman alone
      ‘a woman who is alone’
   a’. o singură femeie (cf. French une seule femme)
      an only woman
      ‘only one woman’
b. un episod adevărat
   an episode real (true, that actually happened)

b’. un adevărat nonsens /*un nonsens adevărat
    a real nonsense

c. un palton vechi
    a winter coat old

c’. un vechi prieten
    an old friend

In addition, in Romanian there exist linearity restrictions on certain modifier classes, such as pre-N for ordinals and biet ("poor, pitiful"), which are naturally explained within a compositional-selectional account, but not on an N-movement account. Thus, an N-movement account will have to explain why biet should occur only pre-nominally, while other quality adjectives may occur post-nominally. On the integral merge account the restriction in occurrence can be explained by the fact that both biet and an ordinal modify a component internal to N, and not N as a referent. These cases can be seen as an alignment of the semantics of these items and their syntactic position inside the nominal expression. Thus, un biet om/bietul om means someone in a pitiful/miserable state, and not the intersection of the set of people and the set of poor things. Likewise, ordinals denote a relative position within a set, of the type based on comparison/contrast, and not just an absolute property. Interestingly enough, biet correlates with another adjective, sărac (poor, penniless) which, unlike biet, can occur both prenominally and postnominally. As predicted on the current approach, there is a contrast in meaning with prenominal sărac being equivalent to biet in interpretation.

(22) a. La omul sărac nici muștele nu trag.
   to man.the poor neither flies.the not attract/come
   ‘Even the flies don’t go to a poor man.’

   a’. El e un om sărac.
   he is a man poor
   ‘He is a poor man (with no money).’

   b. ?Săracul băiat nu a putut plăti.
   poor.the boy not has could to-pay
   ‘The poor boy couldn’t pay.’

The above contrasts pattern nicely with respect to predicative use, which has traditionally been argued to be a criterion for distinguishing among the
various “classes” or types of adjectives. Observe the contrastive pairs in (23) below.

(23) a. Paltonul este vechi
winter coat.the is old

a’. *Prietenul este vechi
friend.the is old

b. Femeia este singură
woman.the is alone

b’. *Femeia este singură
woman.the is only

As argued by Bouchard (1998), the contrast in grammaticality can be explained naturally on the assumption that if an adjective modifies a component internal to the denotation of N, such a property cannot be predicated of N as a closed off category. To the extent that the same adjective is used in both cases with, essentially, the same meaning, the alternative account, which claims multiple senses, seems less feasible. Thus, the syntactic distribution should be seen as a consequence of the type of modification e.g., *vechi (old) and singură (alone) participate in, rather than as correlating with two distinct categories of adjectives. Moreover, in the case of the data in (23), each adjective should be postulated as belonging in two distinct categories simultaneously (i.e. predicative/non-predicative).

In Albanian, too, a group of modifiers always appear in pre-N position due to their meaning or rather the kind of interpretation they impose. This applies, for instance, to definite ordinal numbers, as given in (24a) and certain other categories, such as e.g., “possible-world” modifiers, as ashtuquajtur (“so-called”) in (24b).

(24) a. i pari muaj / e para javë (Albanian)
first.the month / first.the week

b. ashtuquajtur-i profesor / aktor
so-called.the professor / actor

One also finds a fluctuation between pre- and post-N positions depending on selection, clearly demonstrating that modification is the result of free combination (i.e. through merge) rather than the result of observing a strict hierarchy (e.g., of the Agreement projections type). This is demonstrated in the examples in (25) below.
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(25)  
\[ a. \text{ qytet-i i trishtueshëm dimëror} \]  
\[ \text{city.the agr-sad winter} \]  
\[ a'. \text{ i trishtueshëm-i qytet dimëror} \]  
\[ \text{agr-sad.the city winter} \]  
\[ a''. \text{ ?dimëror-i qytet i trishtueshëm} \]

5.2 Head-status for pre-nominal vs. phrase-status for post-nominal

The data from Romanian and Albanian in the previous section, (21)–(24) in particular, demonstrate the relevance of linking differences in semantic interpretation with differences in syntactic structure. That is, the pre-nominal position for adjectives indicates head-status and, thus, the adjective may modify only a sub-set of the set of features associated with N. In contrast, post-nominal modifiers are phrasal and modify the closed off category denoted by N. Further evidence supporting the contrast head-like vs. max-like between pre- and post-N modifiers is found in Romanian, where the dummy adjectival article \( \text{cel} \) is restricted to post-N position (Giusti 1993), whereas pre-nominal adjectives do not require such a marker.\(^\text{15}\) The fact that only post-nominal adjectives may take a pre-posed free morpheme, such as \( \text{cel} \), clearly suggests that they are rather maximal categories. This is also in line with Dobrovie-Sorin’s 1999 treatment of post-N adjectives/\( \text{al} \) genitives as adjoined to DP. Consider the examples in (26) which further confirm the head status of pre-N adjectives.

(26)  
\[ a. \text{ *frumoasa regelui fiicä} \]  
\[ \text{beautiful.the king.GEN daughter (Grosu 1988)} \]  
\[ a'. \text{ frumoasa ta fiicä} \]  
\[ \text{beautiful.the your daughter} \]  
\[ b. \text{ *credinciosul soției sale soț} \]  
\[ \text{truthful.the wife (n) his husband} \]  

In (26a–a’) there is a clear contrast between a maximal genitive phrase, \( \text{regelui} \) (of the king), and the corresponding genitive weak pronoun, \( \text{ta} \) (your), in that the former is not allowed to occur in pre-nominal position (cf. Grosu’s proposal that \( \text{ta} \) is a D, i.e. a head). (26b) shows that other phrase-size items, such as \( \text{credinciosul soției sale} \) (truthful to his wife) are excluded from pre-nominal position, too.
5.3 (8a–a’ ) revisited

The compositional account presents a possible straightforward solution for the Albanian data given in (8a–a’ ) above, repeated here as (27).

(27) a. gazetë tjë vjetër / gazetên e vjetër
newspaper AGR old / newspaper.the AGR old
(Albanian, Kallulli 1999)
a’. *tjë vjetër gazetë / tjë vjetrën gazetë
AGR old newspaper / AGR old.the newspaper

The tests for Number realisation suggest that Albanian realises Number on Det (cf. Dimitrova-Vulchanova 2002). No Det is present in the bare sg. expression in (8a’), hence no Elsewhere application is allowed, the only grammatical linearization being N A (functor>saturator). Note that this account is in line with a proposal in Kallulli (1999) to the effect that bare noun phrases lack the D-layer, and are thus excluded from (movement-) processes applying at this level.

6. The puzzle

6.1 Bulgarian

In all three languages Number is realised on Det, that is, they behave uniformly, and like French, with respect to the Number tests (cf. the Dimitrova-Vulchanova 2002), however Romanian and Albanian display the French linearization pattern, whereas Bulgarian behaves like English (with the exception of marginal/poetic post-N adjectives). Observe the data in (28)–(29) below.

(28) a. našata zemja xubava (Bulgarian)
our.the land beautiful
a’. oči sini / *oči mnogo sini
eyes blue / eyes very blue
b’. stara gora osenova/ *predimno osenova
old woods ash(-tree)/ *predominantly ash(-tree)
(29) a. credinciosul soţ al soţiei sale (Romanian)
thruthful.the husband al wife (p) his
a’. *credinciosul soţiei sale soţ
   truthful.the wife (of) his husband
b. burr-i besnik ndaj së shoqes (Albanian)
   husband.the truthful to his wife
b’. */??besnik-u ndaj së shoqes burrë
   truthful.the to his wife husband
b”’. */??besnik-u burrë ndaj së shoqes
   truthful.the husband to his wife
c. vernijat na žena si můž (Bulgarian)
   truthful.the to wife CL(REFL) man
c’. *vernijat můž na žena si
   *můžút veren na zena si

c. *vernijat na žena si můž (Bulgarian)
   truthful.the to wife CL(REFL) man
   vernijat na žena si můž
   truthful.the to wife CL(REFL) man
   *vernijat můž na žena si
   *můžút veren na zena si

Judged by its poetic, stylistically-marked sounding, the example in (28a) is quite similar to the French expressions discussed in Bouchard (1998), ce plat pays/ma verte prairie/ce rance vin, and, as such, appears to be an Elsewhere application. In addition, Bulgarian post-N adjectives may not be phrasal, as suggested by (28b–b’). In contrast, and quite unlike Albanian and Romanian (witness (29a–b)), Bulgarian pre-N modifiers may be phrasal ((29c–c’')). As expected on the current account, the same adjective in pre-nominal and post-nominal position may give rise to different interpretations. However, in Bulgarian there is a reversal in the position associated with the two distinct meanings (e.g., compared to pre-nominal in Romanian). Observe the data in (30) which demonstrate that a modifier in post-nominal position, as půrvi in (30b), is interpreted idiomatically as a compound with the noun.

(30) a. půrvi den
   first day
b. den půrvi
   day first
   ’the beginning’

The question then is why Bulgarian appears to be the reverse case of Romanian and Albanian. Clearly, the difference is neither related to the realisation of Number, as all three languages opt for expressing Number on the article (Det), nor to Number scope, these being the factors assumed to control Elsewhere applications.
6.2 A proposal

A tentative proposal might be that the functor/saturator linearization parameter in Bulgarian is set differently, i.e. saturator precedes functor. Support other than adjectival modification comes from typical Elsewhere application environments, such as too tight/too loose (split) relations.

One such instance in Bulgarian is the Aux–V relation, a very tight relationship between a functional head and a lexical head in the same domain. Bulgarian exhibits the so-called long-head movement (LHM) pattern applied to V-main and in the absence of other clausal constituents, the default order is V-main Aux, i.e. saturator > functor. An Elsewhere application becomes necessary when the arguments of V are overtly realized, thus “splitting” V-main from Aux. This is illustrated in (31b) below.

(31) a. Jal e beše
   eaten / slept is / had
   ‘(He) has/had eaten/slept.’

b. Ivan e beše jal torta
   ‘I. is / had eaten cake.’

Note that the reversal of the order in (31) above cannot be explained through a phonological requirement for clitics to have an accented host, as only the present tense forms of be are clitics.

More evidence is found in noun–noun expressions of the D(irect) P(aritive) C(onstruction) type and in qualificational noun phrases. In such phrases, the head always precedes the modifier, as shown in (32). Note that this is in line with van Riemsdijk’s 1996 proposal treating N1 (e.g., čaša) as a semi-lexical head and N2 (e.g., voda) as a lexical head within the same nominal extended projection.

(32) a. čaša voda
   glass water

b. kućeto Snoopy
dog.the Snoopy
   ‘Snoopy, the dog’

Both expressions in (32), even though representing different structures, can be seen as instantiating a tight relationship between a functional and a lexical element which, together, express a single referent. Again, an Elsewhere application of the linearization parameter seems to have taken place, with the
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7. Problems and conclusions

We have demonstrated that the compositional merger account has a number of advantages over an N-movement approach. A major advantage of the compositional approach is that it explains differences in the interpretation of the combination adjective-noun as arising from differences in syntactic structure, and not as the result of “type shifts” or through stipulating different categories of adjectives. In addition, a number of facts, otherwise unexplained on the N-movement approach, such as e.g., the cross-linguistic mirror effect or fluctuations within the same language in the ordering of modifiers find a motivated explanation. Moreover, diachronic facts and results in cognitive research also support the basic strategy adopted in the compositional merger approach (cf. the arguments put forward in 4). A problem which has not been addressed so far is attested in noun phrases in Albanian and Romanian where N takes a complement. Consider for instance the data in (33).

(33) a. credința cea strâveche în Dumnezeu (Romanian)
   faith.the cel ancient in God

a’. ćredința în Dumnezeu strâveche
   belief.the in God ancient

a”. creinta în Dumnezeu cea trâveche
   belief in God cel ancient

b. besim-i i vjetër në zot (Albanian)
   faith.the AGR old in God

b’. *besim-i në zot i vjetër
   faith.the in God AGR old

At first glance, the occurrence of the adjective cea strâveche (ancient) in (33a) and i vjetër (old) in (33b) in post-nominal position immediately after N can be accounted for on an N-movement approach on the assumption that the base order is A N XP (complement), and that N has moved one step higher, thus linearly preceding the modifier. A merger approach will have to explain why N first has to merge with the adjective, thus creating a maximal category, and
only then merging this maximal category with the XP, complement of N. A closer look, however, reveals that the post-nominal modifier strâveche occurs with the dummy adjectival article cel, which never occurs with pre-nominal adjectives. If the linear ordering in (33a) were the result of N-movement across strâveche in a specifier on a left branch, then the possibility of inserting cel remains a mystery. It will be recalled from the discussion in 5.2 that when cel combines with an X° category, the result is X’, rather than X°. Further evidence in favour of the merger account and contra N-movement is the possibility for (33a”), which is minimally contrasted to (33a) in that the position of the complement of credinţa is immediately after the noun. This fluctuation with modifiers/constituents on one side of the head is predicted by the integral merger approach, but not by the N-movement account. Furthermore, the ungrammatical (33b’) in Albanian could simply indicate that moving the whole NP (i.e. the nominal along with its complement) to a higher functional projection is illicit, something which will be a problem within a successive XP roll-up account as well.

An option could be to revise the notion of complement in noun phrases, and evaluate to what extent constituents within the noun phrase are likely to instantiate a complement-to-head relationship with respect to N. In the case of [+V, –N] heads the complements of V are subcategorised for by the lexical head (i.e., they are part of the lexical specification of the head). With [+N, –V] heads such lexical specification is missing (cf. Alexiadou and Stavrou 1998 for precautions concerning the CP/DP parallel, and Dimitrova-Vulchanova 1999 for a discussion of possessives, argument structure of the noun phrase and the raising of possessor prepositional phrases in Bulgarian). Many current approaches deal with such linear orders in terms of obligatory raising of the whole maximal projection in which the complement XP is embedded (or fragments of it) to a functional specifier (cf. Koopman and Szabolcsi 1998; Stabler 1999; Androutsopoulos 1999; Cinque 2000). Such approaches do without head movement, only XP movement is assumed. The compositional approach advocated here relies exclusively on merge without any movement at all. A tentative proposal for the data in (33) might be along the lines of treating the potential complement in such phrases as adjoined to the maximal phrase created by merging N with an AP (e.g., the cel phrase in post-nominal position). This is also in line with other proposals (cf. Dobrovie-Sorin 1999) where post-nominal al genitives in Romanian are treated as adjoined to DP and not as occupying a specifier position. In choosing between the two alternative accounts, e.g. XP-movement or integral merger, an apparent
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Criterion would be the motivation underlying the processes argued for. The maximal projection “roll-up”-movement approach clearly accounts both for possible and attested constituent orders, however, the motivation behind when and at what step the derivation stops, remains obscure. In addition, the subtle interpretation differences between the same adjective occurring in different positions remain outside the scope of such accounts. With the integral merger approach the only driving force is semantic selection associated with clear syntactic choices (e.g. the associative merge function), thus aligning modification types (e.g. N-internal modification which operates on components of the noun denotation vs. modifying N as a closed off category) with distinct syntactic positions.

Notes

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1. Note that in language typology studies the variation in modifier-noun linear ordering in a single language is viewed as a transition stage in a shift from AN to NA (cf. Hawkins 1990, among others).

2. The above variation is also found in Greek, however the conditions for its application depart from those generally found in Romanian and Albanian.

3. Cf. the accounts by Taraldsen (1990), Longobardi (1996), and Arnaoudova (1995), among others.

4. A tentative solution within the N-movement approach is the distinction between attributive and predicative adjectives, proposed by Cinque (1994), whereby the latter category are generated postnominally on a right branch. Such adjectives are expected to occur finally in the linear string after N has moved bypassing an attributive adjective generated on a left branch. The problem with this explanation is the necessity to stipulate two distinct types of modifiers with no apparent motivation either in the adjective category or otherwise (e.g., the only empirical distinction between attributive and predicative adjectives is that only the latter occur after possible complements of N).

In a recent paper Cinque (2000) provides an elegant account of the mirror effect through a mechanism of successive XP “roll-up” movement to the specifiers of functional
projects above NP in the structure. While accounting for mirror effects, the XP-movement approach still does not account for subtle interpretation differences when the same adjective occurs pre- and post-nominally.

5. The notion of functor as used in the integral merge approach differs from the terminology proposed by Zwicky (1993) both in its implications and content. In Zwicky’s sense it is modifiers that are functors and as such are optional, iterable, lexically subcategorized, the targets of agreement and triggers for government.

6. The current approach will predict that head-status and functor status by rule coincide, in the sense that there will be no mismatches of the type generally observed in the semantics/syntax interface. This can be easily explained by the fact that a phrase will refer to the same type as the head concept, i.e. the functor. Observe that in the process of concept combination one of the concepts serves as the basis of the combination and is head, and the other concept contributes a feature/property for transfer which fills a slot in the structure of the basic concept and is modifier (cf. alignment theories — Wisniewski 1996, 1997; Wisniewski and Gentner 1991) and constraint theories — e.g. Costello and Keane 2000, 2001). In this sense, an item is unambiguously either a modifier or a head and this is determined by its role in the process of concept combination. Thus, situations whereby the modifier is candidate for head status are naturally ruled out. This is easily demonstrated in the cases of occasional focus reversal when the first concept serves as the basic concept and the second provides a feature for property transfer resulting in a switch to head status for the former (e.g., an elephant pig is interpreted by subjects as “an elephant with pig’s ears and nose”, cf. Costello and Keane 2001). Observe that in such cases it is the first concept which projects and functions as functor in the merge operation (i.e. it is not a saturator/modifier).

Structures which within an X-bar analysis contain a lexical head and a functional head (e.g. an instance of “double-headedness”, as in DPs) are here analysed as forming a complex functor category through the merge of two X⁰ items, the article and the noun, the resulting category also being an X⁰.

The current approach remains silent about cases of exocentricity, e.g. compounds of the type a low-life, with neither of the combining concepts serving as the base/head. Such cases, however, should not be viewed as instantiating the theoretical possibility of a double-headed structure, since neither of the two overt categories functions as head or modifier. Rather, the compound as a whole is the modifier/saturator of a hidden head concept (cf. traditional accounts of the relations instantiated in exocentric compounds).


8. An exception are structures of the type illustrated in (i).

(i) a. those responsible
   b. the editors present

Such structures have been noticed and discussed in the literature(cf. Bolinger 1967; Sadler and Arnold 1994, among others) and proposed to have a stage-level predicate interpreta-
tion, in contrast to pre-N modifiers which generally describe permanent, individual-level properties.

9. Note that the complex functor category is warranted in Zwicky (1993) in what he labels double-headed (paratactic) constructions of the type combining a functional head (e.g., auxiliaries, determiners) and a lexical head. In English other instantiations of this type are contracted infinitival constructions, e.g., wanna/gonna go, go get. Observe that these are cases of incorporation of the functional item into a higher lexical/semi-lexical verb, incorporation being instrumental in allowing the latter to assume a functional status, a situation quite reminiscent of articles incorporating into nouns/adjectives in the Balkan languages. To handle these splits, Zwicky proposes an additional category, Base for the lexical head.

10. Elsewhere applications have been discussed in the literature in connection with split relations, e.g., subjects which occupy Spec,IP, but nevertheless hold a thematic relation to V, also Genitives in Spec,DP which hold a structural relation to DP, but are referentially (and thematically) related to N (cf. Emmonds 1976; Giorgi and Longobardi 1991).

11. The only difference are the liaison effects with pre-N adjectives discussed in Bouchard (1998).

12. Such contradictory labelling is usually the result of failing to separate the notion of contrast from the notion of focus. Thus, both topic phrases and focus phrases may be additionally marked for contrast obscuring the difference between topic and focus otherwise (cf. Lambrecht 1994 and Polinsky and Potsdam 2001 for evidence that languages can mark contrast separately from focus).

13. Cinque (1994) suggests that a tentative explanation in such cases in Romanian might be that such adjectives are heads (cf. Giusti 1991) and, as such, cannot be crossed by N. Even so, the N-movement analysis ought to explain in principle why some of the modifiers inside the DP are heads, while others are phrasal categories, and how this is accommodated within the idea of generation in specifier positions.

14. As a reviewer rightfully points out, the meaning contrast in Romanian is so subtle in some cases, with the adjective corresponding to its basic interpretation, that it is difficult to claim that two different items (senses) are involved. Still, in these cases, too, there is at least a contrast in terms of Information structure, e.g. Topic/Focus contrasts which are quite compatible with an account along the lines proposed here, e.g. as residing in contrasting syntactic structures.

15. When used in pre-nominal position, cel is the only article in the phrase as a whole, and, as such is not dummy, e.g., as in the superlative construction in (i) below.

   (i) cele mai mari clădiri
   the-FPL more big buildings

16. In traditional terms this is tantamount to stating that Bulgarian is head-final, whereas Albanian and Romanian are head-initial. Whether this parameter is set uniformly across all categories of phrases remains an open issue (cf. the discussion in Roberts 1997).
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17. Cf. traditional terminology which treats the Aux-V complex as one phrase, usually labelled the “verb phrase” which includes all auxiliaries and the main verb in a periphrastic construction, but excludes the verb’s complements.

18. For a similar treatment of Greek quantity expressions, see Stavrou, this volume.

19. Essentially the assumption is that maximal projections/XP-remnants are attracted to the specifiers of functional projections higher in the structure. Thus the content/feature of each such functional projection has to be stipulated.

References


Chapter 4

Subnominal empty categories
as subordinate topics*

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0. Introduction

It is a well-known fact that in languages such as French there is a difference between subjects and objects w.r.t. noun ellipsis. Whereas the noun can be left out from an indefinite noun phrase in subject position in (1), this is not possible if it is in object position, as in (2):

(1) Trois parlent l’italien.
    ‘Three speak Italian.’

(2) *J’ai vu trois.
    ‘I have seen three.’

In French, the noun can only be left out in indefinite objects if an overt quantitative pronoun is used:

(3) J’en ai vu trois.
    ‘I have seen three of them.’

Interestingly, not only elided nouns as in (1)–(2) present a subject-object asymmetry, but the quantitative pronoun en as well, but this time the asymmetry is the reverse of the one in (1)–(2): whereas the quantitative pronoun en can be combined with an indefinite object (3), this is not possible with a subject, even not with the subject of an unaccusative verb:

(4) *Trois en ont été lus par Paul.
    ‘Three have been read by Paul.’

In this respect the quantitative pronoun en differs from the genitive pronoun en, which does not present the same asymmetry:
In the generative literature, several syntactic accounts of the subject–object asymmetries in (1)–(4) or the absence of an asymmetry in (5)–(6) have been proposed, e.g. Ruwet (1972), Belletti and Rizzi (1981), Pollock (1986), Rizzi (1990), Cardinaletti and Giusti (1991). I will only discuss a more recent proposal, the one in Pollock (1998). I will show that there are data that are problematic for this syntactic approach. Although I assume that in ungrammatical sentences with *en*, the ungrammaticality is in some cases the result of the movement of *en*, for other cases, I will explore whether a pragmatic/semantic account can be given for *en* being used or not, more specifically if this can follow from the discourse status of the nounless DP as a topic or a focus (also called a ‘comment’).

The chapter is organized as follows. In Section 1, Pollock’s account of noun ellipsis is discussed. In Section 2, I propose a pragmatic/semantic account of the noun ellipsis asymmetry. In Section 3, I also propose a pragmatic/semantic explanation for the quantitative pronoun *en* asymmetry, although I show that the use of *en*, which is a clitic, may sometimes also be blocked for syntactic reasons. In Section 4, the quantitative pronoun is compared to the genitive pronoun *en*. Finally, in Section 5, I summarize the results.

1. A syntactic account of noun ellipsis

According to Pollock (1998) there is a relation between the ungrammaticality of (7) and that of (8):

(7) *J’ai déjà expédié deux *pro à Anne.
   ‘I have already sent two to Anne.’

(8) *Les livres dont j’ai déjà expédié deux *pro à Anne . . .
   ‘The books of which I have already sent two to Anne . . .’

In Pollock’s analysis, the lexico-semantic features of *pro* are licensed (“recovered” locally) from those of *dont*. *Dont* and *deux pro* form a CP, inside a DP. *Deux pro* moves to Spec, DP:
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(9) \[\text{DP}[[\text{deux pro}], \text{F}^0_{\text{CP}}[\text{dont t}]]\]

*Don't* has to move as a head to \(C^0\) in the initial field of the relative clause. However in (8) the movement to \(C^0\) is blocked by the intervening V and I. Since *dont* is not a clitic it cannot move to \(C^0\) by adjoining to V and I. In (10), however, *dont* is extracted from the subject-DP. Since there are no intervening heads in this case, *dont* can move to \(C^0\). The result is grammatical:

(10) Les livres \(c_1[\text{dont}, t]\) trois \(t_1\text{ pro viennent d’être vendus} \ldots\)

‘The books of which three have just been sold . . .’

Pollock assumes that if *dont* is the complement of a lexical noun instead of the complement of an empty head, it is phrasal instead of a head. In that case there are no blocking effects if *dont* is extracted from a DP in complement position. That is why (11) is grammatical:

(11) Le livre \(c_0[\text{dont}, c_1[\text{IP } j’ai lu t_1 \text{ le premier chapitre}]]\) . . .

‘The book of which I have read the first chapter . . .’

For (7) Pollock proposes that there is a null topic operator instead of *dont*, which, just like *dont*, is a head in French, and which also licenses *pro*. Since head movement of the empty operator is also blocked by the intervening V and I, (7) is ungrammatical. If the empty operator is extracted from subject position, there are no blocking heads, and the empty operator can move to \(C^0\):

(12) \(c_1[\text{Op}], t\) Trois \(t_1\text{ pro viennent d’être vendus.}\)

‘Three have just been sold.’

Quantitative *en* also licenses *pro*. It is a head and attaches to a verbal host. There are no blocking heads in (13):

(13) \(j’en, ai lu t, t\) trois \(t_1\text{ pro.}\)

‘I have read three (of them).’

Quantitative *en* can only license *pro* if it minimally c-commands *pro* at spell-out. This explains the contrast between (14) and (15). In (15), the lexical noun does not have to be licensed by *en*:

(14) *[t, Trois \(t_1\text{ pro} en, seront publiés demain.}\]

‘Three (of them) will be published tomorrow.’

(15) [t, Le premier chapitre] \(en, sera publié demain.\)

‘The first chapter of it will be published tomorrow.’
Although for this restrictive set of data Pollock’s analysis seems to be on the right track, it runs into problems if we add other data, e.g. the following ones:

(16) ses livres dont j’ai lu le premier pro
‘his books of which I have read the first’

(17) Op j’ai lu le premier pro.
‘I have read the first.’

(18) ‘J’en ai lu le premier pro, de livre.
‘I have read the first of them (= the first book).’

(19) J’ai lu DP[deux pro]F° CP[de ses livres pro]
‘I have read two of his books.’

Although dont and the null topic operator license pro, (16)–(17) should be ungrammatical, because, in Pollock’s analysis, if they license pro, they are heads. A phrasal analysis such as Pollock proposes for dont with a lexical noun in (11), is not possible for dont in combination with pro, because Pollock assumes that phrasal dont is featureless and would therefore fail to license pro. The same reasoning would apply to the empty operator. However, if dont in (16) and the null topic operator in (17) are heads, it is not clear why these sentences are grammatical. Just as in (7)–(8), V and I block movement to C. As for (18), its ungrammaticality cannot be explained. Just as in (13), pro is licensed by en and movement of en is not blocked. In (19), de ses livres does not minimally c-command pro at spell-out, so that pro is not licensed.

Because of these problems, I will propose another explanation for the subject-object asymmetries in French. What I would like to propose is that there is not a purely syntactic reason for the subject-object asymmetries, but that there is rather a pragmatic/semantic reason: the nounless DP has to be semantically related to a DP in the linguistic context, which is only possible if the relation is feasible from a pragmatic point of view.

2. A pragmatic/semantic account of the noun ellipsis asymmetry

If the noun is left out of a DP, a relation has to be established with the linguistic context in order to provide the nounless gap with an interpretation. I propose that this semantic relation can only be established if the empty noun can qualify as a topic, although part of the DP can qualify as a focus. I illus-
trate this by means of Erteschik-Shir’s (1997, 1999) theory of focus structure.

Erteschik-Shir (1997, 1999) tries to account for relations between sentences by adding the level of Focus Structure to the grammar, a level that mediates between syntax and semantics and that feeds PF because it provides the explicit phonetic spell-out including intonation. Focus structure (f-structure) is an annotated structural description in which Topic and Focus constituents are marked.

Erteschik-Shir’s f-structure theoretical approach to interpretation is dynamic in that it assumes a theory of discourse which defines the state of the common ground both before and after the utterance of the sentence. The common ground consists of a set of file cards with indexed headings which represent existing discourse referents. The common ground propositions form entries on these file cards. The cards on top of the file are licensed as potential topics of an utterance.

Several f-structure rules apply to f-structures (structural descriptions annotated for Topic and Focus), among which the following:

— topic instructs the hearer to locate on the top of his file an existing card;
— focus instructs the hearer to either open a new card and put it on top of his file (in the case of an indefinite) or locate an existing card and put it on the top of the file (in the case of a definite).

When a hearer hears the following sentence, in which I is licensed as the topic, he selects the corresponding card from the top of the file and evaluates the rest of the sentence w.r.t. the topic:

(20) I have a dog.

He also opens a new card, which he labels dog and which he puts on top of the file. Both I and dog are now on top of the file and available as future topics. When the speaker adds the following sentence, the hearer selects dog as the new topic, because of the form of the pronoun:

(21) It is brown.

Besides individual topics such as I or dog, there are also stage topics. Stage topics may be overt (this afternoon, on Park Avenue) or discoursally implied (the here-and-now). In (22), the whole sentence is taken as a focused event predicated of a covert stage topic (the here-and-now):
(22) It is raining.

F-structures can also be assigned to subconstituents of the utterance. They are called subordinate f-structures. An example of a construction involving a subordinate f-structure is the partitive construction. The subordinate f-structure is formed around a card on top of the file which represents a discoursally available set. A constituent which defines a subset of this topic set is focused triggering the partitioning of this set:

(23) I [met [two] FOC-sub [of the students] TOP-sub] FOC.

The new subset card is now available as the main topic:

(24) [[Two] FOC-sub [of the students] TOP-sub] TOP [are intelligent] FOC.

The assignment of subordinate f-structure also explains the following contrast:

(25) *[A friend] TOP is intelligent.


In (25) the indefinite DP has neither a generic nor a contrastive reading and cannot qualify as the topic. The indefinite DP in (26), however, has a specific interpretation and therefore can function as a topic. The utterance (26) instructs the hearer to open a new card for a friend, the subordinate focus, whereas the subordinate topic I already exists as a card. Once this card is opened, the indefinite is (speaker) referential and qualifies for topic status. This explains the grammaticality of (26).

F-structures are constrained by the Topic Constraint, which says that the unmarked f-structure is one in which either the subject or a stage is the topic. This explains the ungrammaticality of (25), in which the indefinite cannot function as a topic with the individual level predicate.

The f-structure in the following sentence takes the subject pronoun as the main topic and the object pronoun as the subordinate topic:

(27) [He] TOP [criticized [her] TOP-SUB] FOC.

How can a discourse theory such as Erteschik-Shir’s Focus Theory account for the noun ellipsis data? Since ellipted nouns have to be known from the context to receive an interpretation, their referent must be available as a card on top of the file, i.e. must have been introduced in the domain of discourse. Ellipted nouns are thus topics. They cannot be newly introduced individuals. We have
seen, however, that there are main topics and subordinate topics. In the
partitive construction (28), de mes collègues is a subordinate topic whereas
deu x is the subordinate focus:

‘He has insulted two of my colleagues.’

Now, I claim that nouns can only be ellipted either if the whole DP is a topic,
as in (29):

‘He has caught three lions. He has killed all three.’

or if the ellipted noun is a subordinate topic, with the quantifier functioning
as the subordinate focus:

‘Two are intelligent.’

Since according to the Topic Constraint, subjects tend to be topics, there will
be a subordinate f-structure with a focalized quantifier and the noun as a
subordinate topic in indefinite subject DPs. Since the noun is a topic, it must
be discoursally available. The noun can be left out in (30), because the subor-
dinate f-structure implies that it is a topic so that there must be an available
card on top of the file.

In the analysis in which partitives involve an empty noun, the empty noun
is a subordinate topic, because it is coreferentiel with the noun within the
partitive PP, which is a topic:

‘He has insulted two of my colleagues.’

The use of a definite determiner before the ordinal in (32) also implies the
definition of a restrictive set. What is asserted is that from a discoursally
available set I have bought the one that is third.

‘I have bought the third.’

That ellipted nouns are always topics is confirmed by the fact that a de
N-dislocation is possible in combination with an empty noun. Dislocated
constituents are always topics:
(33) Je préfère la bleue pro, de robe.
   ‘I prefer the blue dress.’

Indefinite noun phrases in object position are generally interpreted as foci without a subordinate f-structure:

(34) J’ [ai lu trois livres]_{FOC}.
   ‘I have read three books.’

Sentence (35) is like (34) in that no subordinate f-structure is formed. Since the noun does not qualify as a subordinate topic, which must be discoursally available, it cannot be left out:

(35) *J’ [ai lu trois pro]_{FOC}.
   ‘I have read three.’

This also holds for the associate in an impersonal construction:

(36) Il est arrivé trois linguistes.
   ‘There arrived three linguists.’

(37) *Il est arrivé trois pro.
   ‘There arrived three.’

Since there is no trigger for the formation of subordinate f-structure in (37), the empty noun does not qualify as a subordinate topic.

It has been observed by Milner (1978) that with some weak quantifiers noun ellipsis in object position is more acceptable than with others. Milner gives the following examples with dont, which I analyze as a base-generated relative pronoun, following Godard (1988):

(38) des livres dont j’ai lu plusieurs / certains / quelques-uns / un grand
    nombre / des tonnes / des centaines / *beaucoup / *trois
    ‘books of which I read several / certain ones / some / a lot / tons / hundreds / many / three’

The reason for the increased acceptability of noun ellipsis with un grand nombre, des tonnes and des centaines might be that the quantifier is a nominal expression, which can function itself as the nominal complement of the verb and is not necessarily the specifier of a noun. The reason for the increased acceptability of noun ellipsis with plusieurs, certains and quelques-uns might be that these quantifiers indicate a quantity that is evaluated w.r.t. a set, which may be undefined. Certains and quelques-uns indicate a quantity that is negatively evaluated by the speaker, since it is small subset w.r.t. the, possibly
undefined, whole set, *plusieurs* indicates a quantity that is positively evaluated, since it indicates more than the subset of one (see Gondret 1976). This implied partitive interpretation might lead to topicalization of the head noun so that it can be omitted even in object position.

My analysis also predicts that noun ellipsis is not possible in postverbal subjects that present hearer-new information, i.e. that are foci. One such case is the indefinite subject in the stylistic inversion sentence in (39):

(39) *le jour où sont arrivés trois.*

‘the day that three arrived’

Kayne’s (1986) account of the ungrammaticality of (39) is based on Belletti and Rizzi’s (1981) theory of noun ellipsis. The postverbal subject containing PRO is governed by V, which is not allowed. In my analysis, the ungrammaticality of (39) is the result of the whole postverbal constituent being focalized. If subordinate-f structure is formed, i.e. if only part of the postverbal subject is focalized and the empty noun is a topic, the result is grammatical:

(40) *le jour où est arrivé [le troisième]_{FOC-sub} [pro]_{TOP-sub} {FOC-}*

‘The day that the third one arrived’

In this section I have argued that subordinate f-structure, which makes a semantic relation between the nounless DP and a DP in the context possible, is in principle not possible in an indefinite object introduced by a weak quantifier. This restriction on Focus Structure follows from the Topic Constraint, which says that the unmarked f-structure is one in which either the subject or a stage is the topic. Objects tend to be foci, unless a special device is used, such as the pronoun *her* in (27), in which case the object can be a subordinate topic. As a consequence of the Topic Constraint, subordinate topics with a focalized quantifier are natural in subject position but not in object position, unless a special device is used such as a partitive PP or a definite determiner, which mark the (empty) noun within the DP as a (subordinate) topic. In the next section I will argue that the quantitative pronoun *en* is another device to create a subordinate topic. I will show, however, that the use of *en* is restricted because of syntactic considerations.

3. Quantitative *en*

The ungrammatical sentences (35) and (37) become grammatical if the quantitative clitic *en* is added:
(41) J’en ai lu trois.
    ‘I have read three of them.’

(42) Il en est arrivé trois.
    ‘There arrived three of them.’

However, the use of *en* is not possible in combination with a definite DP in
object position, which is problem for a syntactic analysis such as Pollock’s
(1998) — see Section 1:

(43) *J’en ai lu le troisième.
    ‘I have read the third one of them.’

The ungrammaticality of (43) must be due to the presence of the definite
determiner, because (44), with an indefinite determiner, is grammatical:

(44) J’en ai lu un troisième.
    ‘I have read a third one.’

The contrast between (43) and (44) has generally been accounted for in syntactic
terms in the generative literature. Sleeman (1992) assumes that the definite de-
terminer in (43) is a head, whereas the indefinite determiner in (44) is a specifier.
The contrast in grammaticality is attributed to Relativized Minimality (Rizzi
1990). The trace of *en*, which is assumed to move as a head, cannot be antece-
dent-governed by *en* in (43) because the filled D0 functions as a potential ante-
cedent governor. The indefinite determiner in (44) is not a head, but a specifier,
and, as a result, does not block antecedent-government of the trace by *en*.

In Vermandere’s (2002) analysis, *en* is doubled by *pro*, which has nominal
features. Movement of *pro* to the clitic position in (43) is blocked because the
filled D0 intervenes between the *en*-clitic and *pro*. The definite determiner
spells out a nominal feature and (default or marked) φ-features. Since this φ-
feature composition is identical to the one *pro* is endowed with, movement of
*pro* is barred: the determiner itself is closer to the *en*-clitic. The derivation
eventually crashes with a ‘frozen’ *pro*.

A problem for both analyses of the ungrammatical (43) is the contrast
between (45) and (46):

(45) *Elle en salua chacun.
    ‘She greeted every one of them.’

(46) Elle en salua un seulement.
    ‘She only greeted one of them.’
To explain the ungrammaticality of (45), it would have to be assumed that *chacun* is a head, just like the definite article, whereas *un* is a specifier or that *chacun*, but not *un*, has the same \( \varphi \)-features as the definite article. Both solutions seem rather ad hoc. Another possibility would be that *un* is moved from an N position to adjoin to the specifier *chaque* ‘each’ (for such an analysis see Junker and Vinet 1993). If there is already an N, *un*, there is no room for quantitative *en*, which is also generally assumed to move from the N or NP position. However, such an analysis could then also be adopted for *quelques-uns* ‘some’, which is the pronominalized form of *quelques*. With *quelques-uns*, however, *en* can be used:

(47) J’en ai lu quelques-uns.

‘I have read some (of them).’

I therefore assume that *chacun* and *quelques-uns* are taken as morphological units from the lexicon and that they modify a base-generated empty noun or the trace of *en*, in the case of *quelques-uns*. This analysis is supported by the fact that until the 16th century *chacun* could be used with an overt noun (Junker and Vinet 1993):

(48) Entre chascune tour estoit espace de troys cens douze pas. (Rabelais)

‘Between every tower there was a space of 312 steps.’

In Sleeman (1996) I gave a semantic account of the ungrammaticality of (43) and (45). Since the definite determiner and *chacun* are “strong” in the sense of Milsark (1974), the nounless DP they are part of can be related to a DP in the discourse without the use of *en* being necessary. A derivation without *en* is more economical and therefore the preferred one:

(49) J’ai lu le troisième.

‘I have read the third one.’

(50) Elle salua chacun.

‘She greeted each one.’

In this chapter I will pursue this idea. In the previous section, I claimed that a semantic relation between a nounless DP and a DP in the context is only possible if the nounless DP is a topic or if it has subordinate \( f \)-structure, i.e. if the empty noun is a topic whereas the quantifier is focalized. It follows from the Topic Constraint that the unmarked \( f \)-structure is one in which either the subject or a stage is the topic. Objects tend to be foci. A sentence such as (51),
in which the whole object DP is a focus, is ungrammatical, because no relation with a DP in the context can be established to provide the empty noun with an interpretation:

(51) *J’ai lu trois.
    ‘I have read three.’

One of the devices to create subordinate f-structure is to add a partitive PP, see (52) repeated from (31):

    ‘He has insulted two of my colleagues.’

The use of a definite determiner before the ordinal in (53), which is repeated from (32), also implies the definition of a restrictive set:

(53) J’ai acheté [le troisième]FOC-sub [pro]TOP-sub ]FOC
    ‘I have bought the third.’

Another device to create subordinate f-structure is the use of the clitic en. If the quantitative pronoun en is used, which refers to a card on top of the file, partitioning of this topic set is possible by means of focalization of the quantifier so that subordinate f-structure is formed:

(54) J’en ai lu [[trois]FOC-sub [t]TOP-sub ]FOC
    ‘I have read three of them.’

(55) Il en est arrivé [[trois] FOC-sub [t] TOP-sub ]FOC
    ‘There arrived three of them.’

It has to be noted that a topic set can be a restrictive set or a non-restrictive set itself. In (56) the topic set is a restrictive set consisting of four books, which is partitioned by means of the focalized quantifier to form a new set of three books, a subset of the first:

    ‘I bought four books in the afternoon. I read three of them the same evening.’

In (57) just the head on the topic card serves to form a new set:

(57) Hier j’ai lu deux livres. Aujourd’hui j’en ai lu trois.
    ‘Yesterday I have read two books. Today I have read three.’
In both readings (51) is ungrammatical. I claim that this is so because in both cases subordinate f-structure, and hence a relation with a DP in the context, is not possible in the indefinite object introduced by a weak quantifier, unless the clitic en or a partitive PP is added to trigger subordinate f-structure.

I claim that en is only used to create subordinate structure. If f-structure is created in another way, en is not used. This explains the ungrammaticality of en with a partitive PP (58) and with a definite DP or a DP introduced by a strong quantifier, cf. (43) and (45), repeated here as (59)–(60):

(58) *J’en ai lu trois de ses livres.
   ‘I have read three (of them) of his books.’

(59) *J’en ai lu le troisième.
   ‘I have read the third one of them.’

(60) *Elle en salua chacun.
   ‘She greeted each one of them.’

Dont cannot be combined with en either. Since dont cannot be combined with an indefinite object (but see (38) for some exceptions), which is a focus, we would expect en to be possible. For some speakers it is (see Hanse 1987). For those who do not accept it, the reason might be that a genitive phrase in a sentence initial position cannot be doubled by en:

(61) ?? Ces livres, dont j’en ai lu deux.
   ‘These books, of which I have read two (of them).’

(62) ?? De ces livres, j’en ai lu deux.
   ‘Of these books, I have read two (of them).’

(63) Ces livres, j’en ai lu deux.
   ‘These books, I have read two of them.’

Corblin (1995:125) observes that en can optionally be used in combination with a partitive PP if this PP contains itself an empty noun:

(64) J’ (en) ai pris dix des bleues pro.
   ‘I have taken ten of the blue ones.’

I suggested that in partitive constructions the empty noun is a subordinate topic, because it is coreferential with the noun within the partitive PP, which is a topic. Now, if the partitive PP contains itself a empty noun, the first empty
noun can only indirectly get its reference. Therefore, its subordinate topic status is not so clear and *en* can be used to mark it as a topic:

\[(\text{\textit{J}')} \text{TOP} ([\text{\textit{en}}] \text{TOP-sub ai pris} [\text{\textit{dix}}] \text{FOC-sub} ([\text{\textit{t}}] \text{TOP-sub des bleues} \text{pro}] \text{TOP-sub}]) \text{FOC}.\]

Since according to the Topic Constraint, preverbal subjects tend to be topics, subordinate f-structure is naturally formed within a nounless indefinite subject. Therefore the use of *en* is also superfluous in this case, which explains, in my view, the ungrammaticality of (4), repeated here as (66):

\[(66) \quad \text{*Trois ti en ont été lus par Paul.} \]

‘Three of them have been read by Paul.’

In my view, *en* is the lexical variant of the empty pronominal *pro*. The function of *en* is to create subordinate f-structure. In this respect *en* differs from the partitive PP, which can also be used as an explicit topic marker even if the DP already has acquired subordinate f-structure by means of another device:

\[(67) \quad \text{J’ai acheté le troisième de ses livres.} \]

‘I have read the third one of his books.’

\[(68) \quad \text{Trois de ses livres sont très intéressants.} \]

‘Three of his books are very interesting.’

Since, in my analysis, *en* is the lexical variant of the empty pronominal *pro*, it always originates as the semantic head of the DP. In my view there is no distinction between quantitative and partitive *en* (see e.g. Milner 1982, who argues that the first one is a head, whereas the second one is the complement of an empty head). Pollock (1998) always analyzes *en* as partitive *en*. However, if *en* has the same function as a partitive PP, the combination with a nounless DP that already has subordinate f-structure should be possible (cf. (68)). However, it is not, which suggests that *en* is always quantitative:

\[(69) \quad \text{*J’en ai acheté le troisième, de ses livres.} \]

‘I have bought the third one, of his books.’

Haïk (1982) observes that there are speakers for whom *en* is possible in (70) but not in (71):

\[(70) \quad \text{Beaucoup en sont gâtées, de ces pommes.} \]

‘Many of these apples are rotten.’
Subnominal empty categories as subordinate topics

(71) *Beaucoup en sont gâtées, de pommes.
‘Many apples are rotten.’

These data suggest that for those speakers who accept (70), un uneconomical use of quantitative *en* is allowed in combination with a subject. I suggest that if (71) is felt to be worse, this might be so because the Topic Constraint makes a partitive interpretation in subject position more natural than a quantitative interpretation:

(72) ??Beaucoup sont gâtées, de pommes.
(73) Beaucoup sont gâtées, de ces pommes.

Although the reason for the use of quantitative *en* is thus a semantic one, in my analysis, all ungrammaticalities cannot be attributed to its uneconomical use. Since *en* is a clitic, it has to be moved out of the DP to a verbal host. This is why *en* cannot be used with a postverbal subject that presents hearer-new information.

(74) *Le jour où en ont téléphoné trois.
‘The day that three (of them) telephoned.’

In Kayne and Pollock’s (2001) view, such data suggest that the postverbal subject is originally in a high, subject-like, position. The clitic must be extracted to a position c-commanding its original position, which is possible if it is extracted from an object but not if it is extracted from a (high) subject position.

The combination of *en* with an indefinite PP is also grammatical from a semantic point of view, but is ruled out by the illegal movement of *en* out of the PP, see Kayne (1975, 1981):

(75) *Je m’en suis pourvu [de trois t].
‘I have provided myself with three (of them).’

In this respect quantitative *en* resembles genitive *en*:

(76) *J’en, ai parlé du premier chapitre t.
‘I have spoken about the first chapter of it.’

In the next section I will show, however, that in several other respects quantitative *en* differs from genitive *en* and I will argue that the proposed analysis of quantitative *en* can account for the differences.
4. Genitive en

Genitive en does not present a subject/object asymmetry as does quantitative en. It can be extracted from an object, just like quantitative en, see (77), but although it normally cannot be extracted from a subject (Ruwet 1972), see (78), it contrasts with quantitative en in that it can be combined with the subject of an unaccusative verb, cf. (79) with (66), repeated here as (80):

(77) Il en a lu le premier chapitre de l’ouvrage.
‘He has read the first chapter of it.’

(78) *Le premier chapitre en a traité de sa vie.
‘The first chapter (of it) deals with his life.’

(79) La préface a été écrite par Paul.
‘The preface (of it) has been written by Paul.’

(80) *Trois de ces livres en ont été lus par Paul.
‘Three of them have been read by Paul.’

The explanation that is generally given for the grammaticality of (77) as opposed to the ungrammaticality of (78), is that in (78), en is moved to a non-c-commanding position. In (79) the complement of the unaccusative verb moves to subject position after the extraction of en (Ruwet 1972):

(81) DP [La préface a été écrite par Paul.

Since a derivation as in (81) is also possible for (80), I have attributed the ungrammaticality of this sentence to an economy violation. Since subordinate f-structure is created in subject position, en is not needed.

It can be concluded from the contrast between (79) and (80) that the use of genitive en does not lead to an economy violation and therefore resembles the partitive PP (cf. (67)–(68). I propose that this is so because the function of genitive en is not to create subordinate f-structure, but only to explicitly mark the relation with a DP in the discourse. Therefore it can also be used in combination with a definite DP. The use of genitive en is not necessary. Both with a subject and with an object it can be omitted, although Azoulay (1979) observes that with an object it is more required than with a subject. This must be due to the Topic Constraint. Subjects tend to be topics and therefore tend to be more easily in relation with the discourse, whereas objects tend to be foci, i.e. new information:
That genitive *en* has another function than quantitative *en* is also suggested by the fact that genitive *en* is possible in (84), whereas quantitative *en* is not in (85), cf. (59):

(84) J’en ai lu le troisième, de ce livre.
    ‘I have read the third (chapter), of this book.’

(85) *J’en ai lu le troisième, de chapitre.*
    ‘I have read the third chapter.’

In syntactic analyses, it is difficult to account for this difference in grammaticality. In the previous section, I rejected some syntactic analyses of the ungrammaticality of (85) and proposed that it is due to an economy violation: the use of the quantitative pronoun *en* is superfluous because subordinate f-structure is formed otherwise. The use of genitive *en* in (84) does not lead to ungrammaticality, because its sole function is to mark the relation with the context.

5. Conclusion

In this chapter I have proposed that subject-object asymmetries w.r.t. empty nouns receive an explanation in the pragmatic/semantic component of the grammar and not in the syntactic component. This was supported by empirical motivation: I showed that a syntactic analysis such as e.g. Pollock’s (1998) can only account for a restricted set of data. I have rejected any syntactic analysis of the subject-object asymmetry and I have claimed that the asymmetries are the consequence of a constraint on the assignment of information structure to the output of the syntactic component. This constraint blocks the natural assignment of subordinate f-structure — with the noun as a subordinate topic and the quantifier as a subordinate focus — to DPs in object position, unless the empty noun can be licensed as a (subordinate) topic by lexical or syntactic topic markers. Only if the empty noun is a topic, it can receive its interpretation from a noun in the context.
Notes

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References

Chapter 5

‘Transparent’ free relatives as a special instance of ‘standard’ free relatives*

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Abstract

At least four earlier scholars have attempted to come to grips with certain finite free relatives that one of them dubbed ‘transparent’, and which are associated with special syntactic and semantic effects. All four predecessors viewed transparent and ‘standard’ free relatives as distinct constructions in both configurational and feature-typing terms. This chapter defends the null hypothesis that there is a single type of finite free relative construction with a single configurational representation. It is proposed that the special transparency effects noted by my predecessors arise, when real, under the following circumstances: the wh-element binds a property variable that serves as ‘specifiee’ in a specificational construction. It is argued that this analysis avoids a substantial number of difficulties that besiege its competitors and yields superior accounts of both the transparency effects and of certain hitherto unaddressed opacity effects.

Introduction

Four earlier syntacticians — in particular Nakau (1971), Kajita (1977), Wilder (1997), and van Riemsdijk (1998, 1999, 2001), to whom I will occasionally refer en bloc as ‘my predecessors’ — have called attention to free relatives like the one in (2), which they viewed as illustrating a type of construction radically different from the more familiar one illustrated in (1).

(1) Who(ever) steals my purse steals trash.
(2) There is what may be called [a revoltingly large steak] on your plate.
(3) a. #There is [what John bought yesterday] on this desk.
b. #There usually is [whoever Mary hires] in this office.

(4) a. By tomorrow, there can be however many books you order in our library.

b. By tomorrow, there can be whichever number of books you order in our library.

The basis for this view was (1) a number of ‘transparency’ effects that appeared to FP to be found in data like (2) (these effects led Wilder to coin the term ‘T(transparent) F(ree) R(elative)’), and (2) three additional effects that my predecessors took to reflect ‘definitional’ properties of TFRs. The proposed definitional properties were:

A. TFRs are restricted to the ‘bare’ wh-form what, while S(tandard) F(ree) R(elative)s may use any wh-pronouns or phrases, both with and without -ever.

B. In TFRs, the wh-element always binds the subject of a small clause, while in SFRs, wh-phrases may bind a large range of types of position.

C. TFRs may have either definite or indefinite force, while SFRs always have definite force (Jacobson 1995; Grosu and Landman 1998).

The proposed property (C) relied on data like (2)–(3), which were taken to show that SFRs are excluded from the context there be — XP, which is often regarded as a context of ‘indefiniteness.’ However, SFRs are not always excluded from this context, as illustrated in (4) (note that the free relatives in (4) fail to satisfy either (A) or (B), and must thus be viewed as SFRs). In fact, the context at issue is not incompatible with definiteness in general, but only with the definiteness of individuals (Carlson 1977; Heim 1987), and (4a–b) appear to be acceptable because they have the force of ‘. . . there can be the number of books that you order . . .’, or ‘. . . there can be books in the number that you order . . .’, so that it is the cardinality of the set of books, and not the set of books itself, which is definite. It is thus consistent with the data in (1)–(4) to assume that SFRs and TFRs do not differ at the typing level, both possessing whatever feature triggers Jacobson’s uniqueness operator, with the proviso that this operator can bind either an individual or a property variable. In what follows, I will argue for precisely this conclusion, and show that the special effects associated with TFRs emerge just in case the uniqueness operator binds a property variable.

The remainder of this article is organized as follows: In Section 1, I introduce, illustrate, and critically review what my predecessors jointly viewed as
the transparency properties of TFRs, arguing that some of these proposed properties do not exist, and noting that transparency effects entirely comparable to those that survive the critique exist in SFRs as well, except that the construction is transparent with respect to a different kind of element. — In Section 2, I outline the gist of my predecessor’s analyses, noting that despite differences, they all converge on the view that the predicate of the small clause referred to in (B) above — or, in Nakau’s case, the small clause predicate’s lexical head — is the ‘external head’ of its TFR. Since the external/internal position of the small clause predicate will become a controverted issue in this chapter (in Section 4.2. I will in fact argue for an internal in-situ analysis), I will refer to that predicate in what follows with the neutral term ‘semantic nucleus.’ In Section 3, I argue that TFRs exhibit an ‘opacity’ property as well, namely, that they always include an intensional operator with scope over the small clause, and show that this state of affairs is problematic for the analyses of Section 2. In Section 4 I introduce a variety of syntactic and morphosyntactic facts which cast further doubt on the analyses of Section 2. In Section 5 I develop an analysis of TFRs that avoids all the problems of Sections 3 and 4 and successfully deals with the transparency effects. Section 6 summarizes the major results of the chapter.

1. Transparency in TFRs and SFRs

The transparency effects brought up and assumed by some or all of my predecessors (and conveniently summarized in van Riemsdijk 2001) amount to the observation that the semantic nucleus, although apparently not (a projection of) the head of the TFR in the sense of X-bar theory, nonetheless behaves in a number of ways as though it possesses this status. My predecessors’ analyses, as will be seen in Section 2, proposed to account for this state of affairs by actually assigning to the semantic nucleus or to a distinct (sub-)token of it the status of (a projection of the) head of the TFR. For convenience, I group the transparency effects that those predecessors attributed to TFRs in three classes: (1) Transparency I, which concerns necessary matching effects between the semantic nucleus and the TFR, (2) Transparency II, which concerns a language-specific right-edge effect, and (3) Transparency III, which concerns dependencies that are normally inhibited by free relative boundaries, but can nonetheless access the semantic nucleus from the matrix.
I list and illustrate the proposed effects below, arguing that some of them rely on incorrect or misleading data, and should be disregarded or otherwise interpreted.

1.1 Transparency I (matching)

The Transparency I effects listed in van Riemsdijk (2001) involve matching of the following properties: (1) syntactic category, (2) (in)definiteness, (3) (non)humanness, (4) syntactic number, and (5) morphological Case. The first four are introduced in this section, the last, in Section 4.2. I argue in what follows that only (1), (2) and (4) involve transparency, (3) and (5) being based on incorrect evaluations of the data.

1.1.1 Syntactic category

It is well known that what (and its counterparts in a number of other languages) contrasts with other wh-forms, in particular, who, in being vague with respect to both semantic content and syntactic category (as well as in other respects, some of which will be mentioned below; for an impressive demonstration of the underspecification of German was, see Jäger, 2000). Semantically, interrogative what can ask either for a property, as in (5a), or for an individual or a kind of individual, as in (5c). Syntactically, it is consistent with both NP and AP status, as shown by (5b), both versions of which are possible answers to (5a).

(5) a. What do you think John is?
   b. {A fool, foolish}.
   c. What is there on this table?
   d. {The bottle I bought yesterday, the largest bottle you can imagine}.

Now, in contexts that allow only nominal or only adjectival expressions, SFRs are sensitive only to the category of their wh-phrase, while TFRs are sensitive to the category of their semantic nucleus. To illustrate, consider the context of direct object of read, which requires a nominal expression. The free relative in (6a) is an SFR, because of the wh+ever form, and the one in (6b) is most naturally construable as an SFR (paraphrasable as ‘that which . . .’), while the one in (6c) is most naturally construable as a TFR (paraphrasable as ‘something that . . .’; this reading can in fact be forced by putting a parenthetical intonation on what I would call). Observe that the category of the semantic head plays no role in (6a–b), but does play a role in (6c).
(6) a. John reads whatever Mary considers [an interesting book, interesting].
   b. John reads only what Mary thinks is [an interesting book, interesting].
   c. John is reading what I would call [a great book, *interesting].

Consider now the context of prenominal modification in English, which allows APs, but not NPs/DPs, as illustrated in (7a). Correspondingly, the semantic nucleus of a TFR can only be adjectival, as shown in (7b).

    b. He made a what I would call [scandalous,*scandal] proposal.

1.1.2 (In)definiteness
As alluded to in the Introduction, the context there be — XP tolerates indefinite nominals, as well as definite nominals whose definiteness operator binds something other than the individual variable (e.g., the biggest fork imaginable, construed as ‘a fork of the largest imaginable size’), but not definite nominals in which the individual variable is bound by the definiteness operator. This is illustrated in (8a). (8b) shows that when a TFR occurs in the context at issue, entirely parallel restrictions hold of the TFR’s semantic head.

(8) a. There is [a fork, the biggest fork imaginable, #the fork I gave you yesterday] on your plate.
    b. There is [what I take to be [a fork, the biggest fork imaginable, #the fork I gave you yesterday]] on your plate.

1.1.3 (Non)humanness
Wilder brings up the data in (9) and attributes the contrast in acceptability to the (presumed) fact that FRs initiated by what are excluded in contexts that require human nominals, unless the FR is a TFR with a human semantic head. This shows, in his view, that only the semantic head plays a role in the satisfaction of selectional restrictions imposed on TFRs, what being irrelevant in this respect.

(9) a. #I invited [what he recommended].
    b. She invited [what I took to be a policeman].

His conclusion is incorrect because unambiguous SFRs with what can certainly occur in human contexts. As Heim (1987) shows, the ‘gap’ of what may stand
for two distinct semantic variables, an individual one and a degree/kind variable that 'modifies' the former (this view is based on the observation that when the trace of what lies in the context there be — XP, as in (5c), the individual variable needs to be viewed as existentially bound, which implies that the definiteness operator needs to bind some other variable. For an account of SFRs which exhibit the internal configuration just noted and are nonetheless construed as designating a unique sum of individuals, see Grosu and Landman 1998). Now, when what binds a trace in a human context, and also when a what-FR occurs in a human context, the result is acceptable if the uniqueness operator is construable as binding a kind, rather than an individual variable. This is illustrated with a question in (10a), and with unambiguous SFRs in (10b–c) (note that (10c) exhibits the same verbs as (9b) in the two clauses).

(10) a. What did she invite? Mostly lawyers, doctors, people like that.
   b. She invited only [what her husband asked her to invite]: lawyers, doctors, etc.
   c. She invites only what her husband recommends for top jobs: Harvard graduates, friends of the Kennedy clan, etc.

The conclusion seems inescapable that the contrast in (9) has nothing to do with the SFR/TFR distinction, but only with the contextually determined (im)possibility of construing what as designating a unique kind, rather than a unique individual sum. As for the problems caused by an individual construal of what in contexts like (9a), they are traceable, I submit, to the fact that what is appropriate for designating inanimate individuals, or for designating individuals of unspecified animacy, but not for designating animate individuals. Accordingly, an individually construed instance of what may serve as object of a verb like see (which is neutral with respect to the (in)animacy of its object), but not of a verb like recommend (which implies that its object is animate, as brought out by the contrast between what I saw at the end of the road was John and *what I recommended for promotion was John.

1.1.4 **Syntactic number**

Wilder observes that what, although capable of designating a plurality of entities, triggers singular verbal agreement when initiating SFRs without an internal small clause configuration, as shown in (11a). He then observes that in data like (11b–c), which are construable as TFRs, the matrix verb shows agreement with the semantic nucleus. Wilder also observes, however, that seem
also shows agreement with the semantic nucleus, and this, not only in TFRs, but in questions as well (see (11d)). For completeness, I add (11e), which shows that the same pattern of agreement is found in SFRs.

(11)  
(a) What is lying on this desk belongs/*belong to me.  
(b) What seems to be a book is/*are lying on the desk.  
(c) What seem to be books are/*is lying on the desk.  
(d) What seem/*seems to be the problems?  
(e) Whatever seems/*seem to Bob to be a problem is/*are going to be faced soon.

Wilder notes that (11d) points to the conclusion that what inherits the syntactic number of the small clause predicate and that agreement with the matrix verb takes place ‘via what’, and concludes on this basis that (11b–c) reveal little about the nature of TFRs. I disagree with him on this last point, and this, because I view all Transparency I effects as achieved via what (the point will be extensively developed in Section 5).

1.2 Transparency II (right-edge effects)

English and a number of other languages, e.g., German, Dutch, French, Romanian, (but not, e.g., Russian or Modern Greek) exhibit a constraint which, simplifying somewhat, requires that the A head of a pre-nominal AP occur at the AP’s right edge. This constraint is illustrated by the contrast between the two versions of (7c) below. Now, as shown in (7d), the semantic nucleus of a prenominal adjectival TFR is subject to exactly the same constraint.

(7)  
(a) He made a {scandalous, *scandal} proposal.  
(b) He made a scandalous (*in certain ways) proposal.  
(c) He made a what I would call {scandalous,*scandal} proposal.  
(d) He made a what I would call scandalous (*in certain ways) proposal.

As hinted at above, the formulation of the constraint on pre-nominal modification has been slightly over-simplified here. The over-simplification is innocuous in the present context, but the need for a sharpened re-formulation will become apparent in Section 5, where I propose an explanation for this particular transparency effect that relies on a revision of the constraint at issue.
1.3 Transparency III (accessibility)

Wilder and van Riemsdijk offer three types of data which, they maintain, show that the semantic nucleus of a TFR is as accessible to dependencies that involve the matrix as when the remainder of the TFR is suppressed. I will argue, however, that in two of the situations they consider accessibility is an illusion, and that in the third, the dependency itself does not exist.

1.3.1 Extraction

Wilder brings up data like (12a–b), which illustrate extraction out of the small clause predicate of an SFR and a TFR respectively, and draws attention to a contrast in acceptability between them, as well as to the fact that the full version of (12b) seems to be not appreciably worse than its reduced version. However, TFRs are not always transparent to extraction. For example, the full version of (12c) is distinctly worse than its reduced version. As an anonymous referee perceptively observed, the deviance of (12c) is comparable to that of (12d), where extraction has operated out of the as-introduced predicate of an object small clause selected by describe. The facts in (12b–d) point to a conclusion which is extremely important for what follows: Material internal to the TFR and distinct from the semantic nucleus can in principle affect extraction possibilities out of the semantic nucleus. This fact will be exploited in ensuing sections to argue for a specific configurational analysis of TFRs.

(12)  a. *Who would she buy whatever object turns out to be a portrait of t?  
     b. Who did she buy (what seems to be) a nice portrait of t?  
     c. Who did she draw (*what no normal person would describe t as) a successful caricature of t?  
     d. *Who did you describe [this picture as a successful caricature of t]?  

1.3.2 Condition A of the Binding Theory

Van Riemsdijk (1999, 2001) brings up data like (13a–b), and submits on the basis of the observed contrast that anaphors within a small clause predicate may not be bound across SFR boundaries, but may be bound across TFR boundaries. However, data based on anaphors that are not co-arguments of the antecedent should be taken with a grain of salt, since such anaphors are not necessarily subject to locality constraints, or even to a syntactic binding requirement, as suggested by data like the fact that pictures of each other have just been put on sale points to the possibility that John and Mary may take advantage of this opportunity
to acquire the other’s portrait (Reinhart and Reuland 1993). In any event, SFRs are not in general opaque to anaphor binding, as shown by the quite acceptable (13c), and this suggests that the deviance of (13a) is due to some special factor, plausibly, some version of the Specified Subject Condition (Chomsky 1973) that disallows the (hierarchically and linearly) intervening element you. Be this as it may, what crucially matters for what follows is that TFRs are not always transparent to anaphor binding, as shown by the contrast between the reduced and full versions of (13), where the intervening subject is no normal individual. This observation reinforces the point made in the preceding section: Material internal to the TFR and external to the semantic nucleus can in principle affect the ability of the nucleus to establish dependencies with the matrix.

(13)  a. “They live in whatever location you used to refer to as each other’s backyard.”
     b. They live in what is often referred to as each other’s backyard.
     c. They agreed to live in whatever can realistically be referred to as each other’s backyard.
     d. They live in (what no normal individual would describe as) each other’s backyard.

1.3.3 Idiom chunks

Van Riemsdijk (1999) observes that idiom chunks may be separated by TFR boundaries when one chunk is in the matrix and the other, within the semantic nucleus; an illustration is provided in (14a). But it is not clear that the ‘lower’ chunk of the idiom needs to be licensed by the ‘higher’ one, since, as van Riemsdijk himself notes, the lower clause is a possible independent clause, as shown in (14b). If so, it is unclear that there is anything to explain. This conclusion derives further support from the observation, which I owe to an anonymous referee, that idiom chunks with a ‘closer link’ to each other do not readily permit the construction of TFRs, as brought out by the contrast between the two versions of (14c).

(14)  a. Nick has made what one may call significant headway.
     b. I would not call this significant headway.
     c. Nick has kicked what may called the *(proverbial) bucket.

Summarizing the results of Section 1.3., it emerges that none of the proposed Transparency III effects can be taken at face value, and one of them in fact needs to be reinterpreted as an opacity effect (see Section 1.3.1).
1.4 Transparency in SFRs

Having introduced the major facts that my predecessors thought were in need of explanation, and having noted which of them are real, I propose to pause briefly and look at SFRs from the perspective of those facts. Earlier generative studies have never doubted that the wh-phrase of an SFR is head-like in some sense, the major topic of dispute being whether it is a genuine (external) head, as proposed by Bresnan and Grimshaw (1978), or a sort of ‘internal head’, as proposed by Groos and van Riemsdijk (1981) and various later scholars. Under the latter analysis, SFRs exhibit a variety of Transparency I phenomena with respect to their internal head, since the latter matches the SFR in category, animacy, number and gender. In view of this, it seems appropriate to ask how far the parallelism in transparency between TFRs and SFRs goes (modulo the element that serves as semantic nucleus). Since Transparency III effects were shown not to exist, all we need to consider is the single Transparency II effect that was demonstrated in relation to the data in (7). As we shall see, this effect seems to exist in SFRs as well.

We noted in Section 1.1.1 that the presence/absence of right-edge effects comparable to those in (7d) cannot be tested in English, for independent reasons. Romanian, however, makes it possible to test for such effects owing to the fact that the lexical heads of adjectival extended projections may occur within a de-PP, and such a PP may itself occur in ‘extraposed’ position. When the wh-phrase of an SFR is an AP of the kind just described, the A-containing PP may optionally occur in extraposed position. As shown in (15), it is only if extraposition has taken place that the SFR may occur in prenominal modifier position. The parallelism with (7d) is thus complete.

(15) a. *Sunt dispus să fac o nouă şi I-am ready to make a new and [oricat de inovativă vrei] propunere. however of innovative want.2sg proposal
b. Sunt dispus să fac o nouă şi I-am ready to make a new and [oricat vrei de inovativă] propunere. however want.2sg of innovative proposal

‘I am ready to make a new proposal, and however innovative you may want it to be.’

For completeness, I note that extraction out of, and anaphor binding into, an
SFR’s semantic head (i.e., the wh-phrase) are possible, as shown in (16)–(17), and furthermore that the lower chunk of an idiom may occur in the wh-phrase, as shown in (18a). However, this idiom chunk may occur in this position independently of the higher chunk, as shown in (18b), so that (18a) is of no more significance than (14a). As for (16)–(17), they suggest, if anything, that the more deeply embedded position of a small clause predicate compared to that of a reordered wh-phrase is not without (at least potential) consequences. In any event, what matters primarily for our purposes are the conclusions reached in Sections 1.3.1 and 1.3.2, which, as we shall see below, have important implications for competing configurational analyses of TFRs.

(16) Bob, I will buy whichever portrait of t I can find.

(17) John and Mary are willing to buy whichever pictures of each other turn out to be available on the market.

(18) a. I can make whatever headway will satisfy my boss on this project.

    b. That much headway should satisfy anyone!

2. The gist of my predecessors’ proposals

Operating within the Standard Theory and noticing only the existence of nominal TFRs, Nakau (1971) proposed that TFRs are transformationally derived from an underlying representation in which what is replaced by at the N which. For example, he proposed to derive (19a) from (19b) by the transformation in (20).

(19) a. Lakoff has made [what appears to be a radically new proposal].

    b. Lakoff has made [a proposal that appears to be a radically new proposal].

(20) \[ X \rightarrow [\text{Det} \rightarrow [N, \text{Num}] \rightarrow \{_{s} \text{which} \rightarrow [\text{+Subjective}] \rightarrow \text{be} \rightarrow 1 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 10 \rightarrow 11 \rightarrow 12 \rightarrow 13 \rightarrow 1 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 10 \rightarrow 11 \rightarrow 12 \rightarrow 13 \rightarrow 3 = 11. \]

    Conditions: (i) 3 = 11.

    (ii) 2 is Def if 9 is specific, and Indef if 9 is non-specific.

Note that the Transparency I effects of Sections 1.1.1 and 1.1.2 are accounted
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for by the stipulated conditions (1)–(2). The Transparency II effect cannot in principle be handled, since the external head precedes CP, but Transparency III effects (which Nakau did not discuss) are correctly predicted not to exist, since the small clause predicate is CP-internal. — The feature [+Subjective] on term 6 of the structural description will be explicated in Section 3.

Operating within the Extended Standard Theory, Kajita (1977) proposed to account for the head-like properties of TFRs by assuming a rule of reanalysis which, as schematically shown in (21), turns the semantic nucleus, analyzed as a small clause predicate in underlying representation, into the head of the TFR, and the remainder of the TFR, into an adjunct of that head.

\[ \text{(21)} \quad [\text{FR} \ldots \text{XP}_{\text{PRED}}] \rightarrow [\text{XP} [\text{FR} \ldots ] \text{XP}_{\text{PRED}}] \]

Note that this analysis incorrectly predicts a non-existent Transparency III effect if extraction operates on post-reanalysis structures.

Wilder (1998) objected to Kajita’s rule of reanalysis on conceptual grounds, arguing that ‘such a rule would alter theta-relations, turning an argument (the Free relative) into a modifier, and turning a predicate (XP) into an argument’, and proposes to derive TFRs by a rule of backwards deletion from a structure that exhibits two tokens of the semantic head, one in the relative and one in the matrix. For example, (22a) is analyzed as schematically indicated in (22b).

\[ \text{(22)} \quad \text{a. John bought what he took to be a guitar.} \]
\[ \text{b. John bought [what he took to be a guitar] a guitar.} \]

This analysis correctly predicts Transparency I and II effects, but also incorrectly predicts transparency to extraction.

Van Riemsdijk (1998, 1999, 2001) pointed out a serious at least prima facie problem for Kajita’s and Wilder’s analyses, namely, the lack of an obvious account of TFR’s whose semantic nucleus is string-medial. Such TFRs are by no means rare. They are found, for example, in continental West Germanic languages, owing to the fact that small clause predicates typically precede the clause-final verbal complex, in languages like English, whenever the small clause predicate is followed by PPs and/or adverbial CPs, and in languages like Japanese and Korean. Illustrations of the three possibilities just mentioned are provided, respectively, by the German example (23a), by the English examples in (23b–e), and by the Korean example in (36b). Note that in (23d–e), the semantic nucleus is string-medial with respect to a clause that is itself string-medial within the relative.
(23)  a. Ich habe mir [was man als einen schnellen Wagen bezeichnen könnte] gekauft.
    *I have bought myself what one might call a fast car.*

    b. There is now on your plate [what may conceivably look like a rat to anyone who views it from afar].

    c. I just saw [what might well be taken for a meteor by naive observers when visibility is rather poor].

    d. There is now in that corner [what might conceivably be assumed to look like a dragon to me] by anyone unfamiliar with my perceptions.

    e. I just noticed [what may well seem [to be construable as an NP by proponents of LFG] to people unfamiliar with that theory].

To meet the challenge raised by such data, while retaining the view that the semantic nucleus is the head of the TFR, van Riemsdijk proposes to adopt a new theoretical approach, which constitutes an extension to subordinate structures of an approach that earlier writers (e.g., Moltmann 1992) had developed with respect to coordinate structures. Within the proposed approach, trees may share proper subparts of their structures, crossing each other’s branches in the process, with the result that nodes may end up having multiple mothers. In the case of TFRs, van Riemsdijk proposes to view the semantic nucleus as shared by both the matrix and the relative (he also extends this view to SFRs, taking the wh-phrase to be a shared element, *contra* Groos and van Riemsdijk 1981).

The proposed approach can in principle deal both with transparency and with string-medial semantic nuclei, provided that the theoretical framework is explicitly spelled out (note, however, that, just like Wilder’s approach, it incorrectly predicts Transparency to extraction). Since van Riemsdijk does not indicate how relations between nodes, e.g., c-command, are to be defined on the kind of objects he assumes, nor how (compositional) semantics is supposed to work, I will assume that the semantic nucleus *qua* element of the matrix c-commands CP (and thus, itself *qua* element of the relative), and that the semantics interprets the two ‘uses’ of the shared element just like distinct tokens on conventional trees. Some such assumption is obviously necessary to evaluate the implications of van Riemsdijk’s proposal.
3. Opacity effects in TFRs: a problem for externally-headed analyses

The principal thrust of my predecessors’ analyses was to provide an account of transparency effects in TFRs. Those authors also made occasional informal remarks about the semantics of TFRs, but did not pursue the implications of their observations. Thus, Kajita, Wilder and van Riemsdijk suggested that TFRs ‘hedge’ the content of the semantic head, and Nakau proposed that the \textit{raison d’être} of TFRs is ‘that a certain element . . . which denotes the speaker’s or someone else’s subjective stance must be present in the relative clause’ (this quotation explains the import of the feature [+Subjective] in (20)). In support of his proposal, Nakau observes that data like (24), which do not convey anyone’s subjective stance, are odd in ‘out-of-the-blue’ contexts.

(24) ?*John lives in what is a town.

I hold these informal remarks, and in particular, Nakau’s, to be essentially on the right track (note that (24) can be repaired by simply adding \textit{definitely} after \textit{is}, since this signals that only \textit{some} individuals need view the place in question as a town). However, when we attempt to make Nakau’s suggestion more precise, serious problems arise both for his own analysis and for those of the other predecessors.

One small problem, which is easy to take care of, is that the \textit{raison d’être} of TFRs can be satisfied not only by subjective stances, but also by temporal specifications, as illustrated in (25).

(25) a. John lives in what is now a town (but was once a village).
    b. John lives in what was once a village (but is today a town).

A more complete and precise characterization of the \textit{raison d’être} of TFRs is thus that the semantic nucleus, or rather the small-clause to which it belongs, must be in the scope of an \textbf{intensional operator}. That is to say, a TFR needs to imply that the predication expressed by the small clause does not necessarily hold in all (contextually relevant) possible worlds.

The real problem for Nakau’s analysis arises out of the fact that a token of the nominal head of the ScPr is placed outside the scope of the intensional operator. Nakau appears to assume that this move is innocuous, since he states that (19b) is an exact paraphrase of (19a), and in fact submits that this paraphrase relation constitutes support for his analysis. However, the paraphrase relation between (19a) and (19b) is an accidental consequence of tacit contextual assumptions. Note that if we retain the semantic nucleus in (19)
unchanged, but modify the remainder of the example, as, say, in (26), the paraphrase relation vanishes. The paraphrase relation is also absent in another construction that Nakau discussed without noticing the problem it creates (in particular, (27a)), and is certainly absent in cases like (28)–(30).

(26) a. Bob is reading what seems to his wife to be a radically new proposal, but is in fact a letter from his mistress. ≠
b. Bob is reading a proposal that seems to his wife . . . (#but is in fact . . .).

(27) a. Lakoff has made what appears to be a proposal ≠
b. Lakoff has made a proposal which appears to be a proposal].

(28) a. John is kissing what may appear to some observers to be three vertical lines (but is in fact Mary dressed in a funny costume) ≠
b. John is kissing three lines which may appear to some observers to be three vertical lines (#but is in fact Mary . . .).

(29) a. There is now on your plate what no one in his right mind would call a steak (because it is in fact a dead rat) ≠
b. There is now on your plate a steak that no one in his right mind would call a steak (#because it is in fact . . .

(30) a. Bill is what few people would call an optimist (since he firmly believes that the world will come to an end tomorrow) ≠
b. Bill is an optimist that few people would call an optimist (since he . . .).

The problem just noted challenges not only Nakau’s analysis, but also Wilder’s and van Riemsdijk’s. Note that Wilder posits two tokens of the semantic nucleus, one internal and one external to CP, and it is not clear what mechanism can avoid the construal of the external one outside the scope of the intensional operator. The consequences of intensionality for van Riemsdijk’s proposal are harder to evaluate in view of the incomplete specification of the assumed theoretical framework. However, to the extent that the proposed double motherhood of the semantic nucleus implies that the latter is, and must be construed as, (also) a member of the matrix, we must conclude that, in this capacity, it escapes the scope of intensionality. In short, Wilder’s and van Riemsdijk’s analyses appear to be committed, just like Nakau’s, to the view that, e.g., (29a) implies that what is now on ‘your’ plate is a steak.
As far as Kajita’s analysis is concerned, it is in principle possible to deflect the challenge at issue by assuming that scope is established on pre-reanalysis structures. Such an assumption would, however, be inconsistent with the architecture of the Extended Standard Theory, which Kajita assumes. One could, presumably, adapt Kajita’s proposal in a way that avoids the architectural problem just noted, for example, by base-generating the semantic nucleus outside of CP and adjacent to the latter’s right edge, and by assuming that this external head binds an empty category within the small clause, in particular, in predicate position. One could then presumably interpret this structure by exploiting the kind of mechanisms that Sharvit (1997) used to account for ‘connectedness’ effects in pseudo-clefts. However, such an adaptation of Kajita’s analysis can only be taken seriously if it can also deal with the kind of string-medial semantic nuclei illustrated in (23). Until it is shown how this can be done, I submit that the problems raised by (23) are serious enough to disqualify the ‘adapted’ Kajita analysis from further consideration. In fact, such an analysis (as well as Wilder’s) is also conceptually objectionable in relation to TFRs with string-final semantic nuclei, since the structure assigned to TFRs is rather *sui generis*. The kind of complex pre-head modifiers that Kajita’s and Wilder’s analyses envisage are common in languages like Japanese, but hardly in English and typologically similar languages.

Taking stock of the results of this section, we have seen that some externally headed analyses of TFRs (Nakau’s, Wilder’s, van Riemsdijk’s) are seriously challenged by the intensional opacity effects, and that other such analyses (Wilder’s and Kajita’s) are challenged by string-medial semantic nuclei and by typological considerations. All in all, every known externally headed analysis is problematic in some way. But this is not all. In Section 4, we will see additional reasons for being skeptical of such analyses.

4. Arguments for a common null-headed analysis of SFRs and TFRs

In this section, I propose to argue that as far as gross structural properties are concerned, TFRs of the kind found in English are optimally analyzed as a special subinstance of SFRs, and that both need to be analyzed as having null material in external head position, their overt material being entirely internal to the relative CP. Under this view, the null hypothesis is that in both cases, the wh-phrase is in [Spec,CP] (or in some Spec within the ‘COMP area’, if one adopts the ‘split COMP’ hypothesis of Rizzi 1994) and the semantic
nucleus of TFRs is in the predicate position of the embedded small clause. I schematically represent in Figures A and B the minimal properties I attribute, respectively, to SFRs in general and to the special case represented by TFRs [SC = small clause, SN = semantic nucleus].

As will be seen in Section 4.2.1., certain details of these diagrams need to be slightly adapted for a number of languages other than English. The ‘typing’ feature [Def] on C in Figure A and the question mark in Figure B concern the semantics of these constructions, and discussion of this point is postponed until Section 5. — I assume that the null categories in CP-external head position are underspecified categorically (and in other respects), and get specified by agreement with the phrase in [Spec, CP].

The remainder of Section 4 is divided into two major parts. In Section 4.1., I summarize some of the past argumentation in support of the structural analysis in Figure A for SFRs. In Section 4.2., I offer seven arguments in support of the structural analysis in Figure B for TFRs.
4.1 The structure of SFRs

All analyses of (finite) SFRs known to me have assumed that they are something other than ‘bare’ CPs, in particular, that they are externally headed in some way, the foremost reason for this being that their distribution is not that of CPs, but rather that of the category to which their wh-phrase belongs (abstracting away from the effects of Pied-Piping); for arguments in support of this view based on a contrastive comparison of finite and non-finite free relatives, see Grosu (1994, Sect. 5) and Grosu and Landman (1998, Sect. 3). The major debate has been over whether the external head is the wh-phrase itself, a position defended by Bresnan and Grimshaw (1978), or a null category. I reproduce below the gist of three arguments for the latter kind of analysis that have appeared in print (for additional arguments, see Grosu 1994, Study One).

4.1.1 The Nachfeld argument

Groos and van Riemsdijk (1981) pointed out that the position immediately to the right of an embedded verb in Dutch and German (the so called ‘Nachfeld’) allows, in fact, favors finite CPs, including CPs that have been ‘extraposed’ out of subject or object complex DPs, but disallows DPs. Crucially, the Nachfeld also allows SFRs, as illustrated with German data in (31). The acceptability of one version of (31) is problematic under the view that SFRs are headed by their wh-phrase, but follows immediately under the assumption that they are headed by a null category, since this makes it possible to assume that CP has been extraposed. — For completeness, I note two additional points: (A) (31) differs from Groos and van Riemsdijk’s original data in that the matrix of the SFR is non-initially embedded within a higher sentence. The reason for this complication is the following observation by Hirschbühler and Rivero (1973): when a TFR’s matrix is an independent sentence, it is sometimes possible to have DPs in the Nachfeld, presumably because they are construable as a separate elliptical utterance. This relaxation of the Nachfeld constraint is not operative in cases like (31), and this fact makes it possible to close a ‘gap’ in Groos and van Riemsdijk’s argument. (B) The analysis of SFRs in terms of shared structure that is proposed in van Riemsdijk (1999) (see Section 2.4) is inferior to that in Groos and van Riemsdijk (1981) in that it needs to assume the grammar is blind to the wh-phrase’s connection with the matrix just in case the SFR occurs in the Nachfeld.
Nochmals zu wiederholen {was, *die Behauptung, die} du soeben geometrert hast], wäre unangebracht.

To repeat {what, the claim which} you have just uttered] once more would be inappropriate.'

4.1.2 The Pied-Piping argument

Jacobson (1995) noted the non-synonymy of (32a) and (32b). Under an overt external head analysis in terms of standard trees, the external head in (32a) can only be whoever’s picture, and the non-synonymy of (32a) and (32b) is surprising. Under a null external head analysis, whoever’s picture occupies [Spec,CP] in virtue of Pied Piping, and the null head is ‘anteceded’ by whoever, a state of affairs which allows for (32a) a reading that is excluded for (32b). — For completeness, I note that van Riemsdijk’s (1999) approach to SFRs can deal with (32) by assuming that the shared element in (32a) is whoever.

(32) a. Send a present to [whoever’s picture is hanging on that wall]. ≠
   b. Send a present to [anybody’s picture that’s hanging on that wall].

4.1.3 The Contraction argument

It is well-known that in some Germanic languages, in particular, in German, contraction-cum-metathesis may apply to a P and a neuter pronominal object of P; for example, auf das → darauf, auf was → worauf, as illustrated by the reduced versions of (33a,a¹). Grosu (1996) observed that contraction may also apply to a P and a pronoun that is the incontrovertible head of a relative clause construction, as illustrated by the full versions of (33a,a’), which are acceptable to many speakers, but not all (moreover, the contracted full version of (33a) requires emphatic stress on da). Grosu also observed that no one accepts contraction between a P and a w-pronoun that initiates a free relative complement of P, as shown in (33b). A further fact (not noted in Grosu op. cit., but making possible a strengthening of the conclusion urged there) is that a P may not contract with a w-pronoun that initiates its interrogative complement, as illustrated in (33c) (for completeness, I note that two of my informants rejected the uncontracted version of (33c), but most of them accepted it). On the assumption that das/was in (33a,a’) are in CP-external head
position and that was in (33c) is in [Spec,CP] position (which I take to be uncontroversial). CP-external and CP-internal analyses of the wh-phrases of SFRs make opposite predictions with respect to the contracted version of (33b): The former predicts acceptability for those speakers who accept the contracted versions of (33a,a’), the latter, unacceptability for everybody. Since the example at issue is severely deviant for everybody, we have a strong argument in favor of the CP-internal analysis. — For completeness, I note that the facts in (33a) and (33c) may be brought under a more general umbrella if we view the contraction process as an instance of incorporation in the sense of Baker (1988, 1996) and numerous references therein. As prominently noted in that literature, the process of N-incorporation into V may apply to an N that exhaustively forms the object of V, or to one that heads a more complex object of V, but not to any other element of such a complex object. From this perspective, the facts in (33a,a’,c) are just as expected.

(33) a. Die armen Hausfrauen stürzten sich {auf das, darauf},
the poor housewives threw themselves on that thereon
(\%was sie nur kaufen konnten).
what they only buy could
'The poor housewives threw themselves at anything they could buy.'

a’. Ich weiss nicht mehr, {gegen was, wogegen} er sich geäussert
I know not more against what, whereagainst he refl uttered
hat (%was dir am Herzen liegt).
had what you.sg.dat at the heart lies
'I no longer know what he expressed himself against (that is of
decisive interest to you).'

b. Die armen Hausfrauen stürzten sich {auf was, *worauf}
the poor housewives threw themselves on what whereon
sie nur kaufen konnten.
they only buy could
'The poor housewives threw themselves at whatever they could buy.'

c. Sprechen wir jetzt {über was, *worüber} wem zugestossen ist.
speak we now about what whereabouts to-whom happened is
‘Let us now speak about what has happened to whom.’

Space does not permit an exhaustive review of the overt/null head analyses of SFRs, but I have argued at greater length elsewhere (Grosu 1994, 1996) that
the overt head analysis has no advantages over the null head analysis, but does have quite a few disadvantages with respect to the latter. I will thus assume in what follows that a null head analysis is optimal for SFRs.

4.2 The structure of TFRs

In this section, I list a number of arguments, some of which were introduced in earlier sections, which support the view that TFRs have the same overall structural properties as SFRs, in particular, that the CP-external head is null, the wh-pronoun is in [Spec, CP], and the semantic nucleus is in small clause predicate position.

4.2.1 A suggestive morphosyntactic parallelism

A first suggestive fact is that in all the languages I have been able to investigate, SFRs and TFRs are strikingly parallel in their observable morphosyntax, and in some of these languages, they contrast morphosyntactically with every other type of CP in the language. That is to say, although the SFRs and TFRs of certain languages exhibit slightly different morphosyntactic properties than those indicated in Figures A and B, SFRs and TFRs do not differ from each other. To illustrate, the SFRs and TFRs of Hebrew are the only clauses with a ‘doubly-filled COMP’ (see (35)). In Korean, SFRs and TFRs are the only constructions with a CP-internal gap and with the element -kôs in external-head position (see (36)). In various Romance languages, e.g., in Romanian and French, both what-SFRs and TFRs are formed with an overt complementizer, a null operator in [Spec, CP], and an overt element from the demonstrative paradigm in external-head position (Romanian also allows English-like SFRs formed with ce ‘what’, but those seem to be primarily used with the import of English whatever constructions); illustrative data from Romanian and French are provided in (37).

(35) a. [ma she madžig et moshe] madžig gam oti.  [SFR]
    what czer worries ACC Moshe worries also me
    ‘What worries Moshe worries me, too.’

b. Moshe gar be [ma she haiti meta?er ke bayit gadol
    Moshe lives in what czer would-I describe as house large
    be-yoter].  [TFR]
    most
    ‘Moshe lives in what I would describe as an exceedingly large house.’
For completeness, I note that the CP-external position of Romanian cea and French ce, in contrast to the [Spec,CP] position of Hebrew ma, can be demonstrated by the (in)ability to form free relatives with a ‘missing’ P, in which, as argued for in detail in Grosu (1996), the overt P and the wh-phrase form a PP constituent that sits in [Spec,CP] position. As shown in (38), one can form missing-P free relatives comparable to the Hebrew data in (35), but not to the Romanian or French data in (37).

(38) a. Ani mityaxes le ma she gam ata mityaxes.
I refer to what that also you refer
b. *Mã refer la ceea-ce te referi și tu.
refl refer.I to ceea-czer refl.2sg refer also you
c. *Je fais allusion à ce que tu fais allusion toi-même.
   I make hint at ce czer you.sg make hint you-yourself
   'I am referring to what you, too, are referring.'

To the extent that the morphosyntactic parallelism between SFRs and TFRs is a universal, or at least very general phenomenon, as it seems to be, it is unexpected under the view that SFRs and TFRs are different 'constructions' with distinct structural properties, but fully expected under the view that TFRs are simply SFRs of a particular kind.

4.2.2 A Nachfeld argument
A second argument for a common structural analysis of SFRs and TFRs, in particular, one with a null external head, follows from the observation that exactly the very Nachfeld effects noted by Groos and van Riemsdijk with respect to SFRs are found with TFRs as well. The point is illustrated by (39), which is just as acceptable as (31), and whose FR can certainly be interpreted as 'something that many . . .':

(39) Dass vor ihm liegt, was viele als ein ekelregerendes Schweinkotelett bezeichnen würden, überrascht mich.
   'That there is what many would call a revolting pork-chop in front of him surprises me.'

4.2.3 An extraction argument
As pointed out in Section 1.3.1, extraction out of the semantic nucleus of a TFR is sensitive to material that belongs to the remainder of the TFR (see (12c-d), reproduced below for convenience, and comments thereon). Such sensitivity is surprising if the semantic nucleus is external to the relative clause, but follows straightforwardly if the semantic nucleus is in small clause predicate position, where it is c-commanded by the material to the nature of which it is sensitive.

(12) c. *Who did she draw (*what no normal person would describe as) a successful caricature of t?
   d. *Who did you describe [this picture as a successful caricature of t]?
4.2.4 An anaphoric binding argument
As noted in Section 1.3.2, concerning the contrast between the full and reduced versions of (13d) (reproduced below for convenience), elements of the TFR that do not belong to the semantic nucleus may cause intervention effects for anaphoric binding. This is unexpected under a CP-external analysis of the semantic nucleus, but entirely expected if it is analyzed as occupying the small clause predicate position.

(13) d. They live in (*what no normal individual would describe as) each other’s backyard.

4.2.5 The intensionality scope argument
As noted in Section 3, the semantic nucleus of a TFR is construed within the scope of a TFR-internal intensionality operator that c-commands the position of the small clause predicate (see (28)–(30)). It was also pointed out there that this state of affairs is problematic for a CP-external analysis of the semantic nucleus, unless the latter can be shown to be reconstructible in the small clause predicate position. For the analysis I am proposing, the facts at issue are straightforwardly predicted, since the semantic nucleus is taken to be in the scope of the intensional operator throughout the derivation.

4.2.6 The TFR-medial semantic nucleus argument.
As noted in Section 2.4, CP-external analyses of the semantic nucleus have serious difficulties with TFR-medial semantic nuclei (see (23)). An analysis that assigns that element to the small clause predicate position has no difficulty whatsoever with such data.

4.2.7 A morphological Case argument
A final argument for the in situ analysis of semantic nuclei comes from a consideration of data like (40)–(41), which exhibit SFRs and TFRs respectively.

(40) a. %Wen sie mir empfohlen hatte erwies sich als ungeeignet.
who.acc she me recommended had showed himself as unsuitable.
'(The one) she had recommended proved to be unsuitable.'
b. %Ich liebe wer t Gutes tut, und hasse wer t mich
   I love who.nom good does and hate who.nom me
   verletzt.
   offends
   ‘I love (those) who do good, and hate (those) who offend me.’

(41) a. Ich habe mir gekauft, [was von vielen als {ein schneller Wagen, (40) a. Ich habe mir gekauft, [was von vielen als {ein schneller Wagen, I have me bought what by many as a fast car.nom
   *einen schnellen Wagen} bezeichnet werden würde].
   a fast car.nom described be would
   ‘I have bought myself what would be called a fast car by many
   people.’
   b. [Was viele als {* ein schneller Wagen, einen schnellen Wagen}]
   was many as a fast car.nom a fast car.acc
   bezeichnen würden] wurde soeben gekauft.
   describe would is just bought
   ‘What many people would call a fast car has just been bought.’

Comparable data are brought up by van Riemsdijk (1999, 2001), who notes
that the boldfaced phrases in all of them involve ‘mismatches’, in the sense
that they fail to simultaneously satisfy the morphological Case requirements
imposed upon them CP-externally and those imposed upon the corresponding
SFRs/TFRs within the matrix. The italicized semantic nuclei in (41), in
particular, violate a general requirement of the grammar of German that the
subject and predicate of small clauses must agree in Case. Van Riemsdijk
reports that all the versions of data like the above are deviant in his speech,
and views in this state of affairs support for the analysis of SFRs and TFRs that
he urges, and which assigns to all the boldfaced phrases simultaneous
CP-internal and matrix-internal parent nodes (he in fact offers data like (41)
as support for an additional Transparency I effect, which was hinted at the
beginning of Section 1.1).

However, an investigation I conducted with fifteen native German
informants speaking different geographical dialects (some of whom were
linguists, and the remainder, ‘naïve’ informants) yields a rather different
picture. As far as data with SFRs like (40) are concerned, three patterns of
responses emerged. Some very ‘strict’ speakers (e.g., Josef Bayer) agreed with
van Riemsdijk in rejecting both (40a) and (40b). Some ‘laxer’ speakers (e.g.,
Katrin Pittner) rejected (40b) only, in keeping with the principle (operative in
many other languages) that the Case of the wh-phrase must reflect relative-
internal requirements and be indistinct from or more ‘oblique’ than the Case of the SFR (this principle is respected in (40a), since \textit{acc} counts as more oblique than \textit{nom}). Some still laxer speakers (e.g., Ralph Vogel) accepted both subcases of (40), presumably because they assign the same ‘obliqueness value’ to \textit{nom} and \textit{acc}. With regard to (41), however, van Riemsdijk’s judgments seem to be quite idiosyncratic. All the informants I consulted unhesitatingly rejected the italicized versions (where the Case of the semantic nucleus violates small-clause internal requirements) and accepted the non-italicized versions (where the Case of the semantic nucleus is distinct from the Case of the TFR). That is to say, my informants were insensitive to the Case assigned to the TFR in the matrix. Under van Riemsdijk’s analysis of TFRs, such insensitivity of the semantic nucleus to the Case of the matrix is surprising. Under the view that TFRs are simply SFRs with special internal properties, the pattern of acceptability exhibited in (41) is entirely expected. That is to say, all we need to maintain is that all the data in (41) are matching, since \textit{was} is consistent with both \textit{nom} and \textit{acc} status, and that the deviant versions violate an independent agreement rule that is in no way specific to TFRs.

Taking stock of what has been established in Sections 3 and 4, there are a substantial number of reasons for rejecting externally headed analyses of both SFRs and TFRs, and for adopting ‘internally headed’ analyses, more exactly, for adopting the view that the external head is null and that both wh-phrases and semantic nuclei occur where they seem to occur. Even if some of the arguments I have offered are felt not to be decisive in isolation, the conjunction of all of them acquires, I submit, critical mass. I will thus assume the correctness of the analysis in question in what follows, and will proceed to consider the ways in which transparency effects can be accounted for within it.

5. A proposed analysis of TFRs

In Section 4, I argued that TFRs are merely a special subclass of SFRs as far as gross structural and morphosyntactic properties are concerned. In this section, I argue that the same is true of their semantic properties. This result will be shown to have two welcome consequences: (1) it makes it possible to simplify the ‘definitional’ properties of TFRs, and (2) it yields straightforward accounts of the genuine transparency effects.

As a preliminary to tackling the semantics of TFRs, I briefly outline what I take to be the distinguishing semantic properties of SFRs. The characteriza-
tion that follows is based on the analysis in Grosu and Landman (1998, Sect. 3), which is itself a slightly modified version of the kind of analysis put forward in Jacobson (1988, 1995). Thus, the CP of an SFR is initially interpreted (ignoring intensions for simplicity) as a set, much like the CP of a restrictive relative. At this point, the feature [Def] on C (see Figure A at the beginning of Section 4) activates a maximality operator which maps that set to the singleton that contains its unique greatest member, if there is one (if not, the operation is undefined). Depending on the nature of the input set, the output singleton will contain a maximal individual sum, a maximal degree, or a maximal property. The null category in CP-external head position (which, as indicated in Figure A, must match the wh-phrase in categorial specifications), is construed as the identity function, and thus maps the singleton to itself. I assume a comparable construal for ‘free’ relatives with overt external material (see the Korean, Romanian and French data in (36)–(37)). At this point, I assume a syntactically unsupported, (default) semantic operation which maps the singleton set to its unique member. — Having sketched the relevant aspects of the interpretation of SFRs, we now turn to TFRs.

In Section 3, I indicated that I view as essentially correct a slightly modified version of Nakau’s informal suggestion concerning the raison d’être of TFRs. That is to say, it seems to be a fact that TFRs are felicitous just in case the semantic nucleus is in the scope of an intensional operator internal to the TFR. However, it remains to be determined whether this requirement constitutes another ‘definitional’ property of TFRs, additional to (A)–(C) of the Introduction, or whether it can be deduced from something else. At first blush, it may be quite tempting to view TFRs as phrasal counterparts of simplex constructions with lexical (non-intersective) ‘modifiers’, such as allegedly and formerly. In contrast to intersective modifiers, which are construed as functions applied to the ‘modifiee’, non-intersective modifiers are functions applied to a proposition in which the modifiee serves as predicate. This distinction is illustrated by the different kinds of translations exhibited in (42) and in (43)–(46) (the category of the bracketed constituents is indicated in the margin); capitalized constants, e.g., UNICORN, are taken to be of the extensional type ⟨e,t⟩.

(42) a. He was attacked by a [Chinese engineer] Nominal (intersective)
   b. λx. ENGINEER(x) and CHINESE(x)

(43) a. He was attacked by an [alleged unicorn] Nominal (intensional)
   b. λx,∃y[ALLEGED (y, ‘[UNICORN (x)]’)]
c. He was attacked by a [former president]
d. \( \lambda x. \text{FORMERLY} \ \text{PRESIDENT}(x) \)

(44) a. He is [allegedly [a Frenchman, French]] \textit{Nominal–Adjectival–Predicative}
   b. \( \lambda x. \exists y \ [\text{ALLEGED} \ [y, \text{[A FRENCHMAN, FRENCH}(x)]]] \)
   c. He is an [allegedly Chinese] spy. \textit{Adjectival–Modifier}
   d. \( \lambda P \lambda x. P(x) \text{ and } \exists y \ [\text{ALLEGED} \ [y, \text{[CHINESE}(x)]]] \)

(45) a. He spoke to her [allegedly privately], \textit{Adverbial}
   b. \( \lambda R \lambda x. R(e) \text{ and } \exists y \ [\text{ALLEGED} \ [y, \text{[(PRIVATE)(e)]]}] \)

(46) a. She was [allegedly laughing]. \textit{Verbal}
   b. \( \lambda e. \exists y \ [\text{ALLEGED} \ [y, \text{[LAUGH}(e)]]] \)

Now, since TFRs exhibit a range of categorial variation comparable to that found in the above simplex intensional constructions, the temptation I alluded to above is to assign to them comparable semantic analyses, keeping the following point in mind: Since expressions like \textit{alleged unicorn} or \textit{former president} allow the full range of determiners, they are evidently not subject to automatic application of a uniqueness operator, and to achieve semantic parallelism with them, TFRs must be assumed to differ from SFRs in not necessarily exhibiting a uniqueness operator as part of their semantics; that is to say, we need to assume the definitional property (C) of the Introduction. I provide in (47)–(50) TFRs comparable to the simplex constructions in (43)–(46). In all non-primed examples that follow, the (b) or (d) subcase provides the translation of the corresponding (a) or (c) subcase at both the CP and the complex XP level (the null head is construed as the identity function). In (47′b,d), we may assume the further application of existential closure (as a default, syntactically unsupported operation).

(47) a. He is [what I would call t a murderer]. \textit{Nominal–Predicative}
   b. \( \lambda x. \text{WOULD-CALL} \ [I, \text{[MURDERER}(x)]]} \)

(47′) a. He was attacked by [what we took to be t a unicorn]. \textit{Nominal–Argumental}
   b. \( \lambda P \lambda x. [[\text{TOOK} \ [we, \text{[UNICORN}(x)]]] \text{ and } P(x)] \)
   c. John lives in [what was once t a village] (but is today a metropolis).
   d. \( \lambda P \lambda x. [[\text{ONCE} \ [\text{VILLAGE}(x)]]] \text{ and } P(x)] \)
(48) a. He is [what I may call \textit{devious}]. \textit{Adjectival–Predicative}
   b. \(\lambda x. \text{MAY-CALL} [I, '[\text{DEVIOUS} (x)]']\)
   c. He is a dangerous and [what I may call \textit{devious}] spy. \textit{Adjectival–Modifying}
   d. \(\lambda P x. P(x) \text{ and MAY-CALL} [I, '[\text{DEVIOUS} (x)]']\)

(49) a. ?I wanted to speak to him [what you might call \textit{privately}]. \textit{Adverbial}
   b. \(\lambda R e. R(e) \text{ and MAY-CALL} [I, '[\text{PRIVATE}(e)]']\)

(50) a. ?She was [what you might call \textit{laughing too loud}]. \textit{Verbal}
   b. \(\lambda e. \text{MAY-CALL} [I, '[\text{LAUGH-TOO-LOUD} (e)]']\)

The translations just provided may seem to be satisfactory as far as meaning \textit{per se} is concerned, but they are open to two kinds of objection. On the one hand, they presume four definitional properties of TFRs (those listed as (A)–(C) in the Introduction, and the necessary presence of an intensional operator within the relative). On the other hand, they shed little light on the transparency effects which I have argued are real. Take, for example, the categorial matching effects of Section 1.1.1. Since the semantics of the small clause involves the application of the small clause predicate to its subject, the predicate will always be one logical type higher than the subject, and this will sometimes make it impossible for the subject and the predicate to belong to the same syntactic category. In (48b), for instance, \textit{what} serves as argument of an adjective, and must thus be nominal. Note that the semantics in (48b) make it impossible to view the TFR in (48a) as an SFR, since an SFR cannot be adjectival if its wh-phrase is nominal. Faced with these various problems, it seems we would do well to take a step back and start again.

As an alternative to the approach outlined above, I propose to explore a proposal made in Landman (ms.), which crucially contrasts with the foregoing in holding that the relation of the small clause predicate to its subject is equative-specification, rather than (strictly) predicative. This seemingly minor modification has, in conjunction with independently justified assumptions, an impressive number of welcome and illuminating consequences. I indicate what these are, after proposing modified semantic representations, which reflect the above change in assumptions, as well as some of its consequences. Specifically, I propose to replace the translations in (47)–(50) with those in (51)–(54), noting that more radical changes are in principle conceivable, and possibly even desirable. For example, Landman (ms.) translates (52a) as (52b'), which differs from (52b) in ‘breaking up’ the syntactic small clause
by making the equated elements arguments of the (now three-place) verb take. The choice between these two semantic variants, while of unquestionable independent interest, need not be addressed in the present context.

σ is the uniqueness operator, which ‘down-shifts’ a set into its unique maximal member. e is a variable of type (ev), P is a variable of type (e,t), P is a variable of type (s,(e,t)), R is a variable of type (ev,t), and R is a variable of type (s, (ev, t)).

(51) a. He is [what I would call a murderer]. Nominal–Predicative
   b. ω(λP. WOULD-CALL [I, ‘[P = ‘MURDERER’]]

(51’) a. He was attacked by [what we took to be a unicorn]. Nominal–Argumental
   b. λEEx [‘σ(λP. TOOK [we, ‘[P = ‘UNICORN’]])(x) and P(x)]
   c. John lives in [what was once a village] (but is today a metropolis).
   d. λP ∃x(∃t<ts & [‘σ(λP [P = ‘VILLAGE’])(t,x) & P(x)]

(52) a. He is [what I may call devious]. Adjectival–Predicative
   b. ω(λP. MAY-CALL [I, ‘[P = ‘DEVIOUS’]])
   c. He is a dangerous and [what I may call devious] spy. Adjectival–Modifying
   d. λPλx. P(x) and [‘σ(λP. MAY-CALL [I, ‘[P = ‘DEVIOUS’]])(x)

(53) a. ?I wanted to speak to him [what you might call t privately]. Adverbial
   b. λRλe. R(e) and [‘σ(λR. MAY-CALL [I, ‘[R = ‘PRIVATE’]])(e)

(54) a. ?She was [what you might call t laughing too loud]. Verbal
   b. λe. [‘σ(λR. MAY-CALL [I, ‘[R = ‘LAUGH-TOO-LOUD’]])(e)

(52) b¹. ‘σ(λP. MAY-CALL [I, P, ‘DEVIOUS’])

The semantics in (51)–(54) paves the way to an analysis of TFRs as SFRs, in virtue of the (I presume) uncontroversial assumption that equated objects must be of the same logical type. As may be seen by contrasting, for example, (47b) with (51’b), both representations include an existentially quantified individual variable x, but the latter also includes a formula that equates two properties, such that the specified property variable is bound by a uniqueness operator and the extension of the resulting unique property is a property of x. Thus, it becomes possible to assume something which was hinted at in the Introduction, and which may not be assumed under the approach in (47)–(50), namely, that the construal of TFRs, just like that of SFRs, involves
the application of a uniqueness operator. Accordingly, we may replace the question mark in Figure B with the feature ‘[Def]’ on C, in effect making TFRs a subtype of SFRs.

An immediate consequence of the assumption that equated objects are semantically homo-typical is that we get a straightforward account of the transparency effect noted in Section 1.1.2. and illustrated by the parallelism between (8a) and (8b). Depending on the logical type of the specifying element in the equative formula, the variable bound by the uniqueness operator will be an individual or a property variable. Since only unique individuals, but not unique properties, are disallowed in the there BE — XP context, as illustrated in (8a), the contrasts in (8b) follow. — I provide the semantics of the acceptable and unacceptable versions of (8b) in (55a) and (55b) respectively.

\[
\begin{align*}
&\text{(55)} \quad \text{a. } \lambda Q. \exists x [\sigma(\lambda P. \text{TAKE } [I, \{\text{FORK, THE } \ldots \}]])(x) \text{ and } Q(x)] \\
&\text{b. } \sigma(\lambda x. \text{TAKE } [I, [x = \text{the fork I gave you yesterday}]]]
\end{align*}
\]

A second consequence of adopting an equative analysis of the small clause within TFRs is that the ‘definitional’ property (A) of the Introduction, that is, the fact that the typical TFR effects are detectable just in case the wh-element is what, needs no longer be viewed as definitional. As noted already in connection with (5), what is the only element sufficiently underspecified in its semantics to be able to designate an individual, a kind of individual, or a property (such flexibility is not found, e.g., with who, where, etc.). Since one of the most striking property of TFRs, in particular, the possibility of indefinite construals, is found just in case the semantic nucleus designates, and thus may be equated with, a property, it is unsurprising that what needs to be used in such cases. Furthermore, it also becomes understandable why ever forms, in particular, whatever, are disallowed in TFRs, since such forms appear to be generally incompatible with equation-specification independently. For example, Jacobson (1995) observes that wh+ever forms are infelicitous in specificational pseudo clefts (e.g., what(*ever) John eats at lunch is potatoes). Arguably, there may be some incoherence in specifying an entity and simultaneously leaving its choice free. — In short, the fact that the constructions identified as TFRs use what to the exclusion of other forms can be essentially deduced from the equative property.

A third consequence of interest is that the deviance of TFRs without intensional operators, such as the full versions of (56a–b) ((56a) = (24)),
becomes less mysterious, and arguably attributable to violations of pragmatic felicity conditions on equative-specificational constructions (and on declarative sentences in general).

(56)  
\begin{itemize}
  \item a. John lives in (?\textquoteleft what is) a town.
  \item b. John lives in (*\textquoteleft what is) this town.
\end{itemize}

I submit that statements of any kind need to be potentially informative, and that specificational statements are no exception. For example, (57a–b), which equate two properties and two individuals respectively, are potentially informative in view of the fact that it is conceivable that some people might not know that the italicized terms in each example designate identical properties/individuals.

(57)  
\begin{itemize}
  \item a. Brilliant is very smart.
  \item b. John is Bill.
\end{itemize}

In the full versions of (56a–b), on the other hand, the chain headed by what designates nothing more specific than an entity of some sort (at least, in ‘out of the blue’ contexts), and since the semantic nucleus is not in the scope of an intensional operator that excludes the binder of the subject variable, these constructions say nothing more than that the designatum of the semantic nucleus is identical to some entity (whether property or individual) in all (relevant) possible worlds. Since everything is automatically identical to some entity in any conceivable world, in particular, to itself, the equative constructions in these examples are automatically uninformative. This is, I suggest, the source of the infelicity in the kind of data at issue. — Note that when the semantic nucleus is in the scope of an intensional operator, the binder of the subject variable is outside the scope of that operator, so that the equative construction is not automatically true in all (relevant) possible worlds. The fact that it is true in some worlds is thus informative, hence, the felicity of data like (2).

That the infelicity of data like the full versions of (56a–b) is not a property of TFRs per se, but a feature of uninformative equative sentences in general, emerges from a consideration of (58a–b). These data exhibit who-relatives, which are not viewed as TFRs in earlier literature (see the ‘definitional’ property (A) of the Introduction). Nonetheless, the contrast between (58a) and (58b) is exactly parallel to the contrast between the full versions of (56) and (2).
A fourth important consequence of assuming that a TFR’s small clause is specificational concerns the transparency effect noted in Section 1.1.1., namely, that the semantic nucleus determines the syntactic category of the TFR. In an earlier version of this chapter, I sought to derive this effect from equation-specification alone, noting that, for example, a bachelor is an unmarried man may have the force of a definition, while a bachelor is unmarried may not. It turns out, however, that such an approach is too simple, since the subject and predicate of a specificational construction need not always be homocategorial. For example, watchful is on the look-out may be construed as a definition, despite the heterocategoriality of the equated terms, an unsurprising state of affairs, since identity of logical type does not imply identity of syntactic category. But while equation-specification cannot alone account for the effect under consideration, it arguably can do so if the syntactic underspecification of what is taken into account.

In Section 1.1.1., I brought up the data in (5a–b), which show that what is underspecified not only for logical type, but also for syntactic category. The French element ce which heads French TFRs (see (37b’)) is comparably underspecified, a point brought by (59), where ce functions as a discourse anaphor whose antecedent designates a property and may be either nominal or adjectival. For a thorough demonstration of the semantic and syntactic underspecification of the German element was, see Jäger (2000).

(59) Jean est {intelligent, un homme intelligent}, ce que Georges n’est pas. 'Jean is {intelligent, an intelligent man}, which Georges isn’t’

Now, as already pointed out in Section 1.1.4., Wilder (1998) observed that what is underspecified for syntactic number, and that in specificational constructions, it may acquire number specifications from its predicate, as illustrated by (11d) (reproduced below for convenience). That is to say, such constructions may function ‘specificationally’ not only on the semantic plane, but also syntactically with respect to features that are underspecified in the subject. This observation leads Wilder to the conclusion that transparency
effects in syntactic number, such as the one in (11c), cannot be used to support an external-head analysis of the semantic nucleus, since the matching in number of the semantic nucleus with the TFR may be achieved via what.

(11)  
\begin{itemize}
  \item c. What seem to be books are/*is lying on the desk.
  \item d. What seem/*seems to be the problems?
\end{itemize}

Syntactic specification of underspecified subjects can be demonstrated not only with respect to syntactic number, but also with respect to syntactic gender. The French interrogative element quel is inherently unspecified for gender and number, and acquires such specifications from an equative predicate, as illustrated in (60) (the gender distinctions are only orthographic in contemporary standard French, but audible in southern dialects). Correspondingly, TFRs show matching effects in gender, as illustrated in (61).

(60)  
\begin{itemize}
  \item a. {Quels, *quelles} semblent être les problèmes?
    \text{what.mpl what.fpl seem to-be the problems.mpl}
  \item b. {Quelles, *quels} semblent être les options?
    \text{what.fpl what.mpl seem to-be the options.fpl}
\end{itemize}

(61)   
\begin{itemize}
  \item Marie est {ce que j’appellerai {intelligente, *intelligent}\text{Mary is what I-would-call intelligent.fsg intelligent.msg}}
\end{itemize}

Facts like (11c–d) and (60)–(61) point to the conclusion — which in fact constitutes the null hypothesis — that equative constructions may be syntactically specificational with respect to whichever properties turn out to be underspecified in their subject, and thus, categorial ones. If so, we have a straightforward account of the transparency effects in syntactic category which were illustrated in (7). That is to say, given the categorial underspecification of what and various cross-linguistic counterparts (in particular, the null operators used in the Korean and Romance data in (36)–(37)), and given a comparable underspecification of the null external head (and of overt heads like French ce; see (59) and (61)), the semantic nucleus determines the category of its TFR, and thus in effect functions as a syntactic nucleus as well.

It may be useful at this point to take a step back and consider the general picture of TFRs that has emerged so far. The view that TFRs are nothing but SFRs with a special additional property implies that, just as in SFRs of other kinds, the wh-phrase determines (most of) the syntactic and semantic properties of the entire construction. The special additional property of TFRs is that the wh-phrase is itself underspecified in certain respects, for which the
ultimate source of specification is the semantic (and now also syntactic) nucleus.

The conclusion we have just reached implies that the ‘intermediate’ elements through which transparency is ensured, that is to say, the wh-element (or some counterpart in a different language) and the CP-external head, may also adversely interfere with transparency to the extent that they fail to be underspecified. I offer facts from two languages in support of this prediction.

— In Romanian, superficial counterparts of English what-SFRs tend to have the import of English whatever-constructions. This effect is not encountered with an alternative construction which uses an overt external head from the demonstrative paradigm (see (37) and remarks thereon), and which is the preferred, for some speakers, the only possible way of forming TFRs. Since -ever forms are incompatible with specification (as already noted above), the (relative) need for certain items to have the force of -ever constructions correlates with a corresponding inability to serve as subjects of a TFR’s semantic nucleus. — In Korean, as kindly pointed out to me by Soyoung Roger-Yun, the item -kôs may not be used anaphorically to an antecedent that designates a property; in particular, there are no -kôs Korean counterparts to data like (59). Importantly, there are no -kôs counterparts to TFRs like those in (37b, b’), (51a) and (52a, c), either. — Note that such effects receive a natural explanation under a structural analysis of TFRs in Figure B, and more generally, under analyses that view the items in [Spec, CP] and those in CP-external head position as involved in the creation of transparency. Under analyses that view the semantic nucleus as the external head of the TFR, the effects just noted have no obvious account.

A sixth and final consequence of the view of TFRs that I put forward is that we can also derive an account of the transparency effect noted in Section 1.2., that is to say, of the fact that the right-edge condition on pre-nominal APs may be satisfied by the semantic nucleus of an adjectival TFR, even though it is not the TFR’s X-bar theoretic head. To this end, let us take a closer look at the right-edge condition itself.

The version of this condition stated in Section 1.2. requires that the element at the right edge of a pre-nominal AP be its head in the sense of A-bar theory. This version is, however, at variance with a number of facts to which we turn directly.

    b. A [fast enough] car
Consider first (62). In both subcases, the head A is followed by a modifier, but only (62a) is deviant. This distinction can be attributed to the fact that the modifier in (62b), but not the one in (62a), is lexical, and can thus adjoin to the head, forming a complex adjectival head and satisfying the right-edge condition. The German data in (63), however, show that things are not so simple. Apparently, when AP overtly agrees with N in phi-features, agreement morphology must also be realized at the AP’s right edge. Since affixal agreement is a property of atomic lexical items, (63a) fails to satisfy the right-edge requirement, and (63b) is ill-formed because genug is not an adjective, and thus may not bear adjectival inflection. The contrast between (63) and (62b) is paralleled by the Dutch data in (64a–b) and (64c) respectively. In Dutch, indefinite neutral singular nominal expressions do not require overt adjectival agreement, but all others do. Accordingly, (64c) is acceptable and (64a–b) are not.
Now consider the data in (65), where the lexical modifier of the head is itself an adjective (I view it as uncontroversial that *possible* is not the AP’s head, since it does not express a property of the car, but rather of an elliptical proposition. A reasonable paraphrase for (65a) is ‘a car fast to the highest degree to which it is possible for a car to be fast’). (65a) is acceptable for the same reason that (62b) is, and (65b–c) are unacceptable for the same reason that (63a) and (64a) are. Note, however, that (64b’, c’) are acceptable. The reason for this seems to be that the modifier of the head is adjectival, and that the grammars of German and Dutch permit such elements to reflect the agreement properties of the AP, even though they are not the AP’s head. Before drawing conclusions, let us examine the English-Dutch pair in (66a–b).

In these cases, the head A is modified by a phrase, which can thus not adjoin to it. (66a) can thus not be licensed in the way (62b) is. In (66b), on the other hand, the construction is apparently rescued by the fact that the agreement morphology of the AP may be realized on the adjective at its right edge. To account for the facts in (62)–(66), I suggest the following modified constraint (provisional version):

(67) A pre-nominal AP must end in an X* element that agrees with it in syntactic features (other than Case) in virtue of principles of grammar.

I begin by noting that an adjectival head always agrees with its AP in category and, when morphologically allowed, in phi-features as well. Accordingly, heads always satisfy (67). In English, As can agree with their APs in category only, since they uninflectable. Since complex heads like the one in (62b) and (65a) are of category A (by the definition of adjunction), they also satisfy (67), just like simplex heads. As for the right-edge adjectives in (65b’, c’) and (66b), they certainly satisfy (67) with respect to phi-features. With respect to category, they do share the properties of the AP, but accidentally, not in virtue of any principle of grammar, as far as I can see. Since these data are acceptable, it seems necessary to slightly modify (67) as indicated in (67’)(the final version):

(67’) A pre-nominal AP must end in an X* element that is indistinct from it in syntactic features (other than Case), and at least some these features match in virtue of principles of grammar.

Note that (66b) satisfies (67’) for the same reason that (65b’, c’) and (66b) do. On the other hand, (66a) does not satisfy (67’), because the only observable matching, that is categorial matching, is not grammatically induced. Hence, the contrast between (66a) and (66b).
But now observe that (67) yields a straightforward account of the transparency effect we are currently considering. Since the semantic nucleus may agree with the TFR in virtue of grammatical principles that are independently operative in equative constructions and in SFRs of other sorts (something that has amply been demonstrated above), an AP that satisfies (67) may also satisfy this requirement when serving as semantic nucleus of a TFR. We thus have an account of the last transparency effect we proposed to consider.

Before concluding I wish to note a prediction made by (67): since the wh-phrases of all SFRs agree in syntactic features with the SFR as a whole, we expect satisfaction of (67) by the wh-phrase if the head of the latter can occur at the TFR’s right edge. As noted in Section 1.4., this prediction is confirmed by the Romanian example in (15b).

6. Summary of results

The picture of TFRs that emerges from the work of my predecessors is of a construction which only accidentally resembles SFRs, and which moreover differs from the latter in lacking the uniqueness operator and in exhibiting a variety of transparency effects. These effects were viewed as strongly supporting an analysis of the semantic nucleus as an external head of the TFR.

In contrast, the picture that emerges from the present study is that TFRs do not exist as a separate ‘species’, that their superficial similarity with SFRs is not accidental, and that TFRs are actually a subclass of SFRs characterized by an equative-specificational small clause whose subject is bound by the wh-element. I offer a battery of arguments in favour of the thesis that TFRs possess the configurational properties, the morpho-syntax, and the typing interpretable features of SFRs, and I show that their transparency properties, their pragmatically induced intensionality properties, and some of their properties previously viewed as definitional, are derivable from the above characterization in conjunction with independently motivated assumptions.

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Chapter 6

Resolving number ambiguities in Sakha
Evidence for the Determiner Phrase as a processing domain

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1. Introduction

Sentences are heard or read not all at once, but incrementally. This poses some challenging problems for the human sentence processing mechanism (parser), as piecemeal input leads to many ambiguities. For instance, the fragment in (1) can be completed in various ways, each involving a different structural representation of her (2).

(1) I saw her . . .

(2) a. I saw her last night.
   b. I saw her dog.
   c. I saw her dog was gone.

Until recently sentence processing research has been mainly concerned with how the human parser resolves such ambiguities, that is, on the basis of which strategies and what kind of information a particular reading is chosen. An important focus of current research, however, is how the parser recovers from false decisions, that is, what happens when later information appears not to be compatible with the analysis chosen at a particular previous point in the sentence, and which factors make recovery easy or hard (Fodor and Ferreira 1998).

In this chapter we will discuss the processing of number ambiguities in possessive constructions in Sakha, a Turkic language of the Altaic family spoken in the Sakha Republic, Russia. This ambiguity is particularly interesting, as it forms a counterargument against two recent models of reanalysis in
sentence processing. Below, we will first introduce Sakha possessive constructions and the number ambiguity. Next, we will propose an analysis of number in Sakha DPs, which is motivated by processing preferences. Third, we will show why the Sakha data are problematic for existing theories of reanalysis difficulty. We will then present our own proposal that the DP is a separate domain for processing, and discuss its consequences for reanalysis difficulty.

2. Sakha possessives

In Sakha possessive constructions, the possessee agrees with the possessor in person and number. The possessor appears in the unmarked nominative case. The paradigm for singular possessees is given in (3):

(3) a. min at-ym
    I horse-1sg
    'my horse'
b. en at-yn
    you horse-2sg
    'your horse'
c. kini at-a
    he horse-3
    'his horse'
d. bihigi ap-pyt
    we horse-1pl
    'our horse'
e. ehigi ak-kyt
    you.pl horse-2pl
    'your horse'
f. kiniler at-tar-a
    they horse-pl-3
    'their horse'

The possessor can be dropped with no resulting change of meaning. Thus, both min atym and atym are possible translations of 'my horse' although the latter with the possessor dropped is more common. The presence of the possessor does not imply emphasis on the latter although if the possessor needs to be emphasized, it cannot be omitted and in addition has to be stressed.

When the possessee is plural, an additional plural morpheme /-LAr/ is added:
(4) a. min at-tar-ymland
   ‘my horses’
   I horse-PL-1SG

c. kini at-tar-a
   ‘his horses’
   he horse-PL-3

Ambiguity arises with third person plural possessors: both (3f) and (4f) have
the same surface form. In both the singular (3f) and plural (4f) form, the
posessee must display two suffixes indicating agreement with the possessor:
 [+third person] /-A/ and [+plural] /-LAr/. Therefore the plural possessee must
be spelled out as *at-tar-tar-a where the first /-LAr/ signals the number of
horses and the second the number of the possessor. However, due to an
independent morphological constraint, a string of two adjacent /LAr/’s is
prohibited, and one of them has to be deleted. As a result, (3f) and (4f) have
identical surface forms.

Possessive noun phrases can be contrasted with non-possessive ones
exemplified in (5) by a definite DP. Since Sakha has no overt determiners,
either definite or indefinite, the language has to resort to other techniques to
mark (in)definiteness, one of which is the use of demonstrative pronouns. As
can be seen from (5b), there is no agreement in number between the head
noun and the demonstrative and adjectival modifiers.

(5) a. bu xara at
    ‘this black horse’
    this black horse

b. bu xara at-tar
   this black horse-pl.
   ‘these black horses’

3. Number in Sakha possessives

Although the form kiniler at-tar-a is compatible with both the singular and plural interpretation of the possessee, native speakers have a slight preference for the singular (‘their horse’, (3f)), that is, if potentially biasing factors such as plausibility and frequency of occurrence are controlled for (cf. e.g. MacDonald et al. 1994; Trueswell 1996; Trueswell et al. 1994, for effects of these factors on ambiguity resolution). This preference can be accounted for in the following way. A general assumption in parsing research is that the parser tries to minimize processing resources, and hence, does not build more structure than necessary. The parser therefore prefers the simplest structural analysis in the case of ambiguity (see e.g. Frazier 1978; Gorrell 1996). If the structural representation of a singular possessee can be argued to be simpler than that of a plural possessee, the preference for the singular interpretation then falls out from these general parsing considerations.

Singulars are structurally simpler than plurals if the representation of a possessive noun phrase involving a singular head noun lacks a Number projection, that is, a NumP is projected for plurals, but not for singulars. In Sakha, singular has no phonological spell-out. However, this fact, as rightly pointed out by an anonymous reviewer, does not necessarily mean that NumP is lacking in syntax. It is also consistent with an analysis according to which NumP is syntactically realized but its [−plural] value has no phonological spell-out (cf. Ritter 1991; Zribi-Hertz and Mbolatianavalona 1999). However, one argument that a NumP is missing in Sakha non-plural DPs is that such noun phrases can be semantically unspecified in terms of number. Zribi-Hertz and Mbolatianavalona (1999) show that in Malagasy, DPs which occur with the default determiner and which are not overtly marked for singular or plural have no steady singular or plural semantic content: they are interpreted as singular or plural in accordance with the syntactic, lexical and pragmatic context. An example is given in (6) below (= (38b) in Zribi-Hertz and Mbolatianavalona 1999). Zribi-Hertz and Mbolatianavalona assume that such DPs are syntactically deficient in lacking the Number projection.
(6) Masika ny alika.
   mean  Dt dog
   ‘[(1) The dog (2) The dogs (3) Dogs] is/are mean.’

Similar examples can be given for Sakha. The unmarked noun in (7a) can be interpreted as either singular or plural depending on lexical and/or pragmatic factors. This contrasts with (7b), in which the noun is marked for plural and a singular reading is excluded. These facts can be accounted for if the Number projection is absent in the structural representation of (7a).

(7) a. Xonuuga at meccije syldjar.
    field-dat horse graze-ger aux-pres
    ‘A horse/Horses is/are grazing in the field.’
 b. Xonuuga attar meccije syldjallar.
    field-dat horse-pl graze-ger aux-pres
    ‘Horses /*A horse are/*is grazing in the field.’

We therefore assume that a singular reading results not from the presence of a Num head but from the interaction of syntactic, lexical and pragmatic factors. One of these factors is specificity. Specificity is understood here as in Enç (1991): an NP is specific if it is linked to a discourse antecedent by the inclusion relation. Consider (8a) versus (8b): in (8b) the noun phrase appears in the sentence-initial position which is a Topic position in Sakha and which imposes a specific reading on the noun phrase which occurs there. Thus, in (8b) a specific noun phrase cannot be read as plural. In (8a) on the other hand, the same noun phrase is not in a Topic position and therefore no specificity restriction applies. Since no other factors favouring either singular or plural seem to be at play here, the noun phrase ‘tall tree’ in (8a) remains ambiguous. Consider now (8c) where the same noun phrase as in (8a) in the same non-topical position is modified by one more adjective and cannot be read as plural (although it is not necessarily specific): whereas trees are usually tall, not all tall trees have a broad trunk. We will assume that, in addition to topical specificity and adjectival modification, also possession helps individuate the referent of the noun phrase unspecified for number and hence leads to its singularization; hence the steady singular interpretation for the possessive DPs in (3).

(8) a. Olbuorga ürdük mas üüner.
    yard-dat tall tree grows
    ‘A tall tree/Tall trees is/are growing in the yard.’
b. Ürdük mas olbuorga üüner.
   tall tree yard-dat grows
   ‘A/the tall tree/*Tall trees is/*are growing in the yard.’

c. Olbuorga suon ürdük mas üüner.
   yard-dat fat tall tree grows
   ‘A big tall tree/*Big tall trees is/*are growing in the yard.’

Given these considerations, we assume that the Number projection is absent from singular unmarked DPs. We represent a plural possessive DP as in (9), cf. Vinokurova (1998). The possessee is generated in N and undergoes a series of head-movements. First, the possessee raises and adjoins to the Num head to check its number feature. Then the N head (dragging along Num since no excorporation is possible) raises further to the functional head F (which can either be Agr or Poss) where it enters into a Spec–Head relationship with the possessor in Spec, FP. Finally, the possessee ends up in D where it checks its referential features. Subsequent to this, the whole FP raises to Spec, DP.

(9) kiniler at-tar-a
    they horse-pl-3
    ‘their horses’

The derivation of a singular possessive DP proceeds similarly, except that no Number projection is involved.

(10) kiniler at-tar-a
    they horse-pl-3
    ‘their horse’
Assuming this analysis, the preference for the singular interpretation of the possessee in (3f-4f) can be accounted for by the general syntactic parsing principle to prefer the most economical structural analysis. Note that the preference is not likely to be due to a semantic preference for singulars to plurals (e.g. The Principle of Parsimony, Crain and Steedman 1985). First, as has also been argued by Frazier (1999), it is unclear how such a semantic principle can be formulated: why should the postulation of a set of one horse be less effortful than, and hence preferred to, the postulation of a set of multiple horses? Second, if the bias for singular interpretation were merely a semantic bias, it is likely that such a bias is universal. However, there is some counterevidence for this. Turkish, also a Turkic language, has an ambiguity similar to the one in Sakha:

(11) onlar-in at-lar-i

they-gen horse-pl-3

‘their horse/horses’

The possessee in (11) can either be interpreted as singular or plural. However, as opposed to Sakha, a plural interpretation is preferred. This suggests that the resolution of the number ambiguity in possessive constructions is mediated by language-specific syntactic properties, and a general syntactic parsing principle to choose the most parsimonious analysis compatible with the input.

4. Recovery from error and the effect of distance

Above we have seen that the singular interpretation is preferred in ambiguous possessive constructions. However, sometimes this interpretation may later turn out to be incorrect, and the analysis needs to be revised from singular to
plural. A current focus of psycholinguistic research is to investigate what makes such revision easy or hard. One point of controversy is whether the distance between the onset of the ambiguity and the point of disambiguation affects reanalysis difficulty, and if so, how distance should be quantified. We will first give an overview of two approaches concerning the role of distance in recovery from an erroneous decision. Next we will show some data from Sakha that are problematic to both these approaches.

4.1 Theories of revision difficulty

One approach of reanalysis difficulty is the model proposed by Fodor and Inoue (1994; 1998). According to their view, the linear distance between the ambiguous element and the disambiguating information does not affect reanalysis difficulty. Instead, the hierarchical relation between the ambiguous and disambiguating element matters. Fodor and Inoue (1998) give the following (admittedly, non-minimal) contrast to support their claim:

(12) The sick sheep can't easily find food for themselves in winter.

(13) The daughter of the king's son admires himself.

Both sentences contain an ambiguity, which is eventually resolved against the interpretation that is initially preferred. Sheep in (12) is initially interpreted as singular. At themselves, this interpretation can no longer be correct. In this case, revision occurs rather effortlessly. This is different for (13). (13) is initially analyzed with daughter being the head of the subject DP; the genitive marker being attached to king. This leads to problems at himself, as the gender features of the reflexive do not agree with those of the supposed subject. The intended analysis is the one in which son is the head of the subject, with the genitive being attached to daughter of the king. Note that, in contrast to (12), it is very difficult to obtain this analysis.

According to Fodor and Inoue, the contrast between (12) and (13) suggests that the hierarchical relation between the onset of the ambiguity and the disambiguating information matters, rather than the linear distance: in (12) the ambiguous sheep is separated from the disambiguating themselves by five words, but both elements are syntactic dependents of each other. In (13), on the other hand, the ambiguous element (the genitive ’s) and the disambiguating himself are separated by only two words, but are not in a syntactic dependency relation.

In contrast to this view, other researchers claim that the distance between
the disambiguating information and the start of the ambiguity does affect the
difficulty of obtaining the correct reading, at least under certain definitions of
distance. Frazier and Clifton (1998) quantify distance in terms of thematic role
assignment. They postulate a Semantic Cost Principle, according to which
semantically interpreted syntactic decisions are hard to revise. According to
Frazier and Clifton, an element is semantically interpreted if it has been
assigned a thematic role (cf. also Ferreira and Henderson 1991, 1998):

(14) Semantic Cost Principle:
Revising semantically interpreted (confirmed) decisions is more costly
than revising semantically uninterpreted ones [Frazier and Clifton
1998:148]

To illustrate this, Frazier and Clifton contrast (13) with (15):

(15) The commander of the army’s belt-buckle

It is much easier to obtain the correct analysis in (15) than in (13). Note that
in (13), the ambiguous DP has been assigned a thematic role by admires, and
hence, has been semantically interpreted before the disambiguating informa-
tion himself comes along. In (15), on the other hand, no thematic role has
been assigned to the ambiguous elements before the disambiguating informa-
tion belt-buckle is encountered, hence the difference between (15) and (13) is
accounted for.

4.2 Counterexamples from Sakha

As we will demonstrate below, data from Sakha are problematic for both
Fodor and Inoue’s, and Frazier and Clifton’s approaches to revision difficulty.

First, recall that native speakers of Sakha have a preference for the singular
interpretation (‘their horse’) of (3f–4f), repeated here as (16).

(16) kiniler at-tar-a
they horse-PL-they-3, or: they horse-PL-they+horse-3
‘their horse’ ‘their horses’

(16) can be disambiguated by a following verb, as in (17):

(17) a. Kiniler at-tar-a öllö.
they horse-PL-3 died
‘Their horse died.’
b. Kiniler at-tar-a öllü-ler.
   they horse-pl-3 died-pl
   ‘Their horses died.’

Although a singular reading of the subject is preferred, native speakers do not have any difficulty at the plural verb (öllü-ler) in (17b). However, if the ambiguous region is lengthened, e.g. by inserting two adverbs as in (18), a serious parsing difficulty occurs at the plural (18b) vs. singular (18a) verb. This difficulty is rather strong, sometimes even beyond repair:

(18) a. Kiniler at-tar-a beqehee kiehee öllö.
   they horse-pl-3 yesterday evening died
   ‘Their horse died yesterday in the evening.’

b. Kiniler at-tar-a a beqehee kiehee öllü-ler.
   they horse-pl-3 yesterday evening died-pl
   ‘Their horses died yesterday in the evening.’

This is problematic for both the Fodor and Inoue and the Frazier and Clifton accounts of revision difficulty. First, in both the long (18) and the short (17) conditions, the number-ambiguous head of the subject and the disambiguating verb are syntactic dependents. Fodor and Inoue therefore incorrectly predict that revision of the singular into a plural reading is as easy in (18b) as in (17b). Furthermore, thematic role assignment is not different for (18b) and (17b): in both cases the ambiguous DP is assigned a thematic role by the sentence-final verb, which carries the disambiguating information. The Sakha data are therefore also problematic for Frazier and Clifton’s proposal.

5. The extended semantic cost principle

5.1 Our proposal

In our account of the Sakha data we would like to extend Frazier and Clifton’s Semantic Cost Principle (14) to the principle given in (19). We propose that a decision can be semantically confirmed by the completion of a DP (at least for DP internal ambiguities), in addition to thematic role assignment. A DP is both a syntactic and a semantic unit. Once a DP is syntactically completed, its interpretation can be completed: its referent in the discourse can be established; and it can be interpreted e.g. as familiar (Tunstall 1994), or collective/distrib-
ute (Frazier, Pacht and Rayner 1999). Once the DP is interpreted, the sentence processing mechanism shifts its focus to following information. The DP internal structural information is not needed any more and rapidly becomes inaccessible, which makes it hard to later revise the structure of the DP.

(19) **Extended Semantic Cost Principle:**

Revision is hard if the decision is semantically interpreted, either by thematic role assignment, and/or by establishment of a referent

We furthermore assume that DP is not closed off until it is clear that the next word does not belong to the DP. This late closure is needed to allow modification in head-initial languages. An expression such as *the man* may be followed by a relative clause or another modifying expression (cf. also Tunstall 1994). If the DP were already closed off, such modifiers could not be used to restrict the reference of the DP.

Late closure of DPs applies in Sakha, as well. This is illustrated by the following example. A doubly embedded possessive DP such as the one in (20) is multiply ambiguous:

(20) `ehigi kyra ataax oqolorgut yaraxan syanalaax sana okuyy` [you small spoiled children-2PL expensive priced new oonjuudaryn toy-PL-3-acc/gen]

The DP can be split in two places: (i) after nominative `ehigi ‘you’ — early closure, see (21); or (ii), after nominative `ehigi XP oqolorgut ‘your XP children’ — middle closure, see (22). Alternatively, (20) can be interpreted as one entire accusative DP ‘your little spoiled children’s expensive new toys’, cf. (23), or as one entire genitive DP ‘your little spoiled children’s expensive new toy’s’ (24).

(21) `[ehigi] [kyra ataax oqolorgut yaraxan syanalaax sana] [you small spoiled children-2PL expensive priced new oonjuudaryn] alcattygyt.

You broke your little spoiled children’s expensive new toys.’

(22) `[ehigi kyra ataax oqolorgut] [yaraxan syanalaax sana] [you small spoiled children-2PL] [expensive priced new oonjuudaryn] alcattylar.

Your little spoiled children broke their expensive new toys.’
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(23) [Ehigi kyra ataax oqolorgut yaraxan syanalaax sana
[you small spoiled children-2pl expensive priced new
oonnjuurdaryn] alcattybyt.
toy-3-pl -acc broke-1pl
'We broke your little spoiled children’s expensive new toys.’

(24) Ehigi kyra ataax oqolorgut yaraxan syanalaax sana
you small spoiled children-2pl expensive priced new
oonnjuurdaryn tutaqa alcanna.
toy-3-gen handle-3 broke
‘Your little spoiled children’s expensive new toy’s handle broke down.’

According to native speakers’ intuitions, the continuations in (21) and (22) are not as felicitous as those in (23) and (24), in which the expression in (20) is taken as one DP. This suggests that there is a preference to attach incoming material to the current DP. We therefore assume that the DP is not closed off until DP+1, that is, the first word that does not belong to the DP:

(25) DP as a processing domain:
At DP+1 the referent of the DP can be established, and the internal structure of the DP is closed off (cf. Tunstall 1994)

The principles in (19) and (25) account for the contrast in (17) versus (18) in the following way. In (17), where the number of the DP is disambiguated by the verb adjacent to the DP, the internal structure of the DP is still accessible at the point of disambiguation, and revision is easy. In (18), on the other hand, the disambiguating verb is separated from the DP by two adverbs. In this case, the DP has been closed off before the disambiguating verb comes in. Hence, revision is hard.

5.2 Supporting evidence from Sakha

The extended semantic cost principle (19) and the hypothesis that DP is a processing domain (25) make an interesting prediction, namely, that the Sakha number ambiguities are easy to resolve when the point of disambiguation is inside the DP, even if the ambiguous region is rather long. This prediction is indeed borne out.

Consider first the multiply-embedded possessives in (26).
Resolving number ambiguities in Sakha

(26) a. [kiniler yt-tar-yn tyl-a]DP
 they dog-PL-3GEN tongue-3
‘their dog’s tongue’
b. [kiniler yt-tar-yn tyl-lar-a]DP
 they dog-PL-3GEN tongue-PL-3
‘their dogs’ tongues’

The phrase *kiniler yttaryn* is ambiguous between ‘their dog’s’ and ‘their dogs’.
The grammatical number of this noun is disambiguated by the pragmatic information provided by the next noun: one dog cannot have several noses, hence the ambiguous noun must be plural in (26b). Both the singular reading in (26a) and the plural in (26b) are easy to obtain. Crucially, both singular and plural readings of *yttaryn* remain to be processed without any considerable difficulty when we modify the possessee and thus separate it from the possessor as in (27).

(27) a. [kiniler yt-tar-yn inceqej uonna kyp-kyhyl tyl-a]DP
 they dog-PL-3GEN wet and red-red tongue-3
‘their dog’s wet and very red tongue’
b. [kiniler yt-tar-yn inceqej uonna kyp-kyhyl tyl-lar-a]DP
 they dog-PL-3GEN wet and red-red tongue-PL-3
‘their dogs’ wet and very red tongues’

As predicted by the Extended Semantic Cost Principle, obtaining the plural is much easier in (27b) compared to (28) (cf. (18b)) and (29) in which the point of disambiguation is outside of the DP. Note also that both (28) and (29) contain a syntactic cue (the plural morpheme at the verb). In (29) this syntactic cue comes in addition to the pragmatic cue (the plural noses). According to Fodor and Inoue (1994), syntactic cues are generally more informative than pragmatic cues to recover from a false decision. Nevertheless, the plural reading is more difficult to obtain in (28) and (29) compared to (27).

(28) [Kiniler yt-tar-a]DP kiehee xaranaqa ürel-lar.
 they dog-PL-3 evening in.the.dark bark-PL-3
‘Their dogs bark in the dark in the evening.’

(29) [kiniler yt-tar-a]DP inceqej uonna kyp-kyhyl tyl-lar-yn
 [they dog-PL-3]DP wet and red-red tongue-PL-3
 byktar-byt-tar.
 stick.OUT-PAST-PL
‘Their dogs stuck out their wet and very red tongues’
The contrast between (27b), in which the plural reading can be obtain without effort, and (18b) and (28)–(29) in which revision to a plural is hard, suggests that recovery of an erroneous decision is easy when the DP containing the number ambiguity has not been closed off, regardless of the linear distance between the introduction of the ambiguity and the disambiguating information.

6. Concluding remarks

According to existing theories of reanalysis difficulty, recovery from a false decision either is not affected by linear distance between the onset of the ambiguity and the point of disambiguation (as long as the two are syntactic dependents); or, alternatively, recovery becomes harder if a thematic role is assigned to the ambiguous element before disambiguation. We have presented some data from Sakha that are problematic for both approaches. We propose that the DP is a processing domain: when a DP is closed off (at DP+1), a referent of this DP is established. As a result, the syntactic structure is no longer accessible for revision. In the case of the number ambiguities discussed here, the singular reading, which is preferred because it is structurally the most parsimonious (cf. Section 3), can be easily revised into a plural as long as this revision takes place within the DP domain.

We would like to note, however, that the data presented here are based on the intuitions of a few native speakers only. A carefully controlled experiment is currently under way to test the generalizability of the data presented here.

References


Resolving number ambiguities in Sakha


Chapter 7

Weak indefinites*

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0. Introduction

The idea that events should be countenanced as entities in a semantics, commonly attributed to Davidson (1967), has received a great deal of attention over the past couple of decades. Work tends to focus on the internal structure of these events (connecting it to work on aspect and aktionsart), on the one hand, and the usefulness of having them, rather than something like propositions as substitute, within the propositional semantics. See Zucchi (1993), Parsons (1990), and Rothstein (1998), and Tenny and Pustejovsky (2000) as a just few indicators of this interest. Here, I am going to outline, and partially motivate, a programmatic way in which the event semantics and the propositional semantics might be related to one another.

I am going to assume, for the time being without question, the syntactic framework made use of in Diesing (1992). We will examine, as a springboard to further development, some semantic phenomena that helped motivate her framework, and propose in the end that the character of semantics itself, and not syntactic stipulation, gives rise to the phenomena that Diesing observes and uses to motivate her own syntactic framework. An event semantics will be the most important ingredient in articulating how this might happen.

1. Diesing’s framework

Though at times Diesing (1992) makes occasional use of the Barriers framework (Chomsky 1986), in the main the assumptions are those of a version of Government and Binding theory (Chomsky 1981). Working mainly with data from German, Dutch, and English (though other languages come into play as
Diesing sees great usefulness in a certain version of the VP-Internal Hypothesis, in which subjects (may) originate within the VP and be subsequently moved to a higher position in the syntax. This higher position, within the IP, is also a subject position, resulting in two distinct subject positions.

The interpretation of bare plurals is one type of evidence Diesing considers. It is well known that bare plurals have (at least) two distinct readings: an existential reading, and a generic reading. The hypothesis is that bare plurals in subject position are interpreted existentially if appearing within the VP, but generically if appearing in the IP position. Consider (1).

(1) Sharks are visible. (ambiguous)
   a. [IP Sharks [VP e are visible]]
   b. [IP [VP Sharks are visible]]

(1) is ambiguous between two readings, an existential reading in which there are some sharks that can be seen at the moment, and another generic reading in which it is stated that sharks, in general, are of such a size and composition as to make them visible entities (unlike air, microbes, or electrons). The generic reading would thus be accorded the syntactic structure (at LF) in (1a), while (1b) would give rise to the existential reading.

Some syntactic motivation for (1a) vs. (1b) comes from German data, which I will illustrate with but one example. In German it appears that the particles “ja doch” mark the left-hand boundary of the VP; so if a subject appears to its right, it is within the VP, and if it appears to the left, then it is outside the VP, in the IP. Now consider the examples in (2), with a bare plural subject.

(2) a. ...weil ja doch [Linguisten Kammermusik spielen]
   ‘... since there are linguists playing chamber music’
   b. ...weil Linguisten ja doch [Kammermusik spielen]
   ‘... since linguists (in general) play chamber music’

If the subject appears within the VP, as in (2a), then it is interpreted existentially; if it appears outside the VP, under the IP, it is interpreted generically, as in (2b). To give an account of such data, Diesing propose the Mapping Hypothesis. The semantic assumptions are, loosely, that of DRT (Kamp 1981; Heim 1982) in which there is an operation of existential closure unselectively binding all free variables, and operators such as quantifiers, modals, and other elements that create tripartite structures consisting of an operator, a restrictive clause, and a "nuclear scope" (also known as the “matrix clause”). According
to the Mapping Hypothesis, different portions of the sentence are mapped into restrictor and nuclear scope depending on their syntactic positions:

Mapping Hypothesis (p. 10)
— Material from VP is mapped into the nuclear scope
— Material from IP is mapped into a restrictive clause

It is stipulated that existential closure takes place at the VP level (nuclear scope), and it is assumed that bare plurals are indefinites which introduce a free variable. Thus, any bare plural within the VP (at LF) will have its variable bound by an existential quantifier, so (1b), for instance, would be interpreted as follows:

\[ \text{IP} \exists [\text{VP} \text{Sharks}(x), \text{are visible} (x)] \] (existential reading)

On the other hand, if the subject appears under the IP, it is mapped to the restrictor clause of some IP-level operator. In the case of (1b), this is assumed to be the GEN operator, which creates a tripartite structure; the GEN operator binds the variable introduced by the bare plural in its restrictor, giving rise to a generic reading for the NP:

\[ \text{IP} \text{GEN} (\text{Sharks} (x)) (\{\text{VP} e \text{ are visible}\}) \] (“universal” reading)

(= roughly, “If something is a shark it has a propensity towards being seen”)

This line of analysis generalizes to other argument positions, such as object position. So (3a) vs. (3b), in which the bare plural is interpreted existentially in (3a) but generically in (3b).

(4) a. John petted dogs (existential, within the VP, bound by existential closure)
    b. John hates dogs (“universal”, outside the VP, in restrictor of GEN)

This line of thought generalizes to other types of DPs, not limited to bare plurals. Though here, and I’ll be very brief about this, the kind of thinking shifts from reference to higher tripartite structure operators to a notion of “presuppositionality” (restrictor clauses have a presuppositional character to them). The consequence is that any NP/DP that is “presuppositional” in nature must move into a higher position in the IP to be interpretable; it cannot remain within the VP. This makes for a lengthy list of types of DP/NPs:

— Things “bound by” the generic operator
— Strong quantifiers
— Definites and demonstratives
— Proper names
— Specific indefinites
— Partitives
— Unfocused elements (?)
— Pronouns (?)

(Diesing discusses unfocused elements only briefly and inconclusively, and does not mention pronouns explicitly, but I’m assuming their definiteness would also require them to move, at least on deictic and E-type readings.) At this point we ask, what does this leave that need not move out of the VP in order to be interpretable? It turns out to be just the class of weak indefinites, and nothing else.

This concludes my very brief comment on the Diesing (1992) framework. This discussion certainly does not do justice to the range of data she considers in motivating her theory; nor does it do justice to the problems, technical, conceptual, and empirical, that might be noted. My present task is to try and replace the Mapping Hypothesis with a semantically-motivated framework from which the observations associated with the Mapping Hypothesis might follow as a consequence. The twin independent stipulations, the Mapping Hypothesis itself, and that Existential Closure occurs at the VP level only (when in the founding work it was a discourse-level operator), are behind my concerns. But for now, let us return to the question why only weak indefinites are left in the VP.

2. “Incorporated” nominals

I want to argue that the VP is the domain of a context-free interpretive mechanism specifying an event-type, which is then the input to the usual context-sensitive propositional semantics generally assumed for all levels of the sentence. That is, something fundamentally different goes on within the VP that does not go on “above” the VP — it is only information about types/properties that appears there and not information about (contingent) particulars. Hopefully, it will follow from this that only weak indefinites may appear within the VP. I should note that roughly similar notions are to be found in Svenonius (1996) and in Guéron (2001), though details differ significantly.
The strategy I am going to pursue is to examine the nature of some constructions which, depending on plausibility alone, I would regard as paradigm cases of NP/DP’s that must occur within the VP. Incorporation and incorporation-like structures would appear to be the best bet. A paradigm case is presented in (4):

(4) Arnajaraq eqalut-tur-p-u-q. (West Greenlandic, Van Geenhoven 1996)
    A.abs salmon-eat-ind-[u]-3sg
    ‘A. ate salmon.’

Here, the direct object form displays a lack of case-marking (we might also talk in terms of “weak case”, de Hoop 1992), is semantically neutral with respect to number, and must appear adjacent to verb, as is typical of those languages with overt morphological incorporation (e.g. Baker 1988).

I also include bare count singular forms in many languages, those normally displaying articles and/or case-marking in the normal instance, but lacking these in many direct-object constructions. Hindi, for instance, has no articles but normally displays case, but allows some bare singular objects. This, too may well be an instance of object incorporation (Mohanon 1995):

(5) a. Anu kitaab paRh rahii hai. (Hindi, Dayal 1999)
    Anu book.sg read-prog-pr
    ‘Anu is reading a book.’

cf.: b. Anu kitaab-ko paRh rahii hai
    Anu book.sg-acc read-prog-pr
    ‘Anu is reading the book.’

Norwegian has articles but no case-marking (aside from pronouns), but can countenance direct object bare singulars.

(6) Jeg har bestilt billett. (Norwegian; Borthen 1998)
    I have ordered ticket.sg
    ‘I ordered a ticket.’

And Albanian has both articles and case-marking, both of which are absent in bare singular object constructions:

(7) Ana do të blejë biçikletë. (Albanian, Kallulli 1999)
    Anna wants to buy bicycle.sg
    ‘Anna wants to buy a bicycle.’

In all these instances, not just any noun can go with any verb that can take
that noun with an article. For instance, in Hindi one can “see girl” but cannot “see woman”, and so forth. The semantics of these constructions from these (and other) quite diverse languages is surprisingly constant. You get indefinite readings that are neither specific nor partitive (the weak reading only, as pointed out by Enç 1991, for Turkish); these show scope neutrality, with narrow-scope only readings; and they are existential. These are precisely the characteristics one might expect from noun phrases that are always found “within the VP¹” on the Diesing analysis. I am not saying these structures are “the same” in all respects, clearly they are not; but these striking semantic and formal similarities seem a good place to start.

A clear intuition one finds expressed in work on incorporated structures and bare singular (and, occasionally, plural) complements, is that the noun is combining with the verb in a way that is different from the way (true) arguments combine with verbs. The notion that these structures designate “typical activities”, or that the noun “modifies the verb” to form a “complex predicate” represents a persistent driving intuition (Dayal 1999; Haiden 1996; Rapoport 1996; Borthen 1998, among others). I am going to build on these intuitions, but suggest instead that, rather than the mechanisms being different for combining verb and bare argument, they also differ in the kind of denotation expressed.

Preliminary Hypothesis: These types of structures give rise to a denotation that is within the denotation-type of verbs themselves.

I am assuming here that the denotation-type of verbs is qualitatively different from the denotation-type of sentences, not only in “semantic type”, but also with regard to the parameters of semantic evaluation. This is not so in most versions of propositional semantics In a Montague grammar, for instance, a verb meaning is a function that is evaluated with respect to exactly the same parameters (same model, times, worlds, and assignment functions) as full sentences, and everything in between, though it generally does differ in terms of semantic type. That is, in Zucchi’s (1993) terms, the denotations of verbs should not be construed as a subset of the set of propositions. I will shortly sketch a system in which they do differ.

The idea that incorporation-like structures yield meanings that are the same as basic verb meanings would appear to receive some spotty support from the fact that in some incorporating languages, an incorporated transitive verb may take a “doubled” object, as in the Mohawk example in (8), as if it were still a transitive verb.
(8) Kikv rabahbot wa-ha-its-a-hnini-'ki rake-'niha.
   this bullhead fact-m.sg.subj-fish-buy-punct my-father
   ‘My father “fish-bought” this bullhead.’ (Mohawk; Baker 1995)

The fact that most languages displaying object incorporation do not allow such structures, but instead treat the result as a member of the intransitive paradigm, limits the significance of such facts as (8); further, that the free direct object is quite possibly an adjunct and not a genuine object suggests the result is a VP-meaning. If this is so, then the prediction made by the system of interpretation sketched below will be that the free direct object (adjunct) cannot have a weak indefinite reading, and that the incorporated form itself must.

3. Event-types

I am going to follow Bach (1986) in assuming that verbs denote what he calls eventualities. These eventualities, in the present case, are not semantically functional: they have no “argument positions” in the semantics of the familiar sort (though the sentences they appear in do have syntactic argument positions). Verbs and verbs plus their incorporated arguments denote exactly the same sort of thing: verbs are not an n-place functions that are reduced to an n-1-place functions upon addition of an argument, at this level of structure. Let’s be a little more specific.

I am going to take one element of the model to be E, a set of eventualities (which I construe here as event-types). A given verb denotes some member of E, and the verbs collectively denote a subset. Each element of E is related to other elements of that set. As commonly assumed, it has a complete join semilattice structure (not necessarily with atoms) defined by the part-of-relation ≥. (Intuitively, [run] ≤ [move], [sing] ≤ [sing ∨ swim], it is not the case that [laugh] ≤ [eat], and so forth.)

Arguments added at this level modify the verb’s denotation to create, intuitively, a more specific event-type which is itself another member of E, i.e. one that is a part of the original. Thus: [eat cake] ≤ [eat]. Furthermore, [eat cake] will enter into the lattice structure of E generally, like the meaning of a basic verb.

We need to say something about the arguments that are added (noting once again, this is not, at this point, a function-argument semantics). Certainly among those to be added are bare singulars and number-neutral forms. There
is some uncertainty about what we should take these to denote. One idea is that they denote kinds (Carlson 1977; Chierchia 1998). But more recently (e.g. McNally 1998) the term “property”, has been employed, and without really differentiating or deciding between the two here, I’ll employ the somewhat more neutral term “property”, as on Chierchia’s (1998) account bare singular count nouns cannot denote kinds, and I want them included. P is the domain of nominal meanings, and each nominal finds a meaning in this domain. P has a (complete) join semilattice structure defined on it that is similar to that of E, so that, intuitively: [cat] ≤ [mammal], [fat dentist] ≤ [dentist], and it is not the case that [table] ≤ [dog].

If N and N¹ are property-denoting arguments, and [N] ≤ [N¹] both in P, and [V] is a member of E, then [V N] ≤ [V N¹] and both are in E. (And, in the example, if ¬[N] ≤ [N¹], then ¬[V N] ≤ [V N¹]). So, again intuitively [eat cake] ≤ [eat food], and so on.

At this point, the ontology only consists of types of things; there is, quite plausibly, no room here for entities such as individuals; to my knowledge individual-denoting expressions such as proper names are not incorporated. At this point in the interpretation, there are no times, no possible worlds, no truth-only types. It is tempting to use the term “concept” at this point, but I am going to leave open the question of whether this is appropriate. Unmotivated, but plausible assumption: individuals (you, me, Bob) are not properties (or types) and such expressions have no denotation in E or P. The only types of variables countenanced for nominal expressions at this level of interpretation are property-level variables; there are no individual-level variables. If X is a property-level (nominal) variable, the interpretation of [V X] = [V]; that is, it will make no contribution to the interpretation of the constituent until it is assigned a value from P.

4. VP meanings

Above was sketched a notion of what a verb meaning might be, though obviously in much need of further specification. In this section I outline a proposal for VP meanings. This is motivated by two considerations. One the one hand, we need to provide for the addition of other argument expressions; incorporation phenomena only appear to be limited to one argument, typically the direct object but occasionally the (unaccusative) subject. The other consideration is we want to be able to define weak quantifiers, such as “five”
or “many”, which appears to require that a counting of individuals be employed, which is not possible given types only.

To accomplish this, I am going to very roughly follow Bealer (1982) in his definition of extensions of properties. Like the characterizations of verb meanings given above, again we define things non-propositionally. That is, there is still no truth, times, or worlds.

First, we define a domain $\Sigma$ of token, ephemeral events. If I write the letter “t”, and ten seconds later, write the letter “t” again, there are two distinct token events, even though they are of exactly the same type, writing the letter “t”. The extension of a given event type $E$ is $\hat{E} \subseteq \Sigma$, intuitively the set of token events instantiating that event-type. However, these events are not, at this point, situated in worlds; they are not provided with spatio-temporal relations to one another, and have no part-whole relations except as provided for by a join semilattice structure is defined on $\Sigma$. The lattice structure of $E$ is projected homomorphically onto the domain of $\Sigma$. Thus $\hat{\text{[sprint]}} \subset \hat{\text{[run]}} \subset \hat{\text{[move]}}$, and $\hat{\text{[fat cat]}} \subset \hat{\text{[cat]}} \subset \hat{\text{[mammal]}}$. However, if in a given situation I build a house, and as a part of building that house I hammer a nail, then at this level of representation my hammering of the nail would not be a part of building a house. This specification would have to await the mapping of the members of $\Sigma$ into possible worlds.

Corresponding to $P$ there is another domain $U$ of some sort of entities and their pluralities, upon which is defined a join semilattice structure, to account for pluralities. These entities are best understood as property-instantiations, and not as individuals proper (Musan 1995). The problem is that the same individual may have different properties at different times, and in different worlds. The same individual may be a child, then an adult; a student, then a lawyer, and so forth, so the members of $U$ might be looked upon as individuals-while-they-are-an-N, and not individuals proper. If $N$ is an argument property term $P$, its extension is $\hat{P} \subseteq U$. We need to make provision for properties of pluralities in $U$: if $a \in \hat{[N]}$ and $b \in \hat{[N]}$, then $a \lor b \in \hat{[N]}$ (but not conversely, to account for collective readings). That is, if the parts of a group instantiate a property, then the group instantiates that property. Furthermore, if $N$, $N'$ are property-denoting terms and $[N] \subseteq [N']$, then the extension of $N$ will be a sublattice of the extension of $N'$.

Finally, the lattice structure of the verb denotations is projected onto the domain of VP denotations: If $\hat{[\mathcal{V}} \ N \mathcal{]} = A$ and $\hat{[\mathcal{V}} \ N' \mathcal{]} = A'$, and if $\hat{[N]} \subset \hat{[N']}$, then $A \subset A'$. This needs to be made recursive, to account for the addition of more arguments. I am going to assume a version of the proposals of
Carlson (1984) to add arguments. Here, each argument is associated with a thematic role θ, among the set of thematic roles, assigned to arguments by the syntax, which operates on arguments to produce a denotation θ(⌜N⌝) ⊂ Σ. This denotation is intersected with the existing event-type, to produce an event-type which is a subset of the that event-type. As the arguments are assigned different θ-roles, the denotation for each argument will be different, thus distinguishing them semantically from one another. What this means is that for any θ, and θ, if the two are distinct, θ(⌜N⌝) ≠ θ(⌜N⌝) (intuitively, the set of events a participates in as, say, an Agent, are distinct from the set of events it participates in as a Patient). Variables for types (which include the suprema of the nominal expression that enter into the construction) are handled in the same way as above (see Guerts 1996 for one motivation for property-level variables). There is some question of the need for property instantiation variables; it depends on whether the scoping of weak indefinites with respect to one another can be handled through the mechanism of distributivity, which remains an open question at the moment.

Weak indefinite quantifiers, such as “five”, “several”, “many”, “some” and so forth, are treated as essentially intersective modifiers of nominal meanings. That is, if [five] denotes the set of all groups with five atoms, and [cats] denotes all individual and groups of cats, then [five] ∩ [cats] will be all those groups that are cats that have five members (Kamp and Reyle 1993). This is reflective of the fact, noted by Johnsen (1987) that the weak indefinites are their own converses, in contrast to the strong quantifiers.

5. IP meanings

In going from VP to IP, we make a transition to the usual sort of propositional semantics. Before this point, there is no truth, worlds, times, only denotation defined on sets that are types or extensions of types. These types (via their extensions), however, are projected homomorphically into the set of propositions, defining a subset of them — the “thetlic” propositions (Kuroda 1972; Ladusaw 1994).

We now include, at the IP level, a set of possible worlds W and a domain of Individuals Α, into which U is mapped, with the possibility that two or more members of U might be mapped to the same members of Α. We need a mapping from Σ to W. I’ll go the unimaginative route and assume every member of Σ is mapped to some member of W. I’m assuming ephemeral,
Weak indefinites

Token events “get to” make but one “appearance” in the structure of possible worlds, and then they’re done for. Two different events can be mapped to the same world, and possibly to the same event in that world. (Here, I actually have in mind an event-structure of the type discussed in detail in Kamp 1979. I here assume events are parts of possible worlds, but this is only a convenience).

Thus, an event-type $E$ designates a proposition in the following way: $p \subset W$ is the proposition defined by $p = \forall w \exists e [e \in E] ~ \text{and} ~ e \leq w$. Note in particular that if $E$ is expressed by $[V(N)]$, and if $E'$ is expressed by $[V(N')]$ (where the $V$ is the same in both), the set of worlds defined for $[V(N)]$ will be a subset of the worlds defined for $[V(N')]$, preserving the structure of the domain of eventualities.

In more conventional, functional terms, this is the proposition that would be associated with the following expression (assuming $V$ to be a two-place predicate):

$$\exists e \exists x [V(x)(e) \text{ and } N(x)]$$

That is, the existential closure occurring at the transition from VP to IP meanings is a reflection of the projection of the event-semantics meanings of VP’s into the realm of propositional meanings, and need not be stipulated.

6. Weak indefinites again

Now, why weak indefinites within the VP? It is because they conform to the structure of the VP meanings, whereas other expressions do not. They conform to the structure in the following way: If you have a situation that is accurately describable by saying, for instance, *John fed five dogs*, it is automatically redescribable as *John fed five animals* or *John fed at least four dogs*. On the other hand, if you say *John fed most cats* or *John photographed every dog*, it does not follow that he fed or photographed most animals, or every animal. This does not have to do with the upward, downward, or neutral entailings of the quantifier. The issue is whether a situation of type A is automatically redescribable as being of type B. Intuitively, this means that we examine situations “in isolation”, i.e. as stipulated with no further information available.

There is a second, and at least as important reason why weak indefinites only appear within the VP, on Diesing’s account. Namely, evaluation of such sentences as the following, without weak indefinites, require context, i.e. more information than is given by the event-type itself:
(9) a. John fed every dog.
   b. John fed those dogs.
   c. John fed some of the dogs.
   d. John fed MANY dogs (and not others)

In order to evaluate the truth of such sentences, it is necessary to know, for instance, if every dog is all the dogs there are. If you have a group of five dogs that have been fed, has every dog been fed? You cannot tell, without knowing whether there are other dogs (in the context) that have not been fed. The evaluation of those dogs requires context to know if those dogs are the ones being referred to at the moment by the speaker; partitives like some of the dogs requires that you have identified, in the context, a set of dogs, some of which were fed and others (quite possibly) not. For “proportional” readings of the weak indefinites (9d), again, the implication is that some have not been fed, otherwise the utterance is infelicitous. Names, too, require context, to know which individual of that name is being referred to, as do definite descriptions and indexical pronouns. The case of specific indefinite readings, in an intuitive sense, requires context, as outlined in Enç (1991).

The present question is whether the notion of “context” that is introduced at the IP level is simply a stipulation, or whether it flows from the nature of the interpretations themselves. If we view context in the way that is very common at the moment in semantics, flowing from the work of Stalnaker (1978) (see also Chierchia and McConnell-Ginet 2000 for a textbook presentation), it is what is taken to be the case for present conversational purposes. This requires reference to a notion of truth and presupposition, both of which are propositional in nature, and cannot be defined at the VP and V levels with the machinery presented here. As a matter of practice, the operators that require a restrictor clause, as in the case of strong quantifiers, commonly have the restrictor clause “filled in” from context by propositional information. Thus, any expression that requires reference to context to be assigned a value must appear at the IP level, and will be undefined at the VP level. In addition, we observe that sentence-type operators that make reference to context, such as tense or modals, appear within the IP at the relevant level of interpretation.

7. Conclusion

I have outlined the basics of a system of semantic interpretation that attempts a marriage of event-semantics and propositional semantics which will have
some explanatory force in characterizing certain constructions of natural language and their interpretations. I have made almost unquestioned use of Diesing’s (1992) syntactic framework, which makes a clear separation between VP and IP levels in the syntax, setting aside the various critiques of the framework (e.g. Bowers 1992; Bobaljik 1996). At a more abstract level, I have argued that any syntactic theory must allow for the parceling out of two fundamentally different types of information in the semantic interpretation, with the event-semantics portion providing a kind of “core” input into the more usual propositional semantics, which is about the interpretation of entire sentences in context. This chapter has explored but one consequence of this proposed arrangement, an account in Diesing’s terms of why weak indefinite expressions are the only argument types that do not have to be “moved out” of the VP. This is because they, as a class, preserve the lattice structure of eventualities, whereas others, as a class, do not; and, further, they can be defined without reference to context, a propositional notion, whereas the remainder require reference to context, and thus can only receive an interpretation at the IP level, on the Diesing account. I have tried to motivate via the architecture of the semantics proposed what amounts to a stipulation on the Diesing story, that is, that there is existential closure at the VP level (only), by noting that the existential quantifier is a consequence of the projection of eventualities into the domain of propositions. In a vaguer way, I have also attempted to shed some light on the question of why, on a common view of syntax, there appears to be a “higher” and a “lower” argument position for arguments; this makes some sense if we think about the need for argument information in both the event and propositional semantics. In this same way, I may have also been wrestling with the problem of how to implement the insights of Kuroda (1972) and Ladusaw (1996) in attempting to characterize the phenomenon of “thetic” and “categorical” judgments.

In closing, I want to return to some observations that have been made in the recent literature which the framework presented here has the potential for shedding some light on. In McNally (1998:375), on existential sentences of English, it is proposed that “[t]he postverbal NP will thus have to be interpreted as a property or quantification over properties”. This is her account of why weak indefinites only may appear in these constructions. If we take “there” sentences to consist of a property meaning in the postverbal position, which is a VP-internal position, and only acceptable under those circumstances, then we can reproduce McNally’s observations within this framework. Note also, as has been known for some time, strong quantifiers are also
acceptable in this construction, but only if they have a “kind” reading, as in (10). We take this as evidence that property variables may also occur in this position.

(10) There is every *(kind of) animal in that zoo.

Similarly, van Geenhoven (1996), notes that it is possible to associate a non-incorporated quantifier with an incorporated nominal, including weak quantifiers. If the quantifier is strong, however, the variable ranged over must refer to kinds, and not individuals:

(11) Juuna tamarmik atuager-si-v-u-q
    J-ABS all book-get-IND-[u]-3SG
    #J. got all the (individual) books.
    ‘J. got all kinds of books.’

Again, if incorporated constructions involve only a place for properties, and not individuals, then within the framework presented we can begin to understand why this might be so.

Notes

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References


Chapter 8

Predicate–argument mismatches and the Adjectival Theory of indefinites

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1. Two theories of arguments and predicates

In her influential paper, Partee (1987) introduced the notions of argument type and predicate type for the interpretation of noun phrases, and she proposed that the types available for the interpretation of noun phrases in argument position (like three girls in (1a)) are type d of (singular (= atomic) and plural) individuals and ⟨⟨d,t⟩⟩,t of generalized quantifiers, while the type available for the interpretation of noun phrases in predicative position (like three girls in (1b)) is type ⟨d,t⟩ of sets of individuals.

(1) a. Three girls walked
   b. The guests were three girls.

In this chapter, I will adopt this proposal and discuss the relative merits of two alternative ways of giving content to it.

The first theory I call Montague–Partee: it is (the core of) the proposal in Partee (1987), which consists of Partee’s theory of predication, combined with the generalized quantifier theory of determiners, both of which ultimately derive from Montague (1970, 1973) (the second through Barwise and Cooper 1981).

The other theory I call the Adjectival Theory of indefinite determiners. My causal chain for this name goes back to what I think is an initial baptism by Barbara Partee in her marginalia to a first draft of a paper by Godehard Link in the mid 1980s. I mention this, because the unpublished debate between Partee and Link forms the most direct inspiration for this chapter. In published work, versions or traces of the Adjectival Theory can be found in Bartsch (1973), Verkuyl (1981), Link (1987), and Bowers (1987), and most explicitly in Bittner (1994), and in Krifka ms; also related are van Geenhoven (1996), McNally (1998), Dobrovie-Sorin and Laca (1996). This list is far from complete, and the authors on it shouldn’t necessarily be expected to recognize
their proposals in the version of the Adjectival Theory that I will develop here.
Both theories consist of a theory of determiners (A), and a type shifting theory (B).

**Montague–Partee (MP):**

*MP-principle A: the generalized-quantifier theory of determiners*

All noun phrase interpretations are born at argument types.

An interpretation is born at a type if it is generated at that type without the help of the type shifting theory. The type of quantificational and indefinite determiners is the type of relations between sets of individuals: \(\langle\langle \langle d,t \rangle,t \rangle, t \rangle\).

\[
every \to \lambda Q \lambda P. \forall x \in Q: \text{ATOM}(x) \land P(x)
\]

The relation that holds between two sets \(Q\) and \(P\) if every element of \(Q\) is an atomic individual that has \(P\).

\[
three \to \lambda Q \lambda P. \exists x \in Q: |x| = 3 \land P(x)
\]

The relation that holds between two sets \(Q\) and \(P\) if some element of \(Q\) is a sum of three individuals having \(P\). This means that quantificational and indefinite noun phrases are born at the argument type \(\langle\langle d,t \rangle,t \rangle\).

A large part of Partee’s paper is concerned with the interpretation of the definite article. Since in the present chapter that will only be of marginal interest, I will assume only the lowest interpretation that Partee considers: the definite determiner is the sum operation of type \(\langle\langle d,t \rangle,d \rangle\):

\[
the \to \lambda Q. \sigma(Q)
\]

The function that maps \(Q\) onto the sum of its elements if that is in \(Q\), and is undefined if not. This means that definite noun phrases are born at the argument type of individuals, \(d\).

*MP-principle B: the Partee triangle*

Predicate interpretations of noun phrases are derived from argument interpretations with type lowering operation \(BE\).

\[
\begin{array}{ccc}
\text{ARGUMENTS} & \langle\langle d,t \rangle,t \rangle & \text{PREDICATES} \\
\langle\langle d,t \rangle \rangle & \text{LIFT} & \langle\langle d,t \rangle \rangle \\
\langle d,t \rangle & \text{IDENT} & \langle \rangle \\
d & & \langle d,t \rangle \\
\end{array}
\]

\[
\begin{array}{l}
\text{LIFT}[\alpha] = \lambda P. P(\alpha) \\
\text{IDENT}[\alpha] = \{\alpha\} \\
\text{BE}[\alpha] = \{x \in D: \alpha(\{x\})\}
\end{array}
\]
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(The logical language used here is the Language of Plurality from Landman 2000, without distinguishing properly between function types and set types: e.g. Partee’s λx.x=α is written as {α}.) The type shifting operation BE takes a generalized quantifier and maps it onto the set of individuals for which the property of being that individual is in that generalized quantifier.

**The Adjectival Theory (AT):**

**AT-principle A: adjectival semantics of indefinites**

Indefinite noun phrases are born at the predicate type.

**Quantificational** and **definite** determiners are interpreted as in MP as relations between sets. But **indefinite** determiners are interpreted at type \( \langle d,t \rangle \), the type of sets of individuals. This is the same type as that of adjectives, and semantically indefinite determiners combine with the noun through **intersection**:

- **three** → \( \{x \in D: \#x = 3\} \) of type \( \langle d,t \rangle \)
- **girls** → \( ^*\text{GIRL} \) of type \( \langle d,t \rangle \)
- **three girls** → \( \{x \in D: \#x = 3\} \cap ^*\text{GIRL} \)

The set of all sums of girls each consisting of three individuals. This means that quantificational and definite noun phrases are born at argument types, but that indefinite noun phrases are born at the predicate type \( \langle d,t \rangle \).

**AT-principle B: the existential closure triangle**

Argument interpretations of indefinite noun phrases are derived from predicative interpretations through type lifting with Existential Closure.

The type shifting operation EC takes a set \( \alpha \) of individuals and maps it onto a generalized quantifier: the set of all sets that have a non-empty intersection with \( \alpha \).
The comparison between MP and AT will take the form of two matches and a play-off. The first match is a match played at high speed in the next section.

2. The first match

2.1 The infelicity of quantificational predicates

As is well known, quantificational noun phrases in predicate position are infelicitous:

\[(2) \# \text{Nirit is every semantics professor at the party.}\]

This is a point in favor of the Adjectival Theory, because it predicts this: since in AT there is only type lifting and no type lowering and quantificational noun phrases start out at type \(\langle\langle d,t \rangle,t \rangle\), they cannot be shifted to the predicate type.

\[
\text{SCOREBOARD} \quad \text{MP AT}
\]
\[
\text{MATCH 1} \quad 0 \quad 1
\]

However, Partee (1987) gives a semantic argument explaining why quantificational noun phrases are infelicitous as predicates (in terms of their meanings, rather than their type). I will discuss this argument below. For the moment, I will assume that the possibility of such a semantic explanation equals the score:

\[
\text{SCOREBOARD} \quad \text{MP AT}
\]
\[
\text{MATCH 1} \quad 1 \quad 1
\]

2.2 The first mismatch: at least and exactly interpretations

As is well known (see Horn 1972), in argument position numerical noun phrases like three girls have an at least interpretation, and an exactly implicature (which is shown by the felicity of (3a), where the exactly effect is canceled). As mentioned in Partee (1987), it has been observed that in predicate position these numerical noun phrases have an exactly interpretation (as shown by the infelicity of (3b), where the exactly effect cannot be canceled). (This observation seems to be due to Barbara Partee or Nirit Kadmon, or both.)
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In Montague–Partee this can be readily accounted for. You generate at the argument type $\langle\langle d, t \rangle, t \rangle$ distinct interpretations for *three girls* and *exactly three girls*, and make sure to choose them in such a way that type lowering operation $BE$ maps them onto the very same set of individuals.

These facts are a problem, however, for the Adjectival Theory. In AT, indefinite noun phrases start out at the predicate type. But what the facts show is that at that type *three girls* and *exactly three girls* denote the same set $\{x \in \text{*GIRL: } |x| = 3\}$. Since the type lifting operation $EC$ is a function, it cannot map this onto the two argument interpretations we want:

$$\text{three girls} \rightarrow \lambda P. \exists x \in \text{*GIRL: } |x| = 3 \land P(x)$$
$$\text{exactly three girls} \rightarrow \lambda P. \exists x \in \text{*GIRL: } |x| = 3 \land P(x) \land \forall y \in \text{*GIRL} \land P: y \not\subseteq x$$

The conclusion is that AT must replace type shifting operation $EC$ by an operation that is sensitive to more than just the predicate meaning. This is, of course, a disadvantage.

**SCOREBOARD**

MP AT

MATCH 1 2 1

### 2.3 Downward entailing noun phrases: *at most three girls*

The Adjectival Theory predicts the wrong entailments for downward entailing noun phrases like *at most three girls*:

$$EC[ \{x \in \text{*GIRL: } |x| \leq 3\} ] = \lambda P. \exists x \in \text{*GIRL: } |x| \leq 3 \land P(x).$$

With this interpretation, (4a) means: there is some sum of girls, consisting of at most three individuals, each of which walk. It can readily be seen that, on this interpretation, (4a) incorrectly entails (4b), and incorrectly does not entail (4c):

(4) a. At most three girls walked.
   b. Some girl walked.
   c. Not more than three girls walked.

**SCOREBOARD**

MP AT

MATCH 1 3 1
2.4 Negative noun phrases: no girl

The Adjectival Theory predicts the wrong meaning for negative noun phrases like no girl. As Partee (1987) points out, if, following MP, you take the standard (singular) interpretation of no girl at type $\langle\langle d,t \rangle,t \rangle$, and lower it to a predicate with BE, you get what seems to be the correct predicate interpretation:

$$\text{BE}[\lambda P. \neg \exists x \in \text{GIRL}: P(x)] = \text{ATOM-GIRL}$$

The set of singular individuals which are not girls. On the other hand, if, in AT, you start out with that set as the interpretation for no girl at type $\langle d,t \rangle$, and you lift it with EC to $\langle\langle d,t \rangle,t \rangle$, you obviously get the wrong interpretation:

$$\text{EC}[ \text{ATOM-GIRL }] = \lambda P. \exists x \in \text{ATOM-GIRL}: P(x)$$

The set of properties that some non-girl has.

SCOREBOARD  
MP AT  
MATCH 1 4 1  
WINNER: MONTAGUE–PARTEE

3. Whither the adjectival theory

If the prospective for the Adjectival Theory is this bad, one can well wonder why anyone would be attracted to this theory in the first place, and why with rather great regularity it keeps being proposed as an alternative to Montague–Partee. The answer to this lies in the syntax and semantics of numeral phrases in nominals (like three girls in the noun phrase the three girls) and their relation to predicates. In this section I will point out why the Adjectival Theory is attractive, without, unfortunately having the space to belabor any of the points I will make (though some of the points made will be illustrated later in this chapter).

Attraction 1: The most persuasive thing about the Adjectival Theory is that it fits naturally with the theory of plural nouns and determiners developed by Link (1983) and others, and that the combination of the two is very successful in effortlessly, and without stipulation, predicting the correct semantics for nominal numerical phrases. To say it the other way round: there are many arguments to show that inside a noun phrase like the numerical phrase girls, numerical phrases like three, exactly three, at least three, at most
three, etc. behave semantically like intersective adjectives, intersecting with the interpretation of the plural head noun girls.

**Attraction 2**: There are many arguments that the semantics of numerical predicates (i.e. *three girls* in (1b)), and numerical nominals (i.e. *three girls* in the *three girls*) is exactly the same. (For instance, *the three girls* means the *exactly three girls*, and not the *at least three girls.*) This is, of course, directly predicted by the Adjectival Theory, which assigns the numerical nominal and the numerical predicate the same semantics at type (d,t).

**Attraction 3**: The only difference between numerical nominals and numerical predicates seems to be syntactic: in the numerical nominal, numeral phrases can mingle with adjectives (as shown in (5)), while numerical predicates pattern with numerical arguments in that for them the numeral phrase must be initial (as shown in (4)).

(4) a. The animals in the shipment were *fifty ferocious lions*.
   b. *The animals in the shipment were *ferocious fifty lions*.

(5) a. We shipped the *fifty ferocious lions* to Blijdorp, and the *thirty meek lions* to Artis.
   b. We shipped the *ferocious fifty lions* to Blijdorp, and the *meek thirty lions* to Artis.

Of course, there are subtle and hard to pinpoint interpretation differences between the (5a) and (5b) cases. However, it seems that most of these can be attributed to contextual interpretation factors that we know are operative in the adjectival domain anyway, like focus, contrast, comparison set, etc. That is, we find such interpretation differences also when we consider strings of normal adjectives. The point about (4) and (5) is the contrast: (4b) is crashingly bad, while (5b) is not.

The facts in (5b) form an argument in favor of the AT analysis for numerical nominals ([the [three girls]]) and against the analysis of the numerical as part of a complex determiner ([[the three] girls]) (e.g. Barwise and Cooper 1981, Keenan 1987): the complex determiner analysis does not predict the felicity of the order in (5b). (There is one exceptional case here: there are solid syntactic and semantic arguments for assuming that *every three* in *every three lions* patterns both syntactically and semantically as a complex determiner.)

**Attraction 4**: The difference between (4) and (5) can be accounted for syntactically very easily in terms of the NP/DP distinction. We only need to make three simple assumptions, of which the first is in essence AT:
**Assumption 1**: *three girls in the three girls* is an NP, with *three* a numerical adjective. This predicts that inside the NP mingling with other adjectives is possible.

**Assumption 2**: The predicate *three girls* has a DP-layer with an empty determiner D. This tells you that predicate and argument noun phrases are DPs and not NPs.

**Assumption 3**: In the DP with empty D, the numerical adjective must move into the DP-layer.

For my purposes here, I can leave the actual syntax to be assumed here very much underspecified. I am not taking a stand on where the numerical lands in the DP-layer, or on why the movement takes place. This means that the assumption is still compatible with a wide range of syntactic implementations. With these assumptions, the ordering facts about numerical predicates and argument noun phrases follow straightforwardly: if the numerical is in the DP-layer in those noun phrases, it cannot mingle with adjectives which are in the NP-layer. (This account assumes that *every* and *the* are D-elements. It assumes an intersective semantics for the indefinite article *a* (e.g. *a* → ATOM). It does not take a stand on the syntax of *a*, i.e. on the question of whether or not it is a determiner.)

**Conclusion**: The Adjectival Theory with a little bit of syntax predicts the right syntax and semantics for numerical nominals and numerical predicates, without the stipulations that we commonly find in generalized quantifier theory (and hence its descendant Montague–Partee).

It seems that these considerations are strong enough to modify the score a bit: one more point for the Adjectival Theory:

```
SCOREBOARD  MP AT
INTERMISSION  4  2
```

In the next two sections the second match is played. This match consists of playing the first match over, but more slowly now. The game is to re-evaluate the points assigned in the first match. For that reason, while in the first match we handed out points, in the second match we are going to take points away.
4. The second match: predicate–argument mismatches

4.1 Mismatches for quantificational predicates

We come back to the infelicity of sentence (2):

(2) # Nirit is every semantics professor at the party.

Partee (1987) points out the following fact about her type shifting operation BE: if you have a noun phrase of the form every NOUN, then applying BE to its generalized quantifier interpretation will give you a trivial interpretation (the empty set), unless the interpretation of the noun is a singleton set.

Partee argues that, while the determiner every does not contribute as part of its truth conditional semantics a restriction to non-singletons on its complement noun, there is reason to consider the possibility that the determiner every contributes a presupposition that its complement noun is restricted to non-singleton sets.

If so, we can explain why quantificational predicates like the one in (2) are infelicitous: every presupposes that semantics professor at the party is a non-singleton. Lowering this interpretation with BE to a predicate either violates the presupposition (leading to infelicity), or yields a systematically trivial predicate (which is also assumed to be infelicitous).

The problem with this account lies in the assumption that the restriction to non-singletons is a presupposition. Standardly, the restriction of the quantifier every on its complement noun is regarded as an implicature rather than a presupposition (e.g. a standard introduction text like Chierchia and McConnell-Ginet 1990). Winter (1998) discusses Partee’s account directly, and provides strong evidence that the account doesn’t work. Example (6) is modeled on Winter’s example. A standard argument about canceling of implicatures shows that, when the quantificational noun phrase is in argument position, the non-singleton condition cannot be more than an implicature: (6a) is felicitous, showing that the effect gets canceled. On the other hand - and this is the strength of Winter’s argument - Winter shows that in the very same canceling context the quantificational predicate stays infelicitous: (6b) is infelicitous:

(6) a. If Fred and Tanya weren’t at the party, and Nirit was, then every semantics professor at the party danced.
b. #If Fred and Tanya weren’t at the party, and Nirit was, then Nirit was every semantics professor at the party.

(6a) shows that the effect can be canceled, when the noun phrase is in argument position, arguing strongly that it is an implicature. But then, if in (6b) we lower the interpretation of the quantificational noun phrase to a predicate, the result should not be infelicity, but merely canceling of the implicature: that is, (6b) should be felicitous and should not have the implicature that there is more than one semantics professor at the party. But that prediction is wrong: (6b) is infelicitous.

What we see here is that we find a mismatch between the argument and the predicate interpretation of the quantificational noun phrase every semantics professor at the party: the argument interpretation is felicitous, but the predicate interpretation is not. This mismatch is not explained by Montague–Partee. In the Adjectival Theory there is no lowering operation from \((d,t), t\) to \((d,t)\), and hence (2) and (6b) are infelicitous. Thus, we take back the point that we assigned for this in match one to Montague–Partee:

```
SCOREBOARD  MP AT
MATCH 1  3  2
```

### 4.2 Mismatches for downward entailing numerical noun phrases

For noun phrases like at most three girls we find a mismatch not of felicity, but of interpretation. The crucial mismatch that I want to draw attention to here is that while these noun phrases are (of course) downward entailing in argument position, they are not downward entailing in predicate position. This can be seen by looking at the distribution of polarity sensitivity items. (7a), where the numerical noun phrase is in argument position, shows the standard fact about at most three: the polarity item ever is only felicitous in a downward entailing context; since (7a) is felicitous, this shows that the numerical noun phrase in argument position is downward entailing.

But in (7b) the numerical noun phrase is in predicate position, and (7b) is infelicitous. This shows that the numerical noun phrase in predicate position is not downward entailing:

(7) a. At most three scientists who ever got the Nobel Price were at the party.
b. #The guests were at most three scientists who ever got the Nobel Price.

The observation can be shown directly as well. *At most three girls* in argument position, of course, passes the standard tests for downward entailment. But in predicate position it behaves like an intersective predicate, and that means that it is not downward entailing. Look at the examples in (8):

(8) a. The congregants are at most seven Jewish men.
   b. The congregants are men.

Suppose the congregants are 7 men and 15 women. An orthodox rabbi checks whether there is a minyan (for him, 10 Jewish men, for others, 10 Jewish persons), and sneeringly he says (8a). The reaction of my women informants to this set up is outrage, but importantly, not because the rabbi refuses to recognize non-orthodox minyans, but because he fails to count the presence of the women among the congregants in the first place: in the situation sketched (8a) is false, because the congregants actually include 15 women, and that shows that (8a) entails (8b). But this is an upward entailment, showing that *at most seven Jewish men* is not downward entailing in (8b).

The same facts can be replicated for numerical nominals as well: *at most three girls* in *the at most three girls* is not downward entailing, but is an intersective predicate (it denotes the set of sums of girls that consist of at most three atoms). These facts illustrate that indeed the adjectival semantics is correct for numerical predicates and numerical nominals. We see then that we have the following two interpretations:

*At most three girls:*

Argument interpretation: $\lambda P. \neg \exists x \in GIRL: |x| > 3 \land P(x)$

The set of properties that no sum of more than three girls has (downward entailing).

Predicate interpretation: $\{x \in GIRL: |x| \leq 3\}$

The set of sums of girls consisting of at most three singular individuals (intersective).

The problem for Montague–Partee is the following logical fact:

There is no type shifting operation which derives the correct predicate interpretation from the argument interpretation in all relevant cases.

This means that Partee’s type shifting operation BE doesn’t do it. It also means
that the alternative operation MIN proposed in Winter (1998) does not do it either.

The problem is a problem of mismatch in polarity: because the argument interpretation is downward entailing and the predicate interpretation is not, there will be contexts where the argument interpretation is trivial, but the predicate interpretation is not trivial. But it is a fact of logic that you cannot derive with a type shifting operation a non-trivial predicate interpretation from a trivial argument interpretation. Look at (9):

(9)  a. At most 50 girls were at the party.
  b. The guests were at most 50 girls.
  c. The guests were girls.

Suppose that there are 20 girls. In that case, the downward entailing argument interpretation of at most 50 girls is trivial (the set of all sets). This predicts correctly that (9a) is trivially true. However, the predicate interpretation of at most 50 girls is *GIRL. This predicts correctly that (9b) is not trivial: in such contexts (9b) is equivalent to (9c).

There is a illuminating reformulation of the problem. Suppose that there are 20 girls and 20 boys. In that case, the argument interpretations of at most 50 boys and at most 50 girls are the same (the set of all sets), but the predicate interpretations are not (the set of all sums of boys and the set of all sums of girls respectively). But, of course, no function can map the same input onto two outputs, and since the type lowering operation is assumed to be a function, no type shifting operation can.

There is a solution readily available to Montague–Partee. Instead of assuming a simple type shifting operation, we can assume an only slightly more complex operation of Predicate Formation which takes as input the argument interpretation at type \( \langle \langle d,t \rangle,t \rangle \) and the noun interpretation that the argument is based on:

Let \( \alpha = (\text{DET}(\text{NOUN})) \) of type \( \langle \langle d,t \rangle,t \rangle \)

\[
\text{PRED}[\alpha] = \text{NOUN} \cap \text{BE}(\alpha)
\]

If \( \alpha \) is at most fifty girls then its \( \langle \langle d,t \rangle,t \rangle \) interpretation is, in the context given, the set of all sets, and \( \text{BE}[\alpha] \) is D. Then \( \text{PRED}[\alpha] = *\text{GIRL} \cap \text{D} = *\text{GIRL} \).

This works, but now we have equaled this particular score with the Adjectival Theory: we gave Montague–Partee a point because the mismatch between at least and exactly interpretations forces the Adjectival Theory to make the type shifting operation sensitive to aspects of the interpretation not
accessible to a standard type shifting operation (like the noun interpretation).
We see now that we have to make exactly the same assumption, if we adopt
Montague–Partee. We take back the point:

\[
\text{SCOREBOARD\, MP AT}
\]
\[
\text{MATCH } 2\quad 2\quad 2
\]

4.3 Mismatches for negative noun phrases

There is a further problem for this reformulation of Montague–Partee. As
argued above, for the generalized quantifier interpretation of no girl, Partee’s
operation BE gives an acceptable result. However, the new operation PRED
does not give an acceptable result for no girl: the intersection of the set of non-
girls with the interpretation of girl is, of course, empty. This means that, like
the Adjectival Theory, Montague–Partee is forced into a theory which gives a
non-unified account to different indefinite noun phrases (i.e. some shift with
PRED and some shift with BE). Hence, Montague–Partee is not a more
unified theory than the Adjectival Theory.

When it comes to negative noun phrases, I think that every theory will
have to do something special. And this doesn’t bother me much, because I
think there is a lot of evidence that they actually are special. Let me in the
briefest of ways sketch how the Adjectival Theory can deal with negative noun
phrases.

Negative noun phrases in the Adjectival Theory:

Assumption 1: The interpretation of no is negation: \(\neg\). The interpretation of
the predicate no girl at type \(\langle d,t \rangle\) is formed through composition: \(\neg o\)
GIRL, the set of non-girls.

Assumption 2: The grammar treats the nominal negation as being semanti-
cally separable. This point has been made many times in the literature
(e.g. Jacobs 1980). Landman (ms. 1998a) discusses lots of evidence from
Dutch, but also from English, which shows that the nominal negation can
take higher (often auxiliary) scope, while the remaining noun phrase
material remains interpreted in situ.

Assumption 3: This semantic separation takes place in the process that lifts the
predicate interpretation to the argument interpretation: the type lifting
operation does not apply to the composition of \(\neg\) and the indefinite noun
phrase; instead, the negation is separated: the type lifting operation applies
to the interpretation of the indefinite noun phrase, and the negation is composed with the result; the argument interpretation is: \( \neg \alpha \text{EC}[\text{GIRL}] \).

This, of course, gives the correct argument interpretation for \textit{no girl}.

The conclusion is: everybody needs to do something special for negative predicates, the Montague–Partee theory is not more unified here than the Adjectival Theory. Moreover, what the Adjectival Theory can do fits with a battery of facts about semantic separability of nominal negation. This means that one more Montague–Partee point goes:

\[
\text{SCOREBOARD} \quad \text{MP AT}
\]

\[
\text{MATCH} \quad 2 \quad 1 \quad 2
\]

5. **The type shifting theory of existential closure, maximalization, and the null-object.**

Let us now come to the mismatch in \textit{exactly} effects and to the problems in getting the interpretation of \textit{at most three girls} right.

The very same problems have been discussed in Landman (1998, 2000) in the context of the operation of Existential Closure over the event argument in neo-Davidsonian theories of events and plurality. What I claim is that these problems are \textit{general} problems of existential closure operations, and the techniques developed in Landman (2000) can be adapted to the present case. In fact, the analysis here will be simpler than that in Landman (2000) for two reasons.

In the first place, I will be using a 0-object here, which allows me to simplify the general maximalization operation from Landman (2000) (but if you don’t like the 0-object, you can take the more complex operation of Landman 2000 and get the correct semantics too).

Secondly, in this chapter I am only concerned with the problem of getting the meanings right in shifting from \( \langle d, t \rangle \) to \( \langle \langle d, t \rangle, t \rangle \). This means that I am ignoring the complicated interactions between multiple noun phrase arguments of a verb that the theory in Landman (2000) addresses. Since it seemed didactic overkill to expose the reader to the ins and outs of the complex operation when only using it in a simple case, I have simplified it to fit the present case. The resulting simplification is close to a proposal in Kadmon (1987) (which derives partially from suggestions by Barbara Partee and Hans Kamp). This similarity is not surprising, because Kadmon (1987) was one of
the main inspirations for my own work on maximalization. But the general theory is less similar to Kadmon (1987), and, as discussed in Landman (2000), more similar to work on maximalization in Krifka (1989, ms. 1989) and Bonomi and Casalegno (1993).

**Assumptions about plurality**

The plurality structures I will assume are complete atomic Boolean algebras including a 0-object. Singular nouns denote sets of atomic individuals. Pluralization is closure under sum:

\[ *\text{GIRL} = \{x \in D: \exists Y \subseteq \text{GIRL}: x=tY\} \]

This means that the 0-object is an element of the denotation of the plural noun. It will be eliminated from the denotation when later we intersect the noun with the denotation of three, but not when we intersect with the denotation of at most three.

For simplicity, I will restrict myself to distributive cases: thus, in my expressions, \( \lambda \) will range over plural verbal interpretations (which will include the 0-object). Of course, I owe the reader an account of how the 0-object interacts with collectivity, and in general, how the 0-object affects interpretation. I assume minimally that contextual restriction on predicates can exclude the 0-object from denotations. A more general approach, which allows pragmatic manipulation of the 0-object under a pragmatic principle of Avoid Triviality, has very interesting and surprising consequences for the analysis of presuppositions (in particular, problems of local accommodation). I have no space here to go into any of this.

**The grammar of numerical nominals and predicates**

I assume that the semantics of numerical noun phrases is based on a numerical relation, a relation between numbers, which is lexically realized by at least, at most, exactly, etc., and which is semantically present, but not lexically realized in three girls (for simplicity, I assume that three girls is generated as \( \emptyset \) three girls):

\[
\begin{align*}
\text{at least} & \rightarrow \geq; \quad \text{at most} \rightarrow \leq; \quad \text{exactly} \rightarrow =; \quad \emptyset \rightarrow =
\end{align*}
\]

Secondly, I assume that these phrases are marked in the grammar by a feature +R or -R, indicating whether or not the numerical relation is lexically realized. I assume further that this feature percolates up in the grammar.
+R: the numerical relation is lexically realized.
−R: the numerical relation is not lexically realized.

NUMERICAL MODIFIERS

[SYNTAX  SEMANTICS  FEATURE]
[∅     , =       , −R ]
[exactly , =       , +R ]
[at least , ≥       , +R ]
[at most , ≤       , +R ]

A numerical modifier (NM) expressing numerical relation r forms with a number expression (N) a numerical adjective phrase (AP[+NUM]), with interpretation: the set of sums whose cardinality stands in relation r to the denotation of the number expression.

The realization feature R inherits up:

\[ \text{NM} + \text{N} \rightarrow \text{AP}[+\text{NUM}] \]
\[ [\alpha, r, R] + [n, n] \rightarrow [\{x \in D : |x| \ r n\}, R] \]

A numerical adjective phrase combines with a noun phrase in the normal way. Semantically the denotations intersect. The realization feature R inherits up. At this point, we have formed the numerical nominal: an NP with set interpretation, which can be the complement of a determiner. We form the numerical predicate by forming a DP with an empty determiner D and our numerical NP, and moving the AP[+NUM] into the DP-layer. I assume that this does not change the interpretation. The realization feature R inherits up. This gives us the following predicative DPs:

\[ [\emptyset \text{ three girls}, \{x \in *\text{GIRL} : |x| = 3\}, −R] \]
\[ \text{exactly three girls}, \{x \in *\text{GIRL} : |x| = 3\}, +R] \]
\[ \text{at least three girls}, \{x \in *\text{GIRL} : |x| \geq 3\}, +R] \]
\[ \text{at most three girls}, \{x \in *\text{GIRL} : |x| \leq 3\}, +R] \]

Of these, only the last one contains the 0-object in its denotation.

I assume that argument DPs have the same syntax as predicate DPs. We form the argument interpretation from the predicate semantics and realization feature R. I replace the type shifting operation of existential closure by an operation of argument formation which is the result of integrating two operations: existential closure and maximalization. Both operations turn a set expression into a statement:
EXISTENTIAL CLOSURE: EC: \( \langle d, t \rangle \to t \)
\[
EC[X] = \exists x \in X \quad \text{Something is in } X
\]
MAXIMALIZATION: MAX: \( \langle d, t \rangle \to t \)
\[
MAX[X] = tX \in X \quad \text{The sum of } X \text{ is in } X
\]

The idea of **argument formation** is the following. It maps the interpretation of the predicate noun phrase and its realization feature onto a pair of generalized quantifiers. The first element of this pair is the argument interpretation (and that is the only one we will be concerned with), the other element is what I call the implicature-core, the information that can form the basis for an *exactly* implicature.

What argument formation does depends on the realization feature:

— if the realization feature is +R, the numerical relation that the numerical DP is based on is lexically realized, and then argument formation forms a generalized quantifier through existential closure and maximalization. (In this case the implicature core is trivial.)
— if the realization feature is -R, the numerical relation that the numerical DP is based on is not lexically realized, and then argument formation forms a generalized quantifier through existential closure only, storing the maximalization information as an implicature core.

In general, the idea is that both existential closure and maximalization are part of the semantics of indefinite argument DPs, unless the numerical relation is not lexically realized (in which case maximalization is only an implicature).

**Argument formation**
\[
\text{ARG}: \langle d, t \rangle \times \{+R,-R\} \to \langle \langle d, t \rangle, t \rangle \times \langle \langle d, t \rangle, t \rangle
\]
\[
\text{ARG}[\alpha, +R] = \langle \lambda P . \text{EC}[\alpha \cap P] \land \text{MAX}[\alpha \cap P], \lambda P.P = P \rangle
\]
\[
\text{ARG}[\alpha, -R] = \langle \lambda P . \text{EC}[\alpha \cap P], \lambda P.\text{MAX}[\alpha \cap P] \rangle
\]

Two more remarks about the simplification. In the first place, in the present theory MAX entails EC. This is due to the 0-object, and it is precisely where the operation in Landman (2000) (which does without the 0-object) differs. Secondly, the general operation of maximalization in Landman (2000) is more to the point, in that you can show that in the general case you must maximize relative to the numerical relation. Thus, the general operation makes sense of the dependency of the operation on the realization feature R, in a way that the present simpler implementation does not. Thus, indeed, I am
using the simplification because it suffices to make my point, but I am really assuming the general operation.

This gives the following argument DPs:

1. *at least three girls*:

   $\geq$ is upward entailing. Hence $EC(\alpha \cap P)$ entails $MAX(\alpha \cap P)$. We get, after simplification:

   \[
   \text{at least three girls} \rightarrow \lambda \alpha. \exists x \in \text{*GIRL}: |x| \geq 3 \land P(x)
   \]

   The set of properties that some sum of at least three girls has.

2. *three girls*:

   $=$ is not lexically realized: maximalization is an implicature.

   \[
   \text{three girls} \rightarrow \lambda \alpha. \exists x \in \text{*GIRL}: |x| = 3 \land P(x)
   \]

   The set of properties that some sum of three girls has. Since this is compatible with a sum of more girls having those properties, we get an *at least* reading (and an *exactly* implicature).

3. *exactly three girls*:

   $=$ is lexically realized: maximalization is part of the meaning.

   \[
   \text{exactly three girls} \rightarrow \lambda \alpha. \exists x \in \text{*GIRL}: |x| = 3 \land P(x) \land \bigcup \{x \in \text{*GIRL}: |x| = 3 \land P(x)\} \in \{x \in \text{*GIRL}: |x| = 3 \land P(x)\}
   \]

   This means:

   \[
   \text{exactly three girls} \rightarrow \lambda \alpha. \big| \bigcup \{\text{*GIRL} : \alpha \land P\} \big| = 3
   \]

   The set of all properties for which there are exactly three girls having that property.

4. *at most three girls*:

   $\leq$ is downward entailing. Since the 0-object 0 is in $\alpha \cap P$, the statement $EC(\alpha \cap P)$, which is $\exists x \in (\alpha \cap P)$, is a tautology (because obviously there is something, namely 0, in that set). Hence, we correctly predict that we do not get an existence entailment: we get only a maximalization meaning:

   \[
   \text{at most three girls} \rightarrow \lambda \alpha. \big| \bigcup \{\text{*GIRL} \cap P\} \big| \leq 3
   \]

   The set of all properties for which there are at most three girls having that property (and this includes properties that zero girls have).
Conclusion: Argument shift integrates existential closure and maximalization.

Maximization of the numerical relation is made part of the meaning if this relation is lexically realized. What we see is that while the Adjectival Theory runs into serious technical problems if it assumes Existential Closure as its type lifting operation, these problems are resolved if we replace existential closure by Argument Formation. This means that we take back the last point from Montague–Partee:

```
SCOREBOARD MP AT
MATCH 2 0 2
WINNER: ADJECTIVAL THEORY + MAXIMALIZATION
```

6. Slugging it out: conjunctive predicates

We are now concerned with conjunctive predicates, as in (10):

(10) The guests are three boys and four girls.

While we are assuming that three boys and four girls denote sets at type \( \langle d,t \rangle \), it is quite clear that the predicate conjunction in (10) cannot be analyzed as intersection at the type of sets, because that obviously gives you only the empty set. The proper operation for conjoining sets of pluralities is an operation that I will call Sum Pairing:

\[
\alpha \wedge \beta = \{ x \in D : \exists a \in \alpha : \exists b \in \beta : x = a \cup b \}
\]

Variants of this operation have been proposed by various authors (for a variety of linguistic phenomena); for instance, for a very explicit discussion of the problems of conjunction of pluralities of events, see Lasersohn (1995).

Sum Pairing gives the right interpretation for the predicate in (10).

(Note: if we replace in (10) four girls by at most four girls, we notice another argument for the 0-object: with a 0-object Sum Pairing will automatically give the correct interpretation; without a 0-object we have to complicate Sum Pairing considerably.)

As I have formulated it here, Sum Pairing involves Existential Closure on the conjuncts. If, as I have been arguing, maximization effects are a general property of Existential Closure, then we might expect maximization effects (which means, at least interpretations) here, not on the whole conjunctive
noun phrase — that is just a predicate — but inside the conjunction on the conjuncts.

First we check that we do not find an at least interpretation for the whole predicate. Look at the board and example (11):

7, 11, 16, 18, 20, 22

(11) The numbers on the board are two prime numbers and three even numbers. FALSE (#for that matter, four even numbers)

My informants judge that (11) is false, and they judge the continuation infelicitous. This shows that indeed we find normal exactly effects for the whole predicate: the predicate needs to cover the whole set of numbers on the board.

Now look at the next board and examples (12) and (13):

2, 3, 4, 6, 8

(12) a. The numbers on the board are exactly two prime numbers and exactly four even numbers. TRUE
   b. The numbers on the board are exactly two prime numbers and exactly three even numbers. FALSE

(13) a. The numbers on the board are two prime numbers and four even numbers. TRUE
   b. The numbers on the board are two prime numbers and three even numbers. TRUE (for that matter, four even numbers)

Unsurprisingly, my informants judge (12a) and (13a) true in this context (which shows that there is no semantic requirement that the conjuncts should be disjoint). The interesting thing is the contrast between (12b) and (13b). (12b), with exactly lexically realized, is judged false, because there are actually four even numbers. But my informants judge (13b) true, and find the continuation felicitous.

Thus, to be in the conjoined predicate denotation a sum must be a sum of two prime numbers and four even numbers and nothing else (that is the normal exactly effect on the whole predicate). But if one of the numbers is both prime and even, this sum cannot be described as a sum of exactly two prime numbers and exactly three even numbers, but it can be described as a sum of two prime numbers and three even numbers. This means that indeed
we find maximalization effects on the conjuncts in Sum Pairing: inside the conjunction, *two prime numbers* and *three even numbers* have an *at least* reading.

These facts can be incorporated into Sum Pairing straightforwardly in analogy to maximalization in Argument Formation:

**Sum pairing with maximalization:**

\[
\begin{align*}
(a, -R) \land (b, -R) &= \{x: \exists a \in a: \exists b \in b: x = a \cup b\} \\
(a, +R) \land (b, -R) &= \{x: \exists a \in a: \exists b \in b: x = a \cup b \land a = \cup (\{a \in: a \subseteq x\})\} \\
(a, -R) \land (b, +R) &= \{x: \exists a \in a: \exists b \in b: x = a \cup b \land b = \cup (\{b \in: b \subseteq x\})\} \\
(a, +R) \land (b, +R) &= \{x: \exists a \in a: \exists b \in b: x = a \cup b \land a = \cup (\{a \in: a \subseteq x\}) \land b = \cup (\{b \in: b \subseteq x\})\}
\end{align*}
\]

These facts are a problem for Montague–Partee. Montague–Partee distinguishes *exactly three girls* and *three girls* at the argument type, but not at the predicate type. Sum Pairing requires access to this very distinction at the predicate type. But if we access that distinction in a maximalization operation at the predicate type in Sum Pairing, we can just as well access it for maximalization in Argument Formation, and Montague–Partee becomes superfluous.

Have we clinched the case against Montague–Partee? Not yet. The rebuttal might go as follows: Montague–Partee can try to explain the maximalization effects in Sum Pairing by assuming that Sum Pairing involves not the predicate interpretation of the conjuncts, but the argument interpretations. In that case, you would expect maximalization effects. And this can be done easily: conjoin two argument DPs with conjunction at the type of generalized quantifiers, and lower the complex DP to a predicate. If that is the derivation, then indeed, you may well expect maximalization effects.

However, now look at (14)–(16):

(14) The mingling ferocious three tigers and meek four panthers were giving us hair-raising problems.

(15) a. The exactly two prime numbers and exactly four even numbers on the board illustrate a semantics problem.
   b. #The exactly two prime numbers and exactly three even numbers on the board illustrate a semantics problem.

(16) a. The two prime number and four even numbers on the board illustrate a semantics problem.
b. The two prime numbers and three even numbers on the board illustrate a semantics problem.

(14) shows that we are dealing with NP-conjunction: the numerical can mingle with the adjectives, and, importantly, the adjective mingling can naturally be interpreted as taking scope over the whole conjunctive NP, arguing against an account where a determiner the is deleted before the second conjunct.

(15) and (16) show that, as expected, we find exactly the same maximalization facts inside the noun phrase here as in the predicative case in (12)–(13): (15b) is infelicitous, but (16b) is not, showing that three even numbers in (16b) has an at least interpretation.

Now, in order to deal with this, Montague–Partee would have to argue that in (16b) the interpretation of the nominal, the NP two prime numbers and three even numbers, inside the DP in (16b), is itself derived from the interpretation of the argument DP two prime numbers and three even numbers. This is unreasonable.

As argued, the Adjectival Theory with Maximalization can deal with all these facts unproblematically.

SCOREBOARD  MP AT
FINAL SCORE  0  3
WINNER: ADJECTIVAL THEORY + MAXIMALIZATION

7. Who's the winner?

The match is over, the winner has been declared. But who's the winner? As indicated by the list earlier in this chapter, over the last thirty years, many people have proposed to analyze indefinite noun phrases as sets (or properties), and I think often with good arguments. But the bulk of these proposals do not even mention the problems with the Adjectival Theory as exposed in the first match (though these problems have been known for as long as the debate rages). The whole purpose of me playing the first match in this chapter, was to argue that the bulk of proposals in the adjectival tradition actually lose the first match, and are in no way competition to the Montague–Partee analysis. I am completely in agreement with these proposals about the usefulness of the set (or property)-analysis of indefinites. But it just won't do to argue extensively that indefinites are sets, if you then just stick in an existential quantifier and hope for salvation, without addressing these problems. That is no competition
for the generalized quantifier analyses, because the latter, though they may have problems, at least work. (By extension, the same is true in the analysis of there-insertion contexts, where the very same problems come up.)

McNally (1998) is one of the few papers that shows awareness of the problems and tries to do something about them. In fact, her analysis of the non upward-entailing cases is similar to the analysis in Landman (2000) in that it involves a scalar component. But when the chips are down, McNally’s analysis makes no real predictions, because she doesn’t specify what the content of the scales is and how this content is derived. McNally seems to assume that this is just given in context. This is maybe plausible if you only look at arguments of one-place predicates, but, as argued in Landman (2000), no such simple scalar theory will extend to the case of arguments of two-place relations (e.g. in cumulative readings). Whereas the theory discussed in the present chapter is a (didactic) reduction to the one-place case of a general theory of maximalization effects, McNally’s analysis is tailored to the one-place case, and it isn’t at all clear that it extends to the two-place case.

For the adjectival theory to be in the competition against Montague–Partee, it must minimally have an account of the downward entailing cases that works. Besides the present chapter, the only adjectival theory (that I am aware of) that works is Krifka (ms.). Krifka’s proposal is in many respects similar to mine (it is also a scalar theory); he addresses a different set of problems to argue for the same conclusions. A comparison with Krifka’s proposal must wait for another occasion.

As for the winner of the second match, rather than handing out prizes, it is actually more appropriate to look at price tags. What the discussion shows, I think, is that any theory that wants to do full justice to the facts is going to be remarkably complex. Such a theory needs to replace the simple operation of Existential Closure by an operation which integrates, one way or other, but in a sufficiently general way, maximalization effects for scopal and non-scopal readings of arguments of relations, and accommodates both semantically integrated maximalization effects and maximalization implicatures. There doesn’t seem to be a shortcut here: the winner will be complex.

8. Syntax–semantics mismatches

In the syntax of noun phrases, the central distinction that syntactic phenomena make reference to seems to be the NP/DP distinction. In the semantics of noun phrases, the central distinction seems to be the set/non-set distinction.
Since I have argued that predicate noun phrases are DPs with a set interpretation, we see that there is a mismatch between the syntax and the semantics:

The syntax clusters arguments and predicates together.
The semantics clusters predicates and nominals together.

What are the arguments that predicate noun phrases are DPs, and not NPs? I have two major arguments for that. The first argument concerns the mentioned difference in syntax between nominals and predicates, which is easily explained if nominals are NPs and predicates DPs.

The second argument concerns the existence of exceptional cases where quantificational noun phrases are reinterpreted at the set type, and hence can occur as predicates. (This fits with the central idea that type shifting is a mechanism that is available at no cost, but that the grammar may contain special mechanisms that provide something that the type shifting theory doesn’t give you.) I am thinking here of two kinds of examples.

1. I argue in Landman (ms. 1998a) that noun phrases in *there* insertion contexts are semantic adjuncts with a set interpretation (involving a shift which is accessed from the predicate interpretation, and which can involve only noun phrases born at the predicate type.) I show how this accounts for the standard definiteness effects. But, as is well known, there are exceptional cases, where quantificational noun phrases can occur in *there* insertion contexts:

   (17) There is every reason to distrust him.

I argue that it is plausible to assume that what is involved here is a special semantic reinterpretation strategy which gives the quantificational noun phrase a set interpretation. But there is no evidence whatsoever for syntactic restructuring of a DP as an NP in cases like (17), and that is what a matching between the syntactic and the semantic distinctions would require. (I owe this argument to John Bowers, who convinced me of it.)

2. I argued in Landman (1985, 2000) that quantificational noun phrase like *every girl*, but not *each girl*, can shift from a quantificational interpretation (at type $\langle(d,t),t\rangle$) to a collective definite (at type d, and hence shiftable into $\langle d,t\rangle$). *Combine* in (18) is collective on its second argument: (18a) is felicitous, while (18b) is not:

   (18) a. In this class I try to combine *every theory of plurality*.
   b. *In this class I try to combine each theory of plurality.*
I do not assume that collective shift of every NP is part of the regular type shifting theory.

While a collective reading for (18a) seems ok, in general, this shift seems to be a rather restricted phenomenon: for instance, it doesn’t seem to be possible in subject position.

Now, what is relevant for our purposes here is the following. A quantificational noun phrase that has undergone collective shift has a collective interpretation at type d. From this type we can lift it with IDENT into the predicate type. This means that, while we do not get predicative interpretations of quantificational noun phrases in general, collective shifted interpretations might well occur as predicates. And this is indeed the case:

(19)  a. The press is every person who writes about the news.
    b. #The press is each person who writes about the news.

Here again, we find under special circumstances a semantic shift from $\langle d, t \rangle$ to a type from which we can form a predicate. And again, it is completely implausible to assume that this must involve syntactic restructuring of a DP as an NP.

**Moral**

The assumption of the Perfect Matching between syntax and semantics derives, originally, from Montague’s fixed type assumption. This assumption has frequently tempted both semanticists and syntacticians into imperialism (use the perfect match to import as much syntax as you can into the semantics, versus import as much semantics into the syntax as you can, presumably in the hope that the other will go away). But, as I have argued here for noun phrases, syntax and semantics are mismatched. The mismatch makes syntactic and semantic argumentation harder, because you actually need to determine very carefully which distinction (the syntactic or the semantic) your arguments apply to. It makes it also more interesting, because:

All perfect matchings are alike, each mismatch is interesting in its own way.
Acknowledgements

In the academic year 1998/99 I taught a year-long seminar at Tel Aviv University on my recent work on definiteness effects, which, though presented at various conferences, is still unpublished (Landman ms. 1998a, b). The present chapter took shape in the course of that seminar as a conceptual prehistory of the other work.

As such, the chapter and me owe a great debt to the penetrating comments, skepticism, and encouragement of my students Victoria Barabash, Shai Cohen, Gabi Danon, Yael Greenberg, Daphna Heller, Aldo Sevi and Galit Sassoon.

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Chapter 9

Determinerless nouns

A parametric mapping theory

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At least two developments have characterized the progress of general linguistic theory over the last two decades: the emergence of the formal study of the Syntax–semantics mapping and that of parametric theories of grammatical variation.

Grammatical variation as investigated for the morphosyntactic components in parametric theories is usually tentatively supposed to be:

(1) a. discrete;
b. finite;
c. limited (w.r.t the number of actual phenomeric points of contrast exhibited by surface variation across languages).

Now, in the light of the parallel development of theories of the mapping between syntax and semantics at least three questions arise naturally:

(2) a. Does variation exist in the interpretive (semantic) component?
b. Does it display the classical parametric properties mentioned above?
c. Is it always/sometimes independent of morphosyntactic variation?

Questions of this sort have been put on the research agenda most forcefully by Chierchia (1996). The optimal case in point to investigate such problems should be provided, in principle, by instances of syntactic homonymy across languages, understood as cases in which the same surface syntactic shape clearly corresponds to distinct logical representation in different languages.

An ideal testing ground in this sense is that of the Syntax–semantics mapping in the nominal system, for the combination of two reasons: the interpretation of nominals has been one of the main foci of inquiry since (and thanks to) Carlson’s (1977a and b) groundbreaking work and, at the same
time, a good deal of comparative material has more recently been brought to light, especially in the Romance–Germanic domain.

While many Romance and Germanic languages, anyway in particular English and Italian, hardly display obvious structural contrasts in the process of interpretation of overtly determined argument nominals (e.g. every man, the man, a man, two men . . . and their literal correspondents), the situation is much more intriguing and problematic in the case of overtly determinerless nominals. In fact, while one of the two main types of argument determinerless nominals, proper names, seems to display a crosslinguistic constant semantics, but a variable syntax, quite the opposite has been claimed to happen for the other type, namely bare (mass/plural) common nouns (henceforth BNs). In this article I will try to provide some preliminary answers to the general questions above, analyzing the relation between the syntax and the semantics of precisely such two types of entities.

1. The two readings

As in all the Western European languages, BNs in Romance are subject to just two fundamental types of interpretation: the existential one (henceforth Ex) and the generic one (henceforth symbolized as Gen, to be taken as a mere epiphenomenal label for very different types of genericity). Three descriptive proposals have so far been made as to the interpretation of Romance (actually Italian, but other Romance languages appear to be at best equally restrictive) BNs:

— Casalegno (1987): only Ex, unlike English;
— Longobardi (1994): Ex, sometimes Gen (but only with I(ndividual)-level, and never with K(ind)-level predicates, thus with a distribution unlike the English one);
— Chierchia (1996): Ex, Gen, distributed essentially as in English.

In this work I will argue for the following descriptive generalizations:

(3) a. the interpretations of Italian BNs = those of Italian overt indefinites = those of English overt indefinites in the same environments
   b. the distribution of the interpretations of Italian BNs ≠ that of English BNs
   c. Italian BNs (unlike English BNs) are generic only in independent quantificational environments
d. it is Italian overt *definite* that can be generic in all (pragmatically appropriate) environments, like English BNs

Let us then consider the distribution of the two readings for BNs with the main types of predicates (all the following paradigms abstract from the sub-kind or ‘taxonomic’ reading).

2. S(tage) level predicates

With a S(tage)-level predicate there are three main subcases to consider: (a) with an episodic aspect; (b) with a characterizing (=habitual) aspect; (c) with an episodic aspect + a generalizing adverb

(4) a. Elefanti di colore bianco hanno creato in passato grande curiosità.  
   ‘White-colored elephants raised a lot of curiosity in the past.’

b. Elefanti di colore bianco possono creare grande curiosità.  
   ‘White-colored elephants may raise a lot of curiosity.’

c. Elefanti di colore bianco hanno creato sempre/spesso in passato grande curiosità.  
   ‘White-colored elephants always/often raised a lot of curiosity in the past.’

As can be seen, the generic reading of a BN subject with S-level predicates is possible (*pace* Casalegno 1987 and Longobardi 1994), but depends on the presence of a DP-external operator of generality, such as the *habitual* aspect of (4b) or a quantificational *adverb* (in the sense of Lewis 1975) as in (4c). In a way, the subjects of such predicates seem to acquire genericity through generalization from an indefinite series of individual events.

3. I ndividual) level predicates

I-level predicates are supposed to be always characterizing by their lexical meaning (*cf.* Carlson and Pelletier 1995: Introduction, and especially Chierchia 1995): thus a subject BN should normally be able to be Gen and only Gen. This appears correct:
Cani da guardia di grosse dimensioni sono più efficienti Gen
'Watchdogs of large size are more efficient.'

However, serious doubts can be cast on the idea that genericity here is the direct product of a lexical property of I-level predicates; for the situation is more complicated: first, as was the case in (4a) above, the availability of the generic reading becomes much more degraded if only the present tense of (5) is replaced by a tense implying an episodic interpretation; therefore, the presence of a characterizing (habitual) aspect appears to be crucial to license genericity with I-level predicates as well. Second, I-level predicates are at least split in two with respect to such phenomena (all judgments through (8) are given w.r.t. Gen, since the Ex readings are anyway impossible):

(6)  a. Stati di grandi dimensioni sono pericolosi.
'States of large size are dangerous.'
 b. ?? Stati di grandi dimensioni sono prosperi.
'States of large size are prosperous.'

(7)  a. Cani da guardia di grosse dimensioni sono più efficienti/aggressivi.
'Watchdogs of large size are more efficient/aggressive.'
 b. ?? Cani da guardia di grosse dimensioni sono più pelosi/neri.
'Watchdogs of large size are more hairy/black.'

(8)  a. Uccelli di zone paludose sono ghiotti di insetti
'Birds from marshy areas are greedy for insects.'
 b. ?? Uccelli di zone paludose sono scuri/intelligenti.
'Birds from marshy areas are dark/intelligent.'

Let us call the two subclasses A and B, respectively. What is the ratio for this split in the class of I-level predicates? A tentative conjecture is the following: notice that class A is perhaps more 'eventive' than class B, which is more 'stative': if so, we may hypothesize that the present tense here instantiates a formal super-category of 'durational' aspect, superficially neutralizing the semantic distinction habitual/stative, only the latter aspect being selected by class B; but only an habitual aspect, the one semantically selected just by class A, would provide a real generic operator. If so, even subjects of I-level predicates would acquire genericity through generalization from individual events.

Not surprisingly, an explicit adverb of generality like 'usually' can restore full acceptability of Gen in all the (b) examples. Therefore it is likely that the
factors licensing the generic reading of BNs with S-level and I-level predicates are just the same (an aspectual operator of habituality or an adverb of generality) and have actually nothing to do with the distinction between such two predicate types.

To apply a test suggested in Carlson and Pelletier (1995: Introduction), notice also that in all the cases considered the generic flavor seems a property of the sentence, not just of the subject DP, and is retained even if the BN is replaced by a definite specific singular or a proper name.

The descriptive discoveries so far made about the readings of BN subjects in the context of the various predicates can be summed up, just for practical purposes, as follows:

\[ (9) \]
\[
\begin{array}{cl}
\text{S-level} & \\
\text{a. episodic aspect} & \text{Ex} \\
\text{b. characterizing (habitual) aspect} & \text{Ex/Gen} \\
\text{I-level} & \\
\text{c. lexically characterizing A (habitual aspect)} & \text{Gen} \\
\text{d. lexically characterizing B (stative aspect)} & \text{Ø} \\
\end{array}
\]

The existence of case (9b) is what provides for the occurrence of true ambiguities, as noticed by Diesing (1992) and exemplified below:

\[ (10) \]  
\[
\text{In questi casi, pompieri di grande esperienza intervengono in soccorso delle vittime dell'incidente.} \quad \text{Ex/Gen} \\
\text{‘In such cases, firemen of great experience run to the rescue of the victims of the accident.’} \\
\]

4. K(ind)-level predicates

A third class of relevant predicates is constituted by Carlson’s so called K(ind)-level predicates, namely those that cannot apply singularly to the objects which realize a kind but only collectively to the kind itself; here genericity could, obviously, not be achieved just through generalization from predications about events concerning individual objects. As a matter of fact neither Gen nor Ex are possible (non-taxonomic) readings here for an Italian BN (sentence (11b) is irrelevantly grammatical with Ex under a pragmatically improbable non-K-level reading of the predicate):
   'White-colored elephants have become extinct.'

b. *Elefanti di colore bianco diventano sempre più grandi man mano che si va a nord.
   'White-colored elephants grow larger as one drives North.'

c. *Elefanti di colore bianco sono così chiamati per la pigmentazione della loro pelle
   'White-colored elephants are so-called because of the pigmentation of their skin.'

5. Romance and English BNs

Now, already three systematic differences have emerged between Romance and English BNs w.r.t. Gen, pace Chierchia (1996): the generic reading of Italian BNs is in fact impossible with classical kind-level predicates (11), with episodic S-level predicates (4a) and with class B I-level, while in all such cases the corresponding BNs in English can perfectly be generic. Notice in this respect that the generic interpretation of the English gloss of (4a) cannot be simply attributed to the existence of an 'imperfect', i.e. habitual, aspectual reading for the English simple past, since the contrast obtains also in cases where such an habitual reading is semantically out of question:

(12)  a. Elefanti di colore bianco passeranno il Giudizio Universale domani alle 5.  Ex
   'White-colored elephants will undergo the Final Judgment tomorrow at 5.'  Ex/Gen

b. Elefanti di colore bianco sono stati sterminati in massada un cataclisma nel 1874.  Ex
   'White-colored elephants were mass-exterminated by a cataclysm in 1874.'  Ex/Gen

6. BNs and overt indefinites

As anticipated, a crucial and so far unnoticed generalization is that the same interpretive properties of Romance BNs hold of Romance (and, to a large extent, English) overtly indefinite DPs in exactly the same environments; cf.
the following examples, which correspond to the previous ones of (4)–(8) and (11):

(13) a. Degli/Due elefanti di colore bianco hanno creato in passato grande curiosità.  
     Ex  
     ‘Part. art. / Two white-colored elephants raised a lot of curiosity in the past.’

b. Degli/Due elefanti di colore bianco possono creare grande curiosità.  
     Gen/?Ex  
     ‘Part. art. / Two white-colored elephants may raise a lot of curiosity.’

c. Degli/Due elefanti di colore bianco hanno creato sempre/spesso in passato grande curiosità  
     Gen/?Ex  
     ‘Part. art. / Two white-colored elephants always/often raised a lot of curiosity in the past.’

(14) Dei/Due cani da guardia di grosse dimensioni sono più efficienti.  
     Gen Part. art. / ‘Two watchdogs of large size are more efficient.’

(15) a. Uno stato di grandi dimensioni è pericoloso.  
     ‘A state of large size is dangerous.’

b. ?? Uno stato di grandi dimensioni è prospero.  
     ‘A state of large size is prosperous.’

(16) a. Un cane da guardia di grosse dimensioni è più efficiente/aggressivo.  
     ‘A watchdog of large size is more efficient/aggressive.’

b. ?? Un cane da guardia di grosse dimensioni è più peloso/nero.  
     ‘A watchdog of large size is more hairy/black.’

(17) a. Un uccello di zone paludose è ghiotto di insetti.  
     ‘A bird from marshy areas is greedy for insects.’

b. ?? Un uccello di zone paludose è scuro/intelligente.  
     ‘A bird from marshy areas is dark/intelligent.’

(18) a. *Degli/Due elefanti di colore bianco sono estinti.  
     Part. art. / ‘Two white-colored elephants have become extinct.’

b. *Degli/Due elefanti di colore bianco diventano sempre più grandi man mano che si va a nord.  
     ‘Part. art. / Two white-colored elephants grow larger as one drives North.’
7. Anaphoric binding

English BNs are known to provide ambiguities in sentences like the following (from Carlson 1999):

(19) Cats think very highly of themselves.

*Themselves* may refer back to the whole species (kind anaphora) or, distributively, to each individual cat. A Romance BN may occur in a corresponding situation (a characterizing predication) with a generic reading, of course:

(20) Gatti di grandi dimensioni hanno un'alta opinione degli umani.

‘Cats of great size have a high opinion of humans.’

but it does not provide the ‘species’ (non-distributive) reading for the anaphor:

(21) Gatti di grandi dimensioni hanno un'alta opinione di se stessi

‘Cats of great size have a high opinion of themselves.’

The sentence only means that each individual cat thinks highly of itself, although the other reading is by no means impossible in Italian if a non BN (specifically a definite plural: cf. 3.1 below) is used to replace the BN. Once again, in this pattern Italian generic BNs behave like overt indefinite generics:

(22) a. Un gatto di grandi dimensioni ha un'alta opinione di se stesso

‘A cat of great size has a high opinion of itself.’

b. Dei gatti di grandi dimensioni hanno un'alta opinione di se stessi

‘Part. art. cats of great size have a high opinion of themselves.’

The non-distributive reading is in fact as impossible in (22b) as it was in (21) and even more strongly in the singular example (22a).

8. Some conclusions

Thus we may conclude that Italian BNs interpretively pattern exactly like
(both Romance and English) overt *indefinites* in achieving a generic reading only in environments in which the sentence independently provides an external operator of generality. In fact such a reading has been found with:

(23) a. S-level predicates with *habitual* aspect  
    b. I-level predicates with *habitual* aspect  
    c. adverbs of generalizing quantification

Furthermore, the generic reading of Italian BNs is crucially impossible when the nominal must necessarily denote the kind itself and not an indefinite number of instantiations thereof; this was shown to be the case with:

(24) a. kind level predicates  
    b. kind anaphora

Now, notice that in *all* the cases above where the generic reading is not possible for a BN in Italian, it can be restored by replacing the BN with the corresponding overtly definite DP, therefore e.g. by substituting *Gli elefanti bianchi* 'The white elephants' for *Elefanti bianchi* 'White elephants'.

This last observation exhausts, thus, the empirical material sustaining the generalizations summed up in (3) above. Let us move on to the theoretical interpretation of such generalizations.

9. **Romance bare nouns as indefinites**

The generalizations just made naturally prompt the following hypothesis:

(25) Italian, and more generally Romance, BNs are *indefinites* (à la Kamp–Heim), i.e. *quantificational* variables existentially or generically bound

In fact, all the environments of (23) display, as noticed, an intuitively quantificational element, responsible for the characterizing flavor of the sentence, which may be taken to unselectively bind a subject variable (cf. some analogy with *donkey*-anaphora). The other consequence of the observations above is that the Romance languages give us a way to tell apart formally two radically different types of genericity expressions, distinguished in Carlson and Pelletier (1995: Introduction):

(26) a. Referential generics (kind-denoting names): only expressible through overtly definite DPs in Romance.
b. Quantificational generics: expressible through various sorts of indefinite DPs (indef. art., partitive art., cardinality expressions, BNs) bound by external operators of generality (habitual aspect, quantificational adverbs or predicates)

10. Semantic parametrization

With English BNs, genericity seems possible also with episodic predicates and stative (Class B) I-level (and with kind-level predicates). Moreover, English BNs can be employed when a kind is to be directly denoted as such (K-level predicates and kind-anaphora). In sum, in environments other than (23) Romance and English overt indefinites and Romance BNs behave alike, refusing genericity, while English BNs, instead, can be generic, rather corresponding to overt definite mass/plural nominals of Romance (and, to a noticeable extent, to English/Romance overt definite singulars, like the white elephant).

Therefore, let us assume the pattern (23) as a condition on quantificational genericity to be universal and suppose further that English BNs have an additional possibility to achieve a generic reading (also cf. Dobrovie-Sorin and Laca 1996), namely that:

(27) English generic BNs in environments other than (23)–(24) cannot be quantificational (indefinites), but are kind-referring expressions (kind names)

This approach gives rise to the following descriptive semantic parametrization:

(28) a. Romance BNs: only quantificational expressions (variables, indefinites, like overt indefinites and unlike proper names) existentially or generically bound

b. English BNs: potentially ambiguous between a referential interpretation (constants, kind names, unlike overt indefinites and like proper names) and the quantificational interpretation above.

Of the four main classes of entities taken into consideration in this work, then, it turns out that three display the same interpretative properties, thus forming a natural class, while one is singled out as systematically different, hence as spurious in the system, namely English BNs:
Therefore, conceptually if not empirically, Casalegno’s (1987) original intuition was correct in drawing a sharp interpretive distinction precisely between Italian BNs and English BNs.

11. The extended parametrization


First, such works have pointed out the existence of an important distinction between Romance and English concerning the syntax of object-referring nouns, i.e. proper names (PNs), in argument function. In English such nouns may occur determinerless while remaining in the normal post-adjectival position of determined nouns, i.e. they do not need to either be introduced by an overt determiner or move to the pre-adjectival D position (they actually cannot): from this viewpoint they do not differ structurally from bare common nouns:

(29) a. Ancient Rome (was destroyed by the barbarians).
   b. *Rome ancient (was destroyed by the barbarians).

(30) a. I met third children everywhere.
   b. *I met children third everywhere.

In Romance, instead, object-referring nouns in argument function are always necessarily introduced by a phonetically expanded D node: either they occur after a visible determiner (an expletive article, in Vergnaud and Zubizarreta’s (1992), Longobardi’s (1994) sense) or are themselves moved to D (hence necessarily crossing over adjectives), giving rise to typical patterns like (31):

   Ancient Rome (was destroyed by the barbarians)
   b. Roma antica (fu distrutta dai barbari).
   Rome ancient (was destroyed by the barbarians)
   c. L’antica Roma (fu distrutta dai barbari).
   the ancient Rome (was destroyed by the barbarians)
Therefore

(32) In some languages determinerless argument proper names must undergo overt N-to-D raising, in others they never do.

In this sense the syntax of Romance proper names sharply contrasts with that of bare common nouns, which is essentially the same as in English (no N-to-D raising), as can be seen from phrases with obligatorily prenominal adjectives like the ordinal one in (33);

(a) Ho incontrato terzi figli dappertutto.
I met third children everywhere

(b) *Ho incontrato figli terzi dappertutto.
I met children third everywhere

The surface DP-internal structures involved are represented in (34) (with $e$ symbolizing the lack of overt determiner, which at least in Romance may be independently argued to be represented by an actual empty category: cf. Contreras 1986 and subsequent work):

(a) English BNs = English PNs

[ $e$ (Adj) N ] [ $e$ (Adj) N ]

(b) Romance BNs ≠ Romance PNs

[ $e$ (Adj) N ] [ Art (Adj) N ] [ N (Adj) t ]

Second, Longobardi (1994, 1996) has also proposed the existence of a crucial typological generalization crosslinguistically relating the two types of determinerless nominals:

(35) Proper names may occur without a D phonetically filled (either by an expletive determiner or by N-raising) iff generic nouns may freely do so (i.e. iff BNs can be generic also in environments other than (23)–(24), in the terms of this article).

In other words, English and Romance PNs differ in their syntax, English and Romance BNs differ in their semantics, but the two differences are parametrically related: if the semantics of BNs is of the English type, the syntax of PNs will be of the English type as well, and vice versa. If correct, (35) sets a standard of typological adequacy to be met by any serious theory either of bare nouns or of proper names.
Though empirically well motivated (other Germanic languages seem to pattern on the English side, all of Romance and probably Greek pattern on the Italian side) and technically expressible, the relation between the two phenomena remained conceptually hard to understand.

Under the present account to the semantic parametrization of BNs, the typological generalization becomes perfectly understandable: PNs are referential expressions, actually object-referential; BNs differ in Italian and English precisely with respect to their capacity to function referentially, kind-referentially of course. Thus, PNs and referential generic BNs have something a priori in common, they are referential expressions. In other terms they both denote whatever they denote (a kind or object, respectively) not through a variable with a predicative restriction but directly through the lexical reference of the head noun. Longobardi’s (1990 and subsequent work) generalization can now be more perspicuously rephrased as follows: BNs can be referential iff they have the same formal syntax as PNs, the prototypical referential expressions. The condition is positively satisfied in English, though not in Italian.

This amounts to saying that languages always resort to a unified strategy to assign object- and kind-reference to nominal structures, but this strategy is crosslinguistically parametrized: in English referential status can be assigned to nominals with no overtly realized D, in Romance it necessarily depends on a D position overtly occupied either by the noun itself (raised proper names, with object-reference) or by its placeholder, an expletive article (referential generic common nouns, with kind-reference, or, again, proper names, with object-reference). The two parametric strategies are represented in (36):

(36) a. English:

```
[ e (Adj) N ]
     ^  ^
    /   \
   QUANTIFICALATIONAL  REFERENTIAL
```

b. Romance:

```
[ e (Adj) N ]
     ^  ^
    /   \
   QUANTIFICALATIONAL  REFERENTIAL
```

Therefore, in English, BNs can be referential (instantiate kind-denoting constants), unlike the Romance ones, precisely because they have the same surface structure as PNs. The crosslinguistic variation in the interpretation of BNs discussed in this chapter is reduced to the abstract parametric difference
discussed by Longobardi (1994, 1996) with its far-reaching ramifications: in certain languages the referential feature of the determiner position, D, is ‘strong’, that is visible systematic association of referential items with D (either by overt movement of the noun itself or by means of an expletive placeholder) is necessary, rather in the sense in which question operators must be visibly associated by wh-movement to the clause-initial position in many languages. In other languages, the referential properties of D are ‘weak’, i.e. referential readings may affect nominal items not overtly associated with D, exactly as, in some languages, question words are not overtly wh-fronted (cf. Huang 1982 and Cheng 1991 among much related work). N-to-D raising of proper names is thus the other formal rule of syntax whose ultimate association with a precise semantic property is conceptually apparent.

Ultimately, the bulk of the parametric distinction is thus whether the constant or variable status of D must be encoded in the PF or not (cf. Longobardi 1996 for some speculations on this point related to Lazzeroni’s 1995 observation that related semantic properties in some languages may even ultimately affect the prosodic phonology of head nouns): in Romance a D empty at PF always gives rise to a variable, in Germanic it need not. N-to-D movement or an expletive article are two formal devices to prevent a D from being phonologically empty, hence to achieve a referential reading.

The same parameter accounting for the syntax of PNs and the semantics of BNs has been argued in the works cited to neatly cover three other morphosyntactic domains in which Romance contrasts with English and other Germanic varieties (especially affecting the syntactic distribution of BNs, the determiners of empty nouns and Case licensing within DP), so that it eventually turns out to be supported by a cluster of at least five apparently unrelated surface sources of evidence.

12. On comparative semantics

To sum up, the present line of analysis recommends itself, in comparison to other conceivable approaches (in particular those only recognizing one type of genericity, whether quantificational or referential), for at least the following four, among others, empirical and conceptual reasons:

(37) a. it accounts for the interpretations of English BNs;
b. it accounts for the interpretations of Romance BNs;
c. it accounts for the interpretations of Romance and English overt indefinites;
d. it explains the typological relation between the syntax of PNs and the interpretations of BNs;

If these conclusions are correct, they confirm that the crucial discovery in this domain of study is precisely that the principles of interpretation of determinerless nouns, whether proper or common, are basically the same, as originally proposed in Longobardi (1991, 1994).

More generally, they suggest that a very close and abstract mapping exists between syntax and semantics, which emerges even under parametrically different surface forms. But they also suggest some preliminary and partial answer to the main questions raised in the introduction: precise crosslinguistic variation of fine-grained interpretive properties, like the difference between referential and quantificational genericity as applied to the interpretation of BNs, actually exists, and shares the main features of classical parametrization, in particular exhibiting two of the properties of morphosyntactic variation, i.e. discreteness and clustering together of several differences. In cases such as these, comparative semantics seems definitely possible: it appears as contentful as other components of a Principles-and-parameters theory of UG and brings together traditionally distinct domains like analytic philosophy, language typology and dialectology (cf. Longobardi 1994 and Chierchia 1996).

On the other hand, the evidence suggests that the semantic differences, at least in this case, need not necessarily be stated as a primitive semantic parameter (e.g. in the sense of Chierchia 1996), but can well be reduced to differences in the abstract morphosyntax of languages: indeed they seem to be part of the instantiation of one of the most classical and general parameter schemata of syntactic theory (since Huang 1982), namely variation in the feature composition of a functional head which is robustly manifested by the presence or absence of overt movement processes targeting that head. In this sense, this field of inquiry cannot yet convincingly prove that semantic parametrization exists independently of the syntactic one.

References


Chapter 10

A Russellian interpretation of measure nouns*

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1. Introduction

Early treatments of measure nouns like pint, quart, gallon assume that measures are ontologically independent from the entities that exhibit them, and claim that measure nouns denote sets of these abstract, Platonic, measures (Parsons 1970; Cartwright 1975; Wald 1977). If we assume that measures are primitive elements of a model for the interpretation of nouns, then these early treatments would assign simple, first-order, interpretations to measure nouns — namely subsets of the universe of discourse of the model. But the assumption of ontologically independent measures is somewhat problematic. First, it requires a proliferation of entities — namely the measures themselves. It should be borne in mind that these entities are infinite in number and abstract in nature. They are therefore hard to justify — or harder to justify, at any rate, than a set of entities which are finite in number and concrete in nature. Second, it is not enough to stipulate that measures are elements of a universe of discourse. It must be further stipulated that they in effect form a veritable arithmetical domain — as measures can be added, subtracted, multiplied, divided, and ordered by size. In fact, it must be stipulated that measures form an arithmetical domain that precisely coincides with the domain formed by numbers. Third, the connections between measurable entities and their measures must also be stipulated if we are to account for ordinary phrases like one pint of beer, two quarts of wine, and three gallons of milk. This would seem to require the specification of a function that assigns, to each measurable entity, its measure.

And things get only worse if we attempt to use ontologically independent measures to interpret measure nouns. Take for example the singular noun pint. Should it really denote the singleton of the one-pint measure? If so, it
would be a proper name. Yet, it can be pluralized, specified by articles, demonstratives, and possessives, as well as modified by restrictive relative clauses. Moreover, this move raises questions about the identity of measures. For, if we each had a pint last night, how do we escape the implication that we all had the same one?

One way to avoid all of these problems is to follow more recent approaches to the semantics of measure nouns, reject the ontological independence of measures, and interpret measure nouns as relations. These more recent approaches have their roots in analytic philosophy. Thus, acknowledging ideas in Carnap (1926), Quine (1960: 244–f.) claimed that

The case of ‘mile’, ‘degree Fahrenheit’, and the like is clearer: no purpose is served by making units of measure accessible to variables of quantification. We can adequately accommodate these nouns as parts of relative terms ‘length in miles’, ‘temperature in degrees Fahrenheit’. Just as the relative term ‘author’ is true of this and that man relative to this and that book, so ‘length in miles’ is to be understood as true of this and that number relative to this and that body or region. Thus instead of ‘length of Manhattan = 11 miles’ we would now say ‘length-in-miles of Manhattan = 11’ (form ‘F of b = a¹’) or ‘11 is length-in-miles-of Manhattan’ (form ‘Fab’).

Thus, for some semanticists, a measure noun denotes a measure function — a relative-size-preserving function from entities to real numbers (Higginbotham 1995: Sect. 4.3; Chierchia 1998: Sect. 3.2; Krifka 1998: Sect. 2.2). Notice that this avoids all of the above problems. First, there is no recourse to ontologically independent measures. There is, to be sure, recourse to ontologically independent numbers, but these are certainly motivated independently of measures. Second, the arithmetic of measures reduces to the ordinary arithmetic on these numbers. Such an arithmetic is, of course, motivated independently of measures. Third, the function that connects measurable entities with their measures is not needed independently of the interpretation of measure nouns, as the function is this interpretation. Finally, measure nouns are not regarded as highly exceptional proper names.

Unfortunately, the measure function proposal runs into several problems of its own. First, it is cognitively implausible, as it requires the notion of real number to be a logical prerequisite to the notion of measure — a requirement which flies in the face of historical and psychological evidence, as both individuals and societies invariably develop the notion of measure before that of real number (if they develop the notion of real number at all). Second, it calls for an *ad hoc* rule to interpret the nominal formed by a numeral and a
A Russellian interpretation of measure nouns

measure noun. Thus, while ordinary nominals like three cats in effect denote the set of elements of a universe of discourse which are cats in nature and three in number (1a), a measure nominal like three pints would instead refer to the set of entities to which the pint measure-function assigns the number three (1b). 1

(1) a. \( \lambda x \left[ \text{cats}(x) \land \text{three}(x) \right] \)
   b. \( \lambda x \left[ \text{pint}(x) = \text{three} \right] \)

Third, measure functions are too weak to characterize the reference of measure nouns. For, notice that measure functions do not have to preserve the absolute sizes of the measured entities; all they have to do is preserve their relative sizes. This means that the measure function proposal will allow measure nouns \( N \) such that entities measuring \( 2N \) are larger than entities that measure \( 1N \) — although not necessarily twice as large. Needless to say, this is not good enough. 2 Fourth, measure function interpretations render number inflection of measure nouns semantically incoherent. We may therefore have to stipulate that the presence of grammatical features on measure phrases is purely syntactic (Chierchia 1998: 74). Fifth, the measure function proposal requires measure nouns to be intricate, third-order, predicates — and thus differ from ordinary nouns, which are only first-order predicates. For, as the reader will recall, an ordered pair \( \langle x, y \rangle \) is, strictly speaking, the second-order object given by (2).

(2) \( \langle x, y \rangle = \left\{ \{x\}, \{x, y\} \right\} \)

But this means that a function, which is a set of ordered pairs, will be a set of second order objects, and hence a third-order object in its own right (Partee et al. 1990: 27 ff.).

It should be pointed out that, as far as relational interpretations of measure nouns go, the measure function approach is only mildly complex. According to Lønning (1987), a measure noun names an ordered pair consisting of a function from entities to measures followed by a function from measures to real numbers. This means that even if we granted that entities, measures, and real numbers were all primitive elements of the model, measure nouns would still denote nothing less than fifth-order objects! And these relational interpretations furthermore inherit all the other problems that afflict the measure function proposal. The question thus arises as to whether interpretations of measure nouns can be found which have the simplicity of the early treatments but none of their problems.
The purpose of this chapter is to answer this question in the affirmative by developing an interpretation of measure nouns which is both simple in its ontology and adequate in its empirical coverage. The proposal we will develop will rely heavily on a model-theoretic approach to semantics. It will also have a distinct Russellian flavor. For, just like Russell interpreted numerals as sets of numerically equivalent entities, we shall interpret measure nouns as sets of metrically equivalent entities. This means that just like Russell took five to denote the set of entities which number five, we shall take pint to denote the set of entities which measure a pint.

Our chapter is organized as follows. First we present a characterization of the models against which measure nouns will be interpreted (Section 2). These models will prove to be mereological in structure. Then we develop our Russellian proposal, and show that it has the desired properties (Section 3). In the process of doing so we develop some novel diagrams for visualizing the interpretation of measure nouns against continuous domains of measurement. Next we address a series of problems that might arise for our proposal, particularly that of nonnatural measures (Sections 4–5). We conclude by presenting some of the questions these proposals raise for the general interpretation of nouns (Section 6).

2. Models for the interpretation of measure nouns

Let us define the universe of discourse for a particular occasion of linguistic use as the set of entities one may talk about on that occasion. We define next the partitive relation in a particular universe of discourse as the binary relation in that universe which holds of two entities $x$ and $y$ if and only if $x$ can be said to be part of $y$. Putting these two notions together, we define the model for the interpretation of nouns on a particular occasion of linguistic use as the ordered pair consisting of the universe of discourse for that occasion followed by the partitive relation in that universe.

To lighten exposition we will refer to models for the interpretation of nouns on a particular occasion of linguistic use simply as models. No real harm will come of this, as all the models we will refer to in the sequel will be of this type. We will also feel free to refer to elements (subsets) of the universe of discourse of a model simply as elements (subsets) of that model. Although these are all abuses of terminology, they are compensated by the brevity they yield, are defanged by caveats like this one, and are therefore rampant in the literature.
Notice now that no element of any model can be said to be part of itself. This means that the partitive relation of a model is \textit{irreflexive}. Notice also that no two elements of any model can be said to be part of each other. This means that the partitive relation of a model is \textit{asymmetric}. Notice finally that whenever three elements of a model are such that one of them can be said to be part of a second and the second can be said to be part of the third, then the first can be said to be part of the third. This means that the partitive relation of a model is \textit{transitive}. Taken together, these facts mean that every model is a \textit{strictly ordered set}.

Notice next that any time one may talk about a nonempty set of entities individually, one may also talk about that set of entities collectively. Notice also that each of the entities taken individually can be said to be part of the set of entities taken collectively — or at least equal to it if there was only one entity in the set. In other words, the set of entities taken collectively is an \textit{upper bound} for the set of entities taken individually. Notice also that if each of the entities taken individually can be said to be part of anything other than the set of entities taken collectively, then the set of entities taken collectively can also be said to be part of it — or that the set of entities taken collectively is a \textit{least} upper bound for the set of entities taken individually. Taken together, these three points entail that every nonempty set of elements of a model will have a least upper bound in the model — or that every model is \textit{additive}. It should be noted that, since the partitive relations in question are asymmetric, every nonempty set of elements of a model will have a \textit{unique} least upper bound therein.

To illustrate, consider an occasion of linguistic use in which one may talk individually about all the beers of Belgium. Consider, that is, an occasion in which one may talk about \textit{Stella Artois}, \textit{Jupiler}, \textit{Chimay}, and so on. It is not hard to see that this will also be an occasion in which one can talk about these beers collectively. One way to do so is through definite description — as in \textit{the beers of Belgium}. Another is through the conjunction of all the aforementioned names. A third is through deictic description — as in \textit{those beers} or, more simply, as \textit{them}. Notice that each beer of Belgium can be said to be part of the beers of Belgium — so the beers of Belgium taken collectively are an upper bound for the beers of Belgium taken individually. Notice also that if each beer of Belgium can be said to be part of anything other than the beers of Belgium, then the beers of Belgium, taken collectively, can also be said to be part of that as well. So the beers of Belgium, taken collectively, are a least upper bound for the beers of Belgium taken individually. In fact, they are the only least upper bound for the set of beers of Belgium taken individually.
But we still need to establish one more property of models for the sequel. To do so, let us say that two elements of a model overlap iff there is an element of the model which can be said to be part of both. Let us say that two elements of the model are disjoint iff they do not overlap. Now, let \( x \) and \( y \) be two entities one can talk about on a particular occasion of linguistic use. Notice that if \( x \) is part of \( y \) then there is one and only one entity \( z \) one can talk about which satisfies the following two properties. The first is that \( x \) and \( z \) are disjoint. The second is that \( x \) and \( z \) have \( y \) as their least upper bound. Such an entity will be called the difference between \( x \) and \( y \). It follows that any two partitively related elements of the model will have a unique difference — or that every model is subtractive.

To continue with Belgian brew, consider an occasion of linguistic use in which one may talk both about the beers of Belgium and about the lambic beers of Belgium. Notice that the lambic beers of Belgium can be said to be part of the beers of Belgium. Notice also that on this occasion of use one will also be able to talk about the beers of Belgium other than the lambics — witness phrases like the rest of the beers of Belgium, the other beers of Belgium, the nonlambic beers of Belgium, and so on. But the lambic and the nonlambic beers in Belgium will have no common parts — so these beers are disjoint. Moreover, the lambic and the nonlambic beers of Belgium together comprise the beers of Belgium — so the beers of Belgium are the least upper bound for the set consisting of the lambic and the nonlambic beers of Belgium. It follows that the nonlambic beers of Belgium are the difference between the beers of Belgium and the lambic beers of Belgium.

To summarize: we have argued that every model is a strictly ordered set which is both additive and subtractive. In short, it is a mereology. Mereologies were conceived originally by Lesniewski (1916) as paradox-free alternatives to sets, and are closely related to complete Boolean algebras (Tarski 1956a, 333f). Mereologies have been used in foundational areas of geometry (Tarski 1956b) and nominalistic philosophy (Eberle 1970). They have furthermore enjoyed a formal development of their own (Simons 1987). The use of mereologies as models for the interpretation of nouns is hardly new. It was pioneered by Massey (1976) and Wald (1977), and has now become commonplace after the work of Link (1983).

The value of mereological models for the interpretation of nouns stems from the fact that these models are rich enough to support a simple interpretation of all nouns, regardless of whether they are singular or not. To get a feel for the descriptive power of these models, let \( M \) be a model. Let us say that an
element of \( M \) is an \textit{atom} of \( M \) iff it has no parts in \( M \). Let us furthermore say that an element of \( M \) is \textit{atomistic} iff it is the least upper bound for a set of atoms of \( M \). Let us finally say that an element of \( M \) is \textit{atomless} iff no atom of \( M \) is (part of) it. Notice that atoms are individuals taken individually. They can therefore be used to describe the reference of singular nouns. Atomistic entities are individuals taken collectively. As such, they can be used to describe the reference of plural nouns. Atomless entities are instances of unindividuated stuff — if not individuals taken in bulk. They can therefore be used to describe the reference of mass nouns. See Krifka (1989; 1990), Landman (1989; 1991), Barker (1992), Eschenbach (1993), and Ojeda (1993; 1995) among others.

3. A Russellian interpretation of measure nouns

To provide a Russellian interpretation of measure nouns it will pay off to define several terms first. Let \( M \) be a model. We define \textit{metric domain of} \( M \) as follows.

\( \text{(3) Metric domains} \)

\textit{A metric domain of} \( M \) \textit{is the set of elements of} \( M \) \textit{that can be said to be measurable in terms of time, length, width, height, area, volume, weight, force, energy, magnetism, temperature, or luminescence.}

The definition in (3) is of course provisional, as the list it contains is not intended to be complete. The definition is nevertheless advanced so as to make our intent clear, our claim specific, and our coverage bearable.

So let \( \mathcal{D} \) be a metric domain of \( M \). As such, \( \mathcal{D} \) satisfies a number of important formal properties. \( \mathcal{D} \) forms, for example, a strictly ordered set under the partitive relation of \( M \) (every subset of \( M \) does). \( \mathcal{D} \) is also additive (every set of entities that can be said to be measurable individually can be said to be measurable collectively as well). In addition, \( \mathcal{D} \) is subtractive (if both an entity and part thereof can be said to be measurable, then so can the difference between them). It follows that every metric domain is a mereology in its own right under the partitive relation of the model. In fact, it is an \textit{atomless mereology} — i.e. a mereology whose elements are all atomless. Let us furthermore assume that this mereology is continuous, both in its divisibility and in its cardinality (or that every element of a metric domain can be said to divide continuously into entities which are all measurable).\(^4\)

In light of the preceding discussion, \( \mathcal{D} \) may be visualized as a circle from whose circumference a point \( A \) is missing.
The points of the circle may represent the elements of $\mathcal{D}$ (since we assumed $\mathcal{D}$ is continuous in its cardinality, there will be exactly as many elements in $\mathcal{D}$ as there are points in the circle). The missing point $A$ may stand for the least element (would there be one) of $\mathcal{D}$.5

Now let $\mathcal{M}$ be a model and let $\mathcal{D}$ be a metric domain of $\mathcal{M}$. We define the notion of isometry as follows.

(5) **Isometries**

A subset of $\mathcal{M}$ is an *isometry of $\mathcal{M}$ relative to $\mathcal{D}$* if every two elements of the subset can be said to measure the same time, length, width, height, area, volume, weight, force, energy, magnetism, temperature, or luminescence — and this depending on the terms of measurement involved in $\mathcal{D}$.

Thus, the set of liquid entities which measure one pint form an isometry — and so do the temporal entities that last two hours, the entities that are three inches long, the entities that occupy four city blocks, the entities that weigh five pounds, and so on.

To visualize an isometry, let the circle in (4) represent a metric domain $\mathcal{D}$. Let $B$ stand for the point which is diametrically opposed to $A$ in that circle. Suppose $B$ represents the set of entities, taken collectively, that are measurable in terms of one of the parameters mentioned in (3). It follows that $B$ cannot be missing from the circle (metric domains are additive). We construct the diameter $AB$ as shown in (6).
Notice now that the points of $AB$ are linearly ordered by their distance from $A$. This order may represent a maximal chain of $\mathcal{D}$ under the partitive relation of $\mathcal{M}$ (since $\mathcal{D}$ is continuously divisible, both the chain and the order will be equinumerous; moreover, both will have a last element but not a first). Consider next any chord — say $PQ$ — which is perpendicular to $AB$:

![Diagram](image)

$PQ$ represents the set of elements of $\mathcal{D}$ which have the same measure as that of the element represented by the point of intersection of $AB$ and $PQ$ (since $\mathcal{D}$ is continuously divisible, there will be as many points in the chord as entities with that measure). In other words, every chord of (6) which is perpendicular to $AB$ represents one and only one isometry of $\mathcal{M}$ relative to $\mathcal{D}$. Conversely, every isometry of $\mathcal{M}$ relative to $\mathcal{D}$ will be represented by one and only one of these chords.

The set of isometries relative to a domain will be exhaustive of the domain and exclusive of each other (every element of a metric domain must belong to one and only one isometry). In other words, every metric domain can be partitioned into its set of related isometries. Moreover, the least upper bound for every isometry will be the elements of the metric domain taken collectively — and hence corresponds to Point $B$ in its diagram. In other words, every isometry is a cover of this entity (though not necessarily a partition, as members of an isometry may well overlap). Some of these covers will therefore be finer than others (the set of liquid entities measuring one pint is a finer cover than the set of entities which measure one quart). As a matter of fact, the relation of relative fineness in a set of isometries is a strict total order.

We next define the operation of discrete addition of $\mathcal{M}$ as a function that assigns, to each nonempty set of pairwise disjoint elements of $\mathcal{M}$, the least upper bound for that set. Let us say now that a subset of $\mathcal{M}$ is discretely additive iff it contains the least upper bounds for all the nonempty sets of pairwise disjoint elements of that subset. Now, let $\mathcal{D}$ be a metric domain.
Isometric closures

The closure of an isometry \( M \) relative to \( D \) under the operation of discrete addition of \( M \) is the least inclusive subset of \( M \) that contains the isometry and is discretely additive.

Take for example the isometry formed by the set of liquid entities of a model which measure one pint. The closure of this isometry will be the set containing all the liquid entities of the model which measure an integral number of pints.

Notice that the closure of an isometry under discrete addition will include the isometry itself (every singleton subset of \( M \) will be pairwise disjoint and every element of \( M \) is the least upper bound for its own singleton). In addition, this closure will contain all the elements of \( M \) which measure an integral multiple of the measure of the elements in the isometry. What the closure will not include are any of the elements of \( M \) which measure a fractionary multiple of this measure. The reason for this should be clear: the closure contains nothing but least upper bounds for sets of pairwise disjoint entities which have all the same measure. As we shall see below, this exclusion of fractionary multiples will play an important role in the interpretation of measure nouns.

In light of this discussion, we may represent the closure of the isometry in (7) under discrete addition as the bold chords of (9).

Notice that the chords in question intersect \( AB \) at regular distances \( h, 2h, 3h, 4h \) from \( A \). This represents the fact that the elements of the closure of the isometry in (7) measure an integral multiple of the measure of the elements of that isometry.

Every isometric closure will be discretely additive. It will also be subtractive. Yet, it may or may not be a mereology in its own right (since discrete addition is undefined on sets of overlapping elements, it need not include least upper bounds for them, and hence fail to be additive).
We are finally in a position to present the central claim of this chapter. It is given in (10), where $\mathcal{M}$ continues to be a model and $\mathcal{D}$ a metric domain of $\mathcal{M}$.

(10) **Measure roots**

The reference of the root of any measure noun relative to $\mathcal{M}$ is the closure of an isometry of $\mathcal{M}$ relative to $\mathcal{D}$ under the operation of discrete addition of $\mathcal{M}$.

To visualize the reference of the root of the measure noun *pint* relative to $\mathcal{M}$, let us say that $\mathcal{D}$ is the metric domain consisting of all the liquid entities of $\mathcal{M}$ that can be said to be measurable in terms of volume. In other words, $\mathcal{D}$ is just the set of liquid entities of $\mathcal{M}$. The reference of the root of the measure noun *pint* relative to $\mathcal{M}$ can now be represented as in (9) if the bottom chord in that diagram happened to represent the set of liquid entities that measure one pint. The elements corresponding to the points along these chords have volumes of one pint, two pints, three pints, and four pints, respectively. Notice that there are no entities in $\mathcal{M}$ that measure five pints or more. This is because, taken collectively, the liquid entities of $\mathcal{M}$ measure less than five pints.

The root of a measure noun like *pint* occurs unmarked in numeral-noun compounds like *one-pint sample*, *two-pint solution*, *three-pint dose* — and so on. As one might expect, the interpretations of these compounds will be as indicated in (11).

(11)

\[
\begin{align*}
B & = \text{[four-pint]} \\
3b & = \text{[three-pint]} \\
2b & = \text{[two-pint]} \\
b & = \text{[one-pint]}
\end{align*}
\]

But measure roots do not always occur unmarked. In fact, they are often inflected for number — notably singular or plural. To account for the resulting forms, we will relativize the notion of atoms to subsets of a model. Let $\mathcal{M}$ be a model and let $\mathcal{N}$ be a subset of $\mathcal{M}$. We will say that the *atoms* of $\mathcal{N}$ are those elements of $\mathcal{N}$ that have no parts in $\mathcal{N}$. We will also say that $\mathcal{N}$ is *atomistic* iff every element of $\mathcal{N}$ is a least upper bound of a set of discrete atoms of $\mathcal{N}$. We now supplement (10) with (12).
(12) **Number inflection**
   
a. The reference of the singular inflection relative to $M$ is a function that assigns, to each atomistic subset of $M$, the set of atoms of that subset.

b. The reference of the plural inflection relative to $M$ is a function that assigns, to each atomistic subset of $M$, the set of nonatomic atoms of that subset.

It follows from (10), (12), and natural assumptions about the interpretation of complex expressions that singular measure nouns will refer to isometries, while plural measure nouns will refer to least upper bounds for sets of pairwise-disjoint isometric entities. Thus, if the reference of the root *pint* is as diagramed in (9), then the reference of the singular noun *pint* and the plural noun *pints* will be as diagramed in (13) and (14), respectively.

![Diagram](image)

It should be clear that our interpretation of singular measure nouns is Russellian in the sense that these nouns refer to sets of metrically equivalent entities of the model. It should also be clear that entirely analogous interpretations are available for measure nouns of time (*hour*, *minute*, *second*), distance (*inch*, *foot*, *yard*), area (*acre*, *hectare*, *city block*), volume (*quart*, *peck*, *bushel*), weight (*ounce*, *pound*, *ton*) — and so on for each metric domain of a model.

4. **Some apparent problems**

The proposal advanced in the preceding section has all the desired features. It will have the simplicity of early treatments of measure nouns, as it will assign
measure nouns first-order interpretations. Yet, it will avoid the pitfalls of these treatments. First, it will not require any new primitive entities in a model — let alone infinitely many abstract ones. Measure nouns just denote sets of independently motivated elements of the model. Second, it will not require the stipulation of a separate arithmetic of measures — let alone one which mimics the one on numbers; the arithmetic of numbers will extend, automatically, to measures. Third, it will not require a stipulated connection between measurable entities and the measures they have. Measurable entities are just elements of their measures — so the interpretation of one pint of beer, two quarts of wine, and three gallons of milk can be handled through simple intersection (see below). Fourth, it will not require singular measure nouns to refer to singleton subsets of a model. As a consequence of this, singular measure nouns are not exceptional proper names. Similarly they do not raise any problems about the identity of measures — so if we each had a pint last night, nothing suggests we had the same one; all that is required is that the entities we drank belong to the same isometry.

At the same time, the proposal advanced in the preceding section avoids all the problems the more recent treatments run into. First — and foremost — it will not require high-order interpretations of mind-numbing complexity. As indicated above, measure nominals may now refer to simple, first-order, entities. Second, it will not require ad hoc interpretations of nominals formed by a numeral and a measure noun. Thus, instead of the heterogeneous interpretations in (1), we would have the homogeneous ones in (15), where, as might be expected, cats names the set of (discrete) additions of two or more cats.6

(15) a. \( \lambda x [\text{cats}(x) \land \text{three}(x)] \)
    b. \( \lambda x [\text{pints}(x) \land \text{three}(x)] \)

Third, it will require that entities measuring \( 2N \) be twice as large as those measuring \( 1N \); as every entity measuring \( 2N \) will be the discrete addition of two disjoint entities measuring \( 1N \) each. Fourth, it will cohere with independently motivated interpretations of number inflections — namely the ones in (12). Fifth, it does not require implausible cognitive developments. In particular, it does not require the notion of real number as a logical prerequisite. In fact, it does not even require the notion of number. Sure, it presupposes the notion of isometry, but this notion requires judgements of quantity which are only relative (16a); not absolute (16b).

(16) a. This weighs as much as that.
    b. This weighs three pounds.
In addition, the proposal we have developed makes a number of correct predictions (when coupled with independently motivated proposals). Thus, if we assume standard proposals concerning the semantics of numerals in a mereological setting (Link 1987), our proposal entails that \([\text{pint}] = [\text{one pint}]\); that \([\text{pints}] = [\text{two pints}] \cup [\text{three pints}] \cup \ldots\); that \([n \text{ pints}]\) is the set of entities that measure \(n\) pints; that \([m \text{ pints}]\) is less than \([n \text{ pints}]\) whenever \(m\) is less than \(n\); that \([\text{one gallon}] = [\text{four quarts}] = [\text{eight pints}]\); that \([\text{two pints of milk}] = [\text{two pints}] \cap [\text{milk}]\); that \([\text{drank two pints of milk}]\) is the set of entities that drank an element of \([\text{two pints of milk}]\) — and so on.

But the interpretation of measure nouns advanced above might seem to run into problems of its own. After dismissing “sakes” and “behalves” as nonentities, Quine (1964:244) added that

Units of measure turn out somewhat like sakes and behalves. ‘Mile’, ‘minute’, ‘degree Fahrenheit’, and the like resemble ‘sake’ and ‘behalf’ in being defective nouns: they are normally used only in a limited selection of the usual term positions. Their defectiveness, though less extreme than that of ‘sake’ and ‘behalf’, is easily exposed in absurd interrogation. Are miles alike? If so, how can they count as many? And if they cannot, what of the two hundred between Boston and New York?

In other words, if the mile from Point \(X\) to Point \(Y\) is the same entity as the mile from Point \(Y\) to Point \(Z\), then how can there be two miles between Point \(X\) and Point \(Z\)? To avoid this conundrum, Quine proposes to banish units of measurement from the model. But there is no need to do this. While the conundrum may arise for analyses that propose measures as abstract Platonic entities, it will not arise for the interpretation advanced in this chapter. For, if \(X\), \(Y\), \(Z\) are three distinct points, then the mile from \(X\) to \(Y\) and the mile from \(Y\) to \(Z\) will be two distinct entities in the model. And if these two entities do not overlap, then there will be, as desired, two miles between \(X\) and \(Z\). In short, the conundrum is just another instance of the problem of the identity of measures — a problem which is altogether avoided by our proposal.

Furthermore, in his attempt to distinguish quantification over count nouns from quantification over mass nouns, Bunt (1985:137) made the following points.

Numerical quantification over a count noun and amount quantification over a mass noun have different implications for the existence of entities in the extension of the noun. Compare the sentences:

(8.21) There are five onions in the salad.
(8.22) There is five grams of onion in the salad.
Sentence (8.21) claims the existence of five objects in the extension of ‘onions in the salad’; (8.22), by contrast, has no implications for the existence of particular onion-parts. It would of course be wrong to say that five onion-parts, each measuring one gram, are claimed to be in the extension of ‘onion in the salad’. If (8.22) is true, then there are infinitely many onion-parts in the salad that weigh one gram, since the onion [in the salad] can be divided into such [one-gram] parts in infinitely many ways.

We agree with Bunt that, if there is more than one gram of onion in the salad, then there will be more than five ways to pick one gram of onion from the salad. In fact, if the onion in the salad is infinitely divisible, then there will likewise be infinitely many ways to pick one gram of onion from the salad. To each of these ways there will correspond a distinct gram of onion, and each one of these grams will make it into the denotation of the singular noun gram. Interestingly, however, as far as our account is concerned, the infinitely many sums of these “grams” would not make it to the denotation of the plural noun grams. Consequently, (8.22) does not entail (17).

(17) There are more than five grams of onion in the salad.

The reason for this lies with our decision to use pairwise-disjointness in the interpretation of plurality. For, consider once again (10) and (12b). Taken together, they interpret plural nouns as additions of pairwise-disjoint entities. Since (8.22) contains the plural noun grams, all (8.22) asserts is that there are five pairwise-disjoint grams of onion in the salad (and remains silent about how many overlapping grams of onion there are therein). As a matter of fact, if (8.22) asserts that there are exactly five pairwise-disjoint grams of onion in the salad, then it would entail that (17) is downright false.

5. Unnatural measures

Another apparent problem with our proposal deals with marginally acceptable null measures like zero pints. Notice first that this measure can only be true of entities that are measurable in pints (i.e. liquids).8

(18) This paper is zero pints wide.

Notice also that it cannot be true of any entity whose measure is greater than zero.
(19) A: Did you have zero pints last night?
   B: ? Yes, I only had half a pint.

This means that null measures like zero pints should be assigned the set of liquid entities which are measurable in terms of volume and measure zero pints. In other words, they refer to an isometry relative to liquid measure. But there are no entities in a model which measure zero pints, as mereologies cannot contain null elements. This, by the way, is as should be desired:

(20) a. ?I drank a certain zero pints last night.
    b. ?The zero pints that I drank gave me a headache.
    c. ?Drinking those zero pints was a bad mistake.

It follows that a null measure like zero pints must refer to the empty isometry relative to (liquid) volume. This is the denotation diagramed in (21) below. Since Point A is missing from the diagram, the boldfaced portion therein represents an empty set.

(21)

![Diagram with Point A and the label "zero pints"]

But this degenerate isometry is, exactly, what our proposal will assign it, as no reference of any measure root will contain an entity with null measure. It follows that null measure phrases will invariably refer to the empty set — which accounts for their marginal acceptability.

Consider next nonintegral measures. Notice that the reference of a measure nominal can only be a set of entities that measure an integral multiple of a particular unit. This means that if the nominals in (22) are to be interpreted as the set of elements of [pint] or [pints] which measure one point five pints, then these nominals would be necessarily assigned the empty set, and will therefore be incorrectly predicted to be meaningless.

(22) a. one point five pints
    b. one and five tenths of a pint
c. one and a half pints
d. one and one half pints
e. one pint and a half (of a pint)
f. one pint and one half (of a pint)

Notice that we cannot simply revise the interpretation of measure roots and assign them entire metric domains. This would assign mass reference to measure nouns. But this would prevent the meaningful inflection of measure roots for number, as this interpretation is defined only for count roots. In fact, the proposed revision contradicts all the evidence that measure nouns are countable — namely that they can be counted (23a), pluralized (23b), ordered (23c), specified by a(n) (23d), quantified by many (23e), compared by fewer (23f) pronominalized with one (23g) — and so on.

\[(23)\]
\[
a.\text{ one pint, two pints, three pints, \ldots} \\
b.\text{ pints, quarts, gallons, \ldots} \\
c.\text{ the first pint, the second pint, the third pint, \ldots} \\
d.\text{ a pint, a quart, a gallon} \\
e.\text{ many pints} \\
f.\text{ fewer pints} \\
g.\text{ the pint you had and the one I had}
\]

It moreover confounds the reference of all measure nouns that can be interpreted against the same metric domain — so pint, quart, gallon would all turn out to be synonyms!

So we seem to have reached an impasse. On the one hand, we need to interpret the expressions in (22) as measures in pints. On the other hand, we cannot consider them pints. Fortunately, this impasse can be negotiated. Notice that there is, for every integral measure noun — say pint — an infinite series of rational measure nominals — say half of a pint, third of a pint, fourth (or quarter) of a pint, and so on. In fact, some of these nominals have even been lexicalized, as in halfstep, semitone, demitasse, quarter hour, demisemiquaver. Notice also that all these expressions can be interpreted by our proposals. For, suppose we were to declare that rational measure nominals are indeed measure nominals. It now follows from (10) that the reference of the root of a rational measure noun is the closure of an isometry under discrete addition. The isometry needed for the root of a rational measure noun \(nth\) of \(m\) is simply the set of entities which measure an \(nth\) of an \(m\). Thus, if the reference of the root pint is as diagramed in (9), then the reference of the root
half of a pint is as diagramed in (24), and that of one half of a pint as in (25).

Let us regard next the conjunctions in (22) as a type-shifted form of discrete addition. To be more precise, let us interpret the conjunction of two measure phrases \( M_1 \) and \( M_2 \) as in (26).

\[
[M_1 \text{ and } M_2] = \{m_1 + m_2 : m_1 \in [M_1] \land m_2 \in [M_2]\}
\]

It now follows that the unreduced measure phrases in (22e) and (22f) refer to the set of discrete sums \( m_1 + m_2 \) such that \( m_1 \) belongs to the reference of one pint (which is an integral measure phrase) and \( m_2 \) belongs to the reference of one half of a pint (which is a fractionary measure phrase). Since \( m_1 + m_2 \) is the result of discrete addition, \( m_1 \) and \( m_2 \) will be disjoint. In other words, the unreduced expressions in (22e) and (22f) will refer to the set of entities that indeed measure one and a half pints. Thus, if the reference of pint is as diagramed in (9) then that of the unreduced forms in (22e) and (22f) will be diagramed as in (27).

The reduced forms of (22e) and (22f) would now follow from the semantics of ellipsis — so no more needs to be said about them. As to the other forms of
(22), we will assume that they arise from (22e) and (22f) through a series of meaning postulates that reflect the arithmetical competence involved in factorization (22c, d), decimal expansion (22b), and decimal notation (22a). So rational measures like the ones in (22) may, after all, be interpreted as measures in pints without considering them pints!

Since every rational number is a sum of an integer and a proper fraction, the interpretation of the measure phrases in (22) can be generalized to cover all rational measures. But what about irrational measure phrases like \( \pi \) pints, \( e \) pints, \( \phi \) pints, 2 pints — and so on? Since irrational numbers are not sums of an integer and a proper fraction, the interpretation of rational measures just developed does not extend to irrational ones. But is this a problem? As I see them, irrational measure phrases should be considered arcane technical expressions which are not part of ordinary language. Yet, these mathematical expressions are still interpretable by the proposals we have advanced — at least if we allow infinitely long expressions (Langendoen and Postal 1984). For if we do, then we can generalize the interpretation in (26) to (26\(^1\))\(^{9}\), where the ellipsis stands for a countable sequence of terms.

\[
(26') \quad [M_1, \text{and } M_2, \text{and } \ldots ] = \{m_1 + m_2 + \ldots : m_i \in [M_i] \land m_j \in [M_j] \land \ldots \}
\]

Notice that discrete addition is defined for an infinite set of discrete \( m_i \), as we have not restricted this operation to finite sets. Notice also that these sums will be contained in a metric domain, as these domains are additive and continuously divisible.

To interpret an irrational measure phrase like \( \pi \) pints all we need to do is reduce it to a suitable conjunction of integral and fractional measures. This can be done through a meaning postulate that reflects our arithmetical competence concerning. This would be an infinitely long meaning postulate along the lines of (28).\(^9\)

\[
(28) \quad [\pi \text{pints}] = [\text{three pints and one tenth of a pint and four hundredths of a pint and one thousandth of a pint and } \ldots ]
\]

So if irrational measures must have an interpretation, then the proposal advanced in this chapter can support one — provided grammars can encompass infinitely long expressions. All that would be involved would be interpretation rule (26\(^')\) and a series of meaning postulates which describe our arithmetical competence. It follows that our proposal can support interpreta-
tions for all measures involving positive real numbers, regardless of whether they are natural or not.

6. Conclusion

In this chapter we have proposed a simple, first-order, Russellian interpretation of measures. This interpretation eschews new primitive entities, parallel arithmetics, stipulated measure functions, exceptional proper names, ad hoc interpretations, measures incomensurable to sizes, incoherent number inflections, and implausible cognitive developments. The proposed interpretation makes, in addition, a number of correct predictions, avoids problems concerning the individuation of measures, and can be extended to cover all positive measures — albeit via separate meaning postulates. But the proposal also raises some new questions. For, it is generally believed that the reference of a count noun relative to a model is the additive closure of a set of atoms of a model. But, as shown in (23) above, measure nouns are count nouns. They should therefore refer to the closure of a set of atoms of the model. Yet, they plainly do not. The roots of measure nouns like pint, quart, gallon have been argued to refer to an additive closure of a set of continuously divisible liquid entities — namely those which measure a pint, a quart, or a gallon. In fact, these set of continuously divisible entities are not even discrete (two liquid entities which measure one pint each may well overlap). The question thus arises as to what the correct interpretation of count nouns should be (and how they differ from mass nouns). This is a question we must leave for further research.

Notes

* I wish to thank Cleo Condoravdi, Peter Lasersohn, Jan Tore Lønning, and Bart Geurts for comments to earlier versions of this chapter.

1. This observation remains valid even if we regard numerals as functional rather than intersective modifiers and interpret (1a) as \( \lambda x \{ \text{three(cats)}(x) \} \).

2. It is not clear that this problem can be solved. All the proposed measure function can do is preserve relative size by preserving the partitive relation (see below) on the entities in its domain. To preserve absolute size, a measure thereof is called for which is independent of the measure function in question.
3. Models for the interpretation of natural language should not reflect what is, but only what can be said to be. As Link (1983:303) put it, “our guide in ontological matters has to be language itself”.

4. To be more precise, let us assume the mereology in question is isomorphic to the mereology of solids in Tarski (1956b). See Ojeda (1994).

5. If \( \mathcal{D} \) had a least element, this element would be an atom of \( \mathcal{D} \). But this is impossible, as \( \mathcal{D} \) is atomless. See n. 4, bearing in mind that every solid has other solids as parts.

6. Or \( \lambda x[\text{three}(\text{cats})(x)] \) and \( \lambda x[\text{three}(\text{pints})(x)] \) if we were to interpret numerals functionally rather than intersectively. See Footnote 1 above.

7. And to analyze away “mixed numerals” like \textit{two miles} (Higginbotham 1995:414)

8. I assume \textit{pint} is lexically required to refer to a set of liquid entities (cf. ?This paper is \textit{two pints wide}).

9. Or rather a meaning postulate along the lines of the one in the text but which has a variable over measure nouns instead of \textit{pint(s)}. Alternatively, we could settle for arbitrarily precise approximations to interpretations of irrational measure phrases. If we did, then finitary grammars would achieve all-but-perfect interpretations of irrational measures (finite sums of rational numbers approximate irrational numbers with all-but-perfect precision).

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Barker, C. 1992. “Group terms in English: representing groups as atoms”. 


CHAPTER 11

Generalizing over quantitative and qualitative constructions*

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1. Introduction

Quantitative (1a) and qualitative (1b) constructions share a syntactic structure of the type (Det) N1 de NP2:

(1) (Det) N1 de NP2

a. Beaucoup de livres
   a-lot of books
   Quantitative

b. Ton phénomène de fille
   your phenomenon of daughter
   Qualitative

The syntax of these constructions has received a lot of attention in recent years (den Dikken 1995, 1998; Español-Echevarría 1996; Hulk and Tellier 1999, 2000; Doetjes 1997). However, very little work has concentrated on the relation between both constructions. Milner (1978) had already observed that quantitative and qualitative constructions share the same syntactic structure (see also Ruwet 1982). However, the X’ framework of the late seventies did not allow a fully explicit implementation of this claim: the identical syntactic structure proposed could not account for various properties of quantitative and qualitative constructions. Interestingly, most research since the late seventies has focused either on quantitative or on qualitative constructions, without taking their common properties into consideration. We will argue that the parallelism between qualitative and quantitative constructions is even stronger than previously suspected.
2. The generalization

2.1 Two agreement patterns: ‘pure degree’ vs comparison

In both quantitative and qualitative constructions, agreement can be triggered by the element preceding de or by the element following de.

(2) Quantitative
   a. Beaucoup de livres sont/est tombé(s).
      a lot of books are/is fallen
   b. Une montagne de livres sont/est tombée
      a mountain of books are/is fallen

(3) Qualitative (cf. Hulk and Tellier 1999)
   a. Ton phénomène de fille est
      your phenomenon.masc of daughter.fem is
      distrait*(e).
      absent-minded.fem/*masc
   b. Ce bijou d’église romane a été reconstruit(*e).
      that jewel.masc of roman church.fem was rebuilt.masc/*fem

For quantitative constructions, this difference in agreement correlates with the interpretive nature of the quantitative element. In (2a), beaucoup ‘a lot’ has completely lost its original lexical meaning and indicates quantity of high degree. In (2b), by contrast, montagne ‘a mountain’ still retains part of its lexical meaning in that its relation with the quantified element can be paraphrased in terms of comparison. The interpretive difference between (2a) and (2b) can be brought out by a contrast in terms of paraphrasability:

   (4) Comparative paraphrases of quantity
      a. The quantity of books is such that it resembles a mountain.
      b. *The quantity of books is such that it resembles a lot.

This difference between beaucoup ‘a lot’ and une montagne ‘a mountain’ correlates to some extent with the contexts in which they can be used: The use of montagne ‘mountain’ as a quantitative expression is much more selective with respect to its context than beaucoup ‘a lot’ is.

(5) a. Il y a une montagne d’eau dans la rue.
    there is a mountain of water in the street
Generalizing over quantitative and qualitative constructions

b. Une véritable montagne d'eau a déferlé sur les pêcheurs.
   'A true mountain of water bore down on the fishermen.'

These examples show that the comparative interpretation of *montagne* as a great quantity has to be supported by the entire context, precisely because it still retains aspects of its original meaning. By contrast, the quantifier *beaucoup* has completely lost its original meaning which is 'a good strike'. The contextual support required for *montagne* 'mountain' is not necessary for *beaucoup* 'much', as the latter is just an expression of pure degree.

Let us now turn our attention to qualitative constructions. Hulk and Tellier (1997) observe that there is a difference in agreement between (3a) and (3b). Closer scrutiny of the data reveals that we are in fact dealing with a contrast that is strikingly similar to the one displayed in (2ab). In (3a), *ton phénomène* has completely lost its original lexical meaning: it only contributes a strongly positive or negative evaluation of *fille* 'daughter', and as such expresses high/low degree of quality. In (3b), *bijou* still retains part of its lexical meaning. Once again, the difference between what we term the 'pure degree' reading of *phénomène* 'phenomenon' in (3a) and the 'comparative' reading of *bijou* 'jewel' in (3b) can be captured by a difference in paraphrasability:

(6)

**Comparative paraphrases of quality**

a. The quality of the church is such that it resembles a jewel.

b. *The quality of your daughter is such that she resembles a phenomenon.*

Interestingly, both in 'comparatively paraphrasable' (2b) and (3b), the quantifying or qualifying noun which retains some of its lexical meaning determines agreement. In (2a) and (3a), on the other hand, the non-paraphrasable 'pure degree' expressions of quantity or quality correlate with agreement of the NP following *de*.

The descriptive generalization covering agreement in both quantitative and qualitative constructions can be formulated as follows:

**The Quantitative/qualitative Agreement Principle (QAP)**

1. In Quantitative/qualitative constructions, the quantified/qualified noun determines agreement if the quantifier/qualifier has a 'pure degree' interpretation of qua(nt/l)ity.

2. The quantifier/qualifier determines agreement iff the relation between the quantified/qualified noun and the quantifier/qualifier is para-
phrasable in terms of a comparison in which the quantifier/qualifier keeps its lexical interpretation.

In the remainder of this chapter, it will be argued that the QAP can be derived from the syntactic structure of the DP.

2.2 Variation in agreement

It has been observed by Hulk and Tellier (1999) that agreement judgements are not always clearcut. In (8), taken from Hulk and Tellier (1999), the qualifier *bijou* is compatible with both types of agreement:

(8) Qualification

a. *Ce bijou d’église romane a été reconstruit(e).*
   that jewel.masc of roman church.fem was rebuilt.masc/fem
b. *Ce bijou de Marie est absolument exquis(e).*
   that jewel.masc of Marie.fem is absolutely marvelous.fem/masc

Interestingly, agreement varies with the degree of comparison that is possible between qualifier and the qualified NP. While the church in (8a) can be said to be like a jewel, it is hard to maintain in the same way that *Marie* is like a jewel without losing the lexical interpretation of *jewel*. In (8b), the use of *bijou* ‘jewel’ thus only involves a highly positive evaluation of *Marie*. In our analysis, then, agreement with *Marie* in (8b) is not due to animacy, as for Hulk and Tellier (1999), but simply to the fact that a qualitative comparison between animate and inanimate entities is much harder to interpret as a true comparison, favoring a ‘pure degree’ reading. These examples show that in a context favoring the comparison reading, the ‘pure degree’ reading is excluded, while a ‘pure degree’ reading can be obtained in a context where the comparison reading is excluded.

Variation also exists in the quantificational domain. Consider for instance (9):

(9) Quantification

a. Une foule d’étudiants est/ont dans le couloir.
   a crowd of students is/are in the hallway
b. Une foule d’étudiants se sont/s’est succédé.
   a crowd of students have.pl/*sg come one after the other
c. Une foule de problèmes se sont/*s’est produit*(s).
   a crowd of problems have.pt/*sg occurred
   ‘A host of problems have occurred.’

In (9a), the context forces a reading in which the students form a crowd. In this context agreement with the quantifier is obligatory. In the other two examples, the lexical interpretation of foule ‘crowd’ is excluded by the context. In (9b), the distributive nature of the predicate forces a distributive reading on the subject which is incompatible with the ‘mass’ interpretation of crowd, thus forcing a reading of crowd as a ‘pure degree’ quantifier. In (9c), the noun problème ‘problem’ is incompatible with the notion of crowd, as the lexical meaning of crowd involves animacy. As a result, crowd can only receive the ‘pure degree’ reading in this context. In the remainder of this chapter, we will try to show that cases exhibiting variation in fact correspond to two different syntactic structures. We will argue that cases where agreement is determined by the qualifier or quantifier possess a syntactic structure that is radically different from the syntactic structure underlying cases where agreement is with the qualified or quantified noun.

3. Deriving ‘comparative’ and ‘pure degree’ qua(nt/l)ification

3.1 The structure of det N1 de NP2

We will assume that the (derived) syntactic structure of Det N1 de NP2 is as follows, with the nature of XP/YP to be determined later:

(10) \[[XP \[DP Det N1 \] de \[YP NP2 \]]\]
    \[une montagne de livres\]
    \[ton phénomène de fille\]

This means that both the DPs preceding and following de are constituents (See also the appendix). For qualitative constructions, this structure goes against that argued for by den Dikken (1995, 1998). Following Kayne (1994), den Dikken (1995, 1998) proposes a structure for qualitative constructions in which Det is generated in a DP outside of a CP headed by de as in (11). In this structure, qualitative constructions are uniformly derived by predicate inversion, with movement of NP1 to Spec,FP, and incorporation of the head of XP into de/of.
However, Milner (1978) offers a good argument in favor of the idea that the string preceding *de* forms a constituent. Milner (1978) presents contrasts of the following type:

(12) *Pure degree* qualification
   a. Elle avait acheté quelques merveilles de robes et de souliers rouges qui lui allaient à ravir.
      'She had bought some marvels of dresses and (of) red shoes which fit her like a glove.'
   b. *Elle avait acheté quelques merveilles de robes et splendeurs de souliers rouges qui lui allaient à ravir.
      'She had bought some marvels of dresses and splendors of red shoes which fit her like a glove.'

(13) Comparative qualification
   a. Nous avons visité plusieurs bijoux d’abbayes médiévales et d’églises romanes.
      'We have visited several jewels of medieval abbeys and of roman churches.'
   b. *Nous avons visité plusieurs bijoux d’abbayes médiévales et chefs-d’œuvre d’églises romanes.
      'We have visited several jewels of medieval abbeys and masterpieces of roman churches.'

Milner (1978) observes that *Det N1* can be followed by a coordinated structure of *de NP2*, but that *Det* alone cannot be followed by a coordinated structure of qualified *N1 de NP2*, as attested by (12b-13b). We observe that the same is true for quantitative constructions:

(14) *Pure degree* quantification
   a. Une foule de fautes et d’erreurs stylistiques.
      'A large amount of mistakes and stylistic errors.'
   b. *Une foule de fautes et masse d’erreurs stylistiques.
      'A large amount of mistakes and loads of stylistic errors.'
Comparative quantification

a. Des montagnes de livres et de papiers.
   ‘Mountains of books and of papers’

b. *Des montagnes de livres et tas de papiers.
   ‘Mountains of books and heaps of paper.’

If one were to assume with den Dikken (1995/1998) that the determiner of the quantifier/qualifier is in a projection of its own outside of FP, the question arises as to why this determiner cannot have coordinated FPs in its complement. The contrast observed by Milner (1978) strongly suggests that the material preceding *de forms a constituent in the classical sense.

3.2 ‘Comparatives’ vs. ‘pure degree’: a different configuration

We argue that quantitative and qualitative constructions share the same syntactic configurations. The ‘comparative’ constructions (viz. (2b) and (3b)) are analyzed along the lines of the ‘predicate inversion’ analyses proposed by Kayne (1994) among others for possessive and qualitative constructions. In (16) and (17), the nouns *voiture and *bijou are extracted from a clausal projection introduced by *de:

(16) la [CP [NP voiture], de [IP [NP Jean] I° [e]], . . .] (Kayne 1994)
    the car of Jean

(17) ce [CP [NP bijou], de [IP [NP église romane] I° [e]], . . .]
    that jewel of roman church

This allows Kayne (1994) to analyse these DPs in the same way as relative clauses:

(18) the [CP [NP picture] that [IP Bill saw [e]]] (Kayne 1994)

Relative clauses in (18) and the DP constructions in (16)–(17) share the presence of a sentential structure including a C° (Kayne’s D°/P°) element. C° *de can be viewed as the head of a tenseless CP.

We want to integrate Kayne’s insight on the relation between DP *de DP constructions and relative clauses. We assume a structure similar to that of (17) for all ‘comparative’ constructions, with the difference that the determiner is generated as part of the quantifier/qualifier. Predicative inversion can be taken as a syntactic reflex of the paraphrasability of these constructions in terms of comparison. The idea here is that the semantic interpretation of these constructions can be read off directly from their syntactic structure: C° *de
contains an operator that is underspecified for quality or quantity, and the predicative properties of the small clause are responsible for the relation of comparison between the qua(nt/l)ifying and the quantified/qualified noun. Predicate inversion thus creates tenseless relatives.

(19) ‘Comparative’ quantification/qualification (cf. 4b)

a. \[ [CP [DP ce bijou] de [SC [NP église romane] t_{ce bijou}]] \]
   that jewel of roman church

b. \[ [CP [DP une montagne] de [SC [NP livres] t_{une montagne}]] \]
   a mountain of books

In all of these cases, the NP which has been moved into the Specifier of C0 of that determines the agreement properties of the DP as a whole. It can be assumed that C0 de carries agreement features. Its Spec–Head relation with the qualifier ensures that the entire CP carries the features of the qualifier. As a result, the quantifying/qualifying noun in comparative qua(nt/l)ification structures determines agreement. We thus derive the generalization in (4b) from shared properties of the ‘comparative’ construction (3b)–(5b) and possessive/relative constructions.2

By contrast, we claim that the ‘pure degree’ constructions (viz. (2a) and (3a)) do not involve ‘predicate inversion’. This lack of inversion will be shown to directly correlate with lack of agreement with the quantifying/qualifying noun: all and only ‘inverted’ quantifier/qualifiers trigger agreement. We assume that ‘pure degree’ constructions have a syntactic structure containing an (adverbial) functional projection expressing Evaluation in the sense of Cinque (1999). The quantifying/qualifying noun is base-generated in Spec, EvalP. It assumes the interpretation of ‘pure degree’ associated with Eval°, losing the rest of its lexical meaning. Importantly, the EvalP modifies a DP in this case, not a CP as in comparative constructions.

(20) ‘Pure degree’ quantification/qualification (cf. 4a)

a. \[ [EvalP ce \text{ phénomène Eval° [DP ___ de [NP fille]]}] \]
   that phenomenon of girl

b. \[ [EvalP beaucoup Eval° [DP ___ de [NP livres]]] \]
   a lot of books

This structure for ‘pure degree’ quantification/qualification allows us to derive their syntactic and semantic properties. Syntactically, the agreement properties of the DP as a whole are determined by the quantified/qualified noun, since the quantifier/qualifier occupies an adverbial position. This means that the
head of the adverbial projection will agree with the quantified/qualified noun in its complement. As a result, the entire structure will bear the features of the quantified/qualified noun, which thus determines agreement. This derives the generalization in (4a). From a semantic point of view, the structure in (20) must be read as an evaluation in terms of high degree over the qualified noun. In the quantitative domain, 'pure degree' is translated as high quantity, while in the qualitative domain 'pure degree' is interpreted as a strongly positive or negative evaluation. The absence of a syntactic predicative relation between the quantifier/qualifier and the quantified/qualified noun accounts for the absence of a comparative relation between them. This neatly accounts for the fact that the 'pure degree' constructions do not allow for a comparative paraphrase. One particularly clear case in point involves a structure such as (21), for which Hulk and Tellier (1999) observed that the qualifier cannot function as the predicate of the qualified noun. The same is true in the quantificational domain, as shown in (22).

(21) a. Cette sapristi de bonne femme
tat fem good grief of woman fem
b. *Cette bonne femme est (une) sapristi
tat woman is (a) good grief

(22) a. Beaucoup de livres/sable
atlots of books/sand
b. *Les livres sont beaucoup/*le sable est beaucoup
the books are many/ the sand is much

In our account, the contrasts in (21) and (22) can be taken as proof that (21a–22a) is not derived via predicate inversion from an underlying structure involving a form of predication as in (21b–22b). This analysis entails that two entirely different underlying structures are assigned to the cases exhibiting agreement variation in (23a) and (24a).

(23) a. Une foule d’étudiants est/*sont dans le couloir. (cf. (11a))`A crowd of students is/*are in the hallway.’
b. Les étudiants constituent une foule.
‘The students constitute a crowd.’

(24) a. Une foule de problèmes se sont/*s’est produit*(s). (cf. 11c)
   a crowd of problems have.pl/*sg occurred
   ‘A host of problems have occurred’
b. *Les problèmes constituent une foule.
   'The problems constitute a crowd.'

In (23a), *foule* ‘crowd’ is in a comparative construction and retains its lexical meaning, as attested by (23b). The underlying structure of (23a) therefore is that of a relative clause, and involves predicate inversion. In (24a), *foule* ‘crowd’ is in a construction in which its original meaning is lost, as indicated by (24b). Only expressing ‘pure degree’, *foule* ‘crowd’ is hosted by the Specifier of an an adverbal EvalP which modifies a DP.

Although both structures share a Det N1 de NP2 structure on the surface, their underlying structure is nevertheless radically different: *de* is a relative clause marker in the comparative construction, but it is a D° in the ‘pure degree’ construction. The element *de* also functions in other contexts as a complementizer and a determiner, always with an in(de)finite interpretation. In this, *de* can be considered the indefinite counterpart of English *that*, which functions both as a complementizer of finite clauses and a definite determiner.

(25) a. Jean essaie de venir C infinite
    'Jean tries to come.'
  b. ce bijou d’église romane C/ relative clause infinite
    'that jewel of a roman church'
  c. Jean n’a pas lu de livres D indefinite
    'Jean hasn’t read any books'
  d. beaucoup de livres D indefinite
    ‘a lot of books’

(26) a. John thinks that Mary comes C finite
    b. the book that he has read C/ relative clause finite
    c. that book demonstrative D definite

In the comparative construction then, *de* can be viewed as the complementizer of a nonfinite relative clause. In the ‘pure degree’ construction, *de* is an indefinite D° selected by EvalP. We propose that the indefinite D° indicates that the identity and quantity of the qualified noun are not specified. The modification of the indefinite NP by EvalP, which provides quantification/qualification, ‘fills in’ the identity or quantity of the qualified noun. The idea that *de* introduces an unidentified or unquantified NP which is licensed by adverbal modifier is hardly controversial: the same mechanism applies in the verbal domain, where quantificational adverbs license indefinite DPs (cf.
Doetjes 1997). We therefore analyze the licensing of the indefinite DPs in (27) and (28) in exactly the same way.

(27) Adverb outside of DP
   a. Pierre n’a pas lu *(de) livres.
   Pierre neg has not read of books
   ‘Pierre hasn’t read any books.’
   b. Marie a beaucoup lu *(de) livres.
   Marie has a-lot read of books
   ‘Marie read a lot of books.’

(28) Adverb in EvalP
   a. énormément *(de) livres/une foule *(de) problèmes
      enormously of books/a crowd of problems
      ‘a huge amount of books/a host of problems.’
   b. ce phénomène *(de) Jeanne
      that phenomenon of Jeanne

Summarizing, in the analysis advocated here, the syntactic structures for comparative constructions and ‘pure degree’ constructions are substantially different: comparative constructions involve a relative clause structure involving CP, while ‘pure degree’ constructions involve a DP structure. The properties of both comparative and ‘pure degree’ constructions as they have been analyzed here can be summarized as in Table 1.

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Properties</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Comparative</td>
<td>– predicate inversion</td>
<td>Quantitative</td>
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<tr>
<td></td>
<td>– agreement with the quantifier/qualifier</td>
<td>Une montagne de livres</td>
</tr>
<tr>
<td></td>
<td>– share structural and agreement properties with relative clauses</td>
<td>Qualitative</td>
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<tr>
<td></td>
<td></td>
<td>Ce bijou d’église romane</td>
</tr>
<tr>
<td>Evaluative/Pure degree</td>
<td>– no predicate inversion</td>
<td>Quantitative</td>
</tr>
<tr>
<td></td>
<td>– agreement with the quantified/qualified noun</td>
<td>Beaucoup de livres</td>
</tr>
<tr>
<td></td>
<td>– quantifier/qualifier base generated in Spec, EvalP</td>
<td>Qualitative</td>
</tr>
<tr>
<td></td>
<td>– shares properties with adverbial projections</td>
<td>Ton phénomène de fille</td>
</tr>
</tbody>
</table>
4. Internal vs external agreement

In the recent literature much attention has been devoted to so called mismatches between internal and external agreement in qualifier constructions (cf. Hulk and Tellier 1999 and 2000). By internal agreement we mean agreement within the nominal domain, and by external agreement agreement outside of the complex DP with a verb or adjective. So far we have only been concerned with external agreement. One can speak of a mismatch in cases where the internal agreement showing up on the determiner differs from external agreement.

In this section, we will show that the approach adopted here can predict where mismatches occur. As it turns out there are some interesting differences between quantifier and qualifier constructions, which we will account for by making use of independent properties of the quantifier/qualifiers in both constructions.

Let us then evaluate the predictions of the analysis presented here for comparative and ‘pure degree’ constructions. The external agreement of comparative constructions is triggered by the quantifying/qualifying noun, as predicted by the relative clause structure. As far as internal agreement is concerned, the determiner of the quantifying/qualifying noun agrees with this noun, since both are moved as a single constituent from the predicative position.

\[(29)\] Qualification

a. Ce bijou d’église romane a été reconstruit(*e)
determiner masc jewel masc of roman church fem was rebuilt masc fem
b. Ce chef-d’œuvre de fresque, Michelange l’a peint(*e) dans des conditions difficiles
determiner masc masterpiece fem of fresco fem, M. it painted masc fem under difficult circumstances

\[(30)\] Quantification

a. Une foule d’étudiants est/*sont dans le couloir.
   ‘A crowd of students is/*are in the hallway.’
b. Une montagne de livres *sont/est tombée.
   a mountain of books are/ is fallen

As the examples show, there is never a mismatch between internal and external agreement in the comparison construction, as predicted.
In the pure degree cases, external agreement is determined by the quantified/qualified noun. With respect to internal agreement, one would expect that agreement on the determiner is triggered by the quantifying/qualifying noun with which it forms a constituent. As a result, there is a 'mismatch' between internal and external agreement. The determiner agrees with the quantifier/qualifier, while external agreement is triggered by NP2, the quantified/qualified noun:

(31) Qualification
   a. Cette saloperie de vent est ennuyeux.
      That.fem dirt.fem of wind.masc is annoying.masc
   b. Ton phénomène de fille est distraite.
      your.masc phenomenon.masc of daughter.fem is absent-minded.fem

(32) Quantification
   a. Une foule de problèmes se sont/*s’est produit*(s).
      a crowd of problems have.pl/*sg occurred
      'A host of problems have occurred.'
   b. Un tas de fautes ont été corrigées.
      a heap of mistakes were/*was corrected
      'A lot of mistakes were corrected.'

It has been shown, however, that in some cases the agreement on the determiner is triggered by NP2, the qualified noun (Hœybye 1944:278; Imbs 1951; Milner 1978; Hulk and Tellier 1999, 2000):

(33) Internal agreement of the determiner with the qualified noun
   a. Cette grande diable de fille
      this.fem tall.fem devil.masc of girl.fem
      'This tall devil of a girl.'
      those.pl holy.sg name.sg of Prussians.pl have.pl attacked Paris
      'Those damned Prussians have attacked Paris.'

(34) Choice of internal agreement
   a. Ce/cette putain de policier est
      that.masc/fem whore.fem of policeman.masc is
      intelligent(*e).
      intelligent.masc/*fem
      'That damned policeman.'
As Hulk and Tellier (1999) observe, the determiner can be either masculine or feminine in these cases because the noun can either be used as an invective/swearword or as a normal noun. Following in essence Milner (1978), they make the assumption that invectives and swearwords are nouns without phi-features, and as such cannot determine agreement. As a result, invectives/swearwords cannot determine the gender and number features of the determiners and adjectives preceding them.

In the analysis advocated here, we will also make use of the idea that invectives/swearwords are nouns without phi-features. Implementing this insight into our analysis, we have to recall that the gender and number features of Eval\(^\circ\) are set by the features of the qualified noun. The qualifying noun and Eval\(^\circ\) are in a Spec–Head relation. This Spec–Head relation does not result in agreement in cases where the qualifying noun is fully specified for gender and number: the features of Eval\(^\circ\) are already determined by the qualified noun, and the qualifying noun determines the features in its extended projection. As Spec–Head agreement only applies when it needs to, i.e. when underspecified features are present, no Spec–Head agreement occurs in this case. This situation can be represented as follows:

\[(35) \quad [\text{Eval}^\circ \ [\text{Cette canaille}] \ \text{Eval}^p \ [\text{DP __ de [NP gamin]]}]] \]

\[\text{[D fem, sg] \ [N fem, sg] \ [Ev masc, sg] \ [N masc, sg]} \]

that scoundrel of boy

However, if a featureless invective NP is inserted in the qualifying DP, the D heading this DP remains underspecified, since its gender cannot be determined by the featureless invective. However, the underspecified determiner is contained in a DP that is in a Spec–Head relation with Eval\(^\circ\), which carries the gender and number features of the qualified noun. In this case, then, due to Spec–Head agreement of the featureless DP with Eval\(^\circ\), the gender and number features of the determiner of the featureless qualifier will be determined by Eval\(^\circ\), and thus indirectly by the qualified noun. This situation can be represented as follows:

\[(36) \quad [\text{Eval}^\circ \ [\text{Ce canaille}] \ \text{Eval}^p \ [\text{DP __ de [NP gamin]]}]] \]

\[\text{[D masc, sg] \ [N] \ [Ev masc, sg] \ [N masc, sg]} \]
(37) \[ \text{Eval}^\text{P} [\text{Cette grande diable}] \text{Eval}^\text{P} [\text{DP de [NP fille]}]]

that tall devil of girl

Notice that under this account, there are no real feature conflicts at all, as there are in the approach of Hulk and Tellier (1999). These authors make use of functional heads to transmit phi-features within the constructions. They introduce special mechanisms to cope with feature conflicts: features cannot be copied onto a functional head if they conflict. In the analysis presented here, no such mechanisms apply. The only principle needed is the idea that Spec–Head agreement only applies when needed, i.e. when underspecified features are present.

Cases such as in (35)–(36), with a qualifier which can be interpreted either as an invective or as normal noun with ‘pure degree’ interpretation, can have both agreement patterns: if the noun is interpreted as an invective, the determiner agrees indirectly with the qualified noun, otherwise it agrees with the qualifier, as in all other cases.

Another instance of agreement between the qualified noun and the qualifier in Spec,EvalP involves number agreement as in (38)–(39):

(38) \[ \text{Eval}^\text{P} [\text{Ces sacré nom}] \text{Eval}^\text{P} [\text{DP de [NP Prussiens]}]]

those holy name of Prussians

(39) a. Ces animaux/*cet animal de bacchantes sont belles.
b. \[ \text{Eval}^\text{P} [\text{Ces animaux}] \text{Eval}^\text{P} [\text{DP de [NP Bacchantes]}]]

We propose that the qualifying noun is inserted with underspecified number features. The underspecified number features of the qualifier are fixed by Spec–Head agreement with the features of Eval. Only underspecified features are filled in. If a noun does not have any feature specification at all, as is the case of invectives/swearwords, there will be only number agreement on the (underspecified) determiner, but not on the (featureless) invective, as shown by (38), where sacré nom ‘holy name’ is singular, but the determiner ces ‘these’ is plural.
Interestingly, in the 'pure degree' quantificational cases we do not find gender or number agreement of the determiner and/or N1 with the quantified noun:

\[(40) \quad \text{a. un}^*(e) \text{ foule/ des foules de problèmes.masc.pl} \]
\[\text{a.fem/masc lot/ (indef.pl) lots of problems} \]
\[\text{b. un}^*(e) \text{ tas/ des tas d’inspiration} \]
\[\text{a.masc/fem lot/ (indef.pl) lots of inspiration.fem.sg} \]

The contrast between (39a) on the one hand and (40a) on the other shows that a plural qualified noun forces the use of a plural qualifier, while a plural quantified noun does not. At first sight, this difference is not predicted by the configurations assigned to these constructions in our analysis. However, the difference between qualificational and quantificational constructions in this regard can be independently motivated. Part of the explanation is easy. Quantificational nouns always have features, and therefore always determine the gender of the determiner accompanying them. There are no counterparts of invectives/swearwords in the quantificational domain. The absence of obligatory number agreement is more difficult to explain. Indeed, since Eval° inherits the features of the quantified noun, we expect that Spec–Head agreement in EvalP will provide the quantifier with number features, contrary to fact.

Within the logic of our analysis, this suggests that the quantifier bears fixed number features when it is inserted in Spec, EvalP. We suggest that there is a relation between the fixation of Number in the quantificational domain and the relation between number and quantification in general. While number features on a quantifier inserted in Spec, EvalP are fixed, number features on a qualifier inserted in Spec, EvalP are not. This difference correlates with a further difference between quantity and quality. Quantity is a property of a set of individuals, while quality can be a property of each individual in a set. In example (39a), each Bacchant is negatively qualified. In (40a), on the other hand, the set of problems has the property of being large; nothing is said about the individual problems. We propose that the number features of the quantifier need to be fixed in order to avoid a distributive reading, which would be triggered by agreement.

Nevertheless, quantificational 'pure degree' constructions do exhibit particular patterns of 'external' agreement. Consider the following:

\[(41) \quad \text{a. Des masses de sable sont évacuées/est évacué.} \]
\[\text{vast quantities of sand are/is evacuated} \]
b. Des trésors d’ingéniosité ont été déployés/*a été déployé
treasures of ingenuity have/*has been engaged

These cases must be viewed as ‘Evaluative/pure degree’ constructions, since they are not paraphrasable in terms of comparison:

(42) a. *Cette quantité de sable ressemble à des masses.
‘That quantity of sand resembles masses.’
b. *Cette quantité d’ingéniosité ressemble à des trésors.
‘That quantity of ingenuity resembles a treasure.’

Nevertheless, agreement in these cases clearly is with the quantifier, a hallmark of the comparative construction. The exceptional behavior of these ‘pure degree’ constructions can be explained as follows. Following Doetjes (1997, to appear), we assume that mass nouns such as sable ‘sand’ and ingéniosité ‘ingenuity’ do not have a lexical specification for number. As a result, we end up with a configuration for these cases where Eval° cannot inherit a number feature from the quantified nouns sable ‘sand’ and ingéniosité ‘ingenuity’:

(43) [Eval° [ Des masses] Eval° [DP ___ de [NP sable]]]
    [fem, pl] * [Ev masc,] [N masc,] [Ev fem, pl]

(44) [Eval° [ Des trésors] Eval° [DP ___ de [NP ingéniosité]]]
    [masc, pl] * [Ev fem,] [N fem,] [Ev masc, pl]

At best, Eval° can inherit a gender feature from the quantified noun. At the same time however, Eval° is in a Spec–Head relation with an NP that has a full feature specification for both number and gender. Let us now make the natural assumption that feature specifications cannot be ‘mixed’ in Eval°: noun feature specifications have to be taken over in full, or not at all. If we now assume furthermore that the agreement features of Eval° will agree with the fullest feature specification in its context, Eval° will agree with the quantifying NP in its specifier, and not with the underspecified quantified noun.

5. Conclusion

In this chapter, we have formulated a descriptive generalization regarding agreement in both quantificational and qualificational constructions, the QAP (cf. 4): quantificational/qualificational constructions exhibit two agreement patterns depending on the way the quantifier/qualifier is interpreted with
respect to the quantified/qualified noun. When the quantifier/qualifier has a ‘pure degree’ interpretation, external agreement is triggered by the quantified/qualified noun. By contrast, a comparative interpretation involves external agreement triggered by the quantifier/qualifier.

We have argued that this generalization can be derived if two radically different syntactic structures are assumed for comparative quantificational/qualificational constructions on the one hand, and ‘pure degree’ quantificational/qualificational constructions on the other. Comparative quantificational/qualificational constructions involve predicate inversion and the structure of a relative clause, thus triggering external agreement with the inverted quantifier/qualifier. ‘Pure degree’ quantificational/qualificational constructions involve a DP structure without predicate inversion, topped of with an adverbial EvalP. These trigger external agreement with the quantified/qualified noun.

Internal agreement, i.e. agreement inside the qualificational constructions, depends on the nature of the qualifier. The first determiner in these constructions agrees with the qualifier, unless the qualifier lacks phi-features. This observation can be derived from the application of Spec–Head agreement with Eval°. In quantificational ‘pure degree’ constructions internal agreement is determined by the quantifier because there are no quantificational counterpart of swearwords. While in in qualificational pure degree constructions, number agreement obtains between the qualifying and qualified noun, quantificational constructions require number to be fixed on the quantifier in order to obtain a quantificational relation.

Notes

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1. It appears that in Canadian French (Yves Roberge, p.c.) plural agreement is possible in the example (9a). This suggests that in Canadian French, the ‘pure degree’ reading of foule ‘crowd’ is more readily available. This might be due to a lexical process of grammaticalization of the same kind that affected the grammaticalization of beaucoup, originally meaning un beau coup ‘a good strike’, as a ‘pure degree’ expression.
2. Nothing hinges on the particulars of the Kaynian analysis: the essential insight we adopt for the ‘comparative’ construction is that it has the structure and therefore also the agreement properties of relative clauses.

3. This idea allows us to understand Milner’s (1978) observation that constructions as in (i), with non-nominal exclamatives, are ungrammatical.

   (i) *ce zut de livre
       that chucks of book
   (ii) *cette parbleu de voiture
        that by Jove of car

Qualificational constructions require nominal qualifiers. Although sapristi ‘damn’ looks like an exception in this regard, it is worthwhile to point out that it derives diachronically from the noun sacrisme ‘sacristy’. Arguably then, sapristi still retains a specification for N, but no phi-features.

References

Chapter 12

On three types of movement within the Dutch nominal domain*

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1. Superficial symmetry

In Current Issues in Linguistic Theory, Chomsky (1964: 34) presents the following well-known minimal pair:

(1) John is easy to please.
(2) John is eager to please.

At first sight, these constructions are very similar. In both (1) and (2), the sentence corresponds to the following linear ordering of constituents: noun + copular verb + adjective + to + verb. As Chomsky notes, a grammar which only notes the well-formedness of this linear ordering, just reaches the level of observational adequacy. Although from a superficial point of view, the sentences in (1) and (2) are symmetrical, it turns out that the *easy to please*-construction in (1) behaves differently in a number of respects from the *eager to please*-construction in (2). To give one example: (1) can be paraphrased as it is easy to please John, while (2) can not; *it is eager to please John. Chomsky states that a descriptively adequate grammar should assign different structural descriptions to (1) and (2). More specifically, (1) should be given a structural description indicating that John is the direct object of please (the words are grammatically related as in This pleases John); the structural description of (2) should indicate that John is the logical subject of please (as in John pleases someone).

In this chapter I will discuss a case of superficial similarity within the Dutch nominal domain. The superficially identical constructions, which on closer inspection turn out to display different syntactic behavior, are given in (3) and (4).
(3)  a. drie meter zijde
    three meter silk
    ‘three meters of silk’
  b. twee flessen wijn
    two bottles wine
    ‘two bottles of wine’

(4)  a. drie dagen vakantie
    three days vacation
  b. drie minuten voorsprong
    three minutes headstart

At first sight, the examples in (3) and (4) seem to be realizations of one and the same syntactic pattern: a quantity denoting nominal (N1) is preceded by a numeral and followed by a mass noun (N2). The N2 in (3) differs from the N2 in (4) as regards the semantic property concrete versus abstract. That is, in (3) we have a concrete noun whose quantity is specified, whereas in (4) we have an abstract mass noun. Given this semantic distinction, I will refer to the pattern in (3) as the concrete pattern and to the pattern in (4) as the abstract pattern.

The organization of the chapter is as follows. In Section 2, I will show on the basis of subextraction and the distribution of approximative phrases that the concrete pattern and the abstract pattern display different syntactic behavior. From the syntactic behavior of the abstract pattern, one might want to conclude that the sequence N1–N2 (abstract) does not form a syntactic unit. In Section 3, however, evidence will be given for the constituency of this sequence. In Section 4, it will be shown that the abstract pattern, which permits subextraction of the left branch nominal element (N1), displays the same movement behavior as the well-known wat voor N-construction, which also permits left branch subextraction. Section 5 discusses the internal syntax of the abstract pattern and the concrete pattern. It will be proposed that there is a predication relationship between N1 and N2. The quantity designating noun (N1) predicates over the abstract or concrete mass noun (N2). I will argue, furthermore, that the predicate nominal (N1) follows the “subject” (N2) underlingly and that the surface order (N1+N2) is derived by means of a process of DP-internal predicate displacement. In the Sections 6 and 7, I will discuss three types of nominal constructions featuring predicate displacement and address the question as to what kind of movement is involved. It will be argued that the N van N-construction (e.g. een vod van een jurk; a rag of a
dress), displays predicate displacement of the A-movement type. The abstract pattern (e.g. *twee dagen bedenktijd; two days time-for-reflection) displays DP-internal predicate movement of the A-bar type. The head movement type, finally, is found in the Dutch concrete pattern (*flessen wijn; bottles wine). In Section 8, I discuss a variant of the abstract pattern, viz. one in which the displaced quantity designating predicate occurs in a position preceding the definite article, as in: *twee dagen de tijd (two days the time). This construction type clearly shows that the displaced predicate of the abstract pattern occurs in the specifier position of the functional head D (i.e. an A-bar position). Section 9 addresses the issue of cross-linguistic and cross-constructional variation in the domain of DP-internal predicate displacement. The chapter is concluded in Section 10.

2. Underlying asymmetries

On closer inspection of the patterns in (3) and (4), it turns out that underneath of the superficial, linear symmetry (i.e. *Numeral+N1+N2), there is hidden a remarkable syntactic asymmetry. A first asymmetry between the concrete pattern and the abstract pattern concerns the distribution of what I call approximative phrases, i.e. constituents that are introduced by the coordinating conjunction *of, which is followed by a numeral. As illustrated in (5), N1 and N2 cannot be separated by an intervening approximative phrase in the concrete pattern.2 (6), on the other hand, shows that it is possible in the abstract pattern:

   after a bottle or two wine feel I myself mostly a lot better  
   b. *[Een bakkie of drie koffie] drinkt Jan gewoonlijk.  
   a cup or three coffee drinks Jan normally  
   jan puts normally a slice or three cheese on his sandwich  

(6) a. Jan kreeg [een minuut of drie voorsprong].  
   Jan got a minute or three headstart  
   b. [Een dag of twee bedenktijd] zullen ze hem toch wel  
   a day or two time-for-reflection will they him yet surely  
   geven.  
   give
Norbert Corver

Observe that the concrete pattern in (5) is well-formed when the approximative phrase follows N2; see (7). As shown in (8), this is not permitted in the abstract pattern.

(7)  a. Na [een fles wijn of twee] voel ik me meestal een stuk beter.
    b. [Een bakkie koffie of drie] drinkt Jan gewoonlijk.

(8)  a. *Jan kreeg [een minuut voorsprong of drie].
    b. *[Een dag bedenktijd of twee] zullen ze hem toch wel geven.
    c. *[Een dag uitstel of twee] denk ik dat hij wel zal krijgen.

A second asymmetry between the concrete pattern and the abstract pattern concerns the possibility of splitting the measure-constituent from N2, resulting into a discontinuous pattern. The concrete pattern does not allow such a split (see (9)); the abstract pattern does (see (10)).

(9)  a. *Hoeveel lepels kreeg Jan suiker in zijn thee?
    how-many spoons got Jan sugar in his tea
    b. *Hoeveel zakjes zal Jan drop krijgen van oma?
    how-many bags will Jan liquorice get from grandma
    c. *Hoeveel lepels zal ik Jan hoestdrank geven?
    how-many spoons shall I Jan cough-mixture give

(10)  a. Hoeveel dagen zal ik ze bedenktijd geven?
    how-many days shall I them time-for-reflection give
    b. Hoeveel gulden denk je dat ie korting zal krijgen?
    How-many guilders think you that he reduction will get
    c. Hoeveel meter moest hij afstand nemen van de bal?
    How-many meter had-to he distance take from the ball

Pied piping yields a well-formed output for both patterns:

(11)  a. Hoeveel lepels suiker kreeg Jan in zijn thee?
    b. Hoeveel zakjes drop zal Jan krijgen van oma?
    c. Hoeveel lepels hoestdrank zal ik Jan geven?

(12)  a. Hoeveel dagen bedenktijd zal ik ze geven?
    b. Hoeveel gulden korting denk je dat ie zal krijgen?
    c. Hoeveel meter afstand moest hij nemen van de bal?
3. Constituency

Thus far, we have seen that the abstract pattern and the concrete pattern behave differently in two respects: First of all, N1 can be followed by an approximative phrase in the former pattern, but not in the latter. Secondly, in the abstract pattern N1 can move along with a question word, leaving behind N2; this is not allowed in the concrete pattern. These two properties of the abstract pattern are quite remarkable, especially the latter one since, in general, subextraction out of a nominal constituent is not permitted. Given this remarkable behavior, one might even want to propose that the abstract pattern does not form a constituent; i.e. the sequence NUM–N1 would not form a syntactic unit with N2. In this section, I will show that this non-constituency analysis is wrong. The abstract pattern, just like the concrete pattern, forms a syntactic unit (i.e. a complex nominal construction).

Let us first be a bit more specific about the implementation of a non-constituency analysis for the abstract pattern. A line of analysis would be to say that the split pattern is really the result of preposing of a measure phrase which is base-generated in a VP-internal but DP-external position. This would yield a structure like (13a); (13b) would be at the basis of the split pattern in (10a).

\[(13)\]
\[
a. \ldots [VP [NP1 NUM+N1] [V¹ [NP2 N2] V]] \\
b. \ldots [VP [NP1 hoeveel dagen] [V¹ [NP2 bedenktijd] V]]
\]

how-many days time-for-reflection

As shown in (14), measure phrases do occur as modifiers within the verbal projection:

\[(14)\]
\[
a. Ik geloof dat Jan \textit{vijf kilometer} gefietst heeft.  
  I believe that Jan five kilometers cycled has  
b. Ik geloof dat het morgen \textit{vijf graden} gaat vriezen.  
  I believe that it tomorrow five degrees goes freeze
\]

There are good reasons for rejecting the non-constituency analysis in (13) and for adopting an analysis according to which the abstract pattern forms a nominal construction. The constituency of the sequence is first of all shown by the fact that it can be fronted as a syntactic unit to [Spec,CP]:

\[(15)\]
\[
a. [Een minuut of vijf bedenktijd] \textit{geloof ik dat Jan \texttt{t} kreeg.}  
  a. minute or five time-for-reflection believe I that Jan got
\]
Another argument in support of the constituency of the string $NUM+N1+N2$ comes from pronominalization: the sequence can be replaced by a pronominal element.

Jan got five minutes time-for-reflection and Mary got that too.

Finally, the coordination test (only constituents can be coordinated) shows that the string $NUM+N1+N2$ forms a syntactic unit:

(17) [[Drie minuten voorsprong op Karel] en [twee minuten achterstand op Kees]] geloof ik dat Jan had on Kees believe I that Jan had

three minutes headstart on Karel and two minutes arrears on Kees

In short, the constituency of the abstract pattern is undeniable, and there is no support for the alternative structural representation in (13). Notice also that if one adopted such a representation, the following (ill-formed) preposing patterns would be incorrectly predicted to be well-formed:

(18) a. *Korting geloof ik dat Jan [twee gulden —] zal krijgen  
reduction believe I that Jan two guilders will get

b. *Bedenktijd denk ik dat Jan [drie maanden —] zal krijgen  
time-for-reflection think I that Jan three months will get

If one adopts an underlying structure like (13), these preposing patterns would simply involve fronting of the entire (nominal) complement of the verb. As shown by the following examples, such a preposing pattern is possible, in principle.

(19) a. Korting denk ik dat Jan — zal krijgen  
reduction believe I that Jan — will get

b. Bedenktijd denk ik dat Jan — zal krijgen  
time for reflection think I that Jan — will get

Under an analysis in which the measure phrase forms a constituent together with the N2, the ill-formedness of the examples in (18) plausibly relates to the fact that a noun phrase-internal modifier cannot be stranded.
4. Parallelism between the *wat voor N*-construction and the abstract pattern

In the previous section I have shown that the sequence *NUM–N1–N2* forms a constituent. This means that the discontinuous pattern, in which *NUM–N1* is separated from *N2*, must be the result of subextraction out of the nominal domain. As already pointed out above, subextraction of a left branch element out of a nominal constituent is generally impossible (see Ross’s (1967) Left Branch Condition). There is a well-known construction in Dutch, however, which forms an exception to this general ban on left branch extraction, namely the *wat voor N*-construction (cf. Den Besten 1985; Corver 1991; Bennis 1995). In what follows I will show that the split abstract pattern displays the same movement behavior as the split *wat voor N*-construction.

As shown in (20), the *wat voor N*-construction allows two patterns: (i) the discontinuous or subextraction pattern (cf. (20b)) and (ii) the pied piping pattern, i.e. the pattern in which the rest of the noun phrase moves along with the wh-element *wat* (cf. (20a)).

(20) a. [Wat voor prijs], zal hij waarschijnlijk t, ontvangen?
   what for prize will he presumably receive
   ‘What kind of prize will he receive presumably?’

   b. Wat, zal hij waarschijnlijk [t, voor prijs] ontvangen?
   what will he presumably for prize receive

As pointed out by Den Besten (1981), subextraction of *wat* out of the *wat voor N*-construction yields the best result when the noun phrase is a direct object complement to the verb (see (20b)). The split patterns in (10) show that subextraction of the measure phrase out of the noun phrase is permitted if the noun phrase has the function of direct object.

Subextraction of *wat* (21a) or the measure phrase (22b) is not possible when the noun phrase is part of a PP selected by the verb. Pied piping of the entire PP is required (22).

(21) a. *[Wat, heb jij [PP op [t, voor iemand]] gerekend?]
   what have you on for someone counted
   ‘What kind of person did you count on?’

   b. *[Hoewel minuten], had jij [PP op [t, bedenktijd]] gerekend?
   how-many minutes have you on time-for-reflection counted
   ‘On how many minutes’ time for reflection did you count?’
(22)  
a. \[Op \{wat voor iemand\}, heb jij t\_i gerekend?\]  
b. \[Op \{hoeveel minuten bedenktijd\}, had jij t\_i gerekend?\]  

Noun phrases that occupy the structural subject position (Spec, IP) also form islands for extraction (the so-called Subject condition; see e.g. Chomsky 1986). (23a) shows that \textit{wat} cannot be removed out of a subject noun phrase (cf. Den Besten 1985). The impossibility of extracting the measure phrase out of a subject is exemplified in (24a). As illustrated by the b-examples, movement of the entire subject noun phrase yields a well-formed sentence.4

(23)  
a. \textit{Wat}, denk je \[\text{[CP dat \{ti voor mensen\} hun huis hebben verkocht]}\]?  
   'What kind of people do you think have sold their house?'  
b. \textit{Wat voor mensen}, denk je \[\text{[CP dat \{ti hun huis hebben verkocht\}]}\]?

(24)  
a. \textit{Twee dagen}, denk ik \[\text{[CP dat \{ti rust\} wel voldoende zal zijn]}\]  
   'I think two days' rest will be sufficient.'  
b. \textit{Twee dagen rust}, denk ik \[\text{[CP dat \{ti wel voldoende zal zijn\}]}\]

In this context it is interesting to point out another similarity between the split \textit{wat voor N}-construction and the split abstract pattern: both constructions permit subextraction out of the subject noun phrase, if the subject occupies the structural object position (i.e. is a complement to V). Such a configuration is found, for example, in passive constructions like (25), where the indirect object precedes the nominal constituent bearing the grammatical function of subject (example from Koster 1987):

(25) \textit{Wat}, werd hem \[\text{[ti voor boek]}\] gegeven?  
   'What kind of book was given to him?'

Notice now that the same structural context allows subextraction of the measure constituent:

(26) \textit{Hoeveel minuten}, werd hem \[\text{[ti, uitstel]}\] verleend?  
   'A delay of how many minutes was offered to him?'

A fourth island condition which the split \textit{wat voor N}-construction and the split
abstract pattern are both sensitive to is the so-called Negative Island constraint (Ross 1983). Ross (1983) observes for English that non-arguments (i.e. elements that do not receive a thematic role form a predicate) cannot be moved across a c-commanding negation-element. In Corver (1991), the following contrast is noted for Dutch (see also Honcoop 1995):

\begin{align*}
(27) \text{a. } \text{Wat, wist Jan niet [dat hij t moest lezen]?} \\
& \quad \text{what knew Jan not that he had-to read} \\
& \quad \text{‘What didn’t Jan know that he had to read?’} \\
\text{b. } \text{*Wat, wist Jan niet [dat hij [t voor boeken] moest lezen]?} \\
& \quad \text{what knew Jan not that he for books had-to read} \\
& \quad \text{‘What kind of books didn’t John know that he had to read?’}
\end{align*}

In (27a), the interrogative pronoun can be moved across the c-commanding negative element niet. This is allowed, since wat is an argument-expression here; it receives a thematic role form the verb lezen. In (27b), on the other hand, movement of wat across niet yields an ungrammatical sentence. In this example, however, wat is not an argument of the verb lezen; it is the entire noun phrase wat voor boeken that functions as the argument of this verb. As expected, this noun phrase can be moved across the negation.

\begin{align*}
(28) \quad [\text{Wat voor boeken}], \text{wist Jan niet [dat hij t moest lezen]?}
\end{align*}

What is the behavior of the split abstract pattern in those negative island environments? The examples in (29) show that the behavior is the same as that of the split wat voor N-construction. Movement of the measure constituent across the negation is not permitted (see (29a)). The entire nominal constituent containing the measure phrase, however, can be moved across the negation; see (29b).

\begin{align*}
(29) \text{a. } \text{*Twee minuten, denk ik niet dat Jan [t, bedenktijd] zal krijgen.} \\
& \quad \text{two minutes think I not that Jan time-for-reflection will get} \\
\text{b. } \text{[Twee minuten bedenktijd], denk ik niet dat Jan t, zal krijgen.}
\end{align*}

In conclusion, the split abstract pattern displays the same movement behavior as the split wat voor N-construction. An interesting property that is shared by the two constructions concerns the semantic nature of wat and the measure-constituent: the two elements do not behave like arguments (see e.g. the
negative island effect); they rather behave like non-arguments. We will see later that the two elements are DP-internal nominal predicates.  

5. Some remarks on the internal structure

In order to determine the internal structure of the abstract pattern and the concrete pattern, two questions need to be raised: (i) which of the two nouns (N1 or N2) is the nucleus or head of the nominal construction?; (ii) what is the nature of the relationship between the two nominals? My investigation of these questions will lead me to conclude that there is a predication relationship involved in the concrete pattern and the abstract pattern: The quantity designating noun (N1) predicates over the abstract or concrete mass noun (N2). Under the assumption that the predicate nominal (N1) follows the “subject” (N2) underlyingly, the surface order (N1+N2) must be derived by means of a process of DP-internal predicate displacement.

Let us first consider the question which of the two nouns (N1 or N2) is the nucleus or head of the nominal construction. As regards the notion of nucleus/head, a distinction can be made between the semantic nucleus — i.e. the nominal that stands in a semantic selectional relation to the lexical head (e.g. V) — and the syntactic nucleus — i.e. the nominal that agrees with another word within the noun phrase (e.g. agreement in gender or number).

As shown by the examples in (30), it is sometimes unclear which of the two nouns forms the semantic nucleus. Both the measure nominal ((drie) jaar) and the nominal gevangenisstraf can combine with the verb krijgen. At the same time, it is clear that in (30b), the measuree is implicit, and that in (30c) the measure remains unspecified:

\[
\begin{align*}
30 & \quad a. \text{ Deze boef kreeg drie jaar gevangenisstraf } \\
& \quad \text{‘This knave got three years imprisonment.’} \\
& \quad b. \text{ Deze boef kreeg drie jaar.} \\
& \quad c. \text{ Deze boef kreeg gevangenisstraf.}
\end{align*}
\]

In other cases, however, it is clear that N2 is the semantic nucleus, i.e. the nominal element that stands in a semantic-selectional relation to the verb. In (31), for example, N2 (korting) plausibly constitutes the semantic nucleus of the nominal construction. The interpretation of this sentence is: Jan got a discount and this discount amounts to two guilders. We certainly do not have a reading in which Jan receives two guilders (see (31b)). This leads us to
conclude that *korting* is the semantic nucleus of the nominal construction.

(31) a. Jan kreeg [ twee gulden korting].
    Jan got two guilders reduction
b. Jan kreeg twee gulden.
c. Jan kreeg korting.

The concrete pattern displays the same behavior: it is the N2 which stand in a semantic-selectional relationship to the verb (see van Riemsdijk 1998; Corver 1998; Vos 1999). In (32a), for example, it is the cognac rather than the two spoons which gets stirred. And in (32b), the verb *dronk* obviously goes with *bier*.

    Jan stirred two spoons cognac through the soup
b. Jan dronk [twee glazen bier]
    Jan drank two bottles beer

From a syntactic point of view, it is the first nominal (N1) which behaves like the nucleus: N1 agrees in gender with the demonstrative determiner of the complex noun phrase:

(33) a. Dat (neutral) kwartiertje (neutral) bedenktijd (neutral) bleek niet voldoende.
    that quarter-of-an-hour time-for-reflection turned-out not sufficient
b. *Die (neutral) kwartiertje (neutral) bedenktijd (neutral) bleek niet voldoende.

(34) a. Die (neutral) week (neutral) uitstel (neutral) kwam hem goed van pas.
    That week’s delay came in handy.'
b. *Dat (neutral) week (neutral) uitstel (neutral) kwam hem goed van pas.

The concrete pattern behaves in the same way as the abstract pattern: N1 enters into an agreement relationship with the demonstrative determiner:

(35) a. Dit (neutral) glas (neutral) wijn (neutral) smaakt heerlijk.
    this glass wine tastes wonderful
b. *Die (neutral) glas (neutral) wijn (neutral) smaakt heerlijk

(36) a. Die (neutral) slok (neutral) water (neutral) schoot in het verkeerde keelgat.
    that sip water went into the wrong gullet
b. *Dat (neutral) slok (neutral) water (neutral) schoot in het verkeerde keelgat.
Summarizing, both the abstract pattern and the concrete pattern have a hybrid nature: Semantically, N2 behaves like the nucleus of the nominal construction; syntactically, N1 is the nucleus.

Another nominal construction type displaying this hybrid behavior is the so-called \( N \) \textit{van een} \( N \)-construction (Paardekooper 1956; Everaert 1992; Den Dikken 1995):

\begin{align*}
(37) & \quad \text{a. een beer van een vent} \\
& \quad \text{a bear of a man} \\
& \quad \text{‘a man like a bear’} \\
& \quad \text{b. een reus van een kerel} \\
& \quad \text{a giant of a man} \\
& \quad \text{‘a man like a giant’}
\end{align*}

As regards semantic selection, N2 is the nucleus of the noun phrase. In (38), for example, it is a woman that John meets and not a tart. The nominal \textit{taart} just gives a characterization of the woman.

\begin{align*}
(38) & \quad \text{Jan ontmoette [een taart van een vrouw].} \\
& \quad \text{Jan met a tart of a woman}
\end{align*}

As far as agreement with the determiner is concerned, the examples in (39) show that it is the first noun (N1) which agrees in gender with the demonstrative determiner (example from Den Dikken 1995):

\begin{align*}
(39) & \quad \text{a. Moest Jantje [dat \text{(\textit{+neuter})} slagschip\text{(\textit{+neuter})} van een vrouw\text{(\textit{-neuter})}]} \\
& \quad \text{had-to Jan that battleship of a woman} \\
& \quad \text{zoenen?} \\
& \quad \text{kiss} \\
& \quad \text{‘Did Jan have to kiss that battleship of a woman?’} \\
& \quad \text{b. *Moest Jantje [die \text{(\textit{-neuter})} slagschip\text{(\textit{+neuter})} van een vrouw\text{(\textit{-neuter})}]} \\
& \quad \text{zoenen?}
\end{align*}

In light of the above-mentioned similarities, one may wonder what the three nominal constructions (the abstract pattern, the concrete pattern and the \( N \) \textit{van een} \( N \)-construction) have in common. My answer to this question is that the two nominals in each of the three constructions stand in a predication relation to each other. N1 functions as the nominal predicate and N2 as the subject. In the abstract-pattern and the concrete pattern, we have a quantity denoting predicate, whereas in the \( N \) \textit{van een} \( N \)-construction we have a quality-denoting predicate. The predication relationship in the three nominal
constructions can be paraphrased as follows:

(40) a. drie minuten bedenktijd
    three minutes time-for-reflection
    ‘the amount of time of reflection is three minutes’

b. twee lepeltjes cognac
    two spoons cognac
    ‘the amount of cognac is two spoons’

c. die reus van een kerel
    that giant of a guy
    ‘that guy is like a giant’

If we assume that the predication relation has the basic word order subject-predicate, then we can conclude that the surface order in each of the three nominal constructions results from noun phrase-internal predicate displacement: the predicate nominal is moved to the left of the subject. Under the assumption that the predication relation is defined configurationally as a Small Clause (XP) (see Stowell 1981), we have an underlying representation as in (41a). The inverted order is given in (41b).6

(41) a. [DP Do [XP [SUBJ X¹ X₀ [PRED]]]]

b. [DP [PRED [SUBJ X₀ X¹ t₁]]]

6. Predicate displacement within the noun phrase

An important question which now arises is the following: What is the nature of the predicate movement operation? In the generative literature, three types of movement are distinguished traditionally:

— A-movement: movement of a maximal constituent XP to an A-position;
— A¹-movement: movement of a maximal projection XP to an A¹-position; a characteristic property of the landing site (an A¹-position) is its escape hatch function.
— Head movement: movement of a head (X₀) to another head position.

Let us assume that this typology of movement operations does not only hold for argument-type-categories, i.e. those categories which fulfill an argument function in relation to some predicate) but also to (nominal) predicates (see Bennis, Corver and Den Dikken 1998 and Corver 2000 for further discussion).
In Sections 6.1 and 6.2 and in Section 7, I will discuss three types of nominal constructions featuring predicate displacement and address the question as to what kind of movement is involved. It will be argued that the first type of nominal construction, the so-called *N van een N*-construction (e.g. *een vod van een jurk*; a rag of a dress), features predicate displacement of the A-movement type. What I have called the abstract pattern (e.g. *twee dagen bedenktijd*; two days time-for-reflection) displays DP-internal predicate movement of the A-bar type. The head movement type, finally, is found in the Dutch concrete pattern (*flessen wijn*; bottles wine).

### 6.1 A-movement in the *N van een N*-construction

Den Dikken (1995) argues that the predicate displacement operation in the *N van een N*-construction is of the A-movement type (see also Bennis, Corver and Den Dikken 1998). Starting from a Small Clause structure as in (42), we can derive the surface order by moving the predicate nominal to the left of the Small Clause subject:

\[
(42) \begin{align*}
a &. \ [xP \ jurk \ [X \ [X \ [X \ een] \ vod]]] \\
b &. \ [DP \ een \ [FP \ vodl \ [F+X] (= \ van \ een) \ [XP \ jurk \ [X \ t_i]]] ]
\end{align*}
\]

*a rag (of a) dress*

After Predicate Inversion has applied, the predicative NP *vod* is in the specifier position of the functional projection FP. Note that the Small Clause head *X* has raised to F. As proposed by Den Dikken (1995), *van* can be analyzed as a nominal copula here. He argues that this element surfaces as a result of incorporation of the small clause head *X* into F. Movement of *X* to F is forced by the theory of locality on movement operations, more in particular by the Equidistance requirement (Chomsky 1993). According to this locality requirement, a constituent which moves to an A-position Y can only skip another A-position, Z, if both A-positions are equally far away (i.e. equidistant) from the extraction site. Two positions are equidistant if they are members of the same Minimal Domain (cf. Chomsky 1993). After X-to-F-movement has applied in (42b), the nominal *vod* in Spec,FP and *jurk* in Spec,XP are equidistant from the predicate’s extraction site (*t_i*).

### 6.2 Head-movement in the concrete pattern

Corver (1998) proposes that the so-called pseudopartitive construction (cf.
Selkirk 1977), of which the concrete pattern is a sub-class, is derived by head movement of the DP-internal predicate nominal.\textsuperscript{10,11} That is, a nominal head (N\textsuperscript{0}) is moved out of the predicate position and raised to a position to the left of the subject. More specifically, N\textsuperscript{0} is adjoined to the complex head F+X.\textsuperscript{12} Schematically:\textsuperscript{13}

\begin{equation}
\text{(43)} \quad [\text{DP een } [\text{FP } [F+X]+\text{fles}] \text{ [XP water } [X^1 t \text{ } [\text{NP } [N t]],]])]
\end{equation}

Empirical support for the idea that head movement has applied here comes from the distribution of approximative phrases (\textit{of}+\textit{Numeral}). As was discussed in Section 2, the N1 of the concrete pattern cannot be separated from N2 by means of an intervening approximative phrase. This is again illustrated in (44):

\begin{enumerate}
\item a. Na [een fles \textit{of} twee wijn] voel ik me meestal een stuk beter.  
\quad after a \textit{bottle or two wine} feel I myself mostly a \textit{lot better}
\item b. Na [een fles wijn \textit{of twee}] voel ik me meestal een stuk beter
\end{enumerate}

The introductory word of the approximative phrase is the coordinating conjunction \textit{of}. It does not seem implausible to analyze the approximative phrase as an ellipted phrase, where the quantity-denoting nominal is lacking after the numeral: \textit{een fles wijn of twee} (\textit{flessen}). Underlyingly, we then have the structure in (45). The coordinate structure \textit{fles of twee} forms a complex nominal predicate, consisting of two conjoined nominal predicates, namely the NP \textit{fles} and the ellipted NP \textit{twee} (\textit{flessen}). This complex predicate predicates over the nominal \textit{wijn} that occupies the specifier position of the DP-internal Small Clause (i.e. XP). I further assume that the determiner \textit{een} of the complex noun phrase is in D (\textit{e} stands for ellipted category):

\begin{equation}
\text{(45)} \quad [\text{DP een } [\text{FP } [F^1 F] \text{ [XP wijn } [X^1 X^0 \text{ [NP fles]} \text{ of [NP twee } e]],]])]
\end{equation}

Observe that this structure is in line with the standard assumption that conjuncts must be of the same projection-level: i.e. an XP-constituent can only be coordinated with a constituent of the same hierarchical level (YP), but not, for example, with a constituent of another hierarchical level (e.g. the head-level Y\textsuperscript{0}).

The ungrammaticality of (44a), in which the entire coordinated NP (an X\textsubscript{max}) has been moved to the left of the subject \textit{wijn}, suggests that predicate displacement is not of the X\textsubscript{max}-type.

As an alternative we have the structure in (46), where the N\textsuperscript{0} \textit{fles} has been moved to the left of the Small Clause subject, leaving behind the rest of the coordinated structure.\textsuperscript{14}
Norbert Corver

It is quite interesting to see that the Dutch concrete pattern displays the same syntactic behavior as the so-called Construct State-structure of the concrete pattern in a language like Modern Hebrew. As is well-known from the work on possessive constructions (cf. e.g. Ritter 1988), Construct-State structures have the property that N-raising has applied within the nominal domain.

The concrete pattern manifests itself in three guises: First of all, it can be a Construct State construction; in that case the nouns are adjacent (cf. (47a)). Secondly, it can take the analytic form, i.e. N1 and N2 are separated by the prepositional element šel (cf. (47b)).15 Thirdly, it can have the form of an apposition (cf. (47c)); just like in the Construct State pattern the two nominals involved are juxtaposed.

(47) a. bakbuk ýáyin (Construct State construction)
   bottle wine
   ‘a bottle of wine’

b. bakbuk šel ýáyin (šel construction)
   bottle of wine
   ‘a bottle of wine’

c. bakbuk ýáyin (apposition construction)
   bottle wine
   ‘a bottle of wine’

Comparison of (47a) and (47c) shows that the Construct State pattern and the Apposition pattern are sometimes indistinguishable; in those cases the free form of N1 in the apposition pattern and the Construct State form of N1 in the Construct State pattern are identical. There are cases, though, in which the distinction becomes visible, as in kéara salat (bowl of salad; ‘a bowl of salad’) versus kéarat salat (bowl of salad; ‘a bowl of salad’). The former example has the free ending -a (feminine, singular) attached to the stem kéar; the latter has the construct ending -at (feminine, singular) attached to it. In what follows I will focus on the contrast between the Construct State pattern and the pattern featuring šel.

As shown by the examples in (48), the N1 (bakbuk) of the Construct State structure cannot be separated from the second noun (ýáyin) by an intervening attributive AP which has scope over N1. In the analytic construction, N1 and N2 can be separated from each other by an intervening modifier:

(46) [DP een [FP [[F+X₁]+flesj] [XP wijn [X₁ t₁] [[NP [N t₁] of [twee e]]]])]
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(48) a. *bakbuk yarok yáyin
   bottle green wine
   ‘a green bottle of wine’
b. bakbuk yáyin yarok
   bottle wine green
   ‘a green bottle of wine’

(49) bakbuk yarok šel yáyin
    bottle green of wine
    ‘a green bottle of wine’

The same contrast is found when the intervening constituent is an approximative phrase. In the Construct State structure, the approximative phrase \((o + NUM)\) cannot be placed in between N1 and N2 (see (50)). The noun tipat, which has the Construct State form, must be adjacent to N2 (yáyin). In the analytic construction, on the other hand, N1 and N2 need not be adjacent (see (51)).

(50) a. *tipat o štayim yáyin
    drop or two wine
    ‘a drop or two of wine’
b. tipat yáyin o štayim

(51) [bakbuk o šnayim] šel yáyin
    bottle or two of wine
    ‘a bottle or two of wine’

When we compare the Modern-Hebrew examples in (50) with the Dutch examples in (5), we notice that in both languages no approximative phrase can intervene between N1 and N2. Adjacency between N1 and the following nominal phrase is required. This similar behavior suggests that we are dealing here with the same type of nominal construction, viz. a construction in which N-raising has applied to a higher functional head. More specifically, N-raising has applied to the predicate nominal of the DP-internal Small Clause:

(52) a. \([\text{DP een }[\text{FP }[F^1 + \text{flesj}][\text{XP wijn }[X^1 t_1][\text{NP }[N t]]]]]]\)
b. \([\text{D }[\text{FP }[F^1 + \text{bakbuk}][\text{XP yáyin }[X^1 t_1][\text{NP }[N t]]]]]]\)

Just like in the Construct State realization of the possessive relationship, the raised noun assigns genitive case to the nominal constituent to its right. In present-day Dutch and in Modern Hebrew, this genitive case is not morpho-
logically visible in the concrete pattern. In certain languages, though, genitive case is morphologically expressed in these contexts, e.g. in Standard Arabic (53a) and Middle Dutch (53b); see Stoett (1977).

(53) a. senduq-u xudrat-in mukassar-un  
   box-nom vegetables-gen broken-nom  
   ‘a broken box with vegetables’
   b. een lepel honichs  
   a spoon honey-gen  
   ‘a spoonful of honey’

7. The abstract pattern: A¹-movement in the noun phrase

Thus far, we have seen two types of DP-internal predicate movement: (i) A-movement in the N van een N-construction (see (42b)); (ii) head movement in the concrete pattern (see (43)). Can we also identify the A¹-movement type within the nominal domain? In this section, I will argue that predicate displacement within the abstract pattern instantiates A¹-movement.¹⁷

The fact that the measure phrase can be moved out of the containing noun phrase (cf. (10)) already suggests that we are dealing with predicate displacement of the A¹-movement type. For the nominal domain this means that the predicate is moved to Spec,DP. This landing site, just like its clausal counterpart, Spec,CP, functions as an escape hatch for extraction (see Szabolcsi 1994). This DP-internal movement operation is represented in (54a). Via Spec,DP, the measure phrase can leave the noun phrase and move to Spec,CP. (54b) illustrates this for sentence (10a) (irrelevant details omitted).

(54) a. [DP hoe veel dageni [XP bedenktijd [X¹ Xo t|]]]]
   b. [CP [hoeveel dagen]i [C’ zalj [IP ik ze [DP t¹i [D’ Do [XP bedenktijd [X¹ Xo t|]]]] geven tj|]]]

That the approximative phrase moves along with the quantity denoting predicate is in accordance with the Xmax-status of the moved predicate (see the examples in (6)).

(55) [DP een dag of twee el|, XP bedenktijd [X Xo t|]]]

To conclude this section, I would like to draw your attention to the parallelism between the abstract pattern, on the one hand, and the wat voor
N-construction, on the other hand. As we saw in Section 3, both types of nominal constructions allow extraction of a constituent from within the larger noun phrase. For the abstract pattern, I have just argued that a quantity denoting predicate leaves the noun phrase via Spec, DP. In Bennis, Corver and Den Dikken (1998), it is proposed that the *wat voor* N-construction is also an example of DP-internal *A*-movement of a nominal predicate. In this construction, however, the predicate, *wat*, has a qualitative interpretation (‘what kind of’); furthermore it has interrogative force. In their analysis, the element *wat* originates as a predicate in a DP-internal Small Clause structure and is moved to Spec, DP by means of predicate displacement of the *A*-type (see (56)). From that position, the interrogative predicate can leave the noun phrase, yielding a discontinuous pattern; see (57):

(56) \[
\begin{array}{ll}
\text{IP} & \text{wat, D' voor} \\
\text{XP} & \text{NP jongens} \\
\text{X} & \text{Ø} \\
\end{array}
\]

(57) \[
\begin{array}{ll}
\text{CP} & \text{Wat, heb, je, D' voor} \\
\text{IP} & \text{je, D' voor} \\
\text{XP} & \text{NP jongens} \\
\end{array}
\]

ontmoet tj]

What have you for boys met?
‘What kind of boys did you meet?’

8. Twee dagen de tijd (two days the time)

In this section, I will briefly discuss one construction type which is closely related to the abstract pattern. The construction at issue is given in (58).

(58) Ik geef je [twee dagen (de) tijd] om dit op te lossen.
I give you two days (the) time for this PRT to solve
‘I give you two days to solve this’

Also in this case, the predication relation between the two nominals is obvious: “(The) time is two days”. The constituent *twee dagen* predicates over the subject *tijd*. And just like in the abstract pattern, it is possible to move the measure phrase out of the complex noun phrase:

(59) \[
\begin{array}{ll}
\text{Hoewel dagen, denk je dat Jan t, de tijd zal krijgen?} \\
\text{how-many days, think you that Jan the time will get} \\
\end{array}
\]

Besides the subextraction pattern it is also possible to move along (i.e. pied pipe) the rest of the noun phrase:

(60) \[
\begin{array}{ll}
\text{Hoewel dagen de tijd, denk je dat Jan t, zal krijgen?} \\
\end{array}
\]
The fact that the string *hoeveel dagen de tijd* in (60) can be fronted shows that it forms a constituent. Its constituency is also shown by the pronominalization test: the sequence *twee dagen de tijd* can be replaced by the demonstrative pronoun *dat* (see (61)).

(61) a. *Jan kreeg twee dagen de tijd en Marie kreeg dat vier dagen.*
    Jan got two days the time and Marie got that four days
b. *Jan kreeg twee dagen de tijd en Marie kreeg dat ook.*
    Jan got two days the time and Marie got that too

The nice thing about the nominal construction *twee dagen (de) tijd* is that it clearly shows the left peripheral placement of the displaced predicate nominal. The measure phrase precedes the definite article *de*. So, the only logical landing site for the moved predicate is Spec,DP (an A¹-position, on analogy with Spec,CP). The structure of the noun phrase after DP-internal displacement of the measure phrase is now as follows:

(62) \[ [DP twee dagen/hoeveel dagen_1, c\_tijd [XP de [X¹ [X ø ti]]]] \]

Just like other constituents that have undergone DP-internal A¹-movement (see e.g. the measure constituents of the abstract pattern and the *wat voor N-construction*), the measure phrase can leave the DP and move into Spec,CP: 

(63) \[ [CP [hoeveel dagen]_1, c\_zal_1 [IP ik ze [DP 't_1, [c\_tijd [XP de [X¹ X² ti]]]]]]
    how-many days shall I them the time
give

Another property which this construction has in common with the abstract pattern concerns the placement of the approximative phrase *of + Numeral*. Similarly to what we saw for the abstract pattern, the approximative phrase must precede N2 (*tijd*) and cannot follow N2:

(64) a. *Geef 'm [een dag of twee de tijd]*
    give him a day or two the time
b. *Geef 'm [een dag de tijd of twee]*

9. Aspects of variation

Thus far, I have argued on the basis of Dutch that the difference between the abstract pattern (e.g. *drie meter zijde*, three meter silk) and the concrete pattern
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(e.g. drie dagen vakantie, three days vacation) resides in the phenomenon of predicate displacement: the concrete pattern features predicate movement of the head-movement type, whereas the abstract pattern features predicate movement of the $A^1$-movement type; i.e. a predicative XP is moved to Spec,DP (from where it may leave the DP). A question which might be raised is: Why does the abstract pattern feature predicate movement of the $A^1$-type and the abstract pattern predicate movement of the head movement type?

Let me first point out that there is no necessary connection between “type of pattern” (i.e. abstract versus concrete) on the one hand and the “type of predicate displacement operation” on the other. As shown by the following examples from Hebrew, the abstract pattern may be realized as a Construct State construction (cf. (65a)) — featuring head movement (i.e. N-raising) of yemey — and as an apposition pattern (cf. 65b)) — featuring phrasal movement. It further permits the construction in which the nominal copula šel occurs in between the inverted predicate and the DP-internal subject (cf. (65c)):

(65) a. shisha yemey tiyul (Construct State construction)
   six days touring
   ‘six days’ touring’

b. shisha yamim tiyul (apposition construction)
   six days touring
   ‘six days’ touring’

c. shisha yamim šel tiyul (šel construction)
   six days of touring
   ‘six days’ touring’

As shown by these examples, Modern Hebrew permits a greater variety of realizations of the abstract pattern than Dutch. As a matter of fact, the variety of realizations is the same as the one found for the concrete pattern (cf. (47)).

As expected, the approximative expression “or + NUM” can only intervene between N1 and N2 when N1 has the free form (ša’at; ‘hour’). When N1 has the Construct State form, the approximative expression must follow N2:

(66) a. she’at tiyul o shtayim
   hour(CS) touring or two
   ‘a tour of an hour or two’

b. *she’at o shtayim tiyul
   hour(CS) or two touring
Thus, the Hebrew examples show that there is no intrinsic relationship between the abstract pattern and the formal analysis of N1 as a displaced predicate nominal of the phrasal type. As shown by the Construct State construction (66), N1 can also be a nominal head (i.e. N0). As argued by standard analyses of this construction type, this raised noun (she’at) assigns genitive case to the nominal expression to its immediate right (tiyul).

Interestingly, examples like (68), which are drawn from older Dutch texts (around 1920), also exhibit a genitival case on the second noun (cf. Gerlach Royen 1948). This example is very similar to the concrete pattern in (53b), in the sense that the second noun carries genitival case (-s). The example in (53b) was analyzed as follows: After N-raising of lepel across the nominal honichs, which is analyzed as the DP-internal Small Clause subject, lepel assigns genitival case to the nominal element to its immediate right (See (52a) for the corresponding derived representation). It is plausible that the structures in (68) receive the same structural analysis, with N1 assigning genitival case to N2. What this shows is that in older stages of Dutch, the abstract pattern could also be realized as a structure featuring predicate displacement of the head-movement type. In the course of time, Dutch seems to have lost this N-raising analysis for the abstract pattern.

(68) a. [Op [een schot afstand\{-s\}] aan gene zijden van de poelen] at a shot distance-s on those sides of the pools
   ‘At a shot’s distance on the other sides of the pools’
   b. [Binnen [drie weken tijd\{-s\}] heeft Cor Kint dus drie wereldrecords op den rugslag op haar naam gebracht.] in three weeks time-s has Cor Kint thus three world records on the back stroke to her name brought
   ‘Within three weeks, Cor Kint has won three world records on the back stroke’
   c. [Op [eenige boogschoten afstand\{-s\}]] [At [some bow shots distance-s]]
   ‘At a distance of some bow-shots'
Interestingly, Gerlach Royen (1948: 17) also gives the following Dutch examples drawn from texts from around 1920.

(69) a. Op een kanonschotsafstand van de plaats
   At a gunshot-distance of the place
   'Within gun-range'

   b. Op een musketschotsafstand van de brug
   At a musketshot-distance of the bridge
   'Within the range of a musket'

The examples in (69) look quite similar to the one in (68a). A crucial difference is that in (68a), it is the N2 which carries the bound morpheme -s, whereas in (69) this morpheme seems to go with N1 (i.e. kanonschot-s). The orthography suggests that the sequence N1 -s N2 forms a compound-like structure (i.e. a word-structure); that is, it is written as one word. But as we know that orthography can be quite misleading sometimes, the structure may very well be more syntactic; for example:

(70) [[[kanonschot] -s [afstand]]]

And when we realize that the meaning relation between afstand and kanonschot is one of predication (i.e. “distance is a gunshot”), we may come to an analysis in terms of phrasal predicate displacement (of the A-movement type):

(71) [[DP een [[FP kanonschot [F¹ F+Xj (= -s) [XP afstand [X¹ tj ti]]]]]]]

The bound morpheme -s in (71) is not interpreted as a genitival case suffix. It is rather interpreted as an instantiation of the nominal copula which shows up in DP-internal predicate inversion contexts as a result of incorporation of the DP-internal small clause head X into the higher functional head F. Thus, two (overt) nominal copulas can be distinguished: (i) the preposition-like copula van (‘of’) which shows up in the N van/of N-construction (cf. Section 6.1); (ii) the bound morpheme -s.

In present-day Dutch, the abstract pattern N1–s N2 is no longer productive. The abstract pattern in present-day Dutch typically consists of two juxtaposed nominals (as was illustrated throughout this chapter). The absence of a copular element suggests that no head movement of a Small Clause head X to a higher functional head F is involved in the derivation of these constructions. Recall from Section 6.1. that X-to-F movement is needed for creating a structural environment in which the A-moved predicate nominal is as far away
(i.e. equidistant) from the extraction site as the Small Clause subject. That is, the displaced predicate and the Small Clause subject should be members of the same Minimal Domain (Chomsky 1993). From the absence of a copular element, it may be concluded that in the Dutch abstract pattern, predicate displacement is of the A'-movement type; i.e. movement to [Spec, DP]. This was also the outcome of our discussion in Section 7 on the basis of the property of subextraction: the quantity denoting predicate can be removed from within the noun phrase. Under the general view that elements can leave the noun phrase only via its left edge (i.e. [Spec, DP]), the conclusion seems inescapable that the quantity denoting predicate of the abstract pattern occupies [Spec, DP] after DP-internal predicate displacement has applied.

The idea that -s and van are both instantiations of the nominal copula receives indirect support from English. As shown by the following examples drawn from Poutsma (1928), English has both the abstract pattern NI (= MeasurePhrase) + -s + N (cf. (72)) and the abstract pattern NI (= MeasurePhrase) + of + N (cf. (73)).

(72) a. During [my month’s holiday] she was particularly pleased with me
   b. The walk was a solitary walk, . . . but [a minute or two’s distance]
      from his lodgings
   c. It’s [half an hour’s walk] from the station
   d. In [a week or two’s time] he had changed into a werewolf

(73) a. She begged for [an extra week of holiday]
   b. That would have spared me [eight years of misery]
   c. Still it was something to be out in the open air, to get [a few min-
      utes of leisure]
   d. This happened in [a minute of time]

As shown by the examples in (74) and (75), of and -s are in complementary distribution. This complementary distribution suggests that these two elements compete for the same structural slot. Or, more precisely, the nominal copulas of and -s both try to spell out the same complex head, viz. [F+X]. Simultaneous spell out is, obviously, impossible.

(74) a. He begged for [a week of vacation]
   b. He begged for [a week’s vacation]
   c. *He begged for [a week’s of vacation]

(75) a. During [a month’s holiday] you can’t do much
   b. During [a month of holiday] you can’t do much
   c. *During [a month’s of holiday] you can’t do much
From the above discussion it is clear that languages differ in the way the abstract pattern is formally expressed. A language like Modern Hebrew has three ways of expressing the abstract pattern, viz. by means of a Construct State construction, an apposition construction, and the construction featuring šel (cf. (65)) Furthermore, these morphosyntactic realizations are also found for the concrete pattern (cf. (47)). Present-day Dutch, on the contrary, is less rich in its ways of expressing the abstract pattern. Furthermore, as opposed to Modern Hebrew, the Dutch abstract pattern has a different structural representation than the concrete pattern (event though they look alike superficially).

Of course, this issue about the cross-linguistic and cross-constructional variation (i.e. abstract pattern versus concrete one) in contexts of DP-internal predicate displacement deserves more in-depth research. As far as I can see now, two important dimensions along which variation is found are: (i) the case licensing of the two nominals in these constructions; (ii) the spell-out of the nominal copula. As for the former: the Construct State construction permits (rightward) assignment of genitive case by the raised noun (with or without overt spell-out). In Modern Hebrew, both \( N_{\text{concrete}} \) and \( N_{\text{abstract}} \) have this possibility of assigning genitive case to the following nominal element. In present-day Dutch, only \( N_{\text{concrete}} \) can assign genitive case (without morphological spell-out), as in \( \text{een fles wijn}_\text{GEN} \) (a bottle wine + GEN). In older stages of Dutch, this abstract genitive case was spelled out as -s (cf. (53b)). In those cases in which \( N_2 \) is not assigned genitive case, the DP-internal Small Clause subject receives its case under agreement with the inverted predicate nominal. That is the two nominal elements share the case feature that is assigned to the containing DP. In those case agreement contexts, variation may reside in the spell out of the nominal copula (i.e. the preposition-like element \( \text{van/af/}\text{šel} \) versus the bound morpheme -s).\(^{24}\) Modern Hebrew only permits the insertion of the preposition-like element šel and has no bound morphemic copular element. Insertion of šel is permitted in both the abstract pattern and the concrete pattern. In English, the abstract pattern and the concrete one differ in the way the nominal copula is spelled out: The concrete pattern only permits spell out by means of of (a bottle of wine versus *a bottle's wine). The abstract pattern, on the other hand, typically takes the bound morpheme -s (cf. (72)) but also permits insertion of of (cf. (73)). The fact that the concrete pattern does not permit spell out of the nominal copula as -s suggests that it is context sensitive: The complex head [F+X] only spells out as -s, if \( N_2 \) is \(+\text{abstract}\). In the Dutch sequence \( \text{N}_1-\text{N}_2(\text{abstract}) \), there is no morphological spell out of any nominal copula. This is due to the fact that the predicate nominal has undergone direct movement to [Spec,DP]; i.e. predicate displacement is of the
A'-bar movement type rather than the A-movement type. In such cases, domain extending X-to-F movement is not needed in order to render the displaced predicate nominal and the Small Clause subject equidistant from the extraction site; this for the reason that a phrase in an A-position does not count as a potential intervener for a higher phrase in an A'-position.

10. Concluding remarks

I started this chapter with the well-known minimal pair noted by Chomsky in *Current Issues: John is easy to please* and *John is eager to please*. Chomsky rightly points out that, although superficially very similar, these sentences should be assigned different structural analyses. Something similar we noted for the Dutch nominal domain: although the concrete pattern and the abstract pattern are superficially the same, it turns out on closer inspection that the two nominal constructions should be assigned different structural descriptions. More in particular, the difference between the two constructions resides in the phenomenon of predicate displacement: the concrete pattern features predicate movement of the head-movement type, whereas the abstract pattern features predicate movement of the A'-movement type; i.e. a predicative XP is moved to Spec,DP. Besides these two types of predicate movement, I briefly discussed the so-called *N van een N*-construction, which arguably is characterized by the application of predicate displacement of the A-movement type. Thus, the movement typology well-known from the clausal domain — A-movement, A'-movement and head movement — is also attested in the nominal domain. This again strengthens the view that the clausal domain and the nominal domain have much in common. Although there seem to be good reasons for distinguishing these three types of movement within the nominal domain, it is clear that several issues at the level of cross-linguistic and cross-constructional variation are in need of more detailed investigation.

Notes

* This chapter was presented at the conference from NP to DP that took place in Antwerp, February 2000. I would like to thank the audience for useful feedback. I am also grateful to two anonymous reviewers for their comments and suggestions. I also wish to thank Tal Siloni for her help with the examples from Modern Hebrew.
1. The pattern in (3), where N2 is a concrete noun, also permits count nouns as N2, e.g. 
twee dozen sigaren (two boxes cigars; ‘two boxes of cigars’).

2. For some speakers of Dutch, the contrast between (5) and (6) is less sharp. They judge
(6) as being ?* rather than *. As pointed out to me by Henk van Riemsdijk, separation of
N1 and the concrete noun N2 is often permitted in recipes:

   (i) Men voege toe een lepeltje of twee nootmuskaat,
       one add-subjunctive_prt a spoon or two nutmeg,
       een mespuntje of drie kruidnagel en een
       a knife-point or three clove and a
       druppeltje of vier Crème de Cassis
       drop or four Crème de Cassis

Besides the pattern een fles wijn of twee (a bottle wine or two), Dutch has the construction:
een fles wijn of zo (a bottle wine or so; ‘a bottle or so of wine’), where of zo is an expression
of approximation. Speakers of Dutch strongly reject the sequence in which of zo precedes
N2: *een fles of zo wijn. Importantly, the sequence in which of zo precedes N2 is permitted
for the abstract pattern: een minuut of zo bedenktijd (a minute or so time-for-reflection).

3. The N2+verb-sequences in (10) and (12) seem to form fixed combinations (collocations)
with N2. The split abstract pattern is less acceptable with certain other verbs:

   (i) a. ?*Hoeveel dagen heeft dat bedenktijd gevergd?
       how-many days has that time-of-reflection demanded
   b. ?*Hoeveel uur heeft de dokter rust voorgeschreven?
       how-many hours has the doctor rest prescribed

Also in other discussions on extraction from noun phrases, linguists have hinted at the nature
of the relationship between the verb and the noun. In their reaction to Chomsky’s (1973)
observation that extraction from NP is possible (e.g. Who did you see [a picture of —?]),
Bach and Horn (1976), for example, note that the choice of the verb is relevant: *Who did
you destroy [a picture of —]? In these discussions on extraction from NP, the question has
often been raised whether the PP, from which an element is removed, is really part of the
noun phrase. The same question could be raised for the measure phrases in sentences like
(10). That is, one could propose that the N2+V-combination forms a syntactic unit and that
the measure phrase is an adjunct within the VP. In Section 2, this alternative analysis will be
rejected.

4. Extraction of wat out of a subject noun phrase tends to improve when er is added.

   Compare (i) with (23a):

   (i) Wat, denk je [CP dat [er [t, voor mensen] hun huis hebben verkocht?
       what think you that there — for people their house have sold
       ‘What kind of people do you think have sold their house?’

The accessibility of wat for subextraction arguably relates to its lower (possibly,
VP-internal) position within the clause. As shown by (ii), subextraction of the measure
phrase from within the abstract pattern is also permitted when er occupies [Spec,IP] and
the real subject (hoeveel meter afstand) is lower in the clausal structure:
(ii) \[ \text{how many meter had to there — distance taken to-be from the ball} \]

5. See also Koopman and Sportiche (1985) and Rizzi (1990) for the non-argument status of measure phrases. Klooster (1972) already notes the predicative nature of measure phrases.

6. For other studies on nominal phrases that adopt a DP-internal (small) clause configuration and discuss the application of DP-internal predicate displacement, see: Kayne (1994), Den Dikken (1995), Bennis, Corver and Den Dikken (1998).

7. See Moro (1991, 1997), Den Dikken (1995), and Bennis, Corver, and Den Dikken (1998) for discussion of different types of predicate displacement within the clausal domain.

8. Following Bennis, Corver and Den Dikken (1998), I analyze (the second) *een* as the head of the DP-internal Small Clause. They show that *een* neither belongs to N1 nor to N2. The distribution of this spurious indefinite article in DP-internal predicate displacement environments is an issue for future research.

9. Den Dikken draws a parallel with facts observed in Moro (1991, 1997). Moro notes that in clause-internal predicate-inversion contexts, the verbal copula to be obligatorily appears. Compare, for example, the straight order in (i) with the inverted order in (ii):

   (i) I consider John (to be) the best candidate.
   (ii) I consider the best candidate *(to be) John.

10. In English, as opposed to Dutch, the *No faN*-construction (*a hell of a problem*) and the pseudopartitive construction (*a bottle of wine*) display the same syntactic properties (see Corver 1998).

11. It has been argued that head movement of a Small Clause predicate into a higher head also exists in the clausal domain. It has been claimed that an example like (ia) derives from the underlying structure (ib), by adjoining the adjective open to the verb maken, and subsequently moving this complex predicate (i.e. \([V A+V]\)) to the higher verb wil, to which it (right-)adjoins. This yields the derived structure in (ic).

   (i) a. Ik geloof dat Jan de doos wil open maken. I believe that Jan the box wants open (to)make
      'I believe that Jan wants to open the box.'
   b. . . . [dat Jan [sc de doos [ap open]] maken wil]
   c. . . . [dat Jan [sc de doos [ap \([t_i]\)]] \(t_i\) wil \([v \text{ open}_i+maken]\)]

12. I assume that the nominal copula van does not surface when the (complex) head \(\{[F+X]+N\}\) already contains a lexical element (*fles* in (43)).

13. This is the structural representation that goes with the quantity reading. The so-called container reading (*a bottle having wine in it*) of the sequence *een fles wijn* has a different structure. See Corver (1998) for an analysis.
A possible objection against the head movement analysis in (46) might be the fact that *fles* can be preceded by an attributive AP that enters into a modification relation with this noun, as in *een volle fles wijn* (a full bottle wine). One might take this as evidence for a phrasal analysis of the displaced predicate: \([_{10} \text{een } [\text{volle fles}, \text{een wijn t}]]\). Simple constituency tests, however, show that the attributive AP occupies a position external to the sequence \(N_1–N_2\). Consider, for example, the ellipted noun phrase in (i):

(i) Wil je [een volle fles wijn] of [een lege —]?

‘Would you prefer a full bottle of wine or an empty one?’

This ellipsis-pattern would be predicted to be false under an analysis in which the sequence *volle fles* forms a phrasal unit (i.e. \([\text{AP}+N_1] \text{N}_2\)). The sequence \(N_1–N_2\) does not form a constituent and hence would not be available for DP-internal ellipsis. Note that a roughly similar argument holds for English: in the English translation in (i), the pro-word *one* substitutes for the sequence *bottle of wine* (which, in fact, does feature phrasal movement of *bottle*). *One*-substitution is only possible if the sequence substituted for forms a syntactic unit. The implication is, of course, that the attributive AP (*empty*) is external to the sequence \(N \text{ of } N\). From the above facts, I conclude that the attributive AP enters into the nominal structure at a point in the derivation at which the unit \(N_1–N_2\) has already been formed (See also Corver 1998).

One might want to adopt an alternative analysis for the stranding pattern in (46), viz. one in which the sequence *een fles wijn* constitutes a left DP-conjunct which is coordinated with the ellipted DP-conjunct *twee*. Under such an analysis, the string *een flesje wijn of twee* would receive the following structure:

(i) \([_{10} \text{een flesje wijn}] \text{of}_{10} \text{ twee e}\]

Since nothing excludes coordination at the DP-level, a structure like (i) is a possible structure. In fact, it is arguably the structure of the ellipted nominal constituent in (ii), where the right conjunct is interpreted as ‘three glasses of wine’.

(ii) Hoeveel glazen wijn drink je gewoonlijk op een avond?

‘how-many glasses wine drink you usually in an evening’

[Twee glazen wijn of drie [e]!]

‘two glasses wine or three glasses wine’

I should point out, though, that the interpretation of the coordinated structure in (ii) is different from the approximation interpretation in (46). The construction in (ii) is interpreted as a choice between two options: two glasses of wine or three glasses of wine. It does not have the approximation reading. To this it can be added that the intonation pattern of the ellipted nominal construction in (ii) is different from the approximation construction in (46): in the former, the accent falls on the two numerals (*twee, drie*), whereas in the latter the accent falls on the second noun (i.e. \(N_2\)) of the string: e.g. *een flesje WIJN* of twee (a bottle WINE or two).
Thus, although structure (i) is a possible structure in Dutch, I think it is the right one for constructions like (ii), but not for the approximation construction in (46).

15. The definite variant of (47a) is: bakbuk ha yáyin (bottle the wine; 'the bottle of wine'). See Glinert (1989).

16. Štayim is the feminine form, šnayim the masculine form.

17. Recall that the measure phrase of the abstract pattern cannot be moved across a negative element (the Negative Island constraint; see (29). This is now explained by the predicative status of the measure phrase.

18. The element wat also functions as an interrogative predicate nominal in the clausal domain; e.g. Wat is Jan uiteindelijk geworden? 'What has Jan eventually become?'; Wat is hij vroeger geweest? 'What has he formerly been?'.

19. The numeral in (65a) may also take the Construct State form: Shney yemey tiyul. Besides the patterns in (65), Hebrew also has the following construction type: tiyul šel shisha yamim (touring of six days; 'a tour of six days'). In Dutch, this nominal construction is also found: een voorsprong van 6 minuten (a headstart of six minutes). Notice that in this construction type, the order of the two nominals is the reverse of the one found in the abstract pattern 6 minuten voorsprong (6 minutes headstart).

20. The idea that -s should be interpreted as a nominal copula rather than a genitival case suffix was first proposed by Den Dikken (1995, 1998). He argues that a string like John's car has the derived structure in (i): PP is the inverted prepositional predicate, car is the Small Clause subject, and -s is the spell out of the nominal copula.

(i) [DP D [FP [PP tk John] _ [F¹ F+Xj+Pk (= s) [XP car [X¹ tj ti ]]]]]

21. As shown by (72b), the approximative expression or + NUM can intervene between N1 and N2. This shows that the displaced predicate is of the phrasal type.

22. Measure phrases also occur as left members in compounds, as in I gave John [a [one minute] headstart].

23. The pattern in (73), featuring the nominal copula of, is also possible in certain nominal constructions of Dutch. Consider, for example, the following examples:

(i) a. [na [drie dagen rust]]
   after three days rest

   b. [na [drie dagen van rust]]

(ii) a. [na [drie dagen intensive inspanning]]
   after three days intensive exertion

   [na [drie dagen van intensive inspanning]]

24. As shown by (ia) from German (taken from Aarts 1994), the nominal copula von does not necessarily interfere in the case agreement relationship between the predicate nominal (alter Schelm) and the SC-subject (Lohnbediener). As shown by the adapted example (ib), von can entertain a Case relationship with the SC-subject (see also Den Dikken 1998).
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(i) a. ein alter Schelm von Lohnbedienter (from Heinrich Heine)
   an old villain of a waged servant-nom
b. ein alter Schelm von einem Lohnbedienten
   an old villain of a waged servant-dat

References


Norbert Corver


Chapter 13

Semi-lexical nouns, classifiers, and the interpretation(s) of the pseudopartitive construction*

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0. Introduction

The Pseudopartitive Construction (henceforth PPC) illustrated in (1) has received a considerable amount of attention since its first systematic and detailed analyses by Jackendoff (1977), Selkirk (1977), and Akmajian and Lehrer (1976). In fact it appears that this construction has been the touchstone for testing and establishing new developments and major changes within the generative paradigm. Thus, for Jackendoff (1977) it served as supporting evidence for his Uniform Three Level Hypothesis (see (2)), which laid the foundation for the Extended Standard Theory. More recently, it has been used as a representative illustration of the head-complement relation among lexical and functional categories (Löbel 1989) (see (3)) within an exploded DP after Abney (1987), whereas Corver’s (1998) (see (4)) proposal, instantiating a predicative structure, manifests the general lines of Chomsky (1993) concerning locality and reflects antisymmetric notions (Kayne 1994). Corver’s analysis also relies on previous analyses of predicate inversion as put forth by Moro (1993, 1997) and den Dikken (1995, 1998).

(1) a. a rather large number of books (by famous authors)
   b. a handful of questions
   c. ena buketo luludja  (Greek)
      a bunch flowers
   d. un verre d’eau  (French)
   e. una bottiglia di vino  (Italian)
   f. ein Glass Wein  (German)
0.1. Previous analyses

Each of the analyses depicted below incorporates different assumptions about 
(a) the (syntactic) status of the whole PP phrase, (b) the (semantico-syntactic) 
relationship between the two nouns (number-books; handful-questions) (c) the 
status and content of the uppermost D, (d) the status of the N1, the first noun 
in the sequence, first as for its lexical or functional make-up, second as for its 
bar level.

(2) \[ \begin{array}{c}
    \text{N}'''' \\
    \text{N}''' \\
    \text{N}'' \\
    \text{N}''/\text{Q}'' \\
    \text{a handful} \\
    \text{many} \\
    \text{N} \\
    \text{questions} \\
\end{array} \]  
(Jackendoff 1977)

(3) \[ \begin{array}{c}
    \text{QP} \\
    \text{Num} \\
    \text{Q} \\
    \text{Q} \\
    \text{NP} \\
    \text{three} \\
    \text{pounds of} \\
    \text{cherries} \\
\end{array} \]  
(Löbel 1989)

Note: I will call this 'H(ead)–C(omplement)' structure]
The interpretation(s) of the pseudopartitive construction

Note: I will call this ‘P(predicative) S(structure)’ structure

0.2 Purpose of the chapter

Focusing on basic properties of the Greek PPC, I will propose a structure that falls within the Head Complement type employing in crucial ways the (interrelated) ideas of semi-lexical head and (M)-projection as put forth by van Riemsdijk 1998 (and Grimshaw 1991). My proposal focuses on the property of the PPC as a single nominal projection (also Löbel 1999) with crucially a single referent. A crucial part of the proposed analysis is the semantic and syntactic parallelism exhibited by quantifying or measure phrases like ‘a bottle’ in a bottle of wine with simple quantifiers like much/many as in much wine or many people. In particular, my main argument is that the measure/classifier phrase ‘ena bukali’ (a bottle) in ‘ena bukali krasi’ (a bottle of wine) behaves just like a simplex QP within the extended DP nominal structure, which in the PPC is lexically headed by a mass noun or bare plural. This function of the measure/quantity or classifying noun (abbreviated as N1) stems from its categorial status, namely semi-lexicality. N1 is thus an instantiation of the feature complex [+Functional, −Grammatical] (Riemsdijk op. cit.) — i.e., a non grammatical category with functional features and behavior nonetheless. In particular, it is a non grammatical category with functional features and behavior nonetheless. It heads its own category and selects (functionally) a lexical N(P) as its complement. Measure/classifier nouns in PPC are therefore parallel to auxiliary verbs (ibid.; see further Cardinaletti and Giusti (to appear).
for a number of data involving the notion ‘semi-lexical’ verbs which exhibit a behavior strikingly similar to that of measure/classifier nouns illustrated here). However, Cardinaletti and Giusti (2001) reach a different conclusion from the one I am arriving at — namely that these verbs are in fact lexical categories used as functional in the particular constructions. The proposed analysis of the Greek pseudopartitive construction underlines the usefulness of including semi-functional categories, alongside functional and lexical, in the repertory of grammatical categories. Finally, I will present evidence throughout the presentation in support of my hypothesis that the ‘ambiguity’ between the Pseudopartitive and the container/consistive reading (Jackendoff 1977; Selkirk 1977), which is attributed to structural factors, is in fact a reflex of the lexicality vs (semi)functionality (i.e. Q-ness) of the nominal introducing the whole construction.

The remainder of this chapter is organised as follows: In 1 I give a brief description of the construction in Greek, focusing on the role of classifiers and measure nouns in the construction, since the syntactic structure I will propose relies on this role. In 2 I will go through the defining characteristics of the construction, viz. single projectionhood and number/case agreement between the verb and the PPC. In 3 the syntactic similarity of the classifier phrase with a simple QP is highlighted and then in 4 I propose a syntactic structure which basically captures this parallelism: it will be argued that the PPC is a determinerless projection, and in particular a QP. In Section 5 I will briefly discuss the interference of the consistive/container reading of the PPC, which, I claim to be based on the lexical content — vs the functional one — of the noun that ‘introduces’ the construction. In Section 6 the main conclusions will be drawn by reference to the main points of the discussion, and some problems for a crosslinguistic treatment of the PPC with respect to the noun-complement reading will be mentioned.

1. A short description of the PPC in Greek

The PPC in Greek, much like its Dutch counterpart, is of the juxtaposed type, in Corver’s terminology, and instantiates an appositive construction. Crucially, as will further be shown below, ‘case sharing’ (between N1 and N2) in the Greek PPC marks ‘single-projectionhood’ and ‘multi-headedness’ of the strings in (1) above.
The interpretation(s) of the pseudopartitive construction

1.1 Properties of N1

What kind of noun can N1 be? Possible values for N1 can be provided by the following noun classes: (a) N1 is a cardinal noun (*dizina* ‘dozen’, *ekatosti* ‘a hundred’), (b) it can be a quantifier-like noun (*zevghi* ‘pair’, *arithmos* ‘number’, cf. van Riemsdijk, op. cit.: 13), (c) a container (*kuti* ‘box’, *bukali* ‘bottle’), group (*plithos* ‘crowd’)/collective (*sminos* ‘swarm’) or consistive/material (cf. Jackendoff 1977: 121) (*buketo* ‘bunch’, *matsaki* ‘small sprig’) noun, (d) a measure/unit (kilo) noun and (e) a partitive (*komati* ‘piece’, *feta* ‘slice’) noun.

Of these, it is the container class that gives rise to the container reading ‘proper’. As a matter of fact, however, a similar though not identical to the container reading, is also quite often, the consistive reading, which is due to the presence of group and consistive/material denoting nouns. The difference between these two readings is that while in the former the semi-functional noun provides a place holder for the referent of the second noun, in the latter the cumulative reference or aggregation of the second (count) noun constitutes the denotation of the first noun. What should be emphasised is that some noun classes, in particular (c) and to a much lesser extent (e) constitute open classes (they are used very creatively and quite imaginatively in the pseudopartitive construction, cf. *tria tsigara dromos* ‘three cigarettes way’ (meaning a distance that takes the smoking of three cigarettes to be covered), *ena leoforio turistes* ‘a bus of tourists’). The remaining categories (a, b, d) form rather closed classes, as they cannot register new members (at least not freely). It is worth noticing that container and consistive nouns are usually called ‘classifiers’, the term originally employed to describe classifier languages. Chierchia (1998) distinguishes classifiers from measure nouns, primarily on semantic grounds, although, as he writes (p. 73), these are similar as both are relational and both allow quantification of a certain domain of objects. Moreover, concerning the construction under examination here, both these noun classes behave in the same way syntactically; the differences that will be noticed in the following section (2) will be attributed to the semi-lexical character of measure, container/consistive and collective nouns (also van Riemsdijk op. cit.); cardinal/quantifier nouns are (more) functional.

However, what is of importance for the proposed structure of the PPC is that all of the aforementioned noun classes behave alike with respect to the following three facts:

a. they always appear to be preceded by a cardinal or a quantifier (see 1.2)
b. they designate a certain quantity, or amount or number, taken from the denotation of the lexical noun (see 1.2)
c. they are relational in that they require a noun which they measure or quantize. N1 in this sense is always complement taking (Chierchia 1998:72; Corver 1998; Löbel 1999).

1.2 The role of classifiers and measure nouns (N1)

Crucially, N1 in the PP construction sponsors the countability of N2. What happens in particular is that the use of a member of any of the afore mentioned noun classes in combination with a cardinal numeral or Q adjective serves the purpose of ‘counting’ the denotation of a mass noun. The classifier, measure or Q noun thus mediates so that the N selected can be felicitously preceded by a numeral (i.e. it can be counted). Furthermore, it can map the individual reference of a (count) plural noun (a ‘plurality’) into a cumulative one. To illustrate: *krasi (wine), tiri (cheese), nero (water) can be preceded by a numeral only with the mediation of a measure or classifier noun, while flowers, matches, newspapers, books (originally count nouns) can acquire a cumulative reference with the aid of an appropriate classifier/consistive noun (bunch, sprig, etc.). A dependency chain (an interdependence) is thus formed between classifier and noun, numeral and classifier, numeral and noun, something that the proposal to follow aims at capturing. Crucially, a classifier helps to measure or number (with the aid of a numeral) by providing a (pragmatically) appropriate measure unit: “Classifiers double up as measure phrases” (Chierchia 1998:73). Numerals or Qs are thus obligatory with all of the noun classes listed (cf.: Chierchia, op. cit.:55). This is why N1 as an introducer of a PPC is always accompanied by a quantificational (or cardinality) element:  

(5) Thelo ena potiri nero vs Thelo *potiri nero.
want-I a/one glass water want-I glass water

2. Basic syntactic properties of the PPC

1. The whole PPC is a unitary nominal phrase despite the inclusion of apparently two ‘nouns’ in it. This was pointed out already by Jackendoff (1977) and is recently shown by van Riemsdijk 1998 with special reference to Dutch (see
also the detailed older analyses of Selkirk 1977, and Akmajian and Lehrer 1976 on this issue and a recent one by Löbel on evidence from Vietnamese. Greek data are particularly illuminating in this respect on the following evidence.

— The two nouns (N1 and N2) always share the same case, which is assigned to them by the case assigner (P, V) that takes the whole nominal phrase as its complement. As van Riemsdijk (op. cit.) points out, if the second noun were part of a separate projection it would have its own case, independently assigned to it.

(6) Tis prosfere ena buketo iakinthus.

\textit{her-DAT offered-3SG a-SG.ACC bunch-SG.ACC hyacinths-PL.ACC}

I take this property of the construction to strongly suggest that in (6) ‘ena buketo’ as a whole is on a par with simple (Q) modifiers (\textit{pola ‘many’, liga ‘a few’}) of the noun, both on (morpho)syntactic as well as on semantic grounds.\(^6\) (Notice that Qs, just like adjectives and determiners always agree morpho-syntactically with the head noun.)

— No determiner, quantifier or RC can intervene between the two nouns (7), which means that if the second noun formed part of an independent phrase, it should be expected to have its own determiner(s)/modifiers (see also Jackendoff 1977:121). If the two nouns belonged to separate phrases, nothing would prevent each of the two nouns involved from being followed by a relative clause (8).

(7) a. *(. . .) ena buketo tus/olus tus/aftus tus/merikus/arketus iakinthus (. . .) a bunch the/all the/these the/some\(^{PL}/several\) hyacinths

b. *(. . .) ena buketo pu agorase htes iakinthus a bunch that bought-3SG yesterday hyacinths

(8) a. Tis prosfere ena buketo pu agorase htes me

\textit{her-DAT offered-3SG a bunch that bought-3SG yesterday with hyacinths}

b. Tis prosfere ena buketo me polus/olus tus/arketus

\textit{her-DAT offered-3SG a bunch with many/all the/several hyacinths}

\textit{hyacinths}\(^7\)

— The only modifier that can precede N2, thus intervening between N1 and N2, are adjectives. Not any adjective though, but only those adjectives that
appear to subclassify the reference of the lexical noun, so-called classifying adjectives (Bosque and Picallo 1996; Sleeman 1996; Stavrou 1998, among others). The structure I propose (Section 4) accounts for the absence of descriptive/qualifying adjectives, because what is selected by the semi-lexical head is a N(P) and not a full DP, and such adjectives are standardly assumed to occupy positions higher than the NP. Moreover, the occurrence of such adjectives is compatible with the idea of A+N as compound nouns (Borer 1988; Ralli and Stavrou 1997); such A–N sequences are located within the NP.

(9) a. ??ena potiri oreo/nostimo krsis
   a glass nice/tasty wine
b. ena potiri kokino/aspro/xiro krsis
   a glass red/white/dry wine

(10) a. *ena paketo frixta tsiqara (vs ena paketo me frixta tsiqara)
   a pack terrible cigarettes (vs a pack _with_ terrible . . .)
b. ena paketo elafria/amerikanika/afiltra tsiqara
   a box light/american/without filter tsiqara

What is of importance for my analysis, in so far as it argues for a distinction between lexical and semi-lexical N1s, is the evidence provided by the varying possibility of N1 being modified by an adjective, which is semantically a modifier of N2. Cf. the following:

(11) a. ena oreo/kokino/malako zevghari paputsia
   a nice/red/comfy pair of shoes
b. a delicious box of Belgian chocolates
c. a nice warm cup of tea

Here we have good evidence that measure and classifier nouns are not fully lexically ‘transparent’ (cf. Veloudis 1982/5) to adjectival modification of N2 by an adjective that linearly precedes N1. Such nouns then cannot count as ‘full’ nouns for adjectival modification. In (11d–e) on the other hand, it is clear that a cardinal or measure noun does not allow for such adjectival modification:

(11) d. *mia nostimi duzina rodakina
   a tasty dozen peaches
e. *ena akrivo kuti tsiqara
   a expensive box cigarettes

Examples (11d–e) show that not all nouns serving as N1 behave uniformly
with respect to allowing to adjectival modification of N2 and that even within
one and the same noun class there are degrees of lexicality.

Nevertheless, (11a–c) show that measure/classifier/container nouns are on
par with simple Qs, thus, providing more evidence for the claim that the PPC
is a single maximal projection. (11a–c) runs in parallel to (12):

(12) a. two nice/red/comfy shoes (shoes come in pairs)
    b. several delicious Belgian chocolates (packed in boxes)
    c. a lot of nice warm tea (we drink coffee normally in cups)

However one chooses to express the fact illustrated in (11), i.e. by saying that
the N1 is transparent and that the adjective can look through it to N2, or that
the adjective modifies N1 and N2 taken together, the fact remains that in such
cases the adjective is construed with the lexical N (: N2). The prediction I
would like to make at this point is that if N1 is interpreted as (more) lexical its
ability to have its own adjective modification increases, cf.:

(13) a. nice/interesting collection/arrangement of LPs

Here, the LPs themselves may be awful and still the collection per se nice and
interesting (in terms of size, range, etc). In other words, the more lexical
content there is to a noun, the more likely it is for it to be modified by a
descriptive adjective. This observation correlates with the fact that certain
nouns (the ‘lexical’ ones) are more prone to the container (‘noun comple-
ment’) reading than others (which thus are stuck with the pseudopartitive one
only).

Moreover, the prevailing functional character of N1 explains why it cannot
be followed by a modifying PP (*a bottle with a long neck water; see Corver
1998 for a different explanation of this fact): lacking descriptive bulk this
‘noun’ cannot support a prepositional modifier.

— The verb which selects the PPC as its internal argument appears to
semantically select either N1 or N2.

(14) a. efaje ena vazo marmeladha
    ate-3sg a jar marmelade
    b. espase tria vaza marmeladha se ena proi
    broke-3sg 3 jars marmelade in one morning

The fact that the verb in selecting its complement can again ‘see’ the second
noun ‘through’ the first one means that the second noun is accessible to it.
However, at the same time the verb seems also to semantically select the first

noun, a fact which underlines, as we will comment with more detail below, its partly lexical nature (see van Riemsdijk, op. cit. for more on this). Here it should be underlined that this ‘freedom’ of choice for the verb to select either of the two nouns within a single nominal argument is an automatic consequence, one could say idiosyncracy, of the pseudopartitive construction which stems form the categorial nature of the first noun (as not fully lexical and not entirely functional). It is further important that there is no need to distinguish (in structural terms) the ‘free’ choice of the verb.11

2. Number agreement between the verb and the whole of PPC (when in subject position). Here too the verb selects either N1 or N2, as is shown by the fact that it can agree in number with either of them (15):

(15) a. Iparhun/iparhi mia sira diavathmisis.
   are/is a range-sg gradations-pl
   ‘There are a number of gradations.’

b. Ena buketo luludja itan pesmen-o/-a sto patoma.
   ‘A bunch flowers was/were thrown on.the floor.’

This is expected, given, as is assumed here, that the PPC constitutes a unitary phrase involving two nominal constituents. A prediction implicated by the whole approach is that the lack of agreement between the verb and the first noun is more evident if the degree of functionality of this noun is high. This prediction is borne out, cf. (16):

(16) Ena soro rodakina petahtikan/-e apo tus agrotes.
   a (whole) lot peaches were/*was wasted by the farmers

Ena soro, related originally to the collective noun soros (‘pile’) but sliding gradually to a quantifier — in combination with a numeral — is incompatible with a singular verb.12

3. Measure/classifier phrases are like simplex Qs

We have already considered evidence (1.2) that the sequence ‘numeral–classifier’ are syntactically and semantically parallel to simple quantificational heads. Additional evidence of this parallelism is obtained from the following facts:

— Both behave alike with respect to ‘Split topicalization’: 
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(17) a. vivlia agorase pola fetos
   books bought-3SG many this year
b. vivlia agorase mia kuta fetos
   books bought-3SG one box this year

— All of numerals, Qs and measure nouns (plus a numeral) can answer to questions of quantity:

(18) a. — Posa vivlia diavases to kalokeri?
   how-many books read-2SG the summer
b. — pola/tria/ena rafi
   many/three/a shelf

— Both can occur in copulative clauses across the copula:

(19) a. Ta vivlia pu agorase me to xartziliki tu ine pola.
   the books that bought-3SG with the pocket money-his are many
b. Ta vivlia pu agorase me to xartziliki tu ine mia
   the books that bought-3SG with the pocket money-his are one
   box

— Both can license N-ellipsis:

(20) a. I Maria agorase ena forema fetos ala i aderfi tis
   the Mary bought one dress this year but the sister-her
   pola/djo.
   many/two
b. I Maria agorase ena forema fetos ala i aderfi tis mia
   the Mary bought one dress this year but the sister-her one
   dulapa [fozemata].
   wardrobe

Giannakidou and Stavrou (1999) (in the spirit of Lobeck 1995 and Kester 1996) have shown that the omitted N can be licensed by any overt specifier (adjective, quantifier, numeral), the basic assumption being that the missing N and the overt specifier agree in the relevant morphosyntactic features, so that the formal features of what is missing can be recovered through the formal features of what is present. (20b) supports G and S’s claim in so far as measure nouns are claimed here to behave on a par with quantifiers; but it also suggests that the important feature for the licensing of missing N is case (see G&S for
discuss). Obviously in (20b) there is no number and gender agreement, but crucially there is case agreement.

At the same time (21)–(22) illustrate a semantic parallelism between simplex Q, like *many*, and classifier phrases:

(21) a. Every morning he is followed by two police cars.
    
    b. The two police cars that follow him every morning have been ordered to do so by the FBI.

The difference between (21a) and (21b) is to be seen as parallel to (22a–b):

(22) a. I sintaji lei ena potiri zaxari.
        the recipe says one glass sugar
    
    b. . . . ala to ena potiri zaxari ine ligo
        but the one glass sugar is little

Both *two* and *ena potiri* in (21a) and (22a) respectively behave like true quantifiers and get a weak, cardinal reading. However in the (b) versions, in which both the quantifier and the numeral–classifier sequence are preceded by the definite article, they function rather like attributive adjectives/modifiers (‘two police cars’) used to identify the referent of the nominal containing them; they refer to an already numbered/quantized definite entity. ‘Two police cars’ in (21a) refers to an unspecified referent — any two cars (may be even one and the same that drives around and around during the morning) can be following him, whereas in (21b) the cars that follow refer to a contextually salient group of cars. Hence, the numeral or Q, in instantiations like those in (21b), behave syntactically just like attributive adjectives (Giusti 1997). Such a double behaviour of quantifiers like *many* is standard in the relevant literature. I assume it for sequences consisting of a numeral and a classifier (or measure noun) in the PPC as well.

In the following section I will propose a syntactic analysis which aims at capturing these facts.

4. The syntax of the PPC

4.1 The PPC as NumeralP

The fact that in PPCs the lexical head (N) is always a mass noun or ⟨bare⟩
The interpretation(s) of the pseudopartitive construction prevents us from assuming that we have to do with a (ordinary) DP with an empty D licensed under the conditions standardly stated in the relevant literature (Longobardi 1994, among others) and interpreted under the conditions that bare nouns usually are. We have already seen that a PPC without a cardinal determiner is ungrammatical in exactly those contexts where a (bare) mass noun is possible — cf. (5), repeated here as (23a):

(23) a. Thelo *(ena) potiri nero vs thelo nero.
    want-1sg *(a) glass water vs want-1sg water
b. Iparhi sto trapezi *(ena) bukali kras
    is on the table (a) bottle wine
    vs Iparhi sto trapezi kras
    is on the table wine

The same fact holds of classifiers in the plural, cf. (23c–d):

    bought-1sg (some/three/many) bottles wine
    has (two/many) bottles wine

The cardinal determiner appears thus to serve a function parallel to that of a determiner in an ordinary (i.e. one without a classifier/measure phrase) DP. The highest, therefore, functional category must be a NumeralP (or QP), not a DP, selecting a Classifier (or Measure) Phrase as its — functional, I assume — complement, for reasons that have already been exposed in Section 1.2; the obligatoriness of the cardinal determiner can be accounted for if we assume that its presence is information of the c-selection of its complement. The Classifier Phrase (ClP) in turn selects the lexical noun phrase, because its head, as we have seen, is a relational nominal constituent. I assume here that these quantity denoting nouns (i.e. N1) are listed in the lexicon in roughly the way that Löbel (1999) proposes, nam. as [+N_{s}[weight, form, substance, container, . . .], _NP_{c}]. Thus, in the case of pseudopartitives, as opposed to ordinary DPs, Num only indirectly selects N, because of the intervention of the quantity denoting noun. In assuming that the whole PPC must be treated as a QP with argumental (referential) properties, rather than a DP with an empty D, I follow the standard literature on the syntax and semantics of ‘many’ (Giusti 1997, among others). The structure in Figure 1 is primarily intended to capture the assumption that the introducer of the whole PPC is the numeral plural preceded by a numeral/Q which is obligatory in front of a classifier.
(or the Q) and that the whole PPC is therefore a NumP (or QP). Notice that what is labelled here 'numeral' phrase can essentially be equated with Number Phrase, a category which is established within the extended nominal projection on independent grounds crosslinguistically (see, among others, Ritter 1990, Szabolcsi 1994); in this respect then the proposed structure does not add a functional projection to the ones needed anyway.

\[\text{Figure 1.}\]

The prominent characteristic of this structure is that a distinct DP layer is absent, a feature of the PPC to which I turn in Section 4.2. The above structure is ‘translated’ into van Riemsdijk’s 1998 theory of extended or (M-)Projection under Figure 2. The structure under Figure 2 instantiates a single ‘extended’ endocentric projection: the whole PPC is dominated by a unique nominal node and all the categories subsumed under it are of nominal character in accordance with the \textit{Categorial Identity Thesis}.

\textbf{(M-)Projection:}

An (M-)Projection M is the maximal (vertical) path through a tree such that path satisfies the well-formedness conditions CIT and NVR (van Riemsdijk op. cit.: 8).

\textbf{Categorial Identity Thesis}

Within a projection, the values for the C-features must be uniform. (van Riemsdijk op. cit.: 8)

\textbf{No Value Reversal (NVR)}

Within a projection, the following holds:
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Under the assumption that a semi-functional (or semi-lexical) nominal category can be part of the extended projection, the measure phrase — a semi-lexical/functional category of typology [+Functional, –Grammatical] — shares the categorial feature [+N, –V] along with all the rest. The lowest NP is the lexical nominal category closing off the whole projection. The No Value Reversal Condition (van Riemsdijk 1998) is also obeyed in that phrasal projections and their heads carry identical feature values.

\[
\begin{array}{c}
\text{No Value Reversal Condition} \\
\text{(van Riemsdijk 1998)} \\
\end{array}
\]

As a final point of this section it should be said that the proposed structure entails at least three positive consequences which set it apart from the major competing account of the Predicative Structure (PS — cf. 4 above), which has been principally motivated by linguists on the basis of the pseudopartitive construction (see Corver 1998 and references therein): (a) the PS has to stipulate the ‘defective’ character of both the subject and the predicate; in particular, it cannot explain why the ‘subject’ has to be an NP, when typical subjects in any predication relationship, are DPs. Furthermore it cannot explain why neither relative clauses or adjectives (other than a well defined set, see above) can modify the classifier noun. In contrast, the present analysis highlights the idiosyncratic nature of the noun that introduces the construction (the measure/classifier noun), (b) the present analysis does away with predicate movement — an instance of A-movement — which as has been shown elsewhere (Alexiadou and Stavrou 1997:8; Alexiadou and Stavrou 1999; Campos and Stavrou 2000, to appear) does not exist in Greek, and (c) the predicative structure overshadows the indefinite interpretation of the PPC, to which we now turn.

*[-L/F]  
[+L/F]  (ibid.)

\[
\begin{array}{cc}
N_P \text{ (Num/QP)} & N_P \text{ (ClP)} \\
N_F & N_s \\
N_L \\
\end{array}
\]

Note: F = functional; S = semi-lexical; L = lexical
4.2 The PPC as an inherently indefinite construction

Although indefiniteness has not, as far as I know, been considered as a basic property of the construction\textsuperscript{15}, Greek facts are particularly revealing in this respect:

— When the measure, group or quantity noun is used to ‘measure’ or quantize the (denotation of the) lexical head, it does so within an indefinite nominal, as strongly suggested by the following contrast (and see again (23e)):

(24) a. Dose μυ ena potiri krasī.
give-imp me a glass wine

b. *Dose μυ to potiri krasī apo ki pano.
give-imp me the glass wine from there above

The ungrammaticality of (24b) suggests that in Greek the nominal containing a classifier phrase constitutes an indefinite construction, since a definite determiner is clearly excluded. The whole phrase then is interpreted as an indefinite non-specific nominal. This is what the structure in Figure 1 predicts, given that it lacks a DP projection. The question that naturally arises in this juncture is whether \textit{ena} in (24a) (\textit{ena buketo luludja}, lit. a bunch flowers) is just the numeral ‘one’ or the indefinite determiner (English \textit{a}) too (they are homophonous in Greek, as in many other languages). The stress pattern of \textit{ena} suggests that it can be either — if stressed it is the cardinal numeral ‘one’\textsuperscript{16}, if unstressed it is the indefinite determiner.\textsuperscript{17} This is a rather plausible conclusion, as it is compatible with the basic claim of this study, nam. that pseudopartitives are indefinite nominals: cardinals are commonly interpreted either existentially or as (weak) quantifiers — after all, they are indefinite determiners.\textsuperscript{18} Moreover, the proposed structure is compatible with the view that indefinite articles are merged in a projection lower than D. Notice that a very similar line of reasoning, in accounting for Chinese facts involving numeral+classifier+noun, is taken up by Cheng and Sybesma (1999), who claim that noun phrases with overt numerals, in both Cantonese and Mandarin, can only be interpreted as indefinite, overt numerals consistently leading to an indefinite interpretation (op. cit.:528). Finally, the structure in Figure 1 is very close to the structure given by Löbel (1999) (referring back to Li 1999) for English; the difference between the two proposals lies in the way that N1 is employed: for Löbel it is a lexical category with semantic selection properties, whereas in the present framework it is a semi-lexical category with functional selection properties. Nevertheless, N1 can be interpreted as a lexical noun and
rise to the container reading, as will be discussed in the following section.

5. The PPC and the noun-complement or ‘container’ interpretation

So far I have been claiming that sequences consisting of a numeral+classifier+noun preceded by the definite article do not yield a quantity/amount reading, which is characteristic of the PPC, but by using them one refers to some already specified amount/number/quantity of what is denoted by the lexical noun — cf. example (22b) repeated here:

(22) b. the one glass sugar is little

Moreover, (24b) clearly shows that the definite article is excluded from the sequence N1+N2 in the PPC. Nevertheless, (25) forms a minimal pair with (24b) (and with (5) above; cf. also (23e)):

(25) Dose mu to potiri *(to) krasi.
give-me the glass the wine

Above, it was shown that sequences like (1c) and (24b) cannot be preceded by the definite article. Interestingly, this restriction is cancelled if the second noun is definite, as can be seen in (25), in which the PPC is introduced by the definite determiner. In view of this contrast between (24b)) and (25) I assume that the object DP in (25) instantiates the so-called ‘container’ (Corver 1998; ‘noun-complement’: Selkirk 1977; ‘consistive’: Jackendoff 1977) reading of the PPC. At this juncture, it is worth noting that the repetition of the definite article with the second noun evenima prepositional phrase, when the preceding noun is also definite is a characteristic feature of Greek (: ‘definiteness agreement’; of course this feature is more widespread in the language, as it also manifests itself in instances of adjectival modification, but I won’t deal with this here; see Androutsopoulou (1995); Alexiadou and Wilder (1998); Stavrou (1995); Campos and Stavrou 2000 for different analyses of the phenomenon of ‘definiteness agreement’ involving adjectives). Consider (26):

(26) a. came a man with glasses

b. the man with the glasses (that came)
My proposal at this point is that the container/consistive reading does not imply a geometrically different structure from the structure given in Figure 1.\textsuperscript{20} What gives rise to the container reading, licensing it, is the lexical semantics of $N_1$: in the container reading $N_1$ counts as a (fully) lexical N, whereas in the quantity reading, as I argued, $N_1$ is (semi)-functional. On this view, the distribution of the quantificational and the container reading is a function of the properties of the building blocks of the structure of Figure 1: while the quantificational/indefinite reading is own to the maximal projection being a Num/QP, the container reading involves a DP rather than a Q or NumP-it is the presence of the definite article that unambiguously points to the presence of a DP projection in this case. Notice at this point that Cheng and Sybesma (op. cit.) suggest a very similar categorial distinction concerning Cl+ Noun sequences in Cantonese; they claim that such sequences, which are interpreted as definite, lack the Number Phrase layer (which is responsible for the indefinite interpretation), being just ClP. In the light of these remarks then, noun phrases consisting of two definite nominals in 'apposition' are ordinary DPs. The second noun is now lexically rather than functionally selected, as $N_1$ has now lexical properties. A question at this point is whether all the nouns listed under 1.1 above give rise to the ‘noun-complement’ reading. Although it seems to be the case that the container, group, classifier and partitive nouns are the ones that most naturally give rise to the ‘container’ reading, because of their lexical meaning,\textsuperscript{21} all of the noun classes listed in 1.1 seem to license this reading. Those nouns (e.g. quantifier, measure, kind) that do not have the appropriate lexical meaning can acquire it on the basis of lexical inferences, as proposed by Chierchia (1998: 73). In sum, the nouns in 1.1 are mapped to what they ‘contain’, ‘consist of’, ‘include’, even ‘measure’ with the predicates ‘contain’, ‘include’, etc, somehow broadly understood.

What this state of affairs implies with respect to Figure 2 is the minimal change in categorial features of $N_S$; viz. $N_S$ is now $N$. If $N_1$ is lexical then this has a number of reflexes. Most importantly, $N_1$ is now able to theta (and case\textsuperscript{22})-mark $N_2$ (cf. ex. 29 and n. 2). Furthermore, the numeral or quantifier is optional (in much the same way as attributive adjectives are), and can co-occur with a definite determiner. What this suggestion implies is that $N_2$ must
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itself be included in a DP. Nouns like box, bottle, etc., are accordingly listed in the lexicon as follows (adapted from Löbel 1999): [+N1[form, substance, weight, . . .], _DP/PP]. The meaning carried by instantiations like (27) can be also conveyed or paraphrased by a PP headed by the P me ‘with’. Accordingly, (27) can be accurately paraphrased as (28):

(27) To bukali i kolonja tis Elenis.
the bottle the cologne the.gen Helen.gen

(28) [[[to bukali [me tin kolonja]] [tis Elenis]]
the bottle with the.acc cologne.acc the.gen Helen.gen

It is impossible to paraphrase the quantity reading of the PPC as in (28). Nevertheless, measure and quantificational nouns disallow such a PP (*to kilo me tis patates ‘the kilo with the potatoes’), a fact which suggests that not all the nouns (N1) behave uniformly and that there may be degrees of lexicality even when they license the container reading.

Interestingly, when the noun-complement emerges, i.e. when N1 is lexical, the complement DP may also assume the genitive case, so-called ‘consistent’ genitive or genitive ‘of content’, rather than having the same case as the noun selecting it (29). The genitive on N2 is altogether excluded from the quantity reading of the PPC.

(29) a. to plithos ton djadiloton
the crowd the.gen.pl demonstrators.gen.pl
b. to sinolo tu arhiaku iliku
the totality the.gen archive.(adj).gen material.gen

c. *ena bukali neru (in the intended reading)23

In sum, there is enough evidence showing that certain noun classes with enough descriptive content give rise to the so-called container reading (of the pseudopartitive construction). This reading is correlated with (a) the ability of these nouns to stand alone without a complement, (b) their ability to be modified by adjectives (or by any other modifier) on their own right (ex (13)), (b) to be followed by a complement in the genitive case or contained within a PP headed by the P me ‘with’ (ultimately, the difference in lexicality is encoded in the possibility of N1 to case mark its complement) (c) with the loss of the necessarily indefinite/cardinal interpretation of N1. A final remark must be made here and it concerns an automatic consequence of our claims; if the
container reading involves a DP, this DP can be headed not only by the definite determiner, but by the indefinite one as well. This simple assumption can provide an answer to the question posed above regarding the category of *ena* (‘a’, ‘one’) that necessarily precedes N1 in the quantity reading. I tentatively suggest that when *ena* is interpreted as the indefinite ‘a’, we deal with the container reading, viz. a DP rather than a NumP.

6. Conclusions

I argued that many important aspects of the Pseudopartitive Construction can be better understood if the semi-lexical nature of the noun that formally introduces the construction is taken into consideration. An account in terms of this N as a semi-lexical head that is selected by Q or Num and selects the lexical Noun captures the interdependence between numeral and classifier and classifier and (mass/plural) noun. In this respect the sequence Numeral (or Q)–classifier behaves on a par with an ordinary Q in an indefinite DP/QP.

I further proposed that the difference(s) between the PPC (or the quantity reading) and the so-called container reading can be reduced to the semi-functionality vs lexicality of the nouns that introduces the PPC.

Notes

* I would like to thank Artemis Alexiadou, Athina Sioupi, Yanis Veloudis, Geoff Horrocks, Mila Dimitrova-Vulchanova, Theodoros Marinis, Almerindo Ojeda, Gisbert Fanselow, the audience of the DP/NP conference in Antwerp, February 2000 and an anonymous reviewer of this volume for insightful comments and helpful suggestions. Special thanks are due to Anastasia Giannakidou and Winnie Lechner for reading and commenting on an earlier draft of this chapter. Almost at the completion of this chapter, Riet Vos’s doctoral dissertation was brought to my attention, which seems to develop ideas very close to the ones argued for in this chapter. It will be interesting to see in future research to what degree the claims and assumptions which have been independently developed here converge or differ.

1. Cf. Chierchia’s (1998) claim that classifier phrases are part of the quantificational system of a language.

2. For the issue whether a Q is lexical or functional see, for example, Giusti (1997).

3. It is a fact of course that they cannot be used in an unrestricted way, as their featural structure must be matched with corresponding features of their noun complement.
The interpretation(s) of the pseudopartitive construction

4. A. Ojeda (p.c.) points out to me that it cannot be the case that the mass noun is in this way ‘converted’ into a count noun with the aid of a classifier, as nothing whatsoever can alter its substance it will always be ‘mass’ (see his contribution to this volume where he argues that measure nouns receive first order interpretations denoting metrically equivalent entities). Nevertheless, it also remains a fact that at a symbolic level language invents ways to circumvent ontological rigidity, so in the case of the PPC the purpose of num+classifier is simply to enable people to come around the very nature of a mass noun and ‘count’ it by ‘putting’ it within something which is itself countable. Cheng and Sybesma (1999) discuss core cases of ‘classification’ in Chinese, whereby there are two types of classifiers, one called ‘massifiers’, pertaining only to nouns without internal partitioning and the other called ‘count-classifiers’, appropriate for nouns that come with a built-in semantic partitioning. Löbel (1999) calls the Vietnamese counterparts of these two classes mensural and sortal respectively.

5. Quoting Chierchia: “… classifiers are partial functions from pluralities into sets of atoms constituted by members of the pluralities” (Chierchia 1998:72).

6. Number agreement between N1 and N2 is not expected as N2 is either a mass noun (hence singular) or plural. As for gender agreement, given the lexical origin of gender, and the semi-functional nature of N1, N1 is inherently marked for gender, therefore discrepancy in gender agreement between N1 and N2 is expected.

7. Of course, as expected, an RC is possible at the end of the PPC modifying the whole of the phrase:

   (i) Tis prosfere ena buketo iakinthus pu agorase htes.
   her-dat offered-3sg a bunch hyacinths that bought-3sg yesterday

8. And see also Dimitrova-Vulchanova (this volume) for a novel account of A+N combinations, which is very close in spirit to Ralli and Stavrou’s account of such combinations as instantiations of syntactic compounds.

9. More adjectives may in fact modify N2 in so far as they are conceived as classifying its referent, even adjectives like ‘good’ or ‘nice’, if they are conceived of as forming a natural basis for distinguishing types of N2’s.

10. Interestingly, we attest the same phenomenon in other cases too, as in those which are somehow ‘holistically’ interpreted, like inalienable possession, cf.:

   (i) ta andriomena kokala xathapste tu gonju sas (from a folk-song)
   the brave bones unbury the.gen parent.gen yours-clitic
   ‘Dig up the bones of your brave father.’

or noun phrases interpreted under the ‘container’ or noun-complement reading (see Section 5):

   (ii) thermi stalagmi dakrion
   warm drops tears
   ‘warm drops of tears’
Examples like those under (14) have been taken (Selkirk 1977; Jackendoff 1977) to reflect a structural ambiguity of such strings: under one interpretation, the head is the second noun, the first being a kind of specifier/modifier; under the second, the head is the first and the second noun is its complement (Jackendoff’s and Selkirk’s consistive, Corver’s 1998 container reading). Accordingly, in the genuine PPC the verb selects the second noun, whereas when the container or ‘noun-complement’ reading is obtained, the verb selects the first noun. Although this is a possible account (see Corver for discussion; Selkirk 1977 and Stavrou 1983 for Greek), it holds true only of container, partitive and possibly also collective nouns — not quantifier-like or measure ones — as the container noun is much more likely to have a complement than a measure or quantifier-like one (see discussion in Section 5). But the fact illustrated in (14) concerns any type of noun, in other words the strings subject to the container reading are a subset of the strings prone to the pseudopartitive reading.

It should be pointed out however that this ‘freedom’ in subject-verb agreement is a more general phenomenon and is not restricted to the PPC, as it is also attested in all the cases of verbal agreement when the subject is represented by a collective/group noun, as well as in the noun-complement construction whenever the ‘head’ noun is a collective noun.

(i)

a. O kosmos lene/i o, ti thelun/i.

the people.sg say.pl/sg whatever want.3pl/sg

‘People say whatever they want.’

b. To diastima ton deka hronon pu perase/perasan.

the period the-gen/pl ten years-sg/pl that elapsed-3sg/pl.

Notice that roughly the same structure is proposed by Cheng and Sybesma 1999:529, for Chinese indefinite NPs.

It is true that in the PPC what is considered as the predicate in the predicative structure appears to precede the ‘subject’ of predication, so that the hypothesis of predicate movement could in fact be maintained. However, this is the only case, of all the constructions that have been crosslinguistically used to support this hypothesis, that would argue in favor of the predicate movement; hence it cannot be considered here as a strong ‘supporter’ of this process.

Selkirk 1977:302 however says that “the Det under the highest NP will have to be either optionally developed, or null and ‘indefinite’ (also Chierchia 1998:73).

That ena is most naturally interpreted as the cardinal ‘one’ is clearly seen by the fact that in Greek ‘(a) half’ can only appear immediately following ‘ena’ and not after the classifier: ena ke miso (or enamisi) potiri krasi ‘one and a half glass wine’, but not ???ena potiri ke miso krasi ‘one glass and a half wine’, ena ke miso (or enamisi) is clearly a numeral (= 1 1/2).

The indefinite determiner kapjos (singular ‘some’) is also excluded from the PPC, a fact that follows from the fact that this determiner does not express cardinality, which is a prerequisite, as I am arguing here, for the pseudopartitive interpretation (I thank Anastasia Giannakidou for bringing this fact to my attention).
18. An anonymous reviewer suggests that the question whether *ena* is the cardinal or the indefinite determiner maybe related to the question whether *N1* denotes a structured or unstructured object. Cf. the French *tas* or *ensemble*, where we see that the use of the numeral cardinal is only possible in the “structured” reading: *un seul/deux tas d’ordures* (the heap(s) have a structure), *un seul/deux ensemble d’arguments/de musiciens* (the set(s) or ensemble(s) have a structure) vs *un tas d’ordures* (possibly means “much” or “many”), *un ensemble d’arguments/de musiciens* (possibly means “a group of”, “some”, etc.). When there is no structure, *N1* seems to combine with the indefinite only (cf. “a lot of”).

19. When a demonstrative or a quantifier is present at the left of the whole DP, then the definite article is optional in front of the second noun. The second definite article is also optional if the first noun is modified by a numeral. As I don’t understand this ‘idiosyncracy’, I leave it to further study.

20. Contra earlier accounts like those of Selkirk and Jackendoff, who maintained the existence of distinct structures for the two readings. It is further worth pointing out that within Corver’s analysis the container and the quantity readings of the PPC do not entail a different structure but only a different underlying copula (‘be’ for the latter, ‘have’ for the former) within the predicative structure.

21. Notice that it is these same nouns that can occur without a complement — overt or implied — (i.e. as non relational) in well-formed sentences (e.g. *s aresi ekino to bukali* ‘do you like that bottle’, vs *s aresi ekino to kilo* ‘do you like that kilo’).

22. *N2* can be assigned genitive case (see ex. 29 below). It is regular, however, for *N2* to share the same case with *N1*. This is a curious fact, especially under the assumption that *N2* forms part of a DP, hence a referring expression, for which I have no explanation at present.

23. In fact this is a perfectly well formed phrase but has a different meaning: ‘a bottle for water’ or ‘water-bottle’.

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