Morphosyntax of Case:
A Theoretical Investigation of the Concept

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Abstract

The term ‘case’ has long been adopted both in descriptive and theoretical analyses of natural languages. However, their uses refer to a diverse range of linguistic phenomena. In descriptive grammars, case often simply means formal marking of grammatical relations on nouns, or it is sometimes regarded as one of the inflectional properties that determine shapes of words. In derivational generative grammars such as Government and Binding and Minimalist Programme, case is an abstract feature that is assigned or checked under a certain syntactic environment, so that it signals a structural dependency relation between the governor and the governee regardless of its formal manifestation. In constraint-base frameworks such as Lexical Functional Grammar (LFG) and Head-driven Phrase Structure Grammar, since dependency relations in a clause or between clauses are explicitly encoded in a relevant structure, it is a common practice that a treatment of case is similar to the ones found in the descriptive grammars. This thesis aims to investigate phenomena in natural languages which are analysed by postulating case features, to ask to what extent case feature is required in the grammatical system of individual languages, and to establish the theoretical status of case. To this end, I introduce a specific criterion for positing case feature in the grammar, called ‘Beard’s Criterion’ (Beard 1995, Spencer and Otozuro 2005). The criterion prohibits the grammar from postulating case feature unless it is generalised over distinct forms as a part of inflectional properties. Based on that criterion, the current study provides analyses of Icelandic, Hindi-Urdu and Japanese within LFG, primarily focusing on morphological and syntactic aspects of case and related phenomena. Through the investigations, the thesis answers the following questions: if the language needs to refer to case feature, how that feature functions in the grammar of that language, and if the language does not need it, how the phenomena, which have been analysed on the basis of case feature, are accounted for.
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Chapter 1

Introduction

The term ‘case’ has long been adopted both in descriptive and theoretical analyses of natural languages. However, their uses refer to a diverse range of linguistic phenomena. In descriptive grammars, case often simply means formal marking of grammatical relations on nouns, or it is sometimes regarded as one of the inflectional properties that determine the shape of words. In derivational generative grammars such as Government and Binding (gb) and Minimalist Programme (mp), case is an abstract feature that is assigned or checked under a certain syntactic environment, so that it signals a structural dependency relation between the governor and governor regardless of its formal manifestation. In constraint-base frameworks such as Lexical Functional Grammar (lfg) and Head-driven Phrase Structure Grammar (hpsg), since dependency relations in a clause or between clauses are explicitly encoded in a relevant structure, it is a common practice that a treatment of case is similar to the ones found in the descriptive grammars mentioned above. Adopting the framework of lfg, this thesis aims to investigate phenomena in natural languages which are analysed by postulating case features, to ask to what extent the case feature is required in the grammatical system of individual languages, and to establish the theoretical status of case through critical investigations. The languages to be investigated are Icelandic, Hindi-Urdu and Japanese. The crucial questions are if the language needs to refer to a case feature, how that feature functions in the grammar of that language, and if the language does not need it, how the phenomena, which have been analysed on the basis of a case feature, are accounted for.

Before starting the investigation, this chapter provides a summary of various uses of the term case, and clarifies why we need case in some situations, but do not in others. I start with how case works as a morphological inflectional property. I then look at the cases where case is used as a purely syntactic notion. Based on the introduction of those two notions, I will look into an important discussion by Beard (1995), which is referred to as ‘Beard’s
Case as a morphological property

Case is used as a property or feature to define a shape of a given word in many languages. For instance, Latin has the noun inflectional paradigm as in (1.1) where six case features participate in morphological features alongside gender and number. Traditionally, Latin grammar distinguishes five declension classes based on the shapes of the stem. In (1.1), class 3 is further divided into a and b (Blake 2001:4):

(1.1) Latin noun paradigm

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3a</th>
<th>3b</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>feminine</td>
<td>ã-stems</td>
<td>o-stems</td>
<td>cons.stems</td>
<td>i-stems</td>
<td>u-stems</td>
<td>ẽ-stems</td>
</tr>
<tr>
<td></td>
<td>domina</td>
<td>dominus</td>
<td>bellum</td>
<td>cõnsul</td>
<td>cõvis</td>
<td>manus</td>
</tr>
<tr>
<td>‘mistress’</td>
<td>‘master’</td>
<td>‘war’</td>
<td>‘consul’</td>
<td>‘citizen’</td>
<td>‘hand’</td>
<td>‘day’</td>
</tr>
</tbody>
</table>

One of the crucial facts relevant to the current discussion is that the marking of number, gender and case cannot be individually identified, namely we are not able to state that $x$ is the nominative case marker or $y$ is the singular number marker. Instead, the Latin noun inflection exhibits a number of cumulations. For instance, -am is the ending of the singular, feminine, accusative form in class 1, -ẽs is the ending of plural, dative/ablative form in class 1 and 2, and so forth. Another important fact is syncretism, that is none of the classes exhibits distinctive forms for six cases. It is well-known that neuter nouns never show formal distinctions between the nominative and the accusative in Latin (see Aronoff 1994 for discussion). In (1.1), the distinction between the nominative and the vocative is formally expressed only in the singular, masculine in class 2. To describe those facts, it is essential for the grammar to have a set of case features.
The case feature often participates in the inflectional morphology of a wider domain. German, for instance, exhibits inflection for case in the determiner and the noun:

(1.2) German determiner and noun paradigm

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>der Mann</td>
<td>die Frau</td>
<td>das Dozent</td>
</tr>
<tr>
<td>Accusative</td>
<td>den Mann</td>
<td>die Frau</td>
<td>das Dozenten</td>
</tr>
<tr>
<td>Genitive</td>
<td>des Mannes</td>
<td>der Frau</td>
<td>des Dozenten</td>
</tr>
<tr>
<td>Dative</td>
<td>dem Mann</td>
<td>der Frau</td>
<td>dem Dozenten</td>
</tr>
<tr>
<td>Plural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>die Männer</td>
<td>die Frauen</td>
<td>die Dozenten</td>
</tr>
<tr>
<td>Accusative</td>
<td>die Männer</td>
<td>die Frauen</td>
<td>die Dozenten</td>
</tr>
<tr>
<td>Genitive</td>
<td>der Männer</td>
<td>der Frauen</td>
<td>der Dozenten</td>
</tr>
<tr>
<td>Dative</td>
<td>den Männern</td>
<td>den Frauen</td>
<td>den Dozenten</td>
</tr>
</tbody>
</table>

A determiner has six endings in German: -er, -ie, -en, -es, -em and -as. Again, we cannot associate a certain ending with an individual case feature. To define the forms of determiners, case, number and gender features must be all specified (the gender distinction is lost in the plural, though).

Having looked at the inflectional paradigms involving case features, an important question to ask is on what ground different inflectional forms are regarded as having the same case feature. For instance, *domina* and *bellum* are both referred to as the nominative forms in Latin. In German, *den Mann*, *die Frau* and *das Dozenten* are all called the accusative forms. Other nominal inflectional properties such as number and gender are relatively straightforward in this respect, since they are normally reflections of inherent properties of the nouns in question. For instance, the reason that *der Frauen* in German is the plural, feminine form is that the noun itself has those properties. With respect to case, however, the motivations behind the labels are their relations to other words and phrases in syntax. In (1.3a, b), the nominative nouns occur as subjects of the clauses. They also appear as a predicate as in (1.3a). The genitive noun, on the other hand, functions as a possessor in (1.3b). The nouns in the accusative forms occur as direct objects:

(1.3) a. Dominus est cōnsul.
    master.nom be consul.nom
    ‘The master is consul.’
b. Cethegus Ciceronis iānuam obsiđēret enumque vī
   Cethegus,NOM Cicerono,GEN door,ACC beset.IMPF.3.SG him,ACC  violently
   aggredētur.
   attach.IMPF.3.SG
   ‘Cethegus was to beset Cicero’s door and assault him.’

(1.4) shows examples where nouns in certain case forms appear as complements of prepositions in German. Only the genitive form determinant and noun can occur with wegen as in (1.4a). Likewise, (1.4b, c) illustrate that mit and durch require a dative form and an accusative form respectively:

(1.4) a. wegen des Regens
   because of the rain,GEN
   ‘because of the rain’

b. mit dem Zug
   with the train,DAT
   ‘by train’

c. durch den Park
   through the park,ACC
   ‘through the park’

As those examples suggest, we can roughly state that if x and y are given the same case label, they can occur in the same environment in the syntax (if other properties in that environment are compatible with both x and y).

1.2 Syntactic notion of case

The motivation behind case labels such as nominative, accusative, genitive and dative discussed immediately above leads to the notion of syntactic case. That is, if one exponent, whether morphological or syntactic, establishes a certain dependency relation in the syntax, it is given a label x case.\(^1\) Consider the following Korean examples:

(1.5) a. haksayng-i chayk-ul sangea-ey nehessta.
   student-NOM book-ACC box-LOC put,PAST,DECL
   ‘The student put a book in the box.’

   John-NOM friend-ACC meet,PAST,DECL
   ‘John met a friend.’

\(^1\)One extreme form of this conception of case is abstract case in gb and mp where the case feature is associated with a syntactic relation, not necessarily involving formal or phonological manifestation.
In Korean, -i, or -ka when preceded by a vowel, is often referred to as the nominative case. This is due to the fact that -i is attached to a subject noun as shown in (1.5). Likewise, -ul, or -lul after a vowel, is regarded as the accusative case, since it marks a direct object.

The labelling criterion is the same as Latin and German in that the case label is given based on the syntactic environment where a given form appears. However, the crucial difference is that -i/-ka and -ul/-lul mark subjects and objects respectively without an interaction with other nominal properties such as gender and number. This means that morphologically the features like nominative and accusative in Korean are unnecessary. If the theory has a way to express concepts of subject and object, those case features have no role even in the syntax — gfs like subj and obj in LFG and members of subj list and comps list in HPSG are sufficient, for instance.

1.3 Beard’s Criterion

The above observation highlights the rather questionable status of the case feature introduced as a purely syntactic notion. One of the works that most explicitly reject the syntactic notion of case is found in Beard (1995). He argues as follows:

If we are looking for linguistic universals, we wish to account first and foremost for grammatical functions and the syntactic conditions which determine any variation in their marking. Case is not a universal principle but a parameter of synthetic languages and a purely morphological one at that. Case is not a property of nonfusional languages at all; it is a paradigmatic set required to map sets of functions onto nonisomorphic sets of function markers. Where functions are mapped onto a set of Cases, each of which is in turn expressed by a unique affix or adposition, Case becomes irrelevant even to morphology. (Beard 1995:260)

Beard’s claim is to prohibit the grammar from postulating case feature unless it is generalised over distinct forms as a part of inflectional properties. Spencer and Otoguro (2005) call this claim ‘Beard’s Criterion’. Let us look at his argument in slightly more detail.

In Russian, the marking of genitive interacts with the declension class and the number as shown in (1.6) (Beard 1995:257):

<table>
<thead>
<tr>
<th></th>
<th>Class</th>
<th>GenSg</th>
<th>GenPl</th>
</tr>
</thead>
<tbody>
<tr>
<td>stol</td>
<td>stol-a</td>
<td>stol-ov</td>
<td></td>
</tr>
<tr>
<td>okn-o</td>
<td>okn-a</td>
<td>okon-Ø</td>
<td></td>
</tr>
<tr>
<td>cen-a</td>
<td>cen-y</td>
<td>cen-Ø</td>
<td></td>
</tr>
<tr>
<td>dver’</td>
<td>dver-i</td>
<td>dver-øj</td>
<td></td>
</tr>
</tbody>
</table>
As we have observed in the Latin noun inflection, we cannot identify the genitive markers due to the fusional properties Russian exhibits. Instead, all we can say is that the genitive is marked by -a, -i, -ov, -ej or null depending on the other properties of a noun. Further, those endings are used to mark other cases. For instance, -a also marks the nominative and -ej and -oj mark the instrumental as well. With respect to syntactic functions, the genitive case form occurs as subjects, objects, possessor and many others. The nominative appears as subjects and objects and the instrumental functions as possession too. This situation is schematised as follows (Beard 1995:256):

<table>
<thead>
<tr>
<th>Stem</th>
<th>Affix</th>
<th>Category</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 4</td>
<td>∅</td>
<td>NOM</td>
<td>Subject</td>
</tr>
<tr>
<td>Class 1</td>
<td>-a</td>
<td>GEN</td>
<td>Partitivity</td>
</tr>
<tr>
<td>Gen II</td>
<td>-u</td>
<td>INS</td>
<td>Possession</td>
</tr>
<tr>
<td>Classes 2-3</td>
<td>-i</td>
<td>GEN</td>
<td>Partitivity</td>
</tr>
<tr>
<td>Class 4 (Pl)</td>
<td>-ov</td>
<td>GEN</td>
<td>Possessivity</td>
</tr>
<tr>
<td>Class 4 (Pl)</td>
<td>-ej</td>
<td>INS</td>
<td>Punctuality</td>
</tr>
<tr>
<td>Fem. Adj.</td>
<td>-oj</td>
<td>INS</td>
<td>Possession</td>
</tr>
</tbody>
</table>

The interaction between the endings, the classes and the numbers is illustrated as the relation between the stems and the affixes. Further, the affixes are linked not only to the GEN, but also to the NOM and the INS. Those case categories are associated with various functions as indicated by the connecting lines. Hence, Russian grammar needs to capture at least two aspects of this chart. One is the associations between the affixes and the case features in the morphology; and the other is the associations between the case features and the functions in the syntax. In both domains, the postulation of case feature is essential, and this is the situation where “[case] is a paradigmatic set required to map sets of functions onto nonisomorphic sets of function markers” in the above quotation.

Let us turn to a non-fusional language, Bashkir. Like Korean, Bashkir case markers do not interact with any other nominal properties. The genitive is always marked by the suffix -QYŋ with morphophonological alternations such as vowel harmony, consonant truncation and assimilation. The nominative receives no affixation. The accusative is invariably marked by -NY. Syntactically, the genitive signals partitivity and material. The nominative functions as subjects, objects, goals and many others. The accusative also occurs as an object and a goal. If we describe this situation in the same way as Russian, the following figure is obtained (Beard 1995:260):

\[\text{Stem} \quad \text{Affix} \quad \text{Category} \quad \text{Function}\]

| Class 4     | ∅     | NOM      | Subject      |
| Class 1     | -a    | GEN      | Partitivity  |
| Gen II      | -u    | INS      | Possession   |
| Classes 2-3 | -i    | GEN      | Partitivity  |
| Class 4 (Pl)| -ov   | GEN      | Possessivity |
| Class 4 (Pl)| -ej   | INS      | Punctuality  |
| Fem. Adj.   | -oj   | INS      | Possession   |
The obvious difference from the Russian diagram is that the affixes and the case categories have one-to-one relationships. The reasonable question to ask is whether the grammar of Bashkir needs the GEN, NOM and ACC. The introductions of these features are clearly redundant. Instead, a more desirable design of the grammar should look like the following:

(1.9) removes the case features and describes the associations between the syntactic functions and the ‘forms’. This is the essence of Beard’s claim, namely “[w]here functions are mapped onto a set of Cases, each of which is in turn expressed by a unique affix or adposition, Case becomes irrelevant even to morphology.”

This thesis strictly follows Beard’s Criterion and explores to what extent the case feature is necessary in the grammar of individual languages. Note that the investigation is on the ‘theoretical’ status of case. That is, I do not reject that case is used as a synonym of ‘marking’ to obtain typological descriptive generalisations. For instance, as we will see in the following chapters, we often say that the dative is used both for an indirect object and an experiencer subject in many languages. This statement simply means that the same form can occur as an indirect object and an experiencer subject in many languages. This is not a theoretical claim of postulating the dative in the grammars of the languages exhibiting this property.

1.4 Outline of the thesis

Chapter 2 Theoretical background: LFG Basics I will start with an introduction of LFG, the theoretical framework adopted in this thesis. LFG posits two structures in syntax: surface phrase structure and grammatical functional structure. The basic principles of each structure
and the correspondence between them are introduced. Further, the extended architecture, called the projection architecture, is discussed. I shall show how different grammatical information flows into additional structures. The primary focus is placed on the discussion of morphosyntactic structures. Finally, we will look at the recent development of extended projection in the framework.

Chapter 3 Theoretical extension: Issues in LFG morphosyntax  Against the basics of LFG introduced in the previous chapter, we then move on to the more advanced issues in LFG morphosyntax. I will discuss differences between word-based lexicalism and the lexeme-based lexicalism and the advantages of the latter, primarily focusing on realisations of analytic inflections. Further, as a morphological component of LFG, I will introduce Stump’s (2001) Paradigm Function Morphology (PFM) and the architectural design of the framework used in this thesis is presented. We then look at how English prepositional marking is analysed under the current proposal.

Chapter 4 Case and agreement in Icelandic  We start exploring case features by looking at Icelandic in this chapter. Icelandic clearly exhibits properties that require us to posit four case features: nominative, accusative, dative and genitive. The complexity of case in this language arises when it interacts with agreement. After discussion of previous proposals made by Andrews (1982, 1990), I will present an alternative analysis. One crucial aspect of the proposal is the introduction of a new approach to agreement in LFG, called the path approach. The analysis of Icelandic case and agreement reveals the advantages of this new proposal.

Chapter 5 Case and postposition in Hindi-Urdu  The investigation moves on to Hindi-Urdu. In recent works in Hindi-Urdu syntax, it is often argued that postpositional elements introduce case features such as ergative, accusative, dative and genitive. I shall show that the theoretical status of those case features are invalid. Instead, according to Beard’s Criterion, the grammar needs direct, oblique and vocative case distinctions which define the nominal inflectional morphology. We will look at the morphological analysis of case and postpositions provided by modified version of PFM. The interaction between the paradigmatic morphology and complex syntactic and semantic feature description will be established by featural linkage. I further shows that the agreement pattern Hindi-Urdu exhibit can be nicely captured by the path approach introduced in the previous chapter.
Chapter 6 Realisation of Japanese nominal particles  Finally, we will look at Japanese, which is well-known for a large number of nominal particles. I start with the discussion of nominal inflectional features of the language with a descriptive overview of so-called case particles and adverbial particles. The conclusion drawn from the discussion is that none of the features such as number, gender and case is necessary in Japanese morphology and syntax. I then show how the grammar utilises complex combinations of particles encoding various syntactic, semantic and discourse information. Again, the architecture proposed in the thesis shows its explanatory power to realise well-formed particle clusters morphologically and establish the associations with other linguistic information.
Chapter 2

Theoretical background: LFG Basics

Throughout this thesis, I use a constraint-based unification grammatical theory, Lexical Functional Grammar (LFG). This chapter provides an overview of the formal aspects of the framework with illustrative examples. LFG postulates multiple levels of linguistic representations. Each level constructs different types of information and its representation may be defined by different mathematical properties. Such an independence of the representational level reflects an assumption that the various levels of linguistic analysis such as syntax, semantics and prosodic structures are autonomous and obey their own well-formedness conditions. Still, those different levels are related to each other and this relationship is explicated in terms of correspondences between them. In the following three sections, I focus on the syntactic structures. LFG postulates two levels of representations, constituent-structure and functional-structure, and their correspondence. The basic principles and mathematical machineries are introduced there. Against those basics, in section 2.4 the discussion will focus on the representation of morphosyntactic information in LFG and its relation to other levels. The way of introducing multiple levels of representation is explained in terms of an extended framework called the projection architecture. I shall highlight two proposals of the morphological (or morphosyntactic) structure in the LFG literature. Section 2.5 discusses the extended projection incorporated into recent LFG works. Based on the formal and conceptual grounds introduced in this chapter, the discussion leads us to deeper issues of morphosyntax in LFG in the next chapter.

2.1 C-structure

In LFG, syntactic representation involves two levels: c(onstituent)-structure and f(uncional)-structure. I focus on the former in this section. A c-structure is manifested as a phrase
structure tree where configurational and linear ordering relations amongst words and phrases are represented. LFG follows the standard definitions of tree such as the ones found in Partee et al. (1993:437–44). A tree contains a set of nodes and relates them to each other. There are two types of relations in a tree, dominance and precedence, as defined in (2.10):

\[(2.10)\]
\[\text{a. Dominance:} \\
\text{the hierarchical grouping of the parts of the sentence into constituents}\\
\text{b. Precedence:} \\
\text{the left-to-right order of the constituents}\]

The dominance relation is expressed as vertical alignment between the nodes, whereas the precedence relation is as horizontal alignment. In (2.11), the pairs \(\langle a, b \rangle\), \(\langle a, c \rangle\) and \(\langle a, d \rangle\) are in dominance relation (let us name this relation \(D\)), i.e. node \(a\) dominates node \(b\), \(c\) and \(d\); and \(\langle b, c \rangle\), \(\langle b, d \rangle\) and \(\langle c, d \rangle\) are in precedence relation (let us name this relation \(P\)), i.e. node \(b\) precedes node \(c\) and \(d\) and node \(c\) precedes node \(d\).

\[(2.11)\]
\[\begin{array}{c}
\text{a} \\
\text{b} \\
\text{c} \\
\text{d}
\end{array}\]

In a well-formed phrase structure tree, the distributions of nodes obey the following three conditions (Partee et al. 1993:439–41):

\[(2.12)\]
\[\text{a. The Single Root Condition:} \\
\text{In every well-formed constituent structure tree there is exactly one node that dominates every node.}\\
\text{b. The Exclusivity Condition:} \\
\text{In any well-formed constituent structure tree, for any nodes \(x\) and \(y\), \(x\) and \(y\) stand in the precedence relation \(P\), i.e., either \(\langle x, y \rangle \in P\) or \(\langle y, x \rangle \in P\), if and only if \(x\) and \(y\) do not stand in the dominance relation \(D\), i.e., neither \(\langle x, y \rangle \in D\) nor \(\langle y, x \rangle \in D\).}\\
\text{c. The Non-tangling Condition:} \\
\text{In any well-formed constituent structure tree, for any nodes \(x\) and \(y\), if \(x\) precedes \(y\), then all nodes dominated by \(x\) precede all nodes dominated by \(y\).}\]

(2.12a) is straightforward. (2.12b) prohibits two nodes from standing both in dominance and precedence relation such as \(\langle a, b \rangle \in P \land \langle a, b \rangle \in D\), that is no precedence relation holds between the mother and the daughter and no dominance relation holds between sisters. (2.12c) excludes a tree where the precedence relation between the mother nodes is not preserved between the daughter nodes like (2.13):
Another important property in a tree is labelling. Nodes in a phrase structure tree are normally labelled with grammatical types such as syntactic categories and hierarchical positions (Bar-levels). Thus, a labelled phrase structure tree will look like the following:

As a simplest mathematical notion, trees (i.e. c-structures in LFG) can be seen as a set of elements with some defined relations and properties (Kaplan 1987, 1995):

\[
\begin{align*}
N &: \text{set of nodes} \\
L &: \text{set of labels} \\
M &: N \rightarrow N \text{ (dominance)} \\
\prec &\subseteq N \times N \text{ (precedence)} \\
\lambda &: N \rightarrow L \text{ (labelling)}
\end{align*}
\]

\(N\) and \(L\) contain a set of nodes and labels respectively. The function \(M\) maps one node to its mother node, so that it is able to describe the dominance relation between the two. \(\prec\) describes the precedence relation between two nodes. \(\lambda\) is a function that maps a node onto a label.

According to this machinery, a simple c-structure like (2.16a) is described by a set of equations as in (2.16b):

\[
\begin{align*}
\text{a. } & n_1 : S \\
n_2 : NP & \quad n_3 : VP \\
n_4 : N & \quad n_5 : N \\
n_6 : Mary & \quad n_7 : cried
\end{align*}
\]

\(N = \{n_1, n_2, n_3, n_4, n_5, n_6, n_7\}\) \\
\(L = \{S, VP, NP, V, N, Mary, cried\}\) \\
\(M(n_2) = n_1\) \quad \(M(n_3) = n_1\) \quad \(\lambda(n_1) = S\) \quad \(\lambda(n_2) = NP\) \\
\(\lambda(n_3) = VP\) \quad \(M(n_4) = n_2\) \quad \(\lambda(n_4) = N\) \quad \(M(n_5) = n_3\) \\
\(\lambda(n_5) = V\) \quad \(M(n_6) = n_4\) \quad \(\lambda(n_6) = Mary\) \quad \(M(n_7) = n_5\) \\
\(\lambda(n_7) = cried\) \quad \(n_2 < n_3\)

The role of c-structure in LFG is simply to express the domination and precedence amongst constituents. That is, a c-structure is a representation of the hierarchical and linear ordering
organisation of the word string which makes up the external form of the sentence.\(^1\) Therefore, unlike the derivational frameworks such as transformational syntax, no derivational operation that changes one c-structure to another is assumed.

In addition to the fundamental constraints found in (2.12), languages have their own constraints regulating the distributions of constituents. In English, for example, S dominates NP and VP, VP dominates V and optional NP, PP and so on. Such distributional constraints can be stated by a set of equations as in (2.17a), but Phrase Structure (PS) rules such as (2.17b) are normally used:

(2.17)  
\[ M(n_2) = n_1 \land M(n_3) = n_1 \land \lambda(n_1) = S \land \lambda(n_2) = NP \land \lambda(n_3) = VP \land n_2 < n_3 \]

b. S → NP VP

(2.17b) is a constraint stating that a node labelled as S dominates a node labelled as NP and a node labelled as VP; and the NP linearly precedes the VP. The grammar of English is thought to contain a set of language-specific constraints including something like (2.17b). Another language may contain different PS rules such as S → NP, NP, V where commas means the order among two NPs and V is freely exchangeable.

LF\(_G\) is one of the lexicalist theories of grammar where ‘word’ has a special status and the strong division between word-internal structures and structures between words is assumed. The former belongs to the lexicon, whereas the latter belongs to the configurational syntax. The role of morphology is to carry out morphological operations (e.g. combining a root and affixes, changing stem forms etc.) and create a fully inflected word. Those morphological operations are completely separated from the syntactic ones. Since a c-structure is a representation of word-external structure, the lexicalist view is reflected as a constraint over labels of terminal nodes. This point is clearly stated as Relativised Lexical Integrity (Bresnan 2001:92):

(2.18) **Relativised Lexical Integrity:**

Morphologically complete words are leaves of the c-structure tree and each leaf corresponds to one and only one c-structure node.

Lexical integrity prohibits an element smaller than a word to occupy a syntactic terminal. In other words, the internal structure of a word is invisible to syntax. A fully inflected word form is an input to the syntax and occupies a c-structure terminal. Accordingly, a terminal is a word form instantiation of a pre-terminal node which immediately dominates the terminal node. In (2.16a), for example, word form *cried* is an instantiation of the pre-terminal node

\(^1\)This structural correspondence between the word string and c-structure is called \(\pi\).
V. This property of c-structure becomes crucial when we consider the morphology-syntax interface. We will come back to this point in Chapter 3.

2.2 F-structure

As summarised in the previous section, c-structure is a representation of hierarchical and linear ordering properties. However, the syntactic structure must be able to represent more than just the surface structure of a sentence. LFG postulates another level where the functional relations between words and phrases are expressed. This level is called f(unctional)-structure.

A simple example is as follows:

\[
\begin{array}{c}
\text{SUBJ} \\
\text{PERS} \\
\text{NUM} \\
\text{PRED} \\
\text{TENSE}
\end{array}
\begin{bmatrix}
\text{pred} & 'Mary' \\
\text{pers} & 3 \\
\text{num} & sg \\
\text{pred} & 'cry(subj)' \\
\text{tense} & past
\end{bmatrix}
\]

We define an f-structure as a set of ordered pairs such as \( \langle \text{pers}, 3 \rangle \) and \( \langle \text{tense}, \text{past} \rangle \). As suggested in (2.19), those pairs are represented as attribute and value matrices. For instance, the attribute tense takes the value past.

We express a c-structure with a set of elements and some defined relations and properties. An f-structure can be represented in a similar way. What we need is a set of atomic symbols \( A \), a set of semantic forms \( S \) and a set of f-structures \( F \) (Kaplan 1995:11):

\[
(2.20) \quad A: \text{set of atomic symbols} \\
S: \text{set of semantic forms} \\
F = A \rightarrow_f (F \cup A \cup S)
\]

The equation defining \( F \) states that an f-structure takes an atomic symbol as its attribute and the value can be i) an f-structure; ii) an atomic symbol; or iii) a semantic form. Since \( F \) is characterised by such a recursive domain equation, an f-structure can be defined recursively by taking another f-structure. In (2.19), for instance, the atomic symbol subj takes another f-structure as its value. On the other hand, tense, pers and num take atomic symbols past, 3 and sg respectively; and the two preds take the semantic form ‘cry(subj)’ and ‘Mary’.

---

2 As discussed in Kaplan and Bresnan (1982:177), “semantic forms […] are carried along by the syntactic component as unanalysable elements, just like simple symbols. When the f-structure is semantically interpreted, these forms are treated as patterns of composing the logical formulas encoding the meaning of the sentence.” A semantic form comprises the semantic predicate name such as ‘cry’ and ‘Mary’ and sometimes it is followed by an argument-list specification. This list defines a mapping between the argument structure and the grammatical functions, so, for example, the first argument is filled by the formula that results from interpreting the subj of
Similar to the way we describe c-structures by a set of equations, f-structures can also be written down by a set of propositions where a function applies to an attribute and yields a value. LFG uses the following LISP parenthetic notation for function application:

\[(f \, a) = v \text{ iff } (\langle a \, v \rangle \in f), \text{ where } f \text{ is an f-structure, } a \text{ is an atomic symbol and } v \text{ is a value}
\]

If we add function names \(f_n\) to (2.19) as in (2.22a), this f-structure can be described by a set of equations as in (2.22b):

\[
\begin{align*}
\text{(2.22)} \quad &\text{a. } (f_1 \text{ subj}) = f_2 \\
& \quad (f_2 \text{ pred}) = '\text{MARY}' \\
& \quad (f_2 \text{ pers}) = 3 \\
& \quad (f_2 \text{ num}) = \text{sg} \\
& \quad (f_1 \text{ pred}) = '\text{CRY(subj)}' \\
& \quad (f_1 \text{ tense}) = \text{past}
\end{align*}
\]

According to (2.21), the first equation, for example, states that a pair of atomic symbol subj and f-structure \(f_2\) is a member of f-structure \(f_1\), i.e. \(\langle \text{subj, } f_2 \rangle \in f_1\), which is true in (2.22a). Similarly, \(\langle \text{tense, past} \rangle \in f_1, \langle \text{pred, 'MARY'} \rangle \in f_2\) are true in (2.22a) and so on.

Since an f-structure is a set of ordered pairs, it is regarded as a mathematical function. So, for example, \((f_2 \text{ num}) = \text{sg}\) can be read as “the function \(f_2\) is such that applying it to the argument \(\text{num}\) yields the value \(\text{sg}\)” (Kaplan and Bresnan 1982:182). Functional application can yield another function, so a substitution like (2.23a) is possible. If \(f_1\) applies to \(\text{subj}\), it gives us another function \(f_2\), i.e. \((f_1 \text{ subj}) = f_2\). This function further applies to \(\text{num}\) and yields the value \(\text{sg}\). Since an f-structure function only takes one argument, we normally omit the inner parentheses to notate such recursive function applications as in (2.23b):

\[
\begin{align*}
\text{(2.23)} \quad &\text{a. } ((f_1 \text{ subj}) \text{ num}) \\
& \quad = (f_2 \text{ num}) \\
& \quad = \text{sg} \\
&\text{b. } (f_1 \text{ subj num}) = \text{sg}
\end{align*}
\]

the sentence.

\(^3\)Note that this is equivalent to \(f_2(\text{num}) = \text{sg}\) in the standard mathematical notation.
A set of statements found in (2.22b) is called a function(al)-description. The statements in an f-description follow the axiom (2.24) (Kaplan and Bresnan 1982:181):

(2.24) **Uniqueness:**
In a given f-structure a particular attribute may have at most one value.

This condition requires the grammar to assign a unique value to each attribute. Thus, the following f-description is illegal since the f-structure described by the statement in the f-description is ill-formed with a violation of the Uniqueness condition in the Pred value of $f_1$:

(2.25) a. $(f_1 \text{subj}) = f_2$
    $(f_1 \text{pred}) = \text{`shout(subj)'}$
    $(f_2 \text{pred}) = \text{`Mary'}$
    $(f_2 \text{pers}) = 3$
    $(f_2 \text{num}) = \text{SG}$
    $(f_1 \text{pred}) = \text{`cry(subj)'}$
    $(f_1 \text{tense}) = \text{past}$

b. * \[
\begin{array}{c}
\text{SUBJ} \\
\text{PRED}
\end{array}
\begin{array}{c}
\text{f}_2 \\
\text{f}_1
\end{array}
\begin{array}{c}
\text{pred} \\
\text{num}
\end{array}
\begin{array}{c}
\text{`Mary'} \\
\text{SG}
\end{array}
\begin{array}{c}
\text{PRED} \\
\text{TENSE}
\end{array}
\begin{array}{c}
\text{`shout(subj)'/`cry(subj)'} \\
\text{past}
\end{array}
\]

One of the consequences of the Uniqueness condition is the following (Kaplan and Bresnan 1982:180):

(2.26) **Direct Syntactic Encoding:**
No rule of syntax may replace one function name by another.

We have observed that c-structures in LFG are static and no transformational operation is assumed to derive one structure to another. The same is true for f-structures. Direct Syntactic Encoding is the principle that prohibits an f-structure from being derived from another f-structure by replacing the symbols. Therefore, for example, an f-structure for a passive voice sentence is never derived from the active voice counterpart.

The types of symbols appearing in f-structure cover a diverse range of grammatical information. The most fundamental ones are Grammatical Functions (gfs). The following is the list of gfs:

(2.27) \text{SUBJ OBJ OBJ OBJ OBJ OBJ OBJ XCOMP COMP COMP ADJ ADJ ADJ}

\[\text{poss (possessor function) and spec (specifier function) are often included as types of the gfs as well.}\]
ADJ and XADJ are functions for modifiers. The others are governable GFS, that is they appear in the argument list of the governing PRED’s semantic forms. The governable GFS appearing in the f-structure must be properly governed by the predicate and the GFS governed by the predicate must appear in the local f-structure. Those conditions are call completeness and coherence conditions (Kaplan and Bresnan 1982:211–2):

(2.28) a. **Completeness:**

An f-structure is **locally complete** if and only if it contains all the governable grammatical functions that its predicate governs. And f-structure is **complete** if and only if it and all its subsidiary f-structures are locally complete.

b. **Coherence:**

An f-structure is **locally coherent** if and only if all the governable grammatical functions that it contains are governed by a local predicate. An f-structure is **coherent** if and only if it and all its subsidiary f-structures are locally coherent.

According to those conditions, (2.29) is ruled out by the Completeness and (2.30) is by the Coherence. In (2.29), the PRED value of the outmost f-structure contains three GFS, SUBJ, OBJ, OBJ2 according to the its argument structure and grammatical function mapping, but the f-structure only contains SUBJ, which makes it incomplete, i.e. violation of the Completeness. The situation is opposite in (2.30) where the f-structure contains an additional OBJ. This OBJ is not governed by the local predicate as the semantic form of the PRED value only contains SUBJ. Therefore, the structure is incoherent.

(2.29) a. *Mary gave.

b. \[
\begin{array}{l}
\text{PRED} \quad \text{‘GIVE(SUBJ,OBJ,OBJ2)’} \\
\text{PRED} \quad \text{‘MARY’} \\
\text{PRED} \quad \text{‘MARY’} \\
\text{PRED} \quad \text{‘BOY’} \\
\text{SPEC} \quad \text{THE} \\
\text{PRED} \quad \text{‘BOY’} \\
\text{PERS} \quad 3 \\
\text{PERS} \quad 3 \\
\text{TENSE} \quad \text{PAST} \\
\text{TENSE} \quad \text{PAST} \\
\end{array}
\]

(2.30) a. *Mary cried the boy.

b. \[
\begin{array}{l}
\text{PRED} \quad \text{‘CRY(SUBJ)’} \\
\text{PRED} \quad \text{‘MARY’} \\
\text{PRED} \quad \text{‘MARY’} \\
\text{PRED} \quad \text{‘BOY’} \\
\text{SPEC} \quad \text{THE} \\
\text{PRED} \quad \text{‘BOY’} \\
\text{PERS} \quad 3 \\
\text{PERS} \quad 3 \\
\text{TENSE} \quad \text{PAST} \\
\text{TENSE} \quad \text{PAST} \\
\end{array}
\]
\( \theta \) on \( \text{obj}_\theta \) and \( \text{obl}_\theta \) is a variable which indicates a semantic restriction of the \( \text{gf} \). While \( \text{subj} \) and \( \text{obj} \) are semantically non-restricted, that is any kind of argument can be \( \text{subj} \) or \( \text{obj} \) regardless of its semantic role, \( \text{obj}_\theta \) and \( \text{obl}_\theta \) require a certain type of argument. In (2.29), for instance, \( \text{give} \) has \( \text{give}(\text{subj}, \text{obj}, \text{obj}_2) \) as its \( \text{pred} \) value. This \( \text{obj}_2 \) is the only restricted object in English.\(^5\) So, the f-structures for the two sentences in (2.31) can be represented as in (2.32).\(^6\)

(2.31)  

b. Sue asked the teacher a question.

(2.32)  
a. \[
\begin{align*}
&\text{PRED} & '\text{give}(\text{subj}, \text{obj}, \text{obj}_2)' \\
&\text{TENSE} & \text{PAST} \\
&\text{subj} & '\text{Mary}' \\
&\text{obj} & '\text{John}' \\
&\text{obj}_2 & '\text{book}'
\end{align*}
\]

b. \[
\begin{align*}
&\text{PRED} & '\text{ask}(\text{subj}, \text{obj}, \text{obj}_2)' \\
&\text{TENSE} & \text{PAST} \\
&\text{subj} & '\text{Sue}' \\
&\text{obj} & '\text{teacher}' \\
&\text{spec} & \text{the} \\
&\text{obj}_2 & '\text{question}'
\end{align*}
\]

The non-governable \( \text{gf}s \), i.e. \( \text{adj} \) and \( \text{xadj} \), are immune from the Compleness and Coherence conditions since they are not an argument of a predicate. Since technically a phrase or clause may contain an infinite number of modifiers, \( \text{adj} \) and \( \text{xadj} \) are assumed to have a set value. Consider the following example:

(2.33)  
a. The girl handed the baby a very small toy in the morning on Tuesday.

---

\(^5\)See Bresnan and Moshi (1990) for the discussion of multiple object constructions.

\(^6\)Note that so-called ‘indirect object’ corresponds to \( \text{obj} \) and ‘direct object’ to \( \text{obj}_2 \) in double object construction. I will touch upon \( \text{obl}_\theta \) later in Chapter 3.
(4.86a) has two sentential temporal modifiers in the morning and on Tuesday. In (4.86b), therefore, the outermost f-structure has adj taking a set of two adjuncts as indicated by the curly brackets. Moreover, toy is modified by small which is further modified by very. So, the f-structure contains multiple embedded adj, each of which takes a set value.

comp, xcomp and xadj are clausal gfs. comp expresses the grammatical relation of a complement clause to its predicate as found in (2.34). The f-structures for them are (2.35): \(^7\)

(2.34) a. Sue thought that John wept.
b. Sue wondered who hit John.

\(^7\) comp is distinct from a non-clausal gf. Dalrymple and Lødrup (2000) argue for clausal obj as well as comp. See also Berman (2003) for discussion on this point.
Among the clausal GFS, XCOMP and XADJ are called open GFS. In an open GF, the clause-internal SUBJ is satisfied by a re-entrance to the value of one of the GFS in the external f-structure. A typical example of XCOMP is found in a so-called raising sentence:

(2.36) a. Mike seems to hit John.

b. 

In (2.36a), Mike functions as the subject both for seems and hit. In transformational approaches, Mike raises from the subject position of hit to the subject position of seems — Spec-VP/vP to Spec-TP in a version of Minimalist Syntax, for example. In LFG, it is captured by the re-entrance in the f-structure. Hence, in (2.36b), the value of SUBJ in the matrix clause is also the value of SUBJ in XCOMP as indicated by the line.8 This re-entrance or structure-sharing is called functional control.

XADJ, another open GF, receives a similar treatment. One of the typical examples is found in participle constructions like (2.37a) and predicative adjuncts like (2.37b) (Bresnan 1982b).9,10

(2.37) a. Walking along the river, he found a pound.

b. John passed Mary in the hall yesterday drunk as usual.

---

8The notation ‘SEEM(XCOMP)SUBJ’ means that SUBJ is not an argument of seem, rather it is a non-thematic GF for this predicate.

9For sentences like (2.37a), there can be alternative treatments which do not involve a functional control (cf. Williams (1975, 1994)).

10[“…”] is an abbreviated notation of an f-structure.
The subject of the main clause also functions as the subject in the fronted modifier clause in (2.37a) and in the predicative modifier in (2.37b). To account for this property, we can propose the f-structures like (2.38) where the functional controls suggest that the values of the subj in the xadj are identical to the matrix subj, so that the correct grammatical dependency relations are captured.

In addition to the gfs, lfg also postulates another type of grammatical relations called the Discourse Function (df). df includes topic and focus. The most common usage of df is found in long-distance dependency constructions such as wif-fronting ((2.39)), topicalisations ((2.40)) and relative clauses ((2.41)):

(2.39) What does John eat?

\(^{11}\) subj may also be counted as a member of df, which makes subj belong to both gf and df.
The f-structures in (2.39–2.41) contain focus or topic. Those dfs are identified with one of the gfs required by the governing predicates. Those functional controls are licensed by the Extended Coherence Condition (Bresnan and Mchombo 1987:746):

(2.42) **Extended Coherence Condition:**

All functions in f-structure must be bound. An argument function is bound if it is the argument of a pred. An adjunct is bound if it occurs in an f-structure which contains a pred. A focus and topic is bound whenever it is functionally identified with, or anaphorically binds, a bound function.

dfs are not governed by any of the pred, but the Extended Coherence Condition requires them to be bound. In (2.39–2.41), it is attained by the functional control identifying topic/ focus to obj s.

As we have seen so far, types of features appearing in the f-structure are not restricted to grammatical functions. A number of other features has been proposed including nominal morphosyntactic features: person, number, gender; clause temporal features: tense, aspect;
surface word form features: vform, compform; pronoun types: prontype and so forth. An obvious question to be raised is what properties are required in the grammar of a given language. The introduction of a feature that is never referred to in any kind of syntactic phenomena in the language would be redundant in the design of grammar and must be refuted. For instance, introducing person feature in the Japanese grammar cannot be justified, since there is no case where the grammar needs to refer to that feature in the language. This thesis gives careful observations to examples seemingly related to case feature and discusses its status in the grammar of target languages.

2.3 Correspondences

We have observed that LFG postulates two levels of representations in the syntax. The two structures are characterised in different types of description languages and they are constrained by different types of well-formedness conditions. However, it is essential to correlate them properly, so that a hierarchically organised phrase structure tree corresponds to the correct grammatical function structure. The correspondence between c-structure and f-structure is attained by postulating the mapping function \( \phi \). With the symbols used to describe c-structures and f-structures, this function is defined as in (2.43a) and the c-structure and f-structure correspondence is schematised as in (2.43b) where the arrow indicates the mapping from a c-structure node to an F-structure (Kaplan 1995:15):

\[
\begin{align*}
(2.43) & \quad \phi: N \rightarrow F \\
& \quad \begin{array}{c}
\phi(n_1) = \phi(n_3) = \phi(n_4) = f_1 \\
\phi(n_2) = f_2 \\
\phi(n_5) = f_3
\end{array}
\end{align*}
\]

We can describe the correspondence in (2.43b) by a set of equations as in (2.44).

\[
(2.44) \quad \begin{align*}
\phi(n_1) &= \phi(n_3) = \phi(n_4) = f_1 \\
\phi(n_2) &= f_2 \\
\phi(n_5) &= f_3
\end{align*}
\]

We have already introduced the mathematical function \( M \) to describe the dominance relation between nodes in a c-structure. If we apply \( M \) to the c-structure nodes in (2.43b), we obtain the following set of equations:
As shown in (2.44), $n_1$, $n_2$ and $n_3$ are all mapped onto $f_1$ by function $\phi$, so we can describe them by combining (2.45) and (2.44):

(2.46)  
\[
\phi(M(n_3)) = \phi(n_3) \\
\phi(M(n_4)) = \phi(n_4)
\]

Further, we take an f-structure as a function, so that we can describe attribute-value pairs as in (2.47):

(2.47)  
\[
(f_1 q) = f_2 \\
(f_1 r) = f_3 \\
(f_2 s) = t \\
(f_2 u) = v \\
(f_3 w) = x \\
(f_3 y) = z
\]

Therefore, we can complete the description of (2.43b) as follows:

(2.48)  
\[
\phi(M(n_3)) = \phi(n_3) \\
\phi(M(n_4)) = \phi(n_4) \\
(\phi(M(n_2)) q) = \phi(n_2) \\
(\phi(M(n_4)) r) = \phi(n_4) \\
(\phi(n_2) s) = t \\
(\phi(n_2) u) = v \\
(\phi(n_3) w) = x \\
(\phi(n_3) y) = z
\]

Let us apply those descriptive languages to English examples. If we take the string of words (2.49a) for example, it is hierarchically organised as a c-structure by function $\pi$ and the corresponding f-structure is defined by the mapping function $\phi$ as shown in (2.49b):

(2.49)  
\[
a. \text{ Mary gave John a book.}
\]
In (2.17b), we use PS rules to describe the dominance relations and category labels of nodes. PS rules can be a very powerful descriptive device if we attach mathematical annotations to them, so that we can state the constraints on the hierarchical structure of nodes and the mapping of nodes to f-structures. For example, the grammar of English may have the following rule:\footnote{\textit{M}(*) is often abbreviated as \(\hat{*}\). So, \(\phi(\hat{*}) = \phi(*)\) is the same as \(\phi(M(*) = \phi(*))\).}

\begin{equation}
2.50 \quad S \rightarrow NP \quad VP
\end{equation}

\[(\phi(M(*)) \text{ subj}) = \phi(*) \quad \phi(M(*)) = \phi(*))\]

The annotations attached to the category labels are constraints which state how the nodes corresponding to that labels are mapped onto the f-structure. * refers to the node corresponding to that label. Thus, the annotation under the NP says that \(\phi(*),\) i.e. the f-structure corresponding to the NP, is equal to \((\phi(M(*)) \text{ subj}),\) i.e. subj of the f-structure corresponding to the S. Likewise, \(\phi(M(*)) = \phi(*)\) suggests that the f-structure corresponding to the VP is the same as the f-structure corresponding to the S. Since both \(\phi\) and \(M\) are mathematical functions, we can combine them and make them into a composed function, \(\phi \circ M.\) For ease of exposition, we abbreviate those annotations as follows:
(2.51) \[ \phi(M(*)\, =\, \phi \circ M(*)) \]

By using the abbreviated notations, we can write the partial PS rules of English as in (2.52). According to those PS rules, the c-structure can be annotated like (2.53) as well:

(2.52) a. \[ S \rightarrow NP \quad VP \]
\[ (\uparrow \text{subj}) = \downarrow \quad \uparrow = \downarrow \]

b. \[ VP \rightarrow V \quad NP \quad NP \]
\[ \uparrow = \downarrow \quad (\uparrow \text{obj}) = \downarrow \quad (\uparrow \text{obj2}) = \downarrow \]

c. \[ NP \rightarrow \text{Det} \quad N \]
\[ \uparrow = \downarrow \quad \uparrow = \downarrow \]

(2.53)

LFG assumes that attribute-value pairs appearing in f-structure such as \( \langle \text{person}, 3 \rangle \) and \( \langle \text{tense}, \text{past} \rangle \) are associated with lexical items. In other words, the lexicon in LFG contains lexical entries with their f-descriptions and according to the function \( \phi \) the features are properly mapped onto the f-structures. The following are sample lexical entries:

(2.54) a. Mary N \[ (\uparrow \text{pred}) = \text{‘Mary’} \]
\[ (\uparrow \text{pers}) = 3 \]
\[ (\uparrow \text{num}) = \text{sg} \]

b. John N \[ (\uparrow \text{pred}) = \text{‘John’} \]
\[ (\uparrow \text{pers}) = 3 \]
\[ (\uparrow \text{num}) = \text{sg} \]

c. book N \[ (\uparrow \text{pred}) = \text{‘book’} \]
\[ (\uparrow \text{pers}) = 3 \]
\[ (\uparrow \text{num}) = \text{sg} \]

d. gave V \[ (\uparrow \text{pred}) = \text{‘give(subj, obj, obj2)’} \]
\[ (\uparrow \text{tense}) = \text{past} \]

e. a Det \[ (\uparrow \text{spec}) = \text{a} \]

If the f-description of each c-structure terminal is added, we get the following tree:
Obviously, the PS rules in (2.52) are incomplete. For example, S may dominate another S, VP and so on.\textsuperscript{13} Since the PS rules in LFG are constraints regulating the distributions of constituents and their mappings to the f-structure, all the nodes specified in the rules are optional. This is stated as the Economy of Expression (Bresnan 2001:92):

\begin{center}(2.56)\textbf{Economy of Expression:}\end{center}

All syntactic phrase structure nodes are optional and are not used unless required by independent principles (completeness, coherence, semantic expressivity).

The Economy of Expression also prohibits an introduction of unnecessary c-structure nodes. Hence, in the following fronted topicalisation sentence, for example, the c-structure must not contain an empty object NP following the verb:

\begin{center}(2.57)\begin{enumerate}
  \item a. John, Sue likes.
  \item b.\end{enumerate}\end{center}

\textsuperscript{13}For the detailed PS rules for English, see Falk (2001).
c. *

\[
\begin{array}{c}
S \\
(\uparrow \text{TOPIC}) = \downarrow \\
NP \\
\uparrow = \downarrow \\
S \\
\downarrow \\
NP \\
\downarrow = \uparrow \\
NP \\
(\uparrow \text{OBJ}) = \downarrow \\
VP \\
\uparrow = \downarrow \\
V \\
\uparrow = \downarrow \\
NP \\
\downarrow \\
\text{likes} \\
\downarrow \\
NP \\
\downarrow \\
\text{e}
\end{array}
\]

We have seen the functional control identify the values of two \textit{gfs} or the values of a \textit{gf} and a \textit{df} in the previous section. Functional control is defined either by annotations in the relevant PS rules or by lexical specifications in the lexical entries. A raising verb found in (2.36), for example, specifies functional control in its lexical entry. (2.58) shows the sample lexical entry of \textit{seems}:

\begin{equation}
\text{(2.58) seems V} \quad (\uparrow \text{PRED}) = \text{SEEM}^{\langle \text{XCOMP} \rangle \text{SUBJ}} \\
(\uparrow \text{TENSE}) = \text{PRES} \\
(\uparrow \text{SUBJ NUM}) = \text{SG} \\
(\uparrow \text{SUBJ PERS}) = 3 \\
(\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{SUBJ})
\end{equation}

The last equation of the f-description is the specification of the path of functional control, that is it identifies the embedded clause subject (\(\uparrow \text{XCOMP SUBJ}\)) to the matrix clause subject (\(\uparrow \text{SUBJ}\)) in the f-structure. An object raising verb has a different specification, namely (\(\uparrow \text{XCOMP SUBJ} = (\uparrow \text{OBJ})\)), so that the embedded subject is identified with the matrix object. By postulating those lexical specifications of the functional control path, LFG is able to explain the raising structure without resort to transformational or derivational operations in the phrase structure.

Another way of specifying a functional control is found in the treatment of long-distance dependencies. In (2.39-2.41), we have observed that \textit{topic} and \textit{focus} are functionally identified with one of the \textit{gfs} to satisfy the Extended Coherence Condition. (2.59) is another example of topicalisation (Kaplan and Zaenen 1989):
(2.59) Mary, John claimed that Bill said that Henry telephoned.

In (2.59), the f-structure of the topicalised phrase John is identified with the deeply embedded obj via functional control. To attain this type of long distance dependency, we may annotate the functional equation in the PS rule as follows:\footnote{\(2.60\) is a simplified version of the rule. See Kaplan and Zaenen (1989) for the details.}
(2.60) \[ \overline{S} \rightarrow \text{NP} \quad S \]

\((\uparrow \text{TOPIC}) = \downarrow \quad \uparrow = \downarrow \)

\((\uparrow \text{TOPIC}) = (\uparrow \text{COMP* GF})\)

\((\uparrow \text{TOPIC}) = (\uparrow \text{COMP* GF})\) in (2.60) is the constraint regulating the possible functional control identifications between \text{TOPIC} and \text{GF}. This equation is defined with Functional Uncertainty (Kaplan and Zaenen 1989):

(2.61) **Functional Uncertainty:**

\((f\alpha) = v\) holds if and only if \(f\) is an f-structure, \(\alpha\) is a set of strings, and for some \(s\) in the set of strings \(\alpha\), \((f\,s) = v\).

According to the Functional Uncertainty, \((\uparrow \text{TOPIC})\) in (2.60) can be identified with \((\uparrow \text{COMP OBJ}), (\uparrow \text{COMP COMP SUBJ}), (\uparrow \text{COMP COMP COMP SUBJ})\) and so on.\(^{15}\)

In a more flexible way, we can define the functional control path by using metavariable of the attribute. Dalrymple (2001:395–6), for instance, proposes that annotation \((\uparrow \text{TOPIC}) = (\uparrow \text{TopicPath})\) is attached to the fronted topicalised phrase in the PS rule. \text{TopicPath} is a variable to be specified as a certain attribute according to syntactic environments:

(2.62) **English TopicPath:**

\[ \{x\text{comp} | \text{comp} | \text{obj}\}^* \{\text{adj} \in \text{(gf)} | \text{gf}\} \]

\((\rightarrow \text{LDD}) \neq - \quad (\rightarrow \text{TENSE}) \quad \neg(\rightarrow \text{TENSE})\)

\(\leftarrow\) and \(\rightarrow\) are called off-path constraints. They are annotated over an f-structure attribute to refer to another attribute (Dalrymple 2001:151):

(2.63) **Off path constraints:**

In an expression like \((\leftarrow s)\), \(\leftarrow\) refers to the f-structure of which \(a\) is an attribute.

In an expression like \((\rightarrow s)\), \(\rightarrow\) refers to the value of the attribute \(a\).

According to the off-path constraints, (2.62) states which path is possible under what circumstance. For instance, \text{comp} is allowed only when its \text{LDD} value is not \(-16\). \text{obj} is allowed if it contains a \text{TENSE} value, whereas \text{adj} is allowed when it does not contain a \text{TENSE} value and so forth.

### 2.4 M-structure

#### 2.4.1 Projection architecture

So far, we have looked at the two levels of representations and their correspondence in the syntax. In addition to those levels, LFG has been exploring other aspects of linguistics struc-

\(^{15}\)The Kleene star (*) permits any number of \text{comp} in the path.

\(^{16}\)(\text{LDD},+) is introduced when the governing predicate is a verb which permits the long-distance dependency.
ture. Those structures are incorporated into the framework and show different correspondences. The framework having additional grammatical components is called the projection architecture, since various types of information project differently. (2.64) is an example of the semantic projection $\sigma$ (Halvorsen and Kaplan 1988):\footnote{The form of the s-structure varies according to the assumption of semantic component. For example, works in Glue Semantics postulate a different form of s-structure (Dalrymple 1999, 2001, Asudeh 2004).}

\begin{equation}
(2.64)
\end{equation}

In (2.64), both $\phi$ and $\sigma$ are projected from the c-structure. Thus, the mappings from c-structure to s-structure may be defined by equations in the PS rules as in (4.78)\footnote{$\sigma M^*$ is equal to $\sigma(M(\cdot))$.} and the lexical entry for \textit{ran} may contain semantic information as well as f-structural information as in (2.65b):

\begin{align}
(2.65) & \quad a. \quad S \rightarrow NP \quad VP \\
& \quad (\uparrow \text{SUBJ}) = \downarrow \\
& \quad (\sigma M^* \text{ ARG1}) = \sigma^* \quad (\sigma M^* \text{ PRED}) = \sigma^* \\
& \quad b. \quad \text{ran} \quad V \\
& \quad (\uparrow \text{PRED}) = \text{RUN(SUBJ)} \\
& \quad (\uparrow \text{TENSE}) = \text{PAST} \\
& \quad (\sigma M^* \text{ REL}) = \text{RAN}
\end{align}

To link f-structure and s-structure, we can compose the inverse function $\phi^{-1}$ and $\sigma$, namely the composite function $\phi^{-1} \circ \sigma$ allows us to map an f-structure to an s-structure mediated by a c-structure as shown in the path from \text{SUBJ} to \text{ARG1} in (2.64). If we replace $\phi^{-1} \circ \sigma$ by $\sigma'$, we can add $(\sigma M^* \text{ ARG1}) = \sigma'(\uparrow \text{SUBJ})$ (or $(\sigma M^* \text{ ARG1}) = (\sigma' \phi M^* \text{ SUBJ})$) to the lexical entry of \textit{ran}, so that the predicate lexically specifies that its \text{SUBJ} is linked to the \text{ARG1} in the s-structure.

It is often found in the LFG literature that an s-structure is projected from an f-structure rather than a c-structure (Kaplan \textit{et al.} 1989):
In (2.66), the s-structure is constructed by the mapping from the f-structure. Those mappings can be defined lexically. For instance, the lexical entry of *fell* may contain the following f-description:

(2.67) \[ \text{fell} \quad V \quad (\uparrow \text{PRED}) = \text{‘FALL(SUBJ)’} \]
\[ (\uparrow \text{TENSE}) = \text{PAST} \]
\[ (\sigma^\uparrow \text{REL}) = \text{FALL} \]
\[ (\sigma^\uparrow \text{POL}) = 1 \]
\[ (\sigma^\uparrow \text{ARG1}) = \sigma(\uparrow \text{SUBJ}) \]

The specifications of the mapping to the s-structure are described by the function \( \sigma \), but \( \sigma \) takes an f-structure as its argument — notice that the argument of \( \sigma \) was a c-structure node in (2.65b).

### 2.4.2 Morphological projection

One interesting adoption of the projection architecture is found in m(orphological)-structure or m(orphosyntactic)-structure (Butt et al. 1996, Frank and Zaanen 2002). They apply an m-structure for the analysis of auxiliary-verb constructions. In Classic LF, Aux-V constructions in English are treated as a raising structure (Kaplan and Bresnan 1982, Falk 1984).\(^{20}\) That
is, the f-structure contains multiple xcomps whose subj is identified with the matrix subj as in (2.68):

(2.68)

As the functional annotations in the c-structure indicate, the VP headed by be is mapped onto xcomp, so that the clause introduced by the VP functions as a gapped complement. This xcomp contains another xcomp which corresponds to the VP headed by attending. In other words, the embedding in the c-structure is reflected in the f-structure. Since both will and be are treated as raising verbs, they have a specification (↑subj) = (↑xcomp subj) in their f-descriptions (cf. (2.58)). The result of those identifications are illustrated by the functional controls in the f-structure.

Although there are some motivations behind this proposal such as VP ellipsis and VP topicalisation, Butt et al. (1996) point out some difficulties with the proposed f-structure. For instance, it contains unmotivated complexity. It is questionable that an auxiliary verb
introduces a \texttt{pred} value, which has a semantic basis. More crucially, the multiple embedding f-structure is hardly justifiable from cross-linguistic perspectives. F-structure, unlike c-structure, encoding a certain grammatical relations is thought to be invariant amongst languages unless variations are strongly motivated by empirical data. Thus, it is undesirable to postulate the embedding f-structure, which is mirror of the c-structure, based on the fact that English and other Romance and Germanic languages represent some tense and aspect in analytic or syntactic ways (see Chapter 3 for further discussion on this point).

To overcome those problems, we can propose the following structures:

(2.69) \[
S \rightarrow \begin{array}{c}
\text{NP} \\
\text{VP} \\
\text{AUX} \\
\text{V}
\end{array}
\]

In (2.69), the auxiliaries and the main verb are mapped onto the same f-structure, namely they are f-structurally co-head, so that the f-structure no longer contains the embedded xcomps.

One disadvantage caused by this revision is that the subcategorisation constraints on the forms of auxiliaries and verbs cannot be stated lexically. As shown in (2.68), each xcomp specifies its vform value and it must match the requirement of the governing predicate. For instance, \textit{will}, \textit{be} and \textit{attending} may contains the following specifications in their f-descriptions (the irrelevant part is omitted):

(2.70) \[
\begin{align*}
\text{a. } & \text{will} & \text{AUX} & (\uparrow \text{TENSE}) = \text{FUTURE} \\
& & & (\uparrow \text{xcomp vform}) = \text{c base}
\end{align*}
\]

\[
\begin{align*}
\text{b. } & \text{be} & \text{AUX} & (\uparrow \text{ASPECT PROGRESSIVE}) = + \\
& & & (\uparrow \text{vform}) = \text{base} \\
& & & (\uparrow \text{xcomp vform}) = \text{c prespart}
\end{align*}
\]

\[
\begin{align*}
\text{c. } & \text{attending} & \text{V} & (\uparrow \text{vform}) = \text{prespart}
\end{align*}
\]

The constraint equation \(=_{c}\) itself does not introduce the feature, but it requires the feature to exist in the target f-structure. Thus, \((\uparrow \text{xcomp vform}) =_{c} \text{base}\) in (2.70a) states that the vform value of its xcomp must be base, so that a non-base form verb or auxiliary cannot appear
as a complement of will. As shown in (2.70b), be has (↑ vform) = base, so it satisfies the constraint of the governing predicate will. At the same time, be requests prespart value for its xcomp’s vform value when it is used for the progressive aspect, i.e. when it is paired with (↑ aspect progressive) = +, so that only the present participle form of a verb can follow be. This requirement is satisfied by attending, since it has (↑ vform) = prespart as in (2.70c).

Those form specifications cannot be stated in the flat f-structure in (2.69). Therefore, Butt et al. (1996) propose a different projection called μ to describe the form specifications.

As shown in the annotations in (2.71), m-structures are defined over c-structure nodes in Butt et al.’s (1996) approach. So, the annotations ↑ = ↓ and (μM* dep) = μ* on the VP indicates that this VP is mapped onto the same f-structure as its mother node, but it is mapped onto dep of the mother’s m-structure. As a result, we can have multiple embeddings in the m-structure keeping the f-structure flat. As the vform attribute in the m-structure indicates, the form specifications are successfully stated in this structure, rather than f-structure, by the specification of the μ-projection of the lexical entries:

---

21 dep is an attribute representing a morphological dependent in the m-structure.
(2.72)  a. will AUX (↑ TENSE) = FUTURE
        (µM* AUX) = +
        (µM* FIN) = +
        (µM* DEP VFORM) = \( _c \) BASE

b. be AUX (↑ ASPECT PROGRESSIVE) = +
        (µM* AUX) = +
        (µM* FIN) = −
        (µM* VFORM) = BASE
        (µM* DEP VFORM) = \( _c \) PRESPART

c. attending V (µM* FIN) = −
        (µM* VFORM) = PRESPART

(µM* DEP VFORM) = \( _c \) BASE in the lexical entry of will requires its dependent in the m-structure to be in the base form. Since be has (µM* vform) = BASE, it can be mapped onto the value of the DEP of the m-structure of will. Similarly, be has a vform constraint to its DEP, i.e. (µM* DEP VFORM) = \( _c \) PRESPART, so that only a present participle can follow it.

Frank and Zaenen (2002) also propose µ projection and m-structure. The crucial difference from Butt et al. (1996) is that the µ is a projection from f-structure, not c-structure (see a similar contrast for \( \sigma \) found in (2.64) and (2.66)). Therefore, essentially the outermost f-structure in (2.69) is mapped onto the m-structure in (2.71). To attain the mapping, the lexical items need to have different specifications from (2.72):\(^{22}\)

(2.73)  a. will AUX (↑ TENSE) = FUTURE
        (µ↑ AUX) = +
        (µ↑ FIN) = +
        (µ↑ DEP VFORM) = \( _c \) BASE

b. be AUX (↑ ASPECT PROGRESSIVE) = +
        (µ↑ DEP AUX) = +
        (µ↑ DEP FIN) = −
        (µ↑ DEP VFORM) = BASE
        (µ↑ DEP DEP VFORM) = \( _c \) PRESPART

c. attending V (µ↑ DEP DEP FIN) = −
        (µ↑ DEP DEP VFORM) = PRESPART

Since will, be and attending are all mapped onto the same f-structure and the m-structure is defined by a projection from that flat f-structure, the absolute DEP path is required to construct the multiple embedding m-structure. For example, will has (µ↑ FIN) = +, whereas be and attending have (µ↑ DEP FIN) = + and (µ↑ DEP DEP FIN) = + respectively, which are attained by uncertainty path DEP*\(^{22}\). The vform constraints are stated by referring to one-level more deeply embedded DEP’s m-structure in the lexical entry such as (µ↑ DEP VFORM) = \( _c \) BASE and (µ↑ DEP DEP VFORM) = \( _c \) PRESPART.

\(^{22}\) An alternative subscript notation such as (↑µ aux) = + and ((↑ subj)\( \nu \) num) = sg are often used.
Under the assumption of Frank and Zaenen’s m-structure, the agreement features also belong to m-structure. One of the advantages of assuming a mapping from f-structure to m-structure is that reference to agreement features is easily stated in the lexical entry of a verb. For example, the subject-verb agreement found in (2.74a) is captured by the lexical specification in (2.74c):

\[
\begin{align*}
\text{(2.74)} \quad \text{a. John has attended the lecture.} \\
\text{b.} & \quad \begin{array}{c|c}
\text{PRED} & \text{‘ATTEND\langle SUBJ,OBJ\rangle’} \\
\text{TENSE} & \text{PRES} \\
\text{ASPECT} & \text{PERFECT }+ \\
\text{SUBJ} & \text{\langle PRED ‘JOHN’ \rangle} \\
\text{OBJ} & \text{\langle PRED ‘LECTURE’ \rangle} \\
\text{SPEC} & \text{THE}
\end{array} \\
\text{c. has AUX} & \quad (\mu(\uparrow \text{SUBJ } \text{NUM}) = c \, \text{SG}) \\
& \quad (\mu(\uparrow \text{SUBJ } \text{PERS}) = c \, 3)
\end{align*}
\]

\(\mu(\uparrow \text{SUBJ})\) (or \((\uparrow \text{SUBJ})_m\)) refers to the m-structure corresponding to the value of \text{SUBJ} of the f-structure in (2.74b). Thus, the verb correctly refers to the agreement features belonging to the different m-structure via its \text{SUBJ’s f-structure}.

### 2.4.3 Information Spreading

One of the most radical forms of projection architecture is Information Spreading proposed by Andrews and Manning (1993, 1999). Information Spreading originally assumes four types of projections: f, \(\sigma\), m and \(\alpha\), and instead of \(\uparrow = \downarrow\) (f-structure head) in the standard LFG, they postulate two types of heads: \((\uparrow H) = \downarrow\) (syntactic head) and \((\uparrow O) = \downarrow\) (semantic head) (Andrews and Manning 1993). Different types of information are projected differently via function ‘projector’ and ‘projected’ such as projector(f)/projected(f) and projector(\(\sigma\))/projected(\(\sigma\)) (Andrews and Manning 1993:32–3). Andrews and Manning (1999) go one step further and divide the grammatical features into five types and allow them to project differently: \(\kappa\) (syntactic categories), \(\beta\) (phrase structural hierarchies), \(\rho\) (grammatical functions), \(\alpha\) (argument structure) and \(\mu\) (morphosyntactic properties). They are projected from c-structure and directly mapped onto a single structure called the e(xpression)-structure. The projection is attained by positive restriction and Restricted Equality (Andrews and Manning 1999:13–4):\(^{23}\)

\(^{23}\)An equality is often abbreviated as \(= \{\kappa, \mu \ldots\}\).
(2.75)  

a. Positive restriction:
\[
f_{(\text{TENSE,.SUBJ})} = \begin{bmatrix}
\text{TENSE} \\
\text{SUBJ}
\end{bmatrix}
\begin{bmatrix}
\text{PRED}, \text{Fido}' \\
\text{NUM}, \text{SG}
\end{bmatrix}
\]

b. Restricted Equality:
Where \( \alpha, \kappa, \ldots \) are sets of attributes (restricted projections),

\[
f = \{\alpha, \kappa, \ldots\} \equiv_{\text{def}} f_{(\alpha \cup \kappa \cup \ldots)} = g_{(\alpha \cup \kappa \cup \ldots)}
\]

In effect, Information Spreading allows multiple notions of head, namely, categorial head, morphosyntactic head, semantic head and so on. Andrews and Manning (1999:6–18) argue that there is a conceptual advantage of the multiple notions of head by referring to a Romance prepositional indirect object. Since the prepositional phrase like \( a \) los \( \text{niños} \) ‘to the child’ is an indirect object (\( \text{obj} \)), the corresponding f-structure would be (2.76) which is essentially just like a plain NP’s f-structure (Alsina 1996). Thus, the issue here is that it is conceptually more plausible to state that the noun is the semantic and morphosyntactic head, whereas the preposition is the categorial head. This point is nicely captured in Information Spreading as in (2.77) and (2.78).\(^{24}\)

(2.76)  
\[
\begin{bmatrix}
\text{PRED} \\
\text{CASE} \\
\text{NUM} \\
\text{SPEC}
\end{bmatrix}
\begin{bmatrix}
\text{‘CHILD’} \\
\text{DAT} \\
\text{PL} \\
\text{DEF}
\end{bmatrix}
\]

(2.77)  
\[
= \{\kappa, \rho, \alpha, \mu\} = \{\alpha, \rho, \mu\}
\]

\[
= \{\alpha, \rho, \mu\} = \{\kappa, \rho, \alpha, \mu\}
\]

\[
= \{\alpha, \rho, \mu\} = \{\kappa, \rho, \alpha, \mu\}
\]

\[
= \{\alpha, \rho, \mu\} = \{\kappa, \rho, \alpha, \mu\}
\]

\[
\text{los} \quad \text{niños}
\]

---

\(^{24}\)I shall discuss an alternative treatment of preposition in general in Chapter 3.
It is worth noting that the way the projection architecture in LFG captures the well-formedness in various types of linguistic structures is strikingly different from syntactico-centric approaches. For instance, in the derivational theories, it is often the case that the syntactic operations, in particular movement, are responsible for constructing a well-formed surface string or an interpretable form of structure wherever the operations occur (narrow syntax, PF or LF). In the projection architecture of LFG, on the other hand, syntactic constraints, morphological constraints and semantic constraints are stated over different linguistic structures and they may interact with each other via mathematical functions. In the following chapters, we will see a number of instances of the interactions of f-structural features, surface phrase structures, semantic features, discourse features and morphological forms through the analyses of the phenomena traditionally thought to be related to case and grammatical relations.
2.5 Extended projection

The c-structures we have looked at so far are traditional phrase structure trees. In recent LFG, however, more elaborated phrase structures are often adopted. I shall discuss them in this section. The extended projection plays a crucial role in the discussion of issues in LFG morphosyntax in the next chapter.

2.5.1 Functional projection and co-head

Some recent works in LFG assume two types of syntactic categories appearing in c-structure, lexical and functional, and their distributions follow the $\overline{X}$ theory. The intuition behind the introduction of functional categories is that there seems to be distinct configurational positions which are reserved for certain types of elements in many languages. For instance, a finite verb or auxiliary in a declarative sentence is associated with a position called I(NFL), and a subject position can be specified with relation to I called Spec(ifier). The utilisation of functional categories in the theory is not peculiar to LFG. Derivational frameworks such as late Government and Binding and the Minimalist Programme heavily use functional categories. In many cases, the position like C is a landing site of the head movement such as I-to-C movement. Under such an assumption, I itself is phonologically empty at the initial stage of the derivation and filled by a moved phrase, or if it is filled by an overt element, it blocks the head movement and so forth. Unlike those derivational assumptions, however, the functional categories in LFG must always be phonologically overt words, namely a word instantiating a functional category must be base-generated in that position.

(2.79) is the summary of the syntactic categories proposed in LFG (Bresnan 2001:100). Each follows the standard positional assumptions of $\overline{X}$ theory as in (2.80):

\[(2.79) \quad a. \ F^0: C^0, I^0, D^0 \quad \text{(functional categories)}
\]
\[b. \ L^0: N^0, V^0, A^0, P^0 \quad \text{(lexical categories)}
\]

\[(2.80) \quad \begin{array}{c}
\text{XP} \\
\text{Spec} \\
\overline{X} \\
\text{Comp}
\end{array}
\]

As Grimshaw (1991) claims, the functional categories share categorial properties with the lexical categories. In LFG, I is a verbal category, D is a nominal category, C may be either verbal or nominal. Many works in generative grammar assume that the category labels such as $F^0$, $L^0$, $I^0$, $D^0$, $N^0$, $V^0$, $A^0$, $P^0$ are phonologically realised in the PF component, so whether a category is phonologically overt or not is irrelevant in syntax.

---

25Distributed Morphology (Halle and Marantz 1993) or some version of Minimalism assumes that all the phonological realisations occur in the PF component, so whether a category is phonologically overt or not is irrelevant in syntax.
as N, V and A are not primitive concepts, rather they can be decomposed into features. The most well-known proposal is Chomsky’s (1970) \([\pm N, \pm V]\) (and its extension by Jackendoff 1977). Under that proposal, noun is \([+N, -V]\), verb is \([-N, +V]\), adjective is \([+N, +V]\) and adposition is \([-N, -V]\). Alternatively, Jackendoff (1977) proposes \([\pm \text{subj}, \pm \text{obj}]\), namely noun is \([+\text{subj}, -\text{obj}]\), verb is \([+\text{subj}, +\text{obj}]\), adjective is \([-\text{subj}, -\text{obj}]\), adposition is \([-\text{subj}, +\text{obj}]\). Based on those previous proposals, LFG analyses syntactic categories as triples of a categorial feature matrix (2.81), a level of structure (2.82) and feature F (functional or not) (Bresnan 2001:100–1).

\[
\begin{array}{ccc}
\text{V} & + & + \\
\text{P} & - & + \\
\text{N} & - & - \\
\text{A} & + & -
\end{array}
\]

```
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<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>(AP)</td>
</tr>
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(2.83)

\[
\begin{align*}
\text{V}^0: \ & \langle [+\text{predicative}, +\text{transitive}], 0, 0F \rangle \\
\text{VP} = \overline{V}: \ & \langle [+\text{predicative}, +\text{transitive}], 2, 0F \rangle \\
\text{I}^0: \ & \langle [+\text{predicative}, +\text{transitive}], 0, F1 \rangle \\
\text{CP} = \overline{C}: \ & \langle [+\text{predicative}, +\text{transitive}], 2, F2 \rangle \\
\text{DP} = \overline{D}: \ & \langle [-\text{predicative}, -\text{transitive}], 2, F1 \rangle
\end{align*}
\]

The basic concept behind the feature matrix (2.81) is similar to Jackendoff’s (1977) \([\pm \text{subj}, \pm \text{obj}]\), but the values are slightly different. Verbs and adjectives cannot stand alone as arguments, but require an external subject of predication, so they are \([+\text{predicative}]\), whereas nouns and adpositions are not. Verbs and prepositions may take an object, so they are \([+\text{transitive}]\), while nouns and adjectives are not. (2.82) is standard bar-level of the X theory. (2.83) is examples of category decomposition, consisting of the feature matrix, bar-level and F-feature. The functional projection has two layers (F1 and F2). F1 is I for the verbal projection and D for the nominal projection. F2 is C for either verbal or nominal projection. 0F (or F0) corresponds to a lexical category.

\[26\text{In other proposals, Spencer (1999) argues that category labels are predictable from the argument structures of the lexical items and redundant in the syntax.}\]
As a result of those category distinctions, LFG attains a layered phrase structure where functional projections appear above the lexical projection. One of the crucial effects of this theoretical modification is the correspondence between c-structure to f-structure. As summarised in section 2.3, the correspondence is stated by annotations on the relevant PS rule, but cross-linguistic generalisation of the mapping is not pursued. However, Bresnan (2001:102) generalises the c-structure to f-structure correspondence in terms of the positional properties of lexical and functional categories as in (2.84):

\[(2.84)\]

a. C-structure heads are f-structure heads.

\[X^n \uparrow = \downarrow \]

b. Specifiers of functional categories are the grammaticalised discourse functions.

\[\text{FP} \quad (\uparrow \text{df}) = \downarrow \quad \uparrow = \downarrow \]

\[\text{XP} \quad \text{F} \]

c. Complements of functional categories are f-structure co-heads.

\[\text{F} \quad \uparrow = \downarrow \quad \uparrow = \downarrow \]

\[\text{XP} \quad \text{F} \]

d. Complements of lexical categories are the non-discourse argument function cf.

\[\text{L} \quad \uparrow = \downarrow \quad (\uparrow \text{cf}) = \downarrow \]

\[\text{XP} \quad \text{L} \]

e. Constituents adjoined to phrasal constituents are non-argument functions or not annotated.

If a node is an f-structure head, it is mapped onto the same f-structure as its mother, that is the node is annotated as $\uparrow = \downarrow$. Thus, (2.84a) states that X is mapped onto the same f-structure as $\overline{X}$ and XP where X can be any category such as N, V, I and C. (2.84b) says that Spec-FP is a position for subj, topic or focus. For instance, Spec-IP is a position for subj and Spec-CP is a focus position in many languages, so they are annotated as $(\uparrow \text{subj}) = \downarrow$ and $(\uparrow \text{focus}) = \downarrow$ respectively. One of the important points in the proposal is the contrast between (2.84c) and (2.84d). A functional head (F) and its complement (XP) are mapped onto the same f-structure (f-structure co-heads) as illustrated in (2.84c),\(^{27}\) whereas the complement of a lexical head

\(^{27}\)This is called Extended Head Theory. Bresnan (1997) generalises this to so-called mixed categories by allowing the sister of lexical heads to be an f-structure co-head.
2.5. EXTENDED PROJECTION

(L) is annotated as an argument function such as \textit{obj}, \textit{comp} and \textit{xcomp} as in (2.84d). This f-structure co-headedness allows information located at two separate phrase structure nodes to be merged into the same level of f-structure. I will discuss (2.84e) in the next chapter.

Let us look at the illustrations of how those mapping constraints work. (2.85a) and (2.85b) are c-structures of a present tense declarative sentence and a future \textit{wh}-interrogative sentence respectively:

(2.85) a.

\[
\begin{array}{c}
\text{IP} \\
\text{(↑ subj) = ↓} \\
\text{DP} \\
\underline{I} \\
\text{VP} \\
\end{array}
\]

\[
\begin{array}{c}
\text{D} \\
\underline{V} \\
\text{NP} \\
\text{the boy} \\
\end{array}
\]

\[
\begin{array}{c}
\text{V} \\
\underline{\text{Mary}} \\
\text{V} \\
\text{like} \\
\end{array}
\]

In (2.85a), the lexical category V takes a DP complement and according to (2.84d) the VP complement is annotated as (↑ obj) = ↓. (2.84a) licenses the f-structure head status of V and
CHAPTER 2. THEORETICAL BACKGROUND: LFG BASICS

\( \bar{V} \) in the VP projection. In English, Spec-IP is reserved for the position of subject, namely the constituent filling Spec-IP position is annotated as \( (\uparrow \text{subj}) = \downarrow \) \( \text{(cf. (2.84b))} \). According to the Economy of Expression ((2.56)), an unnecessary node must not be introduced, so an I node does not appear in the c-structure in (2.85a), though an IP does to license the subject. Therefore, the DP instantiated by the boy is in Spec-IP without the head I. (2.85b) shows a similar configuration in terms of the verbal projection. However, there are two crucial differences. Firstly, the V position is instantiated by the base form of like and the auxiliary is positioned in the C. In LFG, an auxiliary in a interrogative sentence is thought to be base-generated in the C position, whereas it is base-generated in the I in a declarative sentence (see Chapter 3 for the details). Secondly, the V does not have a complement. Its \( \text{obj} \) is identified with focus via functional control in the f-structure, so in the c-structure, it lacks a complement. Spec-CP is a focus position in English (cf. (2.84b)), which is identified with either one of the gfs in the f-structure. Those examples illustrate that the positions previously regarded as S and \( \bar{S} \) are replaced by IP and CP respectively, and DP takes over NP, as a result of the introduction of the extended projection.

2.5.2 Endocentricity and exocentricity

Phrase structure configurations of many languages such as Romance, Germanic and Slavic languages are nicely analysed by the extended projection introduced above (e.g. King 1995, Sells 2001). However, it is clear that surface phrase structures of various types of languages do not always follow the endocentricity of the \( \bar{X} \) theory. Therefore, LFG retains an exocentric category S as well. S lacks a category head, so it dominates any categories as shown in (2.86) where \( \text{C} \) represent a distinct category from S (Bresnan 2001:110):

\[
(2.86) \quad S \rightarrow C^*
\]

An interesting consequence of the interaction between the endocentric extended projection and the exocentric S is found in the analyses of languages like Tagalog (Kroeger 1993), Walpiri (Austin and Bresnan 1996) and Welsh (Sadler 1997, 1998). The examples in (2.87) are Welsh and (2.88) is the c-structures (Sadler 1997:5–6):

\[
(2.87) \quad \begin{align*}
\text{a. Gwnaeth } & \text{ hi weld } y \text{ draig.} \\
& \text{do.,PAST.3.SG 3.SG.F see the dragon} \\
& \text{‘She saw the dragon.’}
\end{align*}
\]

\[
(2.88) \quad \begin{align*}
\text{b. Gwelodd } & \text{ hi y draig.} \\
& \text{see.,PAST.3.SG 3.SG.F the dragon} \\
& \text{‘She saw the dragon.’}
\end{align*}
\]
In (2.88a), the non-finite verb *weld* ‘see’ sits in V and what appears under the I is an auxiliary. Crucially, the subject DP is not placed in Spec-IP. Welsh is a verb initial language, so a subject follows a finite verb. In (2.88a), therefore, the I takes an exocentric category S as its complement, which is an f-structure co-head of the I according to (2.84c). The subject DP is dominated by that S. (2.88b) is slightly complicated. The finite form of the verb *gwelodd* ‘saw’ is placed under the I and the projection lacks V, namely the VP dominates the object DP without a V. The machinery attaining this result is a lexical change from V to I. That is, although Welsh non-finite verbs are category V, the finite counterparts are I. In the above case, *weld* is V and lacks a tense feature, while *gwelodd* is I with an f-description such as (↑ tense) = past, (↑ subj num) = c3 and (↑ subj per) = csg. In effect, every finite verb in Welsh is base-generated under an I node preceding a subject which is a daughter of an S. Due to the Economy of Expression a V node is not introduced. The upshot of this approach is that we get a similar result as V-to-I movement in the derivational frameworks.28

28Borsley (to appear) argues against this type of approach to Welsh.
2.6 Summary

This chapter focuses on the basic architectural design of LFG. We have observed that the LFG syntax has two distinct structures. A c-structure represents the configurational organisation of constituents, whereas an f-structure displays grammatical relations and other syntactic properties. Those two structures are correlated with each other by the correspondence function \( \phi \). Moreover, the correspondence is generalised with functional extended projections as shown in the previous section. Another extension is found in the projection architecture where further distinct levels of linguistic structures are added to the framework that allows the theory to stretch the domain of analysis. A particular focus was placed upon the morphological structure. We have seen how it is used to account for the form constraints found in the English Aux-V constructions. The theoretical introduction in this chapter has established the basis for the discussion in the following chapters. Before moving on to the analyses of case in individual languages, we shall look at further issues of LFG morphosyntax in the next chapter where more advanced topics of the interactions of c-/f-/m-structures, extended projections and the morphological theory called Paradigm Function Morphology are discussed.
Chapter 3

Theoretical extension: Issues in LFG morphosyntax

Against the basics of LFG introduced in Chapter 2, this chapter focuses on the issues on morphology and its interface to syntax in the framework. According to Lexical Integrity, we can say that LFG is based on word-based lexicalism in that the role of morphology is to construct a well-formed syntactic word paired with a functional description. In this chapter, I shall claim that that assumption has conceptual difficulties particularly in dealing with periphrastic inflections. Based on the insights found in Beard’s (1995) Lexeme Morpheme-base Morphology and other realisation morphology models, I will propose lexeme-based lexicalism. Under that conception, fully inflected expressions constitute a paradigm of a given lexeme, regardless of their surface forms. I will illustrate how the architectural modification operates with simple periphrastic expressions in English. Further, grammatical relation encoding attained by prepositional phrases is also discussed under the current proposal. The chapter is organised as follows. In section 3.1, the discussion of LFG’s slogan called ‘morphology competes with syntax’ is presented. I shall point out the problems with that approach in section 3.2. Section 3.3 shows how paradigmatic organisation of the lexicon is formulated. We will look at the correspondence between morphological units and syntactic units under the current proposal in section 3.4 and 3.5. Section 3.6 gives an interim summary. We then turn to an analysis of English prepositional phrases in section 3.7.

3.1 Morphology competes with syntax

As summarised in Chapter 2, LFG is one of the lexicalist theories of grammar where word has a special status and the strong division between word-internal structures and structures between
3.1. MORPHOLOGY COMPETES WITH SYNTAX

words is assumed. The former belongs to the lexicon, whereas the latter belongs to the syntax. The role of morphology is to carry out morphological operations (e.g. combining a root and affixes, changing stem forms etc.) and create fully inflected words. Those morphological operations are completely separated from the syntactic ones. This point is clearly stated as Relativised Lexical Integrity ((2.18) in Chapter 2). The Lexical integrity prohibits the elements smaller than a word to occupy syntactic terminals. In other words, the internal structure of a word is invisible to syntax. Fully inflected words are inserted into syntax where they are combined, and compose a c-structure and the corresponding f-structure. Thus, the f-description of each word is unified according to the correspondence function $\phi$ and the result of the unification is represented in the parallel corresponding f-structure. Let us look at the following English examples as a point of departure:

(3.1)  

(a)  

\[ \begin{array}{c}
\text{IP} \\
\text{NP} \ \uparrow \downarrow \ \bar{I} \\
\text{John} \ \uparrow \downarrow \ I \\
\text{will} \ \uparrow \downarrow \ V \\
\text{like} \ \uparrow \downarrow \ NP \\
\text{Mary} \ \uparrow \downarrow \ \text{like(...)} \\
\end{array} \]

(b)  

\[ \begin{array}{c}
\text{PRED} \quad \text{LIKE(SUBJ,OBJ)} \\
\text{TENSE} \quad \text{FUT} \\
\text{SUBJ} \quad \text{PRED} \quad \text{JOHN} \\
\text{NUM} \quad \text{3} \\
\text{OBJ} \quad \text{PRED} \quad \text{MARY} \\
\text{NUM} \quad \text{3} \\
\end{array} \]
In (3.1) and (3.2), the f-descriptions written under the terminal nodes are unified and mapped onto the f-structure according to the instructions of functional annotations. One notable difference between (3.1) and (3.2) is the information flow of tense feature. In (3.1), the value of tense of the clause, future, comes from the independent word will occupying the I which is an f-structure co-head with its complement VP. In (3.2), on the other hand, past comes from the V. For (3.1) and (3.2), the following lexical entries are assumed (ignoring the subject and object nouns):

\[(3.3)\]

\[\begin{align*}
(3.3) & \quad \text{a. } \text{like } V & (\uparrow \text{PRED}) = \text{‘LIKE(…)}' \\
& \quad \text{b. } -ed \text{ Inf}_{V} & (\uparrow \text{TENSE}) = \text{PAST} \\
& \quad \text{c. } \text{will } I & (\uparrow \text{TENSE}) = \text{FUT}
\end{align*}\]

The rules of English inflectional morphology combines root like and suffix -ed and creates the fully inflected word, liked. This word is inserted into syntax and contributes its information to the f-structure as illustrated in (3.2). According to the Lexical Integrity, syntax cannot see the internal structure of the word, namely like + -ed. With regard to (3.1), two words (3.3a)
and (3.3c) are inserted into syntax and they are combined following the syntactic principle, i.e. will is a head of an IP and takes a VP complement projected from V, like. Thus, the word created by morphological operations in the lexicon, liked, carries the same kind of information as the one coming from two words, will and like. In LFG, this situation is described as ‘morphology competes with syntax’ (Bresnan 2001:6).

3.2 Problems

The theoretical assumptions in LFG illustrated in the previous section reflect the fact that across languages the same grammatical content often receives different formal manifestations, namely synthetic in some cases and analytic in the other. From a morphological point of view, however, it is worth re-considering at least two points of the LFG assumptions. Firstly, it has long been claimed that assuming a one-one form and function pair for every formal element, that is treating like, will and s alike, is problematic (e.g. Matthews 1972, 1991, Anderson 1992, Aronoff 1994, Beard 1995, Stump 2001). Many works in the realisation morphology have shown the cases of multiple exponent where a single grammatical property is realised by more than one morpheme,\(^1\) cumulation where a combination of multiple morphemes represents a single grammatical property and zero morpheme where it is impossible to identify a single morpheme for a certain grammatical property. Those phenomena are widely observed across languages and can be strong counter-examples for a simple combinatorial based morphological assumption to explain such phenomena.

This point can be extended to multi-word periphrastic expressions as well. In the cases we have looked at as far, there is no complication. However, the situation is not always straightforward, that is the association between a functional word and particular grammatical information is not trivial in many cases. In simple cases like will and (↑TENSE) = FUT, this point is difficult to see, but careful examinations on functional categories reveal conceptual difficulties of the LFG style treatment. For instance, if we consider English progressive aspect (be + present participle), perfective aspect (have + past participle) and passive voice (be + past participle), we will find it difficult to see what kind of information is associated with each, copula verb be and have and a past participle form of the verb. Another example is do auxiliary, which is used with a verb to express negative, interrogative and emphatic information. Although there is good discussion on the English auxiliary system in the standard LFG principles (e.g. Falk 1984, 2003) and it is true that some auxiliaries can be better analysed as

\(^1\)For this distributed exponentence problem, Nordlinger and Bresnan (1996) try to explain Wambaya distributed tense system under the LFG mechanism.
raising verbs or pred bearing verbs, it worth considering a possibility to treat grammatical (or semantically bleached) auxiliaries as a part of inflectional forms, namely by assuming that the progressive aspect is realised by the construction *be* + present participle form of the verb and the future tense is realised by *will* + base form of the verb.\(^2\)

Secondly, it is worth questioning whether the morphology has nothing to do with realising future tense by *will* and *like*, even though it takes the whole role of creating *liked* by combining *like* and *-ed*. As we have observed, the LFG-style unification grammar has a clear advantage of handling grammatical features in that it allows features to be unified into a single (nearly) universal grammatical-function structure (f-structure) regardless of their formal manifestations, and this is the very idea of ‘morphology competes with syntax’. Still the assumption that the job of morphology is combining below-$X^0$ level elements and the job of syntax is combining words is questionable. Consider the following pairs:

\begin{enumerate}[\setlength{itemindent}{1em}]
\item[3.4] a. John shouted. (morphological)
\item b. Did John shout? (syntactic)
\item c. John is bigger. (morphological)
\item d. John is more intelligent. (syntactic)
\end{enumerate}

According to the LFG’s assumptions, (3.4a) is created in the lexicon (morphological) whereas its interrogative counterpart ((3.4b)) is syntactic. In the same vein, the comparative formation in (3.4c) is done in the lexicon, while that in (3.4d) is in syntax. Although the mood is different in the former pair, i.e. declarative and interrogative, it is conceptually difficult to argue that the morphology is responsible for constructing the past tense and declarative mood information, but the syntax is responsible for the past tense and the interrogative mood of the verb phrase or the clause. The situation is even worse in (3.4c, d). Putting the questions like what kind of projection should be assumed for *more* aside, exactly the same information, i.e. comparative, is expressed by the morphology on the one hand, and by the syntax on the other.\(^3\)

To overcome those problems, I shall show how some recent insights in Word-and-Paradigm morphology can provide a more plausible model of morphology in LFG. The basic idea of the proposal is treating inflectional morphology as morphological operations regardless of their exponents, namely multi-word or single word. Thus, *will like* is the case where

\(^2\)This point can be even strongly highlighted in Slavic languages where the composition of participle and auxiliary does not give correct syntactic properties as discussed in Spencer (2001, 2003b). In Serbo-Croat, for instance, the simple past is formed by the l-participle and the auxiliary in the present tense. In Slovene, the l-participle must be used both for the simple past and the analytic future, so that we cannot assign tense feature either to the participle or the auxiliaries.

\(^3\)For more discussion on the similar point point, see Börjars et al. (1997), Ackerman and Webelhuth (1998), Sadler and Spencer (2001), Spencer (to appear) and Ackerman and Stump (2004).
the inflectional morphology makes use of syntactic formatives. The only difference between \textit{will like} and \textit{liked} is whether the formal manifestation is a multi-word periphrastic expression or a single word form change. Although it is obvious that the words filling functional categories follow syntactic principles, the empirical data apparently indicate that functional categories and lexical categories are used to realise morphosyntactic properties as a construction, which are realised by small elements in many other languages or even in the same language. Thus, a possible assumption is that the syntax is equipped with the functional projections for a multi-word inflection specified by the morphology. Then, the better way of handling the phenomena like \textit{have} + past participle and \textit{be} + progressive is allowing the morphology to use both small below-X$^0$ morphemes and function words to realise morphosyntactic properties.

3.3 Paradigmatic organisation of the lexicon

3.3.1 Lexeme vs. grammatical morpheme

As summarised in Chapter 2 and the previous section, LFG assumes that the lexicon contains not only major classes of words such as nouns, verbs and adjectives, but also function words and bound morphemes. Each one of them is paired with grammatical properties (f-description). Words are combined by the syntax and a root/stem and morphemes are combined in the lexicon by the morphology. In this thesis, I propose a different organisation of the lexicon and the morphological operations. As a starting point, let us look at Beard’s (1995) proposal in Lexeme Morpheme Base Morphology (LMBM) where he draws a different kind of divisions among words and morphemes.

Beard separates grammatical morphemes from major lexical categories such as N, V and A. The lexical categories are called lexeme, which is ‘the direct articulation of meaning by sound in the Saussurean sense’ (Beard 1995:45). Thus, LMBM assumes the direct associations of properly specified sequences of phonemes, grammatical features and semantic intentions in each lexeme. Those lexemes are stored in the lexicon. Grammatical morphemes, on the other hand, ‘are defined in terms of an indirect, context-sensitive, often paradigmatic means of reference (conditional indirect articulation)’ (Beard 1995:45). They are results of morphological manifestations over the morphosyntactic properties. There is no direct one-to-one relationship between grammatical morphemes and functions (Separation Hypothesis), therefore they are not stored in the lexicon. Further, grammatical morphemes are divided into bound grammatical morphemes (affixes etc.) and free grammatical morphemes (determiners, auxiliaries, adpositions etc.) depending on whether they occupy syntactic terminals or not.
In other words, word-hood is used for a subdivision within the grammatical morphemes. Obviously, what kind of information is covered by which grammatical morpheme depends on the language. For instance, definiteness in English is normally realised by free grammatical morphemes, i.e., determiners, but many languages use both bound and free grammatical morphemes, i.e., affixations on the head nouns and/or determiners. I summarise the properties of each class here:

(3.5) a. Lexeme:
   i. direct articulation of meaning by sound in Saussurean sense
   ii. stored in the lexicon
   iii. open classes which do not form grammatical paradigm
   iv. phonologically fully specified; zero and empty lexemes are ruled out
   v. susceptible to L(exical)- and I(nflectional)-derivation
   vi. one and only one class and may change class only via Lexical-derivation
b. Grammatical morpheme (bound: affixes, free: determiners, auxiliaries etc.):
   i. indirect, context-sensitive articulation (no one-one form and function pair)
   ii. not stored in the lexicon
   iii. paradigmatic closed classes
   iv. omissive and empty marking
   v. not susceptible to Lexical-derivation
   vi. used for various functions (not constituting a single class, though there must be some subcategorisations among grammatical morphemes).

One of the crucial differences from the standard LFG’s assumption is that LMBM separates out grammatical elements (free/bound grammatical morphemes) from the lexicon, so that the lexicon only contains lexemes. Grammatical morphemes are formal resources used to realise grammatical features.

---

4 ‘Derivation’ in LMBM is a technical term, which is distinct from a traditional notion of derivation. It is an operation over morphosyntactic and semantic features, which does not involve form/spelling (Beard 1995:98). I-derivations are about the grammatical relations of inflection. Beard proposes three tests for distinguishing I-derivation and L-derivations:

(i) a. The peripheral affix test: Word formation marking appears close to the base; inflectional marking is outside word formation marking when it is syntactically engaged. (p.100)
   b. The free analog test: Any property marked by a free morpheme must be a syntactic hence inflectional property. (p.102)
   c. The arbitrariness test: Lexical properties are set lexically to be invariable, whereas inflectional properties are slippery and impossible to fix. (pp.114–5)

Based on those tests, Beard discusses what is lexical and inflectional for nominal and verbal features. For example, Case passes all the three tests, and it is the only inflectional properties unquestionably controlled by syntax. On the other hand, Gender is a lexical category, which is inaccessible to syntax. As for verbal properties, all of them except for Transitivity and Verb Class are categorised into inflectional properties, i.e., the properties like Tense, Aspect, Delimitive, Voice are all inflectional. I do not go into the details of this argument.
Based on the insight of Beard’s Separation Hypothesis, I propose the following architecture of the lexicon in LFG:

(3.6) **Paradigmatic lexicon:**
The lexicon contains a list of lexemes for each of which fully inflected expressions paired with the f-description constitute the inflectional paradigm.

(3.7) **Lexeme:**
If fully inflected expressions $a$ and $b$ have the same $\text{pred}$ value, they occupy cells in the paradigm space of the same lexeme $l$.

According to those modifications, roughly the lexicon takes the format as in (3.8).\(^5\) $\text{kiss}_1$ is a lexeme index, which is uniquely assigned to each lexeme, so that it is distinguished from other lexemes. Its syntactic category is also accompany the lexeme index. The association between root form and lexeme index can be specified by a function $\text{L-index}$ used in Paradigm Function Morphology (Stump 2001:43–4). For instance, *lie* that is two phonologically identical roots for ‘recline’ and ‘prevaricate’ show different inflectional patterns. $\text{L-index}$ places a different lexeme index for each such as $\text{L-index}(\text{lie}) = \text{lie}_1$ and $\text{L-index}(\text{lie}) = \text{lie}_2$. This lexeme is formally realised as fully inflected expressions such as *kiss, kissed, have kissed* and so on. Those expressions constitute the paradigm of the lexeme *kiss*:

---

\(^5\)I shall slightly revise the formulation according to the introduction of technical details.
As illustrated, each expression in the paradigm is paired with a set of equations (f-description). I assume that the available attribute and the permissive values for that attribute are specified for each class of lexemes. For example, the class of verbs is paired with a set of equations shown in (3.9):

(3.9) \( \uparrow \text{PRED} \) = \{list of \text{PRED} values of verb\}
(\( \uparrow \text{TENSE} \) = \{\text{PRES} | \text{PAST} | \text{FUTURE} | \text{NO-TENSE}\}
(\( \uparrow \text{ASPECT PROGRESSIVE} \) = \{+ | -\}
(\( \uparrow \text{ASPECT PERFECT} \) = \{+ | -\}
(\( \uparrow \text{SUBJ PERS} \) = \(c\) \{3\}
(\( \uparrow \text{SUBJ NUM} \) = \(c\) \{sg\}

(3.9) shows that attributes \text{PRED}, \text{TENSE} and \text{ASPECT} are available for a verb lexeme like \text{kiss}. Each cell in the paradigm must be uniquely identified and it must contribute necessary information to the syntax, more specifically the f-structure. Further, as shown in the previous chapter, LFG allows multiple levels of representations (projection architecture). So, each in-

---

6 This is not an exhaustive list of equations for the class.
Inflected expression is also paired with different types of properties via appropriate functions. For instance, semantic feature \( \text{rel} \) can be associated with an expression as in \((\uparrow_{\sigma} \text{rel}) = \text{kiss}\) (or \((\sigma \mathcal{M}^{*} \text{rel}) = \text{kiss}\) if they project from c-structure). In the next section, we shall look at the relation between inflected form and f-description and the feature occurrence within the f-description in more details.

### 3.3.2 Linking expression and function

Based on the Separation Hypothesis, we reject the one-to-one association between grammatical morpheme and function. Instead, we associate a fully inflected expression with functions (f-description). So, the next question to be raised is how such an association is defined. The realisation models of morphology propose various types of architectures of formal manifestation process. LMBM, for example, proposes an independent component, Morphological-Spelling (MS-component) (Beard 1995:55):

\[(3.10)\]

a. Reading the Conditions on Operations
   
i. identify the class of the input lexeme
   
   ii. open the set of rules pertinent to that class
   
   iii. identify any relevant P- or R-features
   
   iv. read the first set of relevant features into memory

b. Execution
   
i. locate the stem (P-features) of the lexeme
   
   ii. execute the modification on the lexical stem conditioned by the grammatical features in memory
   
   iii. erase memory
   
   iv. advance to the next feature and restart the process

Putting the detailed mechanism aside, the process follows the normal business of the realisational model of morphology. Roughly, MS-component checks what class/category the input lexeme is ((3.10a-i)), they access the relevant set of (realisation) rules ((3.10a-ii)), check the phonological features (P) or semantic features (R) of the lexeme ((3.10a-iii)), then takes a bundle of morphosyntactic features associated with the lexeme. To specify the well-formed word, the appropriate realisation rules are selected and the phonological modification is carried out ((6.16-i, ii)). In this thesis, I do not follow this MS-component process in the strict way, but the fundamental assumptions are very similar amongst the proposals as seen immediately below.

---

\(^7\) LMBM assumes the same MS process for I-derivation and L-derivation.
3.3.3 Paradigm Function Morphology

One of the most detailed formalisations of realisation morphology is made by Gregory Stump, called Paradigm Function Morphology (pfm) (Stump 2001) and several attempts have been made for incorporating pfm into LFG as its morphological component (Sadler and Spencer 2001, Luís and Sadler 2003, Spencer 2003a, Otokuro 2003a, Ackerman and Stump 2004, Luís and Otokuro 2004, Sadler and Nordlinger 2004, Andrews 2005). One of the most important aspects of pfm is a function called Paradigm Function (PF). PF takes a pair of a root of a lexeme (X) and a complete set of morphosyntactic properties associated with that lexeme (σ) as its argument, i.e. PF(⟨X, σ⟩). As mentioned in Chapter 2, LFG places a different kind of well-formed constraints to each level of linguistic structure. Thus, in an attempt to incorporating pfm into a part of the LFG architecture, PF can also be regarded as a well-formedness constraint on lexical form in the lexicon.

A morphosyntactic property plays a crucial role in a language’s inflectional paradigm. It takes the form of a pairing of an attribute\(^8\) with one of its permissive values. Following Generalized Phrase Structure Grammar (GPSG) (Gazdar et al. 1985), the attribute can either be atom-valued or set-valued. Therefore, the format would be like (3.11):

\[
\sigma = \{\text{TNS:pres, AGR(su):\{PER:1, NUM:pl\}}\}.
\]

\(^8\)Stump uses a term ‘morphosyntactic feature’ instead of attribute.
\(^9\)See Sadler and Spencer (2001) for discussion on morphological features and syntactic features.
\(^10\)Of course, semantic function σ in LFG is different from pfm’s set of properties σ.
\(^11\)The notation of agreement features will be revised in Chapter 4.

Stump (2001:38) states that “[a] morphosyntactic property is a property which serves to distinguish phrases of the same category according to the different ways in which they participate in syntactic relations such as agreement and government.” Thus, morphosyntactic properties are not purely morphological, rather they also serve as an input to syntax paired with the inflected word.\(^9\) As observed in Chapter 2 and mentioned in the previous section, LFG assumes that a set of equations (f-description) is associated with each lexical item. Moreover, under the projection architecture, the equations are accompanied by different types of functions such as syntactic (φ), morphological (µ) and semantic (σ).\(^10\) Based on those facts, in this thesis, I propose that pfm as the morphological component of LFG reads the equations in the f-description in the same way as the standard pfm reads the morphosyntactic properties. In effect, an expression specified by the morphological component encapsulates features mapped onto different levels of representations. Therefore, the properties stated in (3.11) are represented as follows:\(^11\)
\[ \sigma = \{ (\uparrow \text{TENSE}) = \text{pres}, (\uparrow \text{SUBJ PERS}) = c, 1, (\uparrow \text{SUBJ NUM}) = c \text{ pl} \} \]

PfM imposes various types of well-formedness conditions on morphosyntactic properties. The followings are the most fundamental ones (Stump 2001:41):

(3.13) A set \( \tau \) of morphosyntactic properties for a lexeme of category \( C \) is well-formed in some language \( \ell \) only if \( \tau \) satisfies the following conditions in \( \ell \):

a. For each property \( F : v \in \tau, F : v \) is available to lexemes of category \( C \) and \( v \) is a permissible value for \( F \).

b. For any morphosyntactic feature \( F \) having \( v_1, v_2 \) as permissible values, if \( v_1 \neq v_2 \) and \( F : v_1 \in \tau \), then \( F : v_2 \notin \tau \).

Under the current architecture, both (3.13a) and (3.13b) can be regarded as general constraints over the f-description. (3.13a) requires that a pair \( \langle a, v \rangle \) be available to the lexeme’s category. This condition is already introduced in (3.9) where I assume that each lexeme category has a set of equations consisting of available attributes and permissible values. (3.13b) corresponds to the Uniqueness Condition in LFG (see (2.24) in Chapter 2).\(^{12}\)

Another constraint over the morphosyntactic properties is the property co-occurrence restrictions, which is also proposed in GPSG as Feature Co-occurrence Restrictions (FCRs). This constraint either requires certain attribute-value pairs to co-occur or prevents them from co-occurring. For instance, (3.14) is a partial description of the restrictions of a Bulgarian verb (Stump 2001:42).\(^{13}\)

(3.14) A set \( \tau \) of morphosyntactic properties for a lexeme of category \( V \) is well-formed only if \( \tau \) has a well-formed extension \( \sigma \) such that

a. \( \sigma \) is an extension of \{VFORM:fin\} iff for some permissible \( \alpha \), \( \sigma \) is an extension of \{MOOD:\alpha\};

b. if \( \sigma \) is an extension of \{MOOD:impv\}, then \( \sigma \) is an extension of \{AGR:{PERS:2}\}

\[
\ldots
\]

Given the well-formedness condition (3.13) and the property co-occurrence restrictions (3.14), Stump (2001:42–3) defines the notion of completeness over a set of morphosyntactic

\[\text{\footnotesize 12}^{\text{Strictly speaking, Uniqueness is a constraint over an f-structure, so it might be claimed that in the f-description some attributes could take a disjunction of values. For example, put could have disjunctive values for TENSE as \( \uparrow \text{TENSE} = \{\text{pres} \mid \text{past} \} \). Under the paradigm-based lexicon, however, every fully inflected expression is thought to be uniquely identified in the paradigm space.}}\]

\[\text{\footnotesize 13}^{\text{Extension is defined as follows (Stump 2001:41):}}\]

(i) Where \( \sigma \) and \( \tau \) are well-formed sets of morphosyntactic properties, \( \sigma \) is an extension of \( \tau \) iff (i) for any atom-valued feature \( F \) and any permissible value \( v \) for \( F \), if \( F : v \in \tau \), then \( F : v \in \sigma \); and (ii) for any set-valued feature \( F \) and any permissible value \( \rho \) for \( F \), if \( F : \rho \in \tau \), then \( F : \rho' \in \sigma \), where \( \rho' \) is an extension of \( \rho \).
(3.15) A set $\sigma$ of morphosyntactic properties is complete if and only if $\sigma$ is well-formed and for any morphosyntactic property-set $\tau$ such that $\sigma$ is not an extension of $\tau$, the unification of $\tau$ and $\sigma$ is not well-formed. (3.15) ensures that a complete set of morphosyntactic properties is not allowed to be augmented. As mentioned above, $\mathcal{PF}$ takes a pair of a root of a lexeme $(X)$ and a complete set of morphosyntactic properties and maps the pair of the fully inflected form and the set of morphosyntactic properties onto the unique cell in the paradigm space. Hence, in effect $\mathcal{PF}$ requires that each lexical item be paired with a full set of available functional equations (f-description).\footnote{Since the completeness of morphosyntactic properties is about the $\mathcal{PF}$ application, it does not stop carrying out lexical operations. For instance, lexical rules are applicable in ordinary ways of LFG.}

In the standard pfm, $\mathcal{PF}$ is defined in terms of Realisation Rules (notated as $R$ here). $R$ is a function that takes a pair of an input form and morphosyntactic properties as its argument and yields an output form as in (3.16) (Stump 2001:44):\footnote{Morphological metageneralisations ensure that the output form correctly undergoes morphophonological rules. pfm assumes that an unordered set $\phi_R$ of morphophonological rules constrains the evaluation of $R$, so that the output form $Y'$ receives further phonological alternations by $\phi_R$ (Stump 2001:47–50).}

(3.16) $R_{n,\tau,C}(\langle X, \sigma \rangle) = \langle Y', \sigma \rangle$.

Each $R$ belongs to one of the ordered rule blocks, so that it has a block index $n$. $R$ applies to an input pair only once in each rule block.\footnote{See Otoguro (2003b) and Sadler and Nordlinger (2004) for the possibility of recursive rule applications in the same block.} The function is also indexed by the property set index $\tau$ and the class index $C$. $\tau$ identifies the particular well-formed set of morphosyntactic properties that the rule realises through its application. The class index $C$ indicates the particular class of lexemes whose paradigms the rule may participate in.

The rule selection in each block is determined according to Panini’s principle, namely the most narrowly specified rule applies. The narrowness is defined as follows (Stump 2001:52):

(3.17) a. $R_{n,\tau,C}$ is narrower than $R_{n,\tau',C}$ if $\sigma$ is an extension of $\tau$ and $\sigma \neq \tau$.

b. Where $C \neq C'$, $R_{n,\tau,C}$ is narrower than $R_{n,\tau,C'}$ iff $C \subseteq C'$.

$\mathcal{PF}$ is defined by successive $R$ applications as exemplified in (3.19a). If we notate the result of applying the narrowest rule as $N\mathcal{R}_n$ (Nar$_n$ in Stump (2001)), $\mathcal{PF}$ is defined as in (3.18) (cf. Stump (2001:53)).

(3.18) $\mathcal{PF}((X, \sigma)) = \text{def} \ N\mathcal{R}_{III}(N\mathcal{R}_{II}(N\mathcal{R}_I((X, \sigma))))$
In (3.18), three rule blocks are assumed. The first \( R \) takes an input \( (X) \) and yields an output form \( (Y) \), the second \( R \) takes the output of the first \( R \), i.e. \( Y \), as an input and spells out the output \( Z \) and so on. This cyclicity is described as in (3.19):

\[
R_{III}(R_{II}(R_{I}(\langle X,\sigma \rangle)))
= R_{III}(\langle Y,\sigma \rangle))
= R_{III}(\langle Z,\sigma \rangle)
= \langle W,\sigma \rangle
\]

### 3.4 Morphology/c-structure correspondence

As discussed in section 3.3.1, the only difference between bound and free grammatical morphemes is whether they qualify a word or not. They are both used for realising grammatical features associated with a lexeme. In other words, those formatives are formal resources used by the morphological component. Well-formedness in the morphological component is defined as a correct association between a fully inflected expression and the complete f-description articulated by \( PF \). Hence, \( PF \) must be able to specify the well-formed expression regardless of whether it is synthetic or periphrastic.

The second issue concerning periphrastic inflection is how to map a morphologically well-formed expression to surface phrase structure (c-structure). Unless it is properly placed in the c-structure position, that is a word string satisfies the c-structural well-formedness, the grammar cannot generate the syntactic structure. I shall argue that LFG’s interface between c-structure and a word form is essentially an indexation (or category matching), and the extended functional projection summarised in Chapter 2 nicely provides the correspondence between the morphological well-formed expression and the c-structure position.

#### 3.4.1 Multi-word exponence

As shown in the previous section, \( PF \) maps an input pair \( \langle X,\sigma \rangle \) onto an output pair \( \langle Y',\sigma \rangle \) where \( X \) is a root and \( Y' \) is a fully inflected form. A question arises when \( Y' \) is an analytic expression, namely how \( PF \) yields the analytic expression. There are at least two options. The first one is found in Ackerman and Stump (2004:136) where they allow a realisation rule to generate an analytic exponence.\(^{17}\) It is exemplified as in (3.20).\(^{18}\)

\(^{17}\)See also Stump (2001:233–4).

\(^{18}\)Ackerman and Stump (2004) use a slightly different notation for a realisation rule. (3.20) is equivalent to \( R_{n,[POL,neg]},V(\langle X,\sigma \rangle) = (\langle Y, Z \rangle,\sigma) \) in Stump’s (2001) notation.
(3.20) \( X, \sigma: \{\text{pol}: \text{neg}\} \rightarrow [Y Z] \)

(3.20) gives multiple exponents \([Y Z]\) for single inputs \(X\). The underline indicates that the exponent \(Y\) is the head of the projection \(XP\) such that the root belongs to category \(X\), and \(Z\) is a complement of \(Y\). One of the disadvantages of this approach is that it is unclear how to specify a formal dependency requirement between words. As observed in section 2.4.2 of Chapter 2, it is often the case that a word of a periphrastic expression enforces a formal constraint on another word — *have* requires the following word to be in the past participle form, for example. This type of formal constraint is not straightforwardly accounted for by just specifying a head in the analytic expression.

The second option is to specify multiple stems in the stem selection. Spencer (2004, ms) proposes some architectural modifications to the standard \(\text{PFM}\) called Generalized Paradigm Function Morphology (\(\text{gPFM}\)). In \(\text{gPFM}\), \(P F\) involves the following three processes (cf. Spencer (2004:101)):

(3.21) a. the expression to which the prefix/suffix strings are attached (‘host’)
   b. the set of affixes (‘exponence’)
   c. the positioning of the affixes with respect to the host and their order with respect to each other (‘linearization’)

Incorporating the three steps, Spencer shows that the Finnish inessive, singular noun *talossa* and inessive, plural noun *taloissa* are constructed in the following ways where \(P F\) takes triple of a lexeme index, a set of morphosyntactic properties and a category (I use \(\mathcal{I}\) for a stem selection function here):

(3.22) a. \(P F((\text{talo}, \{\text{CASE}: \text{iness}, \text{NUM}: \text{sg}\}, N))) = \)
   i. \(\mathcal{I}((\text{talo}, \{\text{CASE}: \text{iness}, \text{NUM}: \text{sg}\}, N)) = \text{talo} \)
   ii. \(\mathcal{R}_{1,\text{NUM:sg}},N((\{\text{CASE}: \text{iness}, \text{NUM}: \text{sg}\}) = \emptyset \)
      \(\mathcal{R}_{\text{IL},\text{CASE:iness},N}((\{\text{CASE}: \text{iness}, \text{NUM}: \text{sg}\}) = \text{ssa} \)
      \((\mathcal{R}_{1} \circ \mathcal{R}_{\text{II}}((\{\text{CASE}: \text{iness}, \text{NUM}: \text{sg}\}) = \text{ssa}) \)
   iii. \(\text{talo} < \text{ssa} \)
   b. \(P F((\text{talo}, \{\text{CASE}: \text{iness}, \text{NUM}: \text{pl}\}, N))) = \)
   i. \(\mathcal{I}((\text{talo}, \{\text{CASE}: \text{iness}, \text{NUM}: \text{pl}\}, N)) = \text{talo} \)
   ii. \(\mathcal{R}_{1,\text{NUM:pl}},N((\{\text{CASE}: \text{iness}, \text{NUM}: \text{pl}\}) = i \)
      \(\mathcal{R}_{\text{IL},\text{CASE:iness},N}((\{\text{CASE}: \text{iness}, \text{NUM}: \text{pl}\}) = \text{ssa} \)
      \((\mathcal{R}_{1} \circ \mathcal{R}_{\text{II}}((\{\text{CASE}: \text{iness}, \text{NUM}: \text{pl}\}) = \text{issa}) \)
   iii. \(\text{talo} < \text{issa} \)

The stem selection \(\mathcal{I}\) takes a pair of a lexeme index, a set of morphosyntactic properties and a morpholexical category and returns the stem form *talo* in both cases. According to the set
of morphosyntactic properties, \( R \)s yield proper exponents. Unlike Stump’s (2001) PFM, \( R \) does not involve an affixation to a stem, so that a composite function of \( R \) such as \( R_1 \circ R_2 \) returns a cluster of affixes. Finally, the stem and the cluster of affixes are combined together, which gives us talossa ((3.22a-iii)) and taloissa ((3.22b-iii)) respectively.

Following this modification, we may allow \( S \) to specify multiple stems, so that each stem undergoes regular morphological operations, namely an exponent specification via \( R \) and a linearisation of a stem and an exponent. More specifically, I assume that \( S \) yields not only a set of stems, but also a pair of stem, morpholexical category and a set of equations for morphological projections. (3.23) is a sample of \( S \) application to specify the future/perfect/progressive stems of the lexeme attend:

\[
\begin{align*}
\sigma &= \{ (↑ \text{PRED}) = \text{‘ATTEND(SUBJ,OBJ)’}, \\
(↑ \text{TENSE}) = \text{FUT}, \\
(↑ \text{ASPECT PERFECT}) = +, \\
(↑ \text{ASPECT PROGRESSIVE}) = + \}
\end{align*}
\]

\[
\mathcal{S}((\text{ATTEND, } V, \sigma)) =
\]

i. \textit{will} \quad V \quad (↑_μ \text{AUX}) = + \quad (↑_μ \text{FIN}) = + \quad (↑_μ \text{DEP VFORM}) = \text{c BASE}

ii. \textit{have} \quad V \quad (↑_μ \text{DEP AUX}) = + \quad (↑_μ \text{DEP FIN}) = - \quad (↑_μ \text{DEP VFORM}) = \text{BASE} \quad (↑_μ \text{DEP DEP VFORM}) = \text{c PASTPART}

iii. \textit{be} \quad V \quad (↑_μ \text{DEP DEP AUX}) = + \quad (↑_μ \text{DEP DEP FIN}) = - \quad (↑_μ \text{DEP DEP VFORM}) = \text{PASTPART} \quad (↑_μ \text{DEP DEP DEP VFORM}) = \text{c PRESPART}

iv. \textit{attend} \quad V \quad (↑_μ \text{DEP DEP DEP FIN}) = - \quad (↑_μ \text{DEP DEP DEP VFORM}) = \text{PRESPART}

The \( S \) selects four stems \textit{will}, \textit{have}, \textit{be} and \textit{attend}, each of which is paired with a category and a set of equations. The equations provide necessary properties to undergo affixations or form changes. They also place a formal constraint on its morphological dependent (dep). After each stem receives an affixation process via application of \( R \) and linearisation. There are at least two issues to be considered in \( R \) application. The first question is what an input object of \( R \) is. The second question is how to handle the embedding of \( \text{dep} \) — as far as the \( R \) application is concerned, the depth of \( \text{dep} \) embedding is irrelevant. I assume that an input of \( R \) is a union of \( \sigma \) and a set of equations for morphological projection (named \( \tau \) here) and \( R \) does not check the \( \text{dep} \) embedding, e.g. \( (↑_μ \text{DEP* FIN}) = - \). Hence, for the pair (3.23-iv), the following operation is postulated:
(3.24) \( \sigma = \{ (\uparrow \text{PRED}) = \text{‘ATTEND(SBJ,OBJ)’}, \\
\text{TENSE} = \text{FUT}, \\
(\uparrow \text{ASPECT PERFECT}) = +, \\
(\uparrow \text{ASPECT PROGRESSIVE}) = + \} \)

\( \tau = \{ (\uparrow \mu \text{DEP DEP DEP FIN}) = - \\
(\uparrow \mu \text{DEP DEP VFORM}) = \text{PRESPART} \} \)

\( R_{L(\uparrow \mu \text{DEP VFORM}) = \text{PRESPART}\nu}(\sigma \cup \tau) = \text{ing} \)

\( \text{attend} \prec \text{ing} \)

The outputs form a fully inflected expression *will have been attending*. Notice that the f-description \( \sigma \) is not paired with each word of the expression, rather it is paired with the construction as a whole as illustrated in paradigmatic lexical entries (3.8). So, the lexical entry would be (3.25):

(3.25) \( \text{will have been attending} \quad V \quad (\uparrow \text{PRED}) = \text{‘ATTEND(SBJ,OBJ)’} \)
\( (\uparrow \text{TENSE}) = \text{FUT} \)
\( (\uparrow \text{ASPECT PERFECT}) = + \)
\( (\uparrow \text{ASPECT PROGRESSIVE}) = + \)

This proposal shares the ideas found in Sadler and Spencer’s (2001) analysis on Latin deponent verbs and Spencer’s (2001) analysis on Slavic auxiliary-participle periphrasis based on Ackerman and Weibelhuth’s (1998) insight on ‘constructions’. We can explicitly describe a relation between a set of syntactic properties (f-description) and a constructional exponent, while maintaining the morphological/inflectional regularities of each component of the construction.

### 3.4.2 Well-formedness in c-structure

Once we correctly pair an analytic inflectional form and f-description, the next question is how the constructional expression has correspondences to c-structure. To consider the correspondences, let us start with the discussion of the well-formedness conditions in c-structure we have observed in the previous chapter in more detail. (3.26) is a sample c-structure:

(3.26)

```
<table>
<thead>
<tr>
<th>IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VP</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

| John will V NP |
| like N |

| Mary |
```

(3.27) a. IP \( \rightarrow \) NP I
b. \( \bar{I} \rightarrow I \ VP \)

c. \( VP \rightarrow V \ NP \)

As summarised in Chapter 2, a tree is described by precedence (\( \prec \)) and dominance (\( M \)) relations of sets of nodes (\( N \)) and labels (\( L \)), and the correspondence between nodes and labels is obtained by function \( \lambda \). What types of precedence and dominance relations are considered to be well-formed is language-dependent. English generally follows the \( \bar{X} \)-schemata and is considered to be a head-initial language. Therefore, according to the simplified PS rules in (3.27), an I precedes a VP complement and is dominated by an \( \bar{I} \), a VP dominates a V and an NP and the head V precedes a complement NP as in (3.26).

However, one of the crucial aspects in the well-formedness of c-structure is that the conditions enforced by PS rules are only applicable to the containment relations above \( X^0 \) level, i.e. beyond pre-terminal nodes. Therefore, the dominance relation between a pre-terminal node and a terminal node such as N/John and I/will requires a separate principle.\(^{19}\) This instantiation relation is essentially regulated by category matching. For instance, will is labelled as I in the lexicon, so that it can only be dominated by an I node in c-structure.

One of the implications of the well-formedness based on category matching is that it in effect works as a positional property of each word in the configurational syntax. That is, the category label of a pre-terminal node functions as equality to a category of a word form, so that terminal nodes, i.e. words, also follows the \( \bar{X} \)-schemata of pre-terminal nodes. We have observed that a finite verb in Welsh has a category I whereas a non-finite verb is a V as in (2.88) of Chapter 2. This lexical category change explicitly states which c-structural position each type of verb is generated at. An even clearer case is the position of an English auxiliary. In a declarative sentence, it is placed in an I position as shown in (3.26). But if a sentence is in the interrogative mood, an auxiliary is base-generated in C as in (3.28):

\(^{19}\)If the theory makes no distinction between \( X^0 \) and a word form, namely a word form is one of the properties associated with the \( X^0 \), e.g. phonological feature, this point would be an issue in the lexicon. In LFG, however, Bresnan (2001:91) clearly distinguishes a terminal node from a pre-terminal node. Further, this separation has an advantage for capturing a mismatch between morphological unit and syntactic unit which we will discuss later in the chapter.
To capture the position of \textit{will} in (3.28), it is assumed that the category of \textit{will} is C when it has ($\uparrow$ mood) = q. Thus, I and C may not be lexical properties of \textit{will}, rather they can be regarded as a feature of positional properties. The following data of VP ellipsis ((3.29)), tag questions ((3.30)) and negation ((3.31)) also suggest that I is not inherently associated with a certain type of words, rather it is a property given to a word occupying a certain syntactic position.\footnote{Note that finiteness is not an inherent lexical property constituting a natural class of words.}

\begin{itemize}
\item (3.29)
\begin{enumerate}
\item a. John [\textit{I} \textit{will}] [\textit{VP have been attending the lecture}], but Sue \textit{won’t}.
\item b. John [\textit{I} \textit{has}] [\textit{VP been attending the lecture}], but Sue \textit{hasn’t}.
\item c. John [\textit{I} \textit{is}] [\textit{VP attending the lecture}], but Sue \textit{isn’t}.
\end{enumerate}
\item (3.30)
\begin{enumerate}
\item a. John [\textit{I} \textit{will}] [\textit{VP have been attending the lecture}], \textit{won’t} he?
\item b. John [\textit{I} \textit{has}] [\textit{VP been attending the lecture}], \textit{hasn’t} he?
\item c. John [\textit{I} \textit{is}] [\textit{VP attending the lecture}], \textit{isn’t} he?
\end{enumerate}
\item (3.31)
\begin{enumerate}
\item a. John [\textit{I} \textit{will not}] [\textit{VP have been attending the lecture}].
\item b. John [\textit{I} \textit{has not}] [\textit{VP been attending the lecture}].
\item c. John [\textit{I} \textit{is not}] [\textit{VP attending the lecture}].
\end{enumerate}
\end{itemize}

Interestingly, Hudson (1999) investigates so-called complementisers in English and reaches the conclusion that unlike undoubtedly clear Word Categories such as nouns and verbs, they do not constitute a Word Category, rather they are a Position Category. In other words, there are words which occupy a particular configurational position C, but there is no valid commonality to justify the syntactic property C.\footnote{The words occupying I is more homogeneous than C in that only \textit{have} and \textit{be} can appear both in I and V, and the other so-called tense/modal auxiliaries only appear in I.}

Under the current proposal where periphrastic \textit{will like} is a fully inflected expression of lexeme \textit{like}. We can state a correspondence between an periphrastic expression and c-structural positions by assigning a category label to each word. Let us look at how correspondences are captured with the following set of data on the inflections of lexeme \textit{like}:
(3.32)  a. John **likes** Mary.
   b. **Do** you **like** Mary?
   c. John **will like** Mary.
   d. **Will** John **like** Mary?
   e. I **like** Mary.

Firstly, let us review a possible analysis under the standard LFG mechanism. According to the discussion in section 3.1, the analysis would be described as follows. In (3.32a), *like* and -s are concatenated in the lexicon by rules of morphology. Since -s has f-description \((\uparrow \text{tense}) = \text{pres}, (\uparrow \text{subj pers}) = 3, (\uparrow \text{subj num}) = s\), *likes* also carries those features and occupies a V node in c-structure. In (3.32b), on the other hand, suffix -s is attached to a fronted auxiliary that occupies a C position. Therefore, it is *does* that carries the tense feature and the constraints on subject’s number/person values. In (3.32c), the lexicon has lexical entry *will* whose category is I and it contains \((\uparrow \text{tense}) = \text{fut}\). For (3.32d), the lexicon has a different lexical entry *will* whose category is C and contains \((\uparrow \text{mood}) = q\) (or \((\uparrow \text{type}) = q\)) as well as \((\uparrow \text{tense}) = \text{fut}\), since *will* in the interrogative sentence is placed in a C position. *Like* in (3.32b, c, d) is different from *like* in (3.32e). The former does not have a tense value; otherwise the sentence would violate the Uniqueness Condition, that is the tense value would clash with that of *will*. The latter, on the other hand, should contain \((\uparrow \text{tense}) = \text{pres}\), because otherwise the sentence would lack the tense information. I have already pointed out the difficulties of this approach in section 3.2.

We assume that *will* and -s are both grammatical morphemes and neither of them are stored in the lexicon as stand-alone lexical entries. The information such as tense and mood are associated with a fully inflected expression of lexeme *like*. The lexeme constitutes the paradigm according to the valued features, that is \(\mathcal{PE}((\text{like}, V, \sigma))\) yields a well-formed expression of *like* such as *likes*, *does like* and *will like*. To label category indices for each word, there are two options. The first one is to specify category features as one of the outputs of the stem selection function \(\mathcal{S}\) as illustrated in (3.33) – (3.35).

In (3.33a), only the lexical stem is selected and this stem is labelled as V. It may be decomposed into features as \([+V, F0]\) according to Grimshaw’s (1991, 2000) or LFG’s concept of extended projection. The \(\mathcal{R}\) in (3.33a-ii) gives us an exponent, which in turn attaches to the right of the stem. As a result, the complete well-formed expression is *likes* whose category label is V. In (3.33b), on the other hand, the two stems *do* and *like* are selected and given category C \([+V, F2]\) and V \([+V, F0]\) respectively. Each undergoes an affixation process via \(\mathcal{R}\) and alignment. The first stem *do* receives a suffix to its right.\(^{22}\) The affix is evaluated by

\(^{22}\) Since *do* is the only finite auxiliary that receives a regular s suffixation according the number and person of the subject, we need to exclude the suffixation to other finite auxiliaries. This may be attained by property
morphological metageneralisation, namely it undergoes $\phi^R$, so that it is specified as correct form $es$. The combination in turn becomes $does$. The second stem $like$ does not go through any affixation process. (3.33b-ii) illustrate that there is no rule applicable to this stem called Identity Function Default (IFD). Therefore, $\mathcal{P}\mathcal{F}$ yields the fully inflected expression with category labels as in $does_C\ like_V$.

(3.33) a. $\sigma = \{ (\uparrow \text{PRE}D) = '\text{LIKE}\langle\text{SUBJ,OBJ}\rangle'$, 
(\uparrow \text{TENSE}) = \text{PRES}, 
(\uparrow \text{MOOD}) = \text{DEC}, 
(\uparrow \text{ASPECT PERFECT}) = -, 
(\uparrow \text{ASPECT PROGRESSIVE}) = -, 
(\uparrow \text{SUBJ PERS}) = _c\ 3, 
(\uparrow \text{SUBJ NUM}) = _c\ SG \}

i. $\mathcal{F}(\langle \text{LIKE}, V, \sigma \rangle) =$

\begin{align*}
\text{like} &\quad V \ ( [+V, F0]) \\
(\uparrow \mu \text{ AUX}) &= - \\
(\uparrow \mu \text{ FIN}) &= + 
\end{align*}

ii. $\mathcal{R}_L((\uparrow \text{TENSE})=\text{PRES},(\uparrow \text{SUBJ PERS})=3,(\uparrow \text{SUBJ NUM})=SG;(\uparrow \mu \text{FIN})=+),[+V]) \ (\sigma \cup \tau) = s$

iii. $\text{like} < s_C$

b. $\sigma = \{ (\uparrow \text{PRE}D) = '\text{LIKE}\langle\text{SUBJ,OBJ}\rangle'$, 
(\uparrow \text{TENSE}) = \text{PRES}, 
(\uparrow \text{MOOD}) = Q, 
(\uparrow \text{ASPECT PERFECT}) = -, 
(\uparrow \text{ASPECT PROGRESSIVE}) = -, 
(\uparrow \text{SUBJ PERS}) = _c\ 3, 
(\uparrow \text{SUBJ NUM}) = _c\ SG \}

i. $\mathcal{F}(\langle \text{LIKE}, V, \sigma \rangle) =$

\begin{align*}
\text{do} &\quad C \ ( [+V, F2]) \\
(\uparrow \mu \text{ AUX}) &= + \\
(\uparrow \mu \text{ FIN}) &= + \\
(\uparrow \mu \text{ DEP VFORM}) &= _c\ \text{BASE} \\
\text{like} &\quad V \ ( [+V, F0]) \\
(\uparrow \mu \text{ DEP AUX}) &= - \\
(\uparrow \mu \text{ DEP FIN}) &= - \\
(\uparrow \mu \text{ DEP VFORM}) &= \text{BASE} 
\end{align*}

ii. $\mathcal{R}_L((\uparrow \text{TENSE})=\text{PRES},(\uparrow \text{SUBJ PERS})=3,(\uparrow \text{SUBJ NUM})=SG;(\uparrow \mu \text{FIN})=+),[+V]) \ (\sigma \cup \tau) = s$

Identity Function Default (IFD)

iii. $\text{do} < s_C$

\text{like}_V$

\text{co-occurrence restriction ((3.14)) between the constraining equations and tense/modal features.}

\text{Stump (2001:143) defines IFD as follows:}

(i) Where $n \neq [p, o]$. $\mathcal{R}_{n,i}((X, \sigma)) = \text{def} \ (X, \sigma)$

$[p, o]$ means portmanteau rule blocks, so (i) essentially states that there is a universal rule in every rule block of every category except for a portmanteau block that yields an output identical to an input. In $\mathcal{G}\mathcal{P}\mathcal{F}$, the IFD can simply be defined as a universal rule that gives us no exponent ($\emptyset$).
In (3.34), the only difference between the two inflected expressions is the labels. $S$ specifies a different label to the stem according to mood in $\sigma$, so that $\textit{will}$ in (3.34a) is given $I([+V, F1])$, while $\textit{will}$ in (3.34b) is given $C([+V, F2])$. Neither of the stems receive an affixation (IFD). So, the output expression is identical to the stems.

(3.34) a. $\sigma = \{ (\uparrow \text{PRED}) = \text{\textquoteleft LIKE(SUBJ,OBJ)\textquoteright},$
\begin{align*}
(\uparrow \text{TENSE}) &= \textit{fut}, \\
(\uparrow \text{MOOD}) &= \textit{dec}, \\
(\uparrow \text{ASPECT PERFECT}) &= -, \\
(\uparrow \text{ASPECT PROGRESSIVE}) &= - \\
\}
\]

i. $\mathcal{H}((\text{LIKE}, V, \sigma)) =$
\begin{align*}
\textit{will} & I([+V, F1]) \quad (\uparrow _{\mu} \text{AUX}) = + \\
& (\uparrow _{\mu} \text{FIN}) = + \\
& (\uparrow _{\mu} \text{DEP VFORM}) = \textit{c, BASE}
\end{align*}
\begin{align*}
\textit{like} & V([+V, F0]) \quad (\uparrow _{\mu} \text{DEP AUX}) = - \\
& (\uparrow _{\mu} \text{DEP FIN}) = - \\
& (\uparrow _{\mu} \text{DEP VFORM}) = \textit{BASE}
\end{align*}

ii. IFD

iii. $\textit{will}$

\begin{align*}
\textit{like} & V
\end{align*}

b. $\sigma = \{ (\uparrow \text{PRED}) = \text{\textquoteleft LIKE(SUBJ,OBJ)\textquoteright},$
\begin{align*}
(\uparrow \text{TENSE}) &= \textit{fut}, \\
(\uparrow \text{MOOD}) &= \textit{q}, \\
(\uparrow \text{ASPECT PERFECT}) &= -, \\
(\uparrow \text{ASPECT PROGRESSIVE}) &= - \\
\}
\]

i. $\mathcal{H}((\text{LIKE}, V, \sigma)) =$
\begin{align*}
\textit{will} & C([+V, F2]) \quad (\uparrow _{\mu} \text{AUX}) = + \\
& (\uparrow _{\mu} \text{FIN}) = + \\
& (\uparrow _{\mu} \text{DEP VFORM}) = \textit{c, BASE}
\end{align*}
\begin{align*}
\textit{like} & V([+V, F0]) \quad (\uparrow _{\mu} \text{DEP AUX}) = - \\
& (\uparrow _{\mu} \text{DEP FIN}) = - \\
& (\uparrow _{\mu} \text{DEP VFORM}) = \textit{BASE}
\end{align*}

ii. IFD

iii. $\textit{will}$

\begin{align*}
\textit{like} & V
\end{align*}

Finally, (3.35) shows that $S$ selects only one stem whose label is $V([+V, F0])$. The stem receives no affix, so the output is $\textit{like} V$.

(3.35) $\sigma = \{ (\uparrow \text{PRED}) = \text{\textquoteleft LIKE(SUBJ,OBJ)\textquoteright},$
\begin{align*}
(\uparrow \text{TENSE}) &= \textit{pres}, \\
(\uparrow \text{MOOD}) &= \textit{dec}, \\
(\uparrow \text{ASPECT PERFECT}) &= -, \\
(\uparrow \text{ASPECT PROGRESSIVE}) &= - \\
\}
\]
i. $\mathcal{L}((\text{like}, V, \sigma)) = $

$\begin{align*}
\text{like} & \quad V \quad ([+V, F0]) \\
(\uparrow_{\mu} \text{aux}) & = - \\
(\uparrow_{\mu} \text{FIN}) & = + 
\end{align*}$

ii. IFD

iii. $\text{like}_V$

Another way of labelling is to annotate each word with a category by running an algorithm onto an output string. We can postulate $\mathcal{L}$ as an annotator function taking a pair of the form and $\sigma$, and it returns the labelled form. I abbreviate this operation as in (3.36):

(3.36)  
\begin{align*}
a. \quad \text{likes} & \Rightarrow \text{likes}_V \\
b. \quad \text{does like} & \Rightarrow \text{does}_C \text{ like}_V \\
c. \quad \text{will like} & \Rightarrow \text{will}_I \text{ like}_V \\
d. \quad \text{will like} & \Rightarrow \text{will}_C \text{ like}_V \\
e. \quad \text{like} & \Rightarrow \text{like}_V 
\end{align*}

The difference between the two is where the labelling is incorporated. It is a part of the morphological component, i.e. $\mathcal{P}$, in the former, whereas it is an interface level between the morphology and c-structure in the latter. The choice must be made based on empirical and theoretical plausibility. Or it could be the case that both are necessary. I leave this choice open.

Let us look at the consequence of this paradigmatic periphrastic analysis in the parallel levels of representations of LFG. The following shows how interrogative $\text{does like}$ is treated:
The boxes in the c-structure indicate the string of the verbal projection — what Sells (2001) calls 'spine'. Due to the c-structure to f-structure correspondence (Bresnan 2001:102, (2.84) in Chapter 2), the boxed nodes are all f-structure co-heads. Hence, unlike the standard LFG as-
sumption, (↑ tense) = pres, (↑ mood) = q, (↑ subj pers) = 3 and (↑ subj num) = sg are not located under does, rather the f-description under the V node is associated with the periphrastic expression as a whole. By this way, we can capture the intuition that the present 3rd singular is realised by the construction does + base form of the verb. Does itself is associated with equations of formal/morphological descriptions, so is like. Those equations place mutual formal constraints upon the words within the periphrastic expression, which are represented in the morphological structure.

The three structures in (3.37) clarify the role of the morphological component (or PF) we have been discussing so far. Firstly, it properly pairs an expression with a set of functional equations, i.e. the correspondence between a word string and an f-description. Secondly, words and c-structural positions are specified by labelling, i.e. the correspondence between a word string and c-structure. Those two ties a lexical item (including a multi-word expression), c-structure and f-structure together. And finally, form-related constraints within a lexical item are described, i.e. the correspondence between f-structure and m-structure.

### 3.5 Morphology/c-structure mismatch

So far, we have looked at either clear synthetic or periphrastic expressions, namely the morphology selects a single X₀ word or multiple X₀ words, each of which corresponds to a terminal node in the c-structure. However, there are some cases where a morphologically complete word unit does not seem to correspond to a single terminal node in the c-structure or more than one morphologically complete unit seem to correspond to a single terminal node. In other words, a mismatch between a morphological word and a syntactic word is found in those cases. They are clearly challenging to the Lexical Integrity ((2.18) in Chapter 2), which states that morphologically complete words are leaves of the c-structure tree and each leaf corresponds to one and only one c-structure node. In this section, we shall look at the former type of mismatch found in European Portuguese and consider theoretical implications of them.

Luís (2004) extensively illustrates how pronominal clitics in European Portuguese are constructed in pfm. It is well-known that European Portuguese, like other Romance language, has two types of pronominal clitics depending on its linear precedence with respect to the host. In each example of (3.38), a clitic is placed post-verbally (enclitic) and pre-verbally.

---

24This suggests that auxiliaries that appear to take the VP as a f-structural complement, i.e. xcomp, or to introduce a pred cannot be a part of verb’s fully inflected form. They must be syntactically combined with the complement VP headed by V. A further investigation is required to determine which auxiliaries are treated as a part of inflected expression.
(proclitic):

   the Pedro found -3.pl.acc.m, because 3.pl.acc.m searched
   ‘Pedro found them, because he searched for them.’

   b. As professoras deram -lhes lápis, mas *não lhes deram papel.
   the teachers gave -3.pl.dat pencils; but not 3.pl.dat gave paper
   ‘The teachers gave them pencils, but they didn’t give them paper.’

In European Portuguese, the unmarked position for pronominal clitics is post-verbal. To position a clitic pre-verbally as in the second clauses in (3.38), certain syntactic environments are required. In (3.38a, b), for instance, subordinate complementiser *porque* and negative marker *não* make the clitics placed before the host verb respectively. (3.39) is the list of proclitic contexts/triggers (see Luís and Otoguro (2004) for how to relate those triggers to the positional properties of clitics in LFG):

(3.39) **List of contexts/triggers:**
   a. embedded clauses introduced by complementisers, subordinate conjunctions and relative pronouns
   b. fronted focused phrases (not topicaised)
   c. preverbal wh-phrases
   d. operator-like preverbal adverbs/negation
   e. downward entailment quantifiers and quantified subjects

Luís (2004) shows that enclitics display a significant number of affix properties such as i) rigid ordering, ii) idiosyncratic co-occurrence restrictions, iii) fusion ((3.40)), iv) syncretism ((3.41)), v) and cluster-internal allomorphy ((3.42)):

(3.40) **Fusion:**

<table>
<thead>
<tr>
<th></th>
<th>3.sg.masc.acc</th>
<th>3.sg.fem.acc</th>
<th>3.pl.masc.acc</th>
<th>3.pl.fem.acc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.sg.dat</td>
<td>mo (= me + o)</td>
<td>ma (= me + a)</td>
<td>mos (= me + os)</td>
<td>mas (= me + as)</td>
</tr>
<tr>
<td>2.sg.dat</td>
<td>to (= te + o)</td>
<td>ta (= te + a)</td>
<td>tos (= te + os)</td>
<td>tas (= te + as)</td>
</tr>
</tbody>
</table>

O João deu -mo/*me o
the João gave -1.sg.dat&3.sg.masc.acc
‘João gave it to me.’

(3.41) **Syncretism:**

<table>
<thead>
<tr>
<th></th>
<th>3.sg.masc.acc</th>
<th>3.sg.fem.acc</th>
<th>3.pl.masc.acc</th>
<th>3.pl.fem.acc</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.sg.dat</td>
<td>lho</td>
<td>lha</td>
<td>lhos</td>
<td>lhas</td>
</tr>
<tr>
<td>3.pl.dat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Os professores deram -lhos.
the teachers gave -3.sg/pl.dat&3.pl.fem.acc
i) ‘the teachers gave them to him/her.’
ii) ‘the teachers gave them to them.’

(3.42) Cluster-internal allomorphy:

<table>
<thead>
<tr>
<th></th>
<th>3.sg.masc.acc</th>
<th>3.sg.fem.acc</th>
<th>3.pl.masc.acc</th>
<th>3.pl.fem.acc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.pl.dat</td>
<td>nos + o → no-lo</td>
<td>nos + a → no-la</td>
<td>nos + os → no-los</td>
<td>nos + os → no-las</td>
</tr>
<tr>
<td>2.pl.dat</td>
<td>vos + o → vo-lo</td>
<td>vos + a → vo-la</td>
<td>vos + os → vo-los</td>
<td>vos + as → vo-las</td>
</tr>
</tbody>
</table>

A Maria compra-no-lo/*compra-nos-o.

the Maria buy-1.pl.dat-3.sg.masc.acc

‘Maria buys it for us.’

Proclitics show exactly the same range of cluster-internal allomorphy and rigid ordering. So, Luís proposes to construct both enclitics and proclitics as the same affix unit by the realisation rule (R) of gpfm and to capture the difference in relative order to the verbal host in terms of the linearisation of the affix cluster.

However, the difference between enclitics and proclitics is not just right/left linearisation to the host. In the configurational syntax (c-structure in LFG), enclitics must be adjacent to the host, namely they do not allow any elements to intervene. Proclitics, on the other hand, show some degree of separability from the host. For instance, they can take scope over a co-ordinated phrase as in (3.43) and adverbial words can intervene between a host and a proclitic as in (3.44):

(3.43) a. Apenas a minha mãe me [ajudou e incentivou].
   only the my mother 1.sg.acc helped and encouraged
   ‘Only my mother helped me and encouraged me.’

   b. Acho que lhes [tinham lido uma história e tinham dado um livro].
   think.1.sg that 3.pl.dat had read a story and had given a book
   ‘I think that they had read them a story and given them a book.’

(3.44) Eu sei que ele o ainda não visitou.
   I know that he 3.sg.m.acc yet not visited
   ‘I know that he still has not visited him.’

Me is the object of the two verbs, ajudou and incentivou, in (3.43) and lhes is an indirect object of the two auxiliary + verb combinations, tinham lido and tinham dado, in (3.43b). They do not need to appear with each conjunct, rather they occur only once preceding the whole co-ordinated phrases. This behaviour is uncommon for a true affix. In (3.44), the two adverbial words ainda and não intervene between the clitic o and the host visitou. Again, this type of separation from the host is not found in a true affix.

In the morphological literature, formatives showing a morphological affix status and syntactic independence at the same time are often called ‘phrasal affixes’ (Klavans 1985, Zwicky 1987, Anderson 1992 and many others). Based on those previous studies and the observations
above, Luís concludes that proclitics in European Portuguese are phrasal affixes (syntactically visible affixes) whereas enclitics are not. Hence, although both types of clitics are constructed as a cluster of affixes in the same way as mentioned above, enclitics attach to a verbal stem and proclitics attach to a phrasal position in the syntax in Luís (2004).

However, it is not a straightforward task to incorporate such an analysis of phrasal affixes into LFG. Due to the Lexical Integrity, a c-structure terminal must be a morphologically complete word. Since proclitics in European Portuguese are morphologically affixes, they must attach to the host to be a ‘complete’ inflected unit. But if they occupy a single c-structure terminal with a host, we would lose their phrasal properties in the configurational syntax. To solve the conflict between the theoretical principle and empirical dual properties, Luís and Sadler (2003) assume that proclitics attach to a verbal phrasal node as stated in the placement of the morphological component of pfm, but do not appear in the c-structure. One clear disadvantage is that the assumption that syntactically visible elements do not appear in the c-structure level strongly deviates from the standard LFG formalism (see section 2.1 in Chapter 2). Luís and Otoguro (2004, 2005a) take a different approach. We re-consider the motivation behind the Lexical Integrity and conclude that a morphologically complete unit does not necessarily correspond to a syntactically single unit (c-structure terminal) and name the former ‘morphological token’ and the latter ‘syntactic atom’ (cf. Wescoat 2002).

As a motivation of Lexical Integrity, Bresnan (2001:93) states that “while the relative order of words in sentences is extremely free [. . . ], the relative order of stems and inflections in words (such as the case and tense markers) is fixed.” Reflecting this empirical motivation, the prime role of Lexical Integrity is to stop an element such as a pure affix that does not follow configurational syntactic principles from appearing as a c-structure terminal, which is often found in the derivational theories.25 As shown in the behaviours of phrasal affixes, there are some cases where a morphologically incomplete element still behaves like a syntactically independent unit. Therefore, a solution is to postulate two different types of integrities as definitions of morphological tokens and syntactic atoms:

\[(3.45)\]  

a. **Morphological Integrity:** Morphological tokens are well-formed stem-affix units processed in the Paradigm Function.

b. **Lexical Integrity:** Syntactic atoms are leaves of the c-structure tree and each leaf corresponds to one and only one c-structure node following c-structural constraints.

---

25 This LFG-style lexicalism can be maintained since functional information is separated from c-structure. That is, a minimal element in c-structure may correspond to several functions in f-structure; conversely, a single function may correspond to several c-structure elements (see Bresnan 2001:93, 122n7).
In the majority of cases, a single morphological token corresponds to a single syntactic atom. But European Portuguese proclitics are a clear case of mismatch between them. Let us look at how a mismatch is captured comparing proclitics and enclitics. (3.46) is a minimal pair where the position of adverb *raramente* affects the clitic placement. In (3.46a), the adverb is in the preverbal position, so that the clitic is placed before the verb as a proclitic. In (3.46b), the adverb is in the postverbal position, so the clitic is in the default position (enclitic):

(3.46) a. O João raramente me vê.
   the João rarely 1.SG.DAT sees
   ‘João rarely sees me.’

   b. O João vê-me raramente.
   the João 1.SG.DAT-sees rarely

The \( \mathcal{PF} \) constructs the two realisation patterns as follows:

(3.47) a. \( \mathcal{PF}(⟨\text{VER}, V, σ⟩) = \text{def} \)
   i. \( \mathcal{I}(⟨\text{VER}, V, σ⟩) = ⟨\text{vê}, I, τ⟩ \)
   ii. \( \mathcal{R}... (σ ∪ τ) = \text{me} \)
   iii. \( \text{me} ≺ \text{vê} \)

b. \( \mathcal{PF}(⟨\text{VER}, V, σ’⟩) = \text{def} \)
   i. \( \mathcal{I}(⟨\text{VER}, V, σ’⟩) = ⟨\text{vê}, I, τ’⟩ \)
   ii. \( \mathcal{R}... (σ’ ∪ τ’) = \text{me} \)
   iii. \( \text{vê} ≺ \text{me} \)

In both cases, the same stem \( \text{vê} \) is selected by \( \mathcal{I} \).\(^{26}\) \( \mathcal{R} \) yields the same exponent \( \text{me} \). Finally, the linearisation is made differently between the two cases. The exponent precedes the stem in (3.47a-ii), whereas the order is opposite in (3.47b-iii) (see Luís and Otoguro (2004) for the detailed mechanism of those linearisations). Through those three processes, the well-formed stem-affix combinations are defined. According to (3.45a), each one of them is a morphological token — let us represent a morphological token as \[ \ldots \]. If we suppose European Portuguese has a labelling algorithm as in (3.48) where H is a verb stem and \( x \) and \( y \) are affixes, the two morphological tokens receive labels as in (3.49):

(3.48) \[ x-H-y \] \( \xrightarrow{\mathcal{L}} x_{C_1} \) H-\( y \)\(_{I_1} \)

(3.49) a. \[ \text{me-vê} \] \( \xrightarrow{\mathcal{L}} \text{me } C_1 \text{ vê } I_1 \)

b. \[ \text{vê-me} \] \( \xrightarrow{\mathcal{L}} \text{vê-me } I_1 \)

In (3.49a), a single morphological token corresponds to two syntactic atoms, \( \text{me}_{C_1} \) and \( \text{vê}_{I_1} \). In (3.49b), on the other hand, no mismatch is found. According to (3.45b), syntactic atoms are

\(^{26}\)In Luís and Otoguro (2004), we claim that European Portuguese finite verbs are placed in an I position.
c-structure terminals and follow the c-structural principles. We can postulate the following PS rule for European Portuguese where Cl and non-projective Adv are adjoined to I (cf. Toivonen 2003):

\[(3.50) \quad I \rightarrow Cl \quad Adv^* \quad I \quad \uparrow = \downarrow \quad \downarrow \in (\uparrow \text{ADJ}) \quad \uparrow = \downarrow\]

Accordingly, (3.46a, b) are represented as in (3.51a, b) respectively. Further, since the PS rule allows the intervention of non-projective adverbs, we can correctly describe the c-structure of (3.44) (repeated as (3.52a)) as in (3.52b) where two non-projective adverbs ainda and não are adjoined to the I alongside the clitic:

\[(3.51) \quad \text{a.} \quad \mathcal{P} (\langle \text{VER}, V, \sigma \rangle)\]
\n- stem: vê
- exponence: me
- placement: vê \textless me

\[\text{IP} \quad \text{DP} \quad \text{o João} \quad \text{I} \quad \text{AdvP} \quad \text{raramente} \quad \text{vê-me}\]

\[\mathcal{P} (\langle \text{VER}, V, \sigma \rangle)\]
\n- stem: vê
- exponence: me
- placement: me \textless vê

\[\text{IP} \quad \text{DP} \quad \text{o João} \quad \text{AdvP} \quad \text{raramente} \quad \text{Cl} \quad \text{I} \quad \text{me} \quad \text{vê}\]

\[(3.52) \quad \text{a.} \quad \text{Eu sei que ele o ainda não visitou.}\]
\n'I know that he still has not visited him.'
CHAPTER 3. THEORETICAL EXTENSION: ISSUES IN LFG MORPHOSYNTAX

3.6 Interim summary

Let us summarise the architectural modifications of LFG we made so far. As stated in the Lexical Integrity, standard LFG assumes a strong separation between word-internal structure and word-external structure. A word-internal structure is a domain of the morphology, while a word-external structure is a domain of the c-structure, and an output of the morphological component is equal to an input to the c-structure, namely a morphologically complete word is a leaf of c-structure. Each morphologically complete word is paired with the f-description and undergoes a mapping function to construct the corresponding f-structure. Let us call those theoretical assumptions ‘Word-based Lexicalism’.

Contrary to the Word-based Lexicalism, what we have proposed can be called ‘Lexeme-based Lexicalism’ a la Beard’s (1995) LMBM. In this approach, a morphologically complete word is not necessarily a unit paired with the f-description. As discussed in section 3.4, Paradigm Function can pair multiple morphologically complete words and a f-description, which gives a more natural account to the problems pointed out in section 3.1. Further, we have observed that a morphologically complete word is not necessarily equal to a c-structure terminal as in section 3.5. We have postulated two distinct word-hoods — morphological token and syntactic atom. Their roles are different and sensitive to different types of constraints. The former is purely morphological and sensitive to the regular morphological principles, whereas the latter is the purely configurational syntax and sensitive to the regular c-structural principles. The proposal solves the puzzles of the dual properties of European Portuguese
proclitics. Crucially, the modifications towards Lexeme-based Lexicalism still maintain the core formal aspects of the theory summarised in Chapter 2. Principles of c-structure and f-structure is unchanged; c-structure and f-structure correspondence is strongly maintained by adopting the extended projection; and the projection architecture is nicely incorporated into the morphological component of PFM.

To conclude this chapter, let us look at simple English prepositional markings on oblique arguments and consider what kind of proposal can be made in terms of the tripartite relation between grammatical relations, morphology and phrase structure.

### 3.7 Grammatical Function encoding and periphrasis

As mentioned in Chapter 1, languages vary in how to encode dependency relations (or GFs) in a clause and simply equating case to GF is a not plausible grammatical description. In this section, our focus turns to adpositions. In general, adpositions indicate dependency relations between marked nominals and the governing predicate such as grammatical relations and various types of adjunct relations. I shall summarise the Classic LFG analysis found in Kaplan and Bresnan (1982) and another analysis found in Bresnan (1982a) and Dalrymple (2001) focusing on the lexical entry of English preposition to and how its f-description is mapped onto f-structure. I then consider how the architecture we have discussed so far gives an insight to the current analysis. The argument gives a favour to a realisational approach to adpositions.

#### 3.7.1 P in LFG

**3.7.1.1 OBJ embedded f-structure**

Kaplan and Bresnan (1982) propose a lexical entry for the grammatical use of the preposition to found in (3.53) as (3.54a). (3.54b) is a lexical entry for the governing verb handed (Kaplan and Bresnan 1982:197):

(3.53) A girl handed a toy to the baby.

(3.54)  

a. to P (↑ pcase) = to  
b. handed V (↑ tense) = past  

(↑ pred) = ‘hand((↑ subj),(↑ obj),(↑ to obj))’
To has pcase (prepositional case)\textsuperscript{27} and the verb handed subcategorises for the obj of the preposition as indicated by ($\uparrow$ PRED) = ‘HAND(... ($\uparrow$ OBJ))’, so that the existence of the obj of to does not cause a violation of the Coherence condition, even though to itself lacks a PRED, i.e. it does not state that it takes an obj. A simplified version of the English PS rules is shown in (3.55) and the resultant c-structure for (3.53) would be (3.56) accompanied with the corresponding f-structure (Kaplan and Bresnan 1982:197):

\[
\text{(3.55) a. } \text{VP } \rightarrow \text{ V NP NP PP*} \quad \uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow \quad (\uparrow \text{OBJ2}) = \downarrow \quad (\uparrow (\downarrow \text{PCASE})) = \downarrow \\
\text{b. } \text{PP } \rightarrow \text{ P NP} \quad \uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow \\
\text{(3.56) a.} \]

\[
\begin{array}{c}
\text{S} \\
\text{NP} \quad \text{VP} \\
\text{a girl} \quad \uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow \\
\text{V NP PP} \\
\text{handed} \quad \text{a toy} \quad \uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow \\
\text{P NP} \\
\text{to} \quad \text{the baby}
\end{array}
\]

One of the crucial points is that the pcase value of the preposition is identified with the grammatical function of the prepositional phrase as a whole. I emphasise this point by connecting the two by the line in the f-structure. This is attained by the functional identification

\textsuperscript{27}For adjunct use such as locative in found in in the garden, a preposition is thought to have a PRED value, e.g. ($\uparrow$ PRED) = ‘IN(($\uparrow$ OBJ))’.
Although this analysis reflects the traditional view that a preposition takes an object, the preposition is ‘transparent’ in that it does not have a pred and the whole prepositional phrase including the object noun phrase is subcategorised for by the verb handed. The only function of the preposition is indicating the external dependency relation, i.e. grammatical function to of the whole prepositional phrase.

### 3.7.1.2 Flat f-structure

Some other works in LFG reflect the transparent property of prepositions more straightforwardly. I summarise Dalrymple’s (2001) treatment, which is originally proposed in Bresnan (1982a). She assumes the following lexical entries for a grammatical use of the preposition to and the verb handed (cf. Dalrymple 2001:152):

\[(3.57)\]

a. \( to \) P \( (\uparrow \text{pcase}) = \text{obl} \)

b. \( handed \) V \( (\uparrow \text{tense}) = \text{past} \)
\( (\uparrow \text{pred}) = \langle \text{hand}(\langle \uparrow \text{subj},(\uparrow \text{obj},(\uparrow \text{obl} \text{goal}))\rangle) \rangle \)

For oblique grammatical function and pcase value, Dalrymple uses \( \text{obl}_\theta \) (recall that \( \theta \) is a variable for the thematic property of oblique function). Hence, to has the pcase value \( \text{obl} \text{goal} \) as in \( \text{(3.57a)} \). (3.57b) shows that handed simply subcategorises for \( (\uparrow \text{obl} \text{goal}) \), not \( (\uparrow \text{obl} \text{goal} \text{obj}) \) \((\uparrow \text{to obj}) \) in Kaplan and Bresnan’s notation). The upshot of this change can be seen in the following c-structure and f-structure (the irrelevant part is omitted) (cf. Dalrymple 2001:151–3):

\[(3.58)\]

a. \( (\uparrow (\downarrow \text{pcase})) = \downarrow \)

\( \text{PP} \)
\( \uparrow = \downarrow \)
\( \uparrow = \downarrow \)
\( \text{P} \)
\( \downarrow \)
\( \text{DP} \)
\( \uparrow = \downarrow \)
\( \uparrow = \downarrow \)
\( \text{D} \)
\( \text{NP} \)
\( \downarrow \)
\( \text{the} \)
\( \overbrace{\text{baby}} \)

b. \( \begin{array}{c}
\text{PRED} \\
\text{OBL} \text{goal} \\
\text{SPEC} \\
\text{NUM} \\
\text{PRED} \\
\end{array} '\text{HAND}(\langle \text{subj},(\text{obj},(\text{obl} \text{goal}))\rangle)' \)

\( \text{...} \)

Unlike Kaplan and Bresnan (1982), the DP, complement of the P, is annotated as an f-structure co-head, i.e. \( \uparrow = \downarrow \). The DP is also introduced as a functional projection developed in LFG. As a result of the changes, the f-structure of \( \text{obl} \text{goal} \) becomes flat, which has an embedded obj in Kaplan and Bresnan (1982). That is, all the f-descriptions associated with the P, D and NP are mapped onto the same level of f-structure. Although Dalrymple (2001) still regards P as a lexical category, the c-structure and f-structure indicate that P can be treated as a part
of nominal functional projection. Treating a preposition as a part of extended projection of a noun is also found in Grimshaw (1991, 2000, 2003).\textsuperscript{28} One of the clear advantages of this change is the mapping from (argument)-structure to grammatical functions. It is easy to capture the mapping of a goal argument onto \( \text{obl}_{\text{goal}} \) under the Lexical Mapping Theory (LMT) (Levin 1986, Bresnan and Kanerva 1989), while it is unclear how to map a goal argument to complex (\( \text{obl}_{\text{goal}} \) \( \text{obl}_{\text{obj}} \)) function. Further, cross-linguistically, it is hard to justify the \( \text{obj} \) embedded in the \( \text{obl} \) f-structure. In principle, unmotivated cross-linguistic variations of f-structure must be minimum. But, many languages mark an \( \text{obl} \) function of noun phrase by affixes or clitics, in which case it is impossible to argue the existence of an \( \text{obj} \) within an \( \text{obl} \). In sum, although the Classic LFG analysis found in Kaplan and Bresnan (1982) reflects the traditional observation that a preposition takes an object noun phrase, bringing this fact into f-structure is not desirable conceptually and empirically. Thus, the f-structure co-head approach found in Bresnan (1982a) and Dalrymple (2001) must be favoured. The next step is re-casting this flat f-structure approach under the current realisation model of morphology by treating prepositions as free grammatical morphemes.

3.7.2 Proposal

The proposal rejecting lexical category (or lexeme) status of adpositions is not uncommon. In addition to Grimshaw, Baker (2003), for example, claims that adpositions do not belong to a lexical category. Beard (1995), arguing against Jackendoff (1977) extensively, claims that adpositions are not lexemes, rather they are free grammatical morphemes according to the criteria in section 3.3.1. I summarise some points very briefly. Firstly, adpositions belong to tightly closed classes, which constitute paradigmatic organisation. This point becomes clearer in comparison with clear-cut examples of lexemes such as nouns, verbs and adjectives. Secondly, adpositions normally do not take part in derivational morphology. It is quite unlikely to create a derived lexeme from an adposition productively. Thirdly, adpositions often contract and cliticise. A cliticisation of \textit{a le} into \textit{au} in French is one instance. Finally, adpositions are dependency markers to a governing predicate. It is reflected in LFG’s functional identification (\( \uparrow (\downarrow \text{PCASE}) = \downarrow \) as well. Considering those fact, there are a number of reasons to assume that adpositions do not belong to lexemes.

\textsuperscript{28}Bresnan (2001:123n20) argues against treating P as a functional category referring to Bresnan (1995). However, the argument in Bresnan (1995) is that the different distributions between locative expressions in English and Chichewa indicate that English has a PP projection whereas Chichewa locative markers are clitics, i.e. the locative expression is an NP. It is unclear to me whether it would be a counter argument to the assumption that P is a functional projection, since a distinction between PP and NP is made in c-structure or lexical category status.
Grimshaw (2003:43) summarises the distributional properties of so-called English prepositions as follows:

(3.59)  

a. Only verbal (C):  
that, while, although

b. Only nominal (P):  
during, despite, locatives, directionals

c. Both verbal and nominal (P and C):  
after, before, since, until, for, to, from, than, as

We have observed that functional categories such as I and C are positional classes and there is no inherent common properties among the words occupying those positions. Considering that fact, the distributional overlap between C and P is not surprising. It suggests that so-called prepositions are simply a type of words occupying an extended head (or possibly the highest extended head) of both verbal and nominal projections.\(^\text{29}\)

Grimshaw explicitly formulates a nominal extended projection including prepositions as follows, which is parallel to the verbal projection:

(3.60)  
a. \(N \ [\text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde}] \ F0\)
b. \(D \ [\text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde}] \ F1\)
c. \(P \ [\text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde} \text{\textasciitilde}] \ F2\)

(3.61)  
\[ PP \\
|   \overline{P} \\
|   P \ DP \\
| \overline{D} \\
D \ NP \]

The question is how to integrate the functional extended projection and flat f-structure into the current modified architecture of \(\text{LFG}\) proposed above. One option is to simply transfer Dalrymple’s approach. A set of equations is paired with an analytic expression. Thus, the \(\mathcal{PP}\) places to the \textit{baby} in the paradigm space as follows:\(^\text{30}\)

(3.62)  
\[ \sigma = \{ \begin{align*} \uparrow \text{pred} &= \text{‘baby’}, \\
\uparrow \text{spec} &= \text{the}, \\
\uparrow \text{num} &= \text{sg}, \\
\uparrow \text{pcase} &= \text{obl}\_\text{goal} \} \]

\(^{29}\)This type of distributional overlap is widely observed in languages. In Japanese, for instance, formatives such as \textit{kara} ‘since, from’, \textit{made} ‘until’, \textit{yori} ‘than’, \textit{nara} ‘if, as for’, \textit{sika} ‘only’, \textit{dake} ‘only’ and \textit{hodo} ‘as, about, the more’ are all used both as nominal and clausal particles (see Chapter 6 for details).

\(^{30}\)I omit the morphological equations for each stem. They may include a formal restriction for pronouns as found in \textit{to him}.  

i. $\mathcal{S}(\langle \text{baby}, N, \sigma \rangle) =$

\[ \begin{array}{ll}
  & \text{to} \\
\text{the} & \text{D} \text{([+N, F1])} \\
\text{baby} & \text{N} \text{([+N, F0])}
\end{array} \]

ii. IFD

iii. $\text{to}_P$

\[ \begin{array}{ll}
\text{the}_D \\
\text{baby}_N
\end{array} \]

We retain the normal LFG PS rules of VP as in (3.63a). Since P and D are extended heads of a noun projection, they are f-structure co-heads according to the c-structure and f-structure correspondence. Thus, the PS rules for them would be (3.63b, c):

(3.63) a. $\text{VP} \rightarrow \text{V} \{ \{ \text{NP} \} \} \{ \{ \text{NP} \} \} \text{PP}$

\[ \left. \begin{array}{l}
\uparrow = \downarrow \\
(\uparrow \text{OBJ}) = \downarrow \\
(\uparrow \text{OBJ2}) = \downarrow \\
(\uparrow (\downarrow \text{PCASE})) = \downarrow
\end{array} \right\} \]

b. $\text{PP} \rightarrow \text{P} \text{DP}$

\[ \begin{array}{ll}
\uparrow = \downarrow & \uparrow = \downarrow
\end{array} \]

c. $\text{DP} \rightarrow \text{D} \text{NP}$

\[ \begin{array}{ll}
\uparrow = \downarrow & \uparrow = \downarrow
\end{array} \]

Another option is to incorporate Nordlinger’s (1998) Constructive Morphology. Based on the fact that some affixes are used as a signal of grammatical function (gf), Nordlinger proposes that gf is constructed from the affix itself. To this end, she assumes that an inside-out designator is associated with the affix. First of all, let us look at how an inside-out designator works in comparison with an outside-in. Consider the following example:

(3.64)

The f-structures corresponding to the VP, DP, D and NP are $f_1$, $f_2$, $f_3$ and $f_4$ respectively as indicated in the functional identifications in the c-structure. To refer to the f-structure of the DP from the VP, we use the outside-in designator as shown in $(f_1 \text{ OBJ})$, namely ‘$f_1$’s OBJ’. Since the f-structure of the DP is $f_2$, to state that OBJ of the VP’s f-structure is the DP’s f-structure, we use $(f_1 \text{ OBJ}) = f_2$ $(\uparrow \text{ OBJ}) = \downarrow$ in arrow notation. The one that plays the opposite role is the inside-out designator. That is, if we want to refer to the VP’s f-structure
from the DP, we use a notation \((\text{obj } f_2) ((\text{obj } \uparrow)\text{ in arrow notation})\). In other words, \((\text{obj } f_2)\) states that \(f_2\) is the value of \(\text{obj}\) of the outer f-structure \((f_1\) in this case).

Nordlinger’s innovation is that an inside-out designator is paired with a \(gf\) bearing a \(ff\) and it is allowed to define the outside f-structure (Nordlinger 1998:96):

\[(3.65)\]
galalarrinyi-ni gini-ng-a
dawu bugayini-ni
3.SG.MASC.AC-1.O-NFUT bite big.1-ERG
‘The big dog bit me.’

\[(3.66)\]
a. \(ni (\uparrow \text{case}) = \text{ERG} ((\text{subj } \uparrow) \text{obj})\)
b. \[
\begin{array}{c}
\text{N} \\
(\downarrow \text{Pred}) = \text{DOG} \\
(\uparrow \text{case}) = \text{ERG} \\
(\text{subj } \uparrow) \text{obj}
\end{array}
\]

\[(3.65)\] is a sentence of Wambaya. Nordlinger treats the affix \(ni\) as an ergative case marker and it is attached to a subject noun of a transitive verb. Thus, \((3.66a)\) is the proposed lexical entry of \(ni\). It is paired with \((\uparrow \text{case}) = \text{ERG}\). Crucially it also defines the \(gfs\) of the outer f-structure. \((\text{subj } \uparrow) \text{obj})\) defines two f-structures: Firstly, the f-structure of N with \(ni\) is a value of \text{subj} as suggested by \((\text{subj } \uparrow)\), i.e. it constructs \text{subj} in the outer f-structure; secondly, the outer f-structure also takes \text{obj} as one of its values. The \(c\)-structure and the f-structure in \((3.66b)\) illustrate those points.

Adopting Nordlinger’s insight to the current morphological model is relatively straightforward. The replacement of the f-description as in \((3.67)\) establishes an association of the constructive inside-out designator and a PP oblique argument. Since the \(gf\) of PP is directly defined by the PP itself (or marking on the argument), \((\uparrow (\downarrow \text{pcase})) = \downarrow\) is no longer necessary. Instead, we can simply annotate underspecified \(gf\) to a PP argument under VP as in \((3.68)\):

\[(3.67)\]
\[
\sigma = \{ \ (\uparrow \text{Pred}) = \text{'baby'}, \\
(\uparrow \text{spec}) = \text{the}, \\
(\uparrow \text{num}) = \text{sg}, \\
(\text{oobl}_\text{goal} \uparrow) \ \} 
\]

\[(3.68)\]
\[
\text{VP} \rightarrow \text{V} \{ \text{NP} \} \{ \text{NP} \} \text{PP} \\
\uparrow = \downarrow \ (\uparrow \text{obj}) = \downarrow \ (\uparrow \text{obj}2) = \downarrow \ (\uparrow \text{gf}) = \downarrow
\]
Although this option works well for the given example and the association between a dependency marker and a $gf$ plays a crucial role in the grammar in many languages, there is a potential difficulty. In English, a number of verbs and predicative adjectives require a certain prepositional phrase as their obj. For instance, (3.69) shows that participate, talk and dependent take objects headed by in, to and on respectively:

(3.69)  
  a. The lecturer participated [pp in the discussion group].
  b. The students talked [pp to the lecturer].
  c. They were dependent [pp on him].

The obj status of the PPs is found in passivisation as shown in (3.70). A promotion of obl to subj is not possible whereas that of obj and ob2 is allowed as illustrated in the contrast between (3.71a, b) and (3.71c):

(3.70) The lecturer was talked to by the students.

(3.71)  
  a. *The baby was handed a toy to by a girl.
  b. *The baby was given a toy to by a girl.
  c. The baby was given a toy by a girl.

Therefore, it is undesirable to encode the $gf$ via inside-out designator in a PP projection. If we keep the association between pcase and a PP, we can easily state the formal requirement placed upon a PP argument by a verb as in (3.72) (cf. Butt et al. 1999:128–9):

(3.72)  
  a. participate V ($\uparrow$ pred) = ‘participate(subj, obj)’
      ($\uparrow$ tense) = pres
      ($\uparrow$ obj pcase) = c in

31 Bresnan (1982a:398–9), proposes lexical entries for rely as in (i):

(i)  
  a. [rely]V, ($\uparrow$ pred) = ‘RELY-ON((subj)(oblON))’
  b. [rely on]V, ($\uparrow$ pred) = ‘RELY-ON((subj)(obj))’

(ii)  
  a. NP Mary VP V relies PP on NP John
     b. NP Mary VP V relies on NP John

(i-a) states that rely takes onLON, namely the oblique argument whose pcase value is on. In (i-b), on is incorporated into rely following Bresnan’s (1982c: 50–72) V-P Incorporation, so that rely on takes ob1. In the former case, the V node is rely and its sister is a PP in the c-structure as shown in (ii-a). In the latter case, on the other hand, rely on occupies the V node and its sister is an NP as in (ii-b). The current proposal can capture the ob status of PP on John, while maintaining the c-structure like (ii-a).
According to the lexical entry of (3.72b), the c-structure and f-structure for (3.69b) are represented as follows:

(3.73)

![Diagram of c-structure and f-structure for (3.72b)]

We can extend this approach to obl as well. obl is also a grammatical function governed by a predicate. For instance, verbs such as hand, give, sell and donate all require a PP oblique argument headed by to, whereas deprive takes a PP headed by of. So, the pcase can be specified as follows:

(3.74)  

a. handed V \((↑ \text{PRED}) = \text{‘HAND(SUBJ,OBJ,OBL)’}\)  
\((↑ \text{TENSE}) = \text{PAST}\)  
\((↑ \text{OBL PCASE}) =_c\text{ TO}\)

b. deprived V \((↑ \text{PRED}) = \text{‘DEPRIVE(SUBJ,OBJ,OBL)’}\)  
\((↑ \text{TENSE}) = \text{PAST}\)  
\((↑ \text{OBL PCASE}) =_c\text{ OF}\)

This line of proposal can remove the identification of pcase to gf \((↑ (↓ \text{PCASE})) = ↓\). Thus, the PS rule of VP can be stated as in (3.75). This is a kind of rule found in the xle grammar as well (cf. Butt et al. 1999:19):

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32 Locative obl. PPs tend to be diverse in terms of prepositional marking. For instance, verbs like place, put and leave can take various PPs such as on, onto, in, for and so on.

33 In this proposal, a function of pcase is no longer a gf specification, rather it becomes a formal manifestation of prepositional marking. So, it might be more plausible to state the constraint over morphological structure as in \((↑ \text{OBL})_µ \text{PCASE} = \text{of}\). I leave this issue open.
The combination of a modified lexical entry of verb, a periphrastic inflectional expression of PP and the PS rule yields the following c-structure and f-structure:

This kind of treatment of PP also provides a straightforward account to the Spanish indirect object shown in the Information Spreading analysis of Andrews and Manning (1999) (section 2.4.3 in Chapter 2).

A possible objection to this analysis is a removal of type specification of obl. It is a common practice in LFG to specify the type of obl as obl-goal, obl-loc and so on. However, I know no syntactic phenomenon that requires a reference to a type of obl — a functional uncertainty path sensitive to obl-goal and obl-loc distinction, for example. Thematic role or semantic role of obl argument can be referred to relevant feature in argument-structure and semantic-structure. Therefore, the proposal does not damage the explanatory power of the framework.
3.8 Summary

In this chapter, we have modified the morphology and syntax interfaces in LFG based on the concept of lexeme and realisation morphology. Firstly, we have rejected word-based lexicalism and introduced lexeme-based lexicalism. Following the insights found in Beard’s (1995) LMBM, the paradigmatic lexicon is postulated where fully inflected expressions are paired with functional descriptions regardless of their surface forms. Further, we have discussed a correspondence between morphological unit and syntactic unit by considering periphrastic inflection in English and European Portuguese proclisis. We have then looked at how grammatical relation encoding by prepositions in English can be captured under the current proposal. Those discussions have established the basis required in the following chapters. The paradigmatic lexicon will play a crucial role in the analysis of Icelandic in the next chapter. The periphrastic or encoding will further be developed in the analyses of Hindi-Urdu in Chapter 5 and Japanese in Chapter 6.
Chapter 4

Case and agreement in Icelandic

Icelandic is well-known for its complicated case marking patterns, in particular it allows a wide range of quirky case markings both on subjects and objects. One of the intriguing properties of such diverse case marking patterns is their relation to agreement. That is, the controller of agreement changes depending on which case is assigned to which argument NP. This complex interaction between case marking and agreement is challenging to any kind of grammatical theory. In LFG, Andrews (1982, 1990) provides a detailed analysis of the phenomena. However, his proposal has some disadvantages: It does not fit well to the theoretical assumptions of LFG; and it is not applicable to other languages as a general theory of case and agreement. This chapter is an attempt to pursue an alternative. I propose a case theory which combines the structural and lexical approaches to case assignment found in the LFG literature. Further, I introduce a new approach to agreement. The combination of the two proposals nicely captures the Icelandic data. Moreover, it can be a general approach to case and agreement cross-linguistically.

The chapter is organised as follows. In section 4.1, the basic set of data of case and agreement in Icelandic is introduced. Section 4.2 presents semantic properties of non-canonical case marking. In section 4.3, we shall summarise the mismatches between case marking and form discussed in Sigurðsson (2003). Section 4.4 is devoted to the overview of agreement in the language. I will summarise the previous LFG account of the phenomena based on the assumption of composite Grammatical Functions (GF) found in Andrews (1982, 1990) and point out the difficulties of the analysis in section 4.5. Section 4.6 is the analysis consisting of two points. In the first part, I start with the discussion of the concept of case. I propose two types of case assignment mechanism. The second part is the analysis of the agreement. Based on the off-path constraints (Dalrymple 1993), I introduce a path approach. I illustrate that the proposal neatly accounts for the data without resort to composite GFs. Further, I provide a
unified account for agreement inside an NP.

4.1 Overview of case markings

In this section, I will summarise the case marking patterns on subjects and objects in Icelandic. Yip et al. (1987:228ff) provide exhaustive lists as in (4.1):

(4.1)  
a. Intransitive
   Nom, Dat, Gen, Acc
b. Transitive
   Nom-Nom (Acc-Nom) (Gen-Nom) Dat-Nom
   Nom-Acc Acc-Acc
   Nom-Dat
   Nom-Gen (Acc-Gen)

(4.1a, b) are lists of possible case markings on a subject of an intransitive verb and on a subject-object pair of a transitive verb respectively. The patterns in parentheses suggest that they are uncommon. As in other languages with nominative-accusative case system, the nominative is the canonical marking on subjects. That is, nominative subjects are unrestricted with respect to thematic roles or the like; they can be agents, themes, goals, or experiencers. The other markings on subjects are non-canonical (i.e. lexical, quirky or oblique). As for objects, the accusative, as often assumed, is the canonical case. Therefore, the distributions where we find a dative/genitive/accusative subject and/or a nominative/dative/genitive object are the non-canonical patterns. I will discuss each one of them in the following subsections.

4.1.1 Subjects

It is well-known that a subject NP with a non-canonical case marking (oblique subject) in Icelandic, unlike in German, is a true subject of the clause, though it does not trigger an agreement with a finite verb (Zaenen et al. 1985) (see below for the discussion of agreement). Andrews (2001b:89) reports that there are thirteen pieces of evidence for the subjecthood of such an oblique case marked NP. Since the argument of the subject-status has been discussed extensively in the literature, I simply assume that they are true subjects.

(4.2) illustrates a dative case marking on subject. This pattern is extremely common in Icelandic. When the predicate is transitive, the object is always marked by the nominative.

(4.2) Dative subject
   a. Barninu batnaði veikin
      the.child.dat recovered from the.disease.nom
      ‘The child recovered from the disease.’
b. Mér kól nar
   me.DAT getting cold
   ‘I am getting cold.’

A rough generalisation of the properties of this type is that most of the dative subjects are an experiencer argument of a psychological predicate. However, as we will see below, not all the experiencer subjects are marked by the dative. Some are marked by the nominative like a subject of sjá ‘see’, and others are by the accusative like a subject of vantar ‘lack’. In addition, theme, goal and benefactive arguments are often marked by the dative as well (Sigurðsson 2003:231):

(4.3)  
a. Henni hlotnaðist mikill heiður.
   her.DAT got much honour.NOM
   ‘She acquired great honour./She was greatly honoured.’

b. Rigningunni slotaði.
   the.rain.DAT abated/ceased.
   ‘It stopped raining.’

Another non-canonical pattern is an accusative marking on subject. It, again, is often found in a subject of an intransitive verb as shown in (4.4a). In transitive verbs, as summarised in (4.1b), the pattern where both subject and object are marked by the accusative is found as in (4.4b), though it shows slightly restricted distributions. The genitive or nominative case on an object NP is extremely rare, in particular, the combination of an accusative subject and a nominative object is idiomatic and non-productive — Yip et al. (1987:231) report only two instances, sækja ‘seek’ and henda ‘happen to someone’.

(4.4)  
Accusative subject
a. Mig kelur
   me.ACC freezing
   ‘I am freezing/getting frostbitten.’

b. Dreginga vantar mat
   the.boys.ACC lacks food.ACC
   ‘The boys lacks food.’

c. Mig sækir syfja.
   me.ACC seeks sleepiness.NOM
   ‘I am sleepy.’

A genitive marking on subjects is extremely rare, but a restricted set of predicates such as gæta ‘noticed’ and geta ‘mentioned’ shows this pattern:

(4.5)  
Genitive subject
### 4.1. Overview of Case Markings

a. Verkjanna gætir ekki
   the.pains.gen noticeable not
   ‘The pains are not noticeable.’

b. Konungs var þangað von
   the.king.gen was thither expectation.nom
   ‘The king was expected there.’

#### 4.1.2 Objects

The canonical case on objects is the accusative. However, Icelandic, like many other lan-
guages, shows non-canonical case markings on objects as well. The one most widely found
is a dative object. A direct object marked by the dative can be a benefactive as in (4.6a) and
a theme as in (4.6b). Under those cases, a subject is always in the nominative (see (4.1))

(4.6) Dative object
   a. Þeir björguðu stúlkunni.
      they rescued the.girl.dat
      ‘They rescued the girl.’
   b. Hann kastaði steinum í ljósastaur.
      he threw rock.dat at lightpost
      ‘He threw a rock at the lightpost.’

A genitive marking on objects is also observed as shown in (4.7) (Andrews 1982:467,

(4.7) Genitive object
   a. Stúlkan beiðmín
      the.girl.nom awaited me.gen
      ‘The girl waited for me.’
   b. Ég vænti skipsins.
      I expected the.ship.gen
      ‘I expected the ship.’
   c. Mig iðrar þess.
      me.acc repents this.gen
      ‘I repent this.’

Genitive objects occur with nominative subjects, but Yip et al. (1987:230) report one example
of the combination of an accusative subject and a genitive object — in Old Icelandic minna
‘remember’ also shows this pattern.

It is well-known that the non-canonical case on objects is preserved under passivisation
Chapter 4. Case and Agreement in Icelandic

(4.8) a. Stúlkunni var bjargað.
   the.girl.dat was rescued
   ‘The girl was rescued.’

   b. Skipsins var vænt.
   the.ship.gen was expected
   ‘The ship was expected.’

This case preservation shows a clear contrast to the canonical accusative case object. An accusative marked object changes its case to the nominative under passivisation as in (4.9):

(4.9) a. Höskuldur sannfærði hana.
   Höskuldur.nom convinced her.acc
   ‘Hoskuldur convinced her.’

   b. Hún var sannfærð af Höskuldi.
   she.nom was convinced by Höskuldur.dat
   ‘She was convinced by Hoskuldur.’

However, accusative objects illustrate one aspect of the rather complicated picture of the Icelandic case marking system. It is often claimed that there seems to be two different types of accusatives on object NPs. That is, although cross-linguistically the accusative is the default case for the objects, Icelandic appears to have a lexical accusative case on objects in addition to the default accusative. Zaenen and Maling (1984) show the following patterns involving transitive-unaccusative alternations:

(4.10) a. Stormurinn blés strompinn af húsinu
   the.storm.nom blew the.chimney.acc of the.house
   ‘The storm blew the chimney off the house.’

   b. Strompurinn blés af húsinu.
   the.chimney.acc blew off the.house
   ‘The chimney blew off the house.’

(4.11) a. Verkamennirnir breikkuðu veginn.
   the.workers.nom widened the.road.acc
   ‘The workers widened the road.’

   b. Vegurinn breikkaði.
   the.road.nom widened
   ‘The road widened.’

Although both types of accusatives show exactly the same behaviour under passivisation, i.e. both change to the nominative, the lexical accusative is preserved when the verb is used as an unaccusative verb as in (4.10), while the structural accusative becomes the nominative under the same situation as in (4.11).1

1 As discussed in Zaenen and Maling (1984), the dative is peculiar in this respect. Some are preserved when the verb is unaccusative like the lexical accusative case, but others change to the nominative. Note that both
Another deviation from the canonical object case marking is nominative objects. They are the default case when the subject is in the dative. We also find both subject and object are marked by the nominative. As we have seen in the previous subsection, however, the combination of an accusative subject and a nominative object is hardly found and they are basically idiomatic expressions.

### 4.2 Properties of oblique case marking

The linking between a certain case marking on an argument NP and the argument’s semantic properties is arbitrary in many cases. Therefore, it seems impossible to find a one-to-one correlation between a certain semantic property and a certain case marking. However, there are some interesting tendencies between them that is worth mentioning, so I summarise some of them found in the literature. Jónsson (1997–8:35–9) investigate 337 verbs taking taking accusative and dative subjects and show the distribution of them based on thematic roles as in (4.12) (quoted in Eythórsson 2002:198):

<table>
<thead>
<tr>
<th></th>
<th>Accusative</th>
<th>Dative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme</td>
<td>14</td>
<td>19</td>
<td>33</td>
</tr>
<tr>
<td>Goal</td>
<td>0</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Experiencer</td>
<td>37</td>
<td>227</td>
<td>264</td>
</tr>
<tr>
<td>Unclassified</td>
<td>7</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>279</strong></td>
<td><strong>337</strong></td>
</tr>
</tbody>
</table>

The table suggests that a dative subject on an experiencer argument is the most common association. One of the semantic differences between the predicates taking a dative experiencer subject and those taking an accusative subject is that the former are associated with psychological states as in (4.13a), whereas the latter are with physiological states (4.13b) (Andrews 1982:461–3).

(4.12)

me.dat is-nauseated at syntax  
‘I abhor syntax.’

b. Mig velgir við setningafraeði.  
me.acc is-nauseated at syntax  
‘Syntax turns my stomach.’

The predicates taking an accusative subject also tend to be associated with aimless, gradual motions, whereas the predicates taking a dative subject tend to be sharp, sudden motions.

types remain dative under passivisation.
The accusative case on an experiencer subject can be altered to the dative, which is frowned on by Icelandic language teachers. This phenomenon is called Dative Sickness (DS) (Smith 1994, 1996). Therefore, although a subject of langar is normally in the accusative as in (4.14a), it can also be in the dative as in (4.14b) (Smith 1996:22):

(4.14) a. Mig me.\text{acc} langar að fara.  
‘I long to go’

b. Mér me.\text{dat} langar að fara.  
Interestingly, when the subject undergoes the DS, sometimes the object changes its case as well. For instance, verbs of lacking bresta and þróta show the dative-nominative pattern when they change an accusative subject into a dative one by DS ((4.15a) vs. (4.16a) and (4.15b) vs. (4.16b)). Vantar, on the other hand, retains the accusative marking even when its subject changes to the dative as in (4.15c) and (4.16c) (Smith 1996:28–9):

(4.15) a. Mig me.\text{acc} brestur kjark.  
‘I lack courage.’

b. Mennina me.\text{acc} þrótur mat.  
‘The men lack food.’

c. Mig me.\text{acc} vantar hníf.  
‘I lack a knife.’

(4.16) a. Mér me.\text{dat} brestur kjarkur.  
‘The boat drifted to sea.’

b. Honum me.\text{dat} þróttur.  
‘The man lacked strength’

c. Mér me.\text{dat} vantar hníf.  
‘The man could be seen against the house.’

One point to note in the DS is that the alternation is strictly restricted to an accusative experiencer argument (Smith 1996:27–8):

‘The boat drifted to sea.’

b. Manninn/*Manninum bar við hæinn.  
‘The man could be seen against the house’
4.2. PROPERTIES OF OBLIQUE CASE MARKING

In (4.17), since the subjects are not an experiencer, the DS is not allowed. Therefore, although it is not the case that a certain case is directly associated with a thematic role, it is reasonable to assume that the account of the DS needs to refer to both case and a thematic property of an NP.²

Another interesting aspect of the semantics of case marking is that there are some cases where a non-canonical marking on subjects must not occur. Jónsson (2003) provides an extensive survey of such cases. Firstly, agentive subjects are never marked by the dative, accusative or genitive, i.e. they are always in the nominative. There are some caveats about this notion of agentivity. Agentive in this case is very broad and should not be taken as a thematic role agent or the like. (5.89) is examples where blæða is used in different meanings (Jónsson 2003:130):

(4.18) a. Mér blæði
  me.dat bled
  ‘I was bleeding.’

b. Mér blæðir þetta í augum
  me.dat bleeds this.nom in eyes
  ‘I am deeply troubled by this.’

c. Ég blæddi
  i.nom paid
  ‘I paid.’

An unaccusative use of blæða ‘bleed’ takes a dative subject as shown in (5.89a). Blæða also has a metaphorical meaning in which the subject is marked by the dative as in (5.89b). In both cases, the subjects are experiencers. If blæða means ‘pay’, however, its subject is agentive. According to the generalisation just mentioned, the subject cannot be marked by the oblique cases. Therefore, only the nominative is allowed as illustrated in (5.89c).

Secondly, Jónsson (2003:135) suggests the following two conditions which prohibit an oblique subject:

(4.19) a. Psych-verbs denoting strong positive feelings cannot have an oblique subject

b. Psych-verbs which canonically take animate objects cannot have an oblique subject

Since both refer to psych-verbs, the subjects are experiencer arguments. For (4.19a), Jónsson lists verbs of admirations, worship, love, necessity and desire. Although the ‘strong positive feeling’ is a rather vague notion, the point can be highlighted by the case marking

²Icelandic has another case alternation where an accusative subject changes to the nominative. This alternation is not constrained by thematic properties. See Smith (1994, 1996) for details.
contrast between verbs having a similar meaning but different strength of the feeling (Jónsson 2003:138-9):

(4.20) a. Krakkarnir vilja fara.
    the.kids.nom want go
    ‘The kids want to go.’

b. Krakkana langar að fara.
    the.kids.acc wants to go
    ‘The kids want to go.’

c. Ég þarf peninga.
    I.nom need money.acc
    ‘I need money (right now).’

d. Mig vantar peninga.
    me.acc needs money.acc
    ‘I need money.’

Since vilja denotes a stronger feeling than langa, it is not allowed to take an oblique subject as in (4.20a). Similarly, the necessity denoted by þarf is stronger than that by vanta, which makes the subject in the nominative in (4.20c). The strength difference, Jónsson argues, is confirmed by the fact that verbs like vilja and þarf cannot take intensifier prefix dauð and sár as they already denote the strong feelings. Such prefixations are possible for langa and vanta:

(4.21) a. Krakkana dauðlangar/sárlangar að fara.

b. Mig þarbóvantar/sárvantar peninga.

c. *Krakkarnir dauðvilja/sárvilja fara.

d. *Ég þarðþarf/sárvarf peninga.

(4.19b) is relatively straightforward. Some verbs canonically take an animate object by their semantic nature. Jónsson notes that the object of vorkenna ‘feel sorry for’ and samgledjast ‘be happy for’ must be animate, and therefore the subject must be marked by the nominative. Although verbs like lelskar ‘love’ and hatar ‘hate’ can also take an inanimate object, the canonical status of an animate object is confirmed by the fact that i) a missing object can only be understood as animate (4.22); and ii) they can only be passivised if the object is animate (4.23) (Jónsson 2003:140):

(4.22) Hann kann að elska en ekki að hata.
    he knows to love but not to hate
    ‘He knows how to love (people) but not how to hate (people).’

(4.23) a. María var hótuð af öllum.
    ‘Mary was hated by everyone.’
b. *Popppkkorn er hatað af öllum.
   ‘Popcorn is hated by everyone.’

The combination of a nominative subject and an animate object conversely suggests that psych-verbs with an oblique subject do not take an animate noun phrase as their canonical object. Jónsson claims that psych-verbs with an oblique subject typically denote feelings towards events or inanimate things. For example, sárna ‘hurt’ cannot take an inanimate object without a preposition. In addition, gruna ‘suspect’ takes a nominative subject when the object is animate as in (4.24a), while it takes an accusative subject when the object is a clause as in (4.24b). (Jónsson 2003:142):

(4.24) a. Deir gruna mig um að hafa stolið smjörinu.
   they.nom suspect me.acc of to have stolen th.butter
   ‘They suspect me of having the stolen butter.’

b. Þá grunar að ég hafi stolið smjörinu.
   them.acc suspects that I have stolen the.butter
   ‘They suspect that I have stolen the butter.’

We now turn to the properites of case on theme subjects. Although theme subjects in Icelandic are dominantly marked by the nominative, about 30 verbs take an accusative or dative theme subject. The distributions of dative subjects and accusative subjects are almost equal as shown in (4.12). Jónsson highlights motion verbs that take theme subjects. The constraint which does not allow motion verbs to take oblique subjects is as follows (Jónsson 2003:144):

(4.25) Strictly intransitive motion verbs cannot have an oblique theme subject.

Jónsson claims that ‘strictly intransitive’ means that motion verbs that are able to function as both intransitives and transitives without any morphological change can take accusative/dative theme subjects. If a verb requires -st suffix to behave as an intransitive, it always takes a nominative subject. Those points are highlighted in the following contrasts:

   the.surf.nom drove the.boat.acc to shore
   ‘The surf drove the boat to the shore.’

b. Bátinn rak á land.
   the.boat.acc drove to shore
   ‘The boat was driven to the shore.’

(4.27) a. Tillagan þokaði málinu áleiðis.
   the.proposal.nom moved the.case.dat forward
   ‘The proposal moved the case forward.’
b. Málinu þokaði áleiðis.
   the.case.dat moved forward
   ‘The case moved forward.’

   John.nom moved the.chair.acc
   ‘John moved the chair.’

In (4.26) and (4.27), the verbs can be either an intransitive or a transitive and take an accusative subject and a dative subject respectively. (4.28), however, suggests that the subject must be in the nominative for the verbs to which the suffix -st is added in the intransitive use. Jónsson argues that one of the motivations behind the impossibility for strict intransitive verbs to take oblique subjects comes from semantic properties of the verbs. That is, they tend to denote internally caused eventuality (Levin and Rappaport Hovav 1995). The subjects of such verbs show more agent-like properties in that they do not require an instigator to start the motions. As we have observed above, agentivity in a broad sense prohibits an oblique case marking on a subject. Therefore, an internal causation can be regarded as one of the keys which stop the accusative or dative marking on subjects. Conversely, change-of-state verbs take oblique theme subjects even if they are strictly intransitive (Jónsson 2003:145):

(4.29) a. Tillöguna dagaði uppi.
   the.proposal.acc died
   ‘The proposal got nowhere.’

b. *Nefndin dagaði uppi tillöguna.
   the.committee.nom died the.proposal.acc
   ‘The committee killed the proposal.’

c. Rómaveldi hnignaði.
   the.Roman.empire.dat declined
   ‘The Roman empire declined.’

d. *Keisarinn hnignaði Rómaveldi.
   the.emperor.nom declined the.Roman.empire.dat
   ‘The emperor caused the Roman empire to decline.’

As indicated by the ungrammaticality of (4.29b, d), change-of-state verbs like daga uppi ‘die’ and hnigna ‘decline’ lack transitive counterparts and they are, therefore, thought to denote an internally caused eventuality. Still, those verbs take accusative or dative subjects as in (4.29a, c). Although Jónsson indicates the possibility that they are classified as externally caused change-of-state verbs where the causer cannot be overtly expressed, no real explanation is
provided for the reason that those verbs fail to express the causer. So, the agentivity constraint Jónsson (2003) presents should be at best regarded as a general tendency of the relation between case marking and semantic properties of verbs and arguments.

For the properties of object case markings, Svenonius (2002) argues that event structures play a crucial role to license the dative and accusative cases. Following recent works in the derivational theory, he assumes that a transitive verb consists of two distinct parts regardless of its morphological realisation: one is a projection of \( v \) and the other is of \( V \) as schematised in (4.30):

(4.30) \[
\begin{array}{c}
\vdash P \\
\vdash v' \\
\vdash v \\
\vdash V' \\
\vdash V \\
\end{array}
\]

\( v \) and \( V \) are event variables and they introduce various kinds of subevents, so that the clause comprises two subevents. Svenonius claims that the case marking on objects is a reflex of the temporal relations of those two subevents. He defines the accusative and dative licensing contexts as follows:

(4.31) **Accusative/dative contexts**

a. Event variables introduced within a syntactic constituent \( \alpha \) may represent a complex event \( x \) consisting of two (or more) subevents \( y \) and \( z \) (and . . .)

b. If the event \( x \) consists of subevents \( y \) and \( z \), then \( y \) and \( z \) are related temporally.

c. If the temporal relation of \( y \) and \( z \) is one of total overlap, then accusative case is licensed in \( \alpha \).

d. If the temporal relation of \( y \) and \( z \) is not total overlap dative case is licensed in \( \alpha \).

e. Aspectual features of \( y \) and \( z \) may force or prevent total overlap.

The crucial point in the contexts is the status of overlap between the two subevents. If the event introduced by \( V \) temporally synchronises the event introduced by \( v \), the object of that transitive verb receives the accusative case as stated in (4.31c). If there is a temporal gap between the two subevents, the object of that transitive verb receives the dative case as in (4.31d). Svenonius claims the following contrasts of the case markings of movement verbs support his argument:

(4.32) a. *draga* acc ‘pull, drag, draw’

b. *flytja* acc ‘move, transport, carry’
c. *færa* acc ‘move, bring’

d. *hækka* acc ‘raise’

e. *lækka* acc ‘lower’

(4.33) a. *kasta* dat ‘throw, fling, hurl’

b. *þeyta* dat ‘fling, blow’

c. *henda* dat ‘throw away, discard’

d. *þrykkja* dat ‘kick or smash’

e. *dúndra* dat ‘kick or smash’

Both types of verbs have a causer subevent expressed by the \( v \) projection and the caused subevent expressed by the \( V \) projection. The difference between those two is that in (4.32) the causation must be accompanying throughout the whole event, whereas in (4.33) once the causer initiates the event, the following action follows by itself. That is, the cause subevent and the caused subevent in (4.32) are temporally indistinguishable, while those in (4.33) are inconsistent.

Further examples Svenonius shows are an accusative/dative alternation of the same verb taken from Maling (2001):

(4.34) a. *skjóta fuglinn* ‘shoot the bird’ (acc)

b. *skjóta kúlunni* ‘shoot the bullet’ (dat)

c. *skutla hvalinn* ‘harpoon the whale’ (acc)

d. *skutla skutlinum* ‘throw the harpoon’ (dat)

Those are cases where the verb has different event structures depending on the object. In the accusative examples in (4.34a, c), the agent’s participation is cotemporaneous with the patient’s undergoing the effect, namely the two subevents exhibit a total overlap. This is not true for the dative examples. Once a bullet or harpoon is released in the causer subevent, it goes on without the continuation of the causer.

Svenonius also shows the dative taking verbs like *hjálpa* ‘help’, *trúa* ‘trust, have faith in’ and *þakka* ‘thank’ and an accusative/dative alternation of beneficiary taking verbs like *þvo* ‘wash’ and *ðurrka* ‘dry’. As Svenonius admits, however, the aspectual explanation for the former is rather weak. In the latter, I do not see any plausibility to account for the following contrasts in terms of the temporal relationship between the two subevents, although I acknowledge a semantic difference between them such as thematic roles and a possibility that it might affect the case marking difference in some part of the grammar.

(4.35) a. Kristín þurrðið handklæðið.

Kristin dried the.towel.acc

‘Kristin dried the towel.’
4.3 Case mismatches

Although semantic properties in relation with case markings in section 4.2 are interesting and there may be some tendencies or diachronic motivations behind them, the diverse range of marking patterns in Modern Icelandic seems to reject the analysis built upon the semantic bases. Andrews (1982:464), for instance, states that “while there is a good deal of systematicity to case selection, there is no invariant meaning that one can assign each case which will then provide an explanation of its distribution.” Typical examples of the complexity can be found in Sigurðsson (2003). Sigurðsson argues for the importance of the distinction between morphological case and abstract case (or deep case). In his derivational theory, abstract case is either structural or inherent (semantic). The examples of inherent cases he shows include experiencer case, recipient case, possessor case, partitive case, instrument case and various types of locatives (cf. Fillmore 1968). On the other hand, morphological case is a realisation of abstract case, e.g. nominative, accusative, dative forms of NPs and so on. This division gives us the following schematic picture (Sigurðsson 2003:230):

\[
\begin{align*}
\text{Deep case 1} & \rightarrow \text{Exponents 0, 1, 2, 3, \ldots} \\
\text{Deep case 2} & \rightarrow \text{Exponents 0, 1, 2, \ldots} \\
\vdots & \\
\text{Deep case n} & \rightarrow \text{Exponents n, \ldots} \\
\vdots & 
\end{align*}
\]

The right arrows are read as ‘is reflected by’ or ‘is realised as’. Thus, (4.36) suggests that one deep case can correspond to more than one exponents (morphological case) and vice versa. For instance, deep case 2 can be realised as exponent 0, 1 or others. Conversely, the same exponent appears more than once; exponent 1 is a realisation of Deep case 2 as well as 1, for example.

As an illustration of the former, he presents examples where the morphological dative case is used to realise various deep cases such as possessors ((6.15a)), prepositional ob-
jects ((6.15b)), objects of adjunctives ((6.15c)), instrumentals ((6.15c)) and other adverbials ((6.15d)) in addition to the uses we have already observed (Sigurðsson 2003:232–3):

\[
\text{(4.37) a. Hún gekk við hlíð þér.} \\
\text{She walked at side.} \quad \text{acc me.} \quad \text{dat} \\
\text{‘She walked at my side.’} \\
\text{b. Hún stóð hjá honum.} \\
\text{She stood by him.} \quad \text{dat} \\
\text{‘She stood by him.’} \\
\text{c. Hann er líkur henni.} \\
\text{He is similar her.} \quad \text{dat} \\
\text{‘He resembles her.’} \\
\text{d. Ég skildi þetta mínum eigin skilningi.} \\
\text{I understood this my own understanding.} \quad \text{dat} \\
\text{‘I understood this in my own way.’} \\
\text{e. Hún söng lagið fjórun sinnum.} \\
\text{She sang the song four times.} \quad \text{dat} \\
\text{‘She sang the song four times.’}
\]

The examples in (6.15) all include morphological dative marked NPs. But in terms of their functions in the clause, we hardly find common properties amongst them.

We have already looked at the cases where a single deep case receives more than one realisation. For instance, an experiencer subject is realised by a morphological nominative, accusative or dative case. Further, Sigurðsson shows various markings on inalienable possession construction (4.38a), pronominal partitive construction (4.38b), genitive/prepositional objects (4.38c) and arbitrary lexical cases (4.38d, e) (Sigurðsson 2003:238–42):

\[
\text{(4.38) a. Hún horfði í augu hans.} \\
\text{She looked in eyes his.} \quad \text{gen} \\
\text{Hún horfði í augu honum.} \\
\text{She looked in eyes him.} \quad \text{dat} \\
\text{‘She looked in(to) his eyes.’} \\
\text{b. Sumir mennirnir fóru.} \\
\text{Some men left} \quad \text{some.nom the.men.nom left} \\
\text{Sumir mannanna fóru.} \\
\text{Some men left} \quad \text{some.nom the.men.gen left} \\
\text{‘Some of the men left.’} \\
\text{c. Hún beið hans.} \\
\text{She waited him.} \quad \text{gen}
\]
4.4 Agreement

In Icelandic, the form of a predicate is sensitive to the case, person, number and gender features of one of its arguments. In particular, selection of the agreement controller is often regulated by the case markings on the arguments in a clause. Therefore, a proper treatment of case marking system in Icelandic should capture its relation to agreement as well. This

Hún betið eftir honum.
She waited for him.
‘She waited for him.’

d. Við fengum mikið fé.
we.nom got much money.acc
Við söfnuðum miklu fé.
we.nom collected much money.dat
Við öfluðum mikils fjár.
we.nom obtained much money.gen
‘We got/collected/obtained much money.’

e. Við fórum í land.
we.nom went in land.acc
Við fórum að landi.
we.nom went toward land.dat
Við fórum til lands.
we.nom went to land.gen
‘We went ashore.’

Two or three sentences in (4.38a-c) are more or less free variations of the same semantic content (or deep case). So, a possessor NP can be realised either as the genitive or the dative as shown in (4.38a). Similarly, a partitive NP can be expressed by the nominative, the genitive or the preposition af + dative. (4.38d, c) suggest that verbs regulate its argument’s case regardless of its semantic properties. Thus, the object of earning is expressed by the accusative, the dative and the genitive depending on the predicate. Likewise, it is quite common that a preposition selects an NP in a certain morphological case as its object.

The semantic properties we have observed in section 4.2 may contribute to the process of constituting a class of predicates in terms of argument case marking patterns. However, as often found in a morphological inflectional class, such contributions are at best tendencies and in many cases classifications are arbitrary. Sigurðsson’s (2003) argument strongly illustrates this point.

4.4 Agreement
fact also confirms the necessity of case feature in Icelandic syntax (cf. Spencer and Otoguro 2005). In this section, I summarise the various agreement patterns mainly based on Sigurðsson (1996).

Sigurðsson categorises the Icelandic agreement into the following six patterns:

- subject-verb agreement
- predicate-verb agreement
- object-verb agreement
- agreement with subjects of certain infinitives
- non-agreement

The subject-verb agreement is observed when a subject is in the nominative. When the predicate is a finite verb, it agrees with a nominative subject in person and number as shown in (4.39). When the predicate is either an adjective or a past participle, it agrees with a nominative subject in number, gender and case as in (4.40):

        we.nom read.1.pl the.book.acc
        ‘We read the book.’

    b. Þið hófðuð leisið bókina.
        you.nom.pl had.2.pl read the.book
        ‘You had read the book.’

(4.40)  a. Stelpurnar voru duglegar.
        the.girls.nom were efficient.nom.f.pl
        ‘The girls were efficient.’

    b. Strákarnir voru kosnir.
        the.boys.nom were elected.nom.m.pl
        ‘The boys were elected.’

In (4.39), the finite verbs change their forms according to the person and number of the nominative subject, while in (4.40) the predicative adjective and past participle inflect for case, gender and number according to those values of the subjects.

When a subject is not in the nominative, however, the agreement pattern is different. Both finite verbs and predicative adjectives/past participles are in the default forms, i.e. there is no agreement between the subject and the predicate:
4.4. AGREEMENT

(4.41) Strákunum leiddist.
   the.boys.DAT.PL bored.DFT
   ‘The boys were bored.’

(4.42) a. Strákunum var illt.
   the.boys.DAT.WAS.DFT bad.DFT
   ‘The boys were bad.’

   b. Gluggunum var lokað.
   the.windows.DAT.M.PL.WAS.DFT closed.DFT
   ‘The windows were closed.’

In (4.41), the verb appears as default forms due to the lexical dative marking on the subject. The default form of a finite verb is identical to the third person singular form. Similarly, because of the dative subject, the predicative adjectives in (4.42a) and the past participle in (4.42b) do not participate in agreement, rather they are in the default form, which is identical to the neuter, singular and nominative/accusative form.³

The data we have looked at so far appear to suggest that a finite verb and a predicative adjective/participle must agree with a nominative subject. However, careful observations reveal that it is not the case. For example, in raising-to-object (ECM) constructions where a subject in an embedded clause is in the accusative, the predicate adjective/participle in an embedded clause takes the accusative form due to the agreement with the accusative subject. This point becomes clearer in contrast with passive counterparts (Andrews 1982:445):

(4.43) a. Þeir segja hana (vera) vinsæla.
    they.NOM say her.ACC to be popular.SG.F.ACC
    ‘They say she is popular.’

   b. Hún er sögð (vera) vinsæl.
    she.NOM is said to be popular.SG.F.NOM
    ‘She is said to be popular.’

   c. Þeir telja hana (vera) sagða (vera) vinsæla.
    they.NOM believe her.ACC to be said.SG.F.ACC to be popular.SG.F.ACC
    ‘They believe her to be said to be popular.’

   d. Hún er talin (vera) sögð (vera) vinsæl.
    she.NOM is believed to be said.SG.F.NOM to be popular.SG.F.NOM
    ‘She is believed to be said to be popular.’

³(4.42b) is a passive example where the lexical dative marking on the theme argument is retained. As Sigurðsson (1996:9) notes, if the predicate is used for non-passive, namely describing the state of the window, the subject is in a nominative and accordingly the predicate agrees with its nominative subject:

(i) Gluggarnir voru lokaðir.
   the.windows.NOM.M.PL.WERE.3.PL closed.NOM.M.PL
   ‘The window were closed.’
In (4.43a), the subject of *vinsælur* is the accusative pronoun *hana* since it is raised to (or placed in) the object position (or similar sorts depending on the framework). This accusative pronoun is the controller of the agreement. *Vinsælur*, therefore, takes the accusative form. In (4.43b), on the other hand, *hún* is in the subject position of the matrix clause due to the passivisation, that is the case of the agreement controller changes to the nominative. As a result, *vinsælur* is in the nominative form. (4.43c, d) are the further illustrations of this point where the predicate in each embedded clause agrees with the accusative ((4.43c)) and the nominative ((4.43d)).

Similarly, a predicate can agree with a non-nominative subject in secondary predication constructions. For example, (4.44) suggests that the secondary predicate in each sentence is in the accusative as a result of the agreement with the accusative matrix object which also functions as the subject of the secondary predicate (Andrews 1982:449–50):

(4.44) a. Ég vil hann dauðan.
    I.nom want him.acc dead.sg.m.acc
    ‘I want him to be dead.’

b. Við kusum Höskuld skipstjóra.
    we.nom chose Höskuldur.acc captain.sg.m.acc
    ‘We chose Höskuld as a captain.’

However, there is a further complication in this construction. That is, a secondary predicate can also agree with a dative NP:

(4.45) Strákunum verður kalt svona fáklæddum.
    the.boys.dat will be cold.dat so few clothed.dat.pl
    ‘The boys will freeze, so scantily dressed.’

In (4.45), the secondary predicate agrees with the dative matrix subject which also serves as the subject of the secondary predicate, so that it ends up with the dative plural form *fáklæddum*. This phenomenon might be related to the agreement pattern found in equi sentences (Andrews 1982:451):

(4.46) a. Hún lofaði honum að vera góð.
    she.nom promised him.dat to be good.nom

b. Hún bað hann að vera góðan/góður.
    she.nom requested him.acc to be good.acc/nom

c. Hún skipaði honum að vera góður/góðum.
    she.nom ordered him.dat to be good.nom/dat
    ‘She promised/requested/ordered him to be good.’

Under an equi sentence, the nominative form is always possible for the predicate in the embedded clause, though the accusative is preferred in (4.46b). But, the agreement with the
matrix object is also available. So, it is possible for the embedded predicate to take a form in the dative or accusative. Since, unlike raising-to-object sentences, the subject of the embedded predicate is not token-identical to the object of the matrix clause, such an agreement is not obligatory. Andrews (1982) calls this phenomenon ‘case attraction’ and extensively argues that it is a part of performance. In particular, the nominative form is far more preferred than the dative case attraction in the sentences like (4.46c). Therefore, it is more plausible to distinguish this type of case attraction from the agreement in the secondary predication found in (4.45).

Another case where the subject-verb agreement fails is found in a clause with a demonstrative subject. If the subject is það ‘it’ or þetta ‘this’, the verb does not agree with it. Instead, it agrees with its complement as shown in (4.47):

\begin{enumerate}
\item \(\text{það} \text{ er} \text{ um} \text{ bara} \text{ við}.\)
\begin{align*}
\text{it} & \text{ are.1.PL only we.NOM}
\text{‘It is only us.’}
\end{align*}
\item \(\text{þetta} \text{ hafa} \text{ sennilega} \text{ verið} \text{ tveir} \text{ menn.}\)
\begin{align*}
\text{this} & \text{ have probably been two men.NOM.PL}
\text{‘This has probably been two persons/men.’}
\end{align*}
\end{enumerate}

The finite verb vera in (4.47a) is in the first person plural form indicating that it agrees with the complement pronoun við. In the same way, hafa is in the plural form despite the existence of þetta.

We have observed a non-agreement pattern in (4.41) and (4.42). But if the case frame is the dative subject + nominative object, a finite verb participates in agreement with the nominative object as in (4.48):

\begin{enumerate}
\item Henni leiddust strákarnir.
her.DAT bored.3.PL the.boys.NOM
\text{‘She found the boys boring.’}
\end{enumerate}

Sigurðsson (1996) argues that although it is often reported that this type of object agreement is optional based on examples like (4.49), it is not a correct generalisation.

\begin{enumerate}
\item Henni leiddist strákarnir.
her.DAT bored.DFT the.boys.NOM
\text{‘She found the boys boring.’}
\item Henni líkaði ekki þessar athugasemdir.
her.DAT liked.DFT not these comments.NOM
\text{‘She did not like these comments.’}
\end{enumerate}

Based on an investigations of nine informants, he found out that such a non-agreement pattern in the Dat-Nom frame is restricted to clauses with leiðast ‘find boring’ and líka ‘like’. 
Furthermore, he claims, even in sentences with these two verbs, the object agreement is preferred to non-agreement. So, it is slightly misleading to claim that the object-agreement is optional and the two patterns are free variations.

The agreement with a nominative object is available even for a predicate higher in the structure:

(4.50) Honum eru taldir hafa verið gefnir peningarnir.
     him.dat are.pl thought.nom.m.pl have been given.nom.m.pl the.money.nom.m.pl
     ‘He is thought to have been given the money.’

In (4.50), the subject honum is in the dative because it is a subject of the passive verb gefnir, but it is positioned in the subject position of the matrix clause due to the subject raising verb. Since it is in the dative, the predicate of the matrix clause, i.e. taldir, does not agree with it, and interestingly it agrees with the nominative object of the embedded clause, i.e. peningarnir.

One of the crucial constraints regarding the Dat-Nom case frame is that only a third person NP can appear as a nominative object. Thus, the following sentences are ungrammatical regardless of their verb forms:

       her.dat bored.2/3.pl you.nom.pl
       ‘She found you boring.’

b. *Henni leiddumst við.
   her.dat bored.1.pl we.nom
   ‘She found us boring.’

c. *Henni líkuðuð þið.
   her.dat liked.2.pl you.nom.pl
   ‘She liked you.’

d. *Henni líkuðum við.
   her.dat liked.1.pl we.nom
   ‘She liked us.’

(4.52) ?* Henni leiddist við.
      her.dat bored.dft we.nom

(4.51) shows that even though the verb form correctly reflects the person and number features of the object, the sentence is unacceptable. When we use the default verb form as in (4.52), the sentence still rejects a non-third person object NP. The same fact is applicable to the Dat-Nom in passive of a ditransitive verb as shown in (4.53a). On the other hand, there is no problem with the Nom-Dat passive frame as in (4.53b):
Interestingly, however, Sigurðsson (1996) reports that there are cases where a non-third person object is more or less acceptable in the Dat-Nom case frame (judgments are Sigurdsson’s):

(4.54)  a.?Henni líkaði ég.
    her.dat liked.1/3.sg I.nom

   b. ?Henni leiddist ég.
    her.dat like.1/2/3.sg I.nom

   c. ?Henni leiddist þú.
    her.dat like.1/2/3.sg you.nom.sg

According to his survey, 5 out of his 9 informants (3 for OK and 2 for ?) answered (4.54a) is acceptable. Moreover, 8 informants (5 for OK and 3 for ?) judged (4.54b, c) as acceptable. The reason behind the result is the forms of the verbs as indicated by the glosses. As illustrated in the paradigms of the verbs forms in the past tense (4.55), the first person singular form of líkur is homophonous to the default form (third person singular), and also the first and second person singular form of leidast is identical to the default third person singular form:

(4.55) | líkur | leidast |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 sg</td>
<td>líkaði</td>
</tr>
<tr>
<td>2 sg</td>
<td>líkaðir</td>
</tr>
<tr>
<td>3 sg (dft)</td>
<td>líkaði</td>
</tr>
<tr>
<td>1 pl</td>
<td>líkuðum</td>
</tr>
<tr>
<td>2 pl</td>
<td>líkuðuð</td>
</tr>
<tr>
<td>3 pl</td>
<td>líkuðu</td>
</tr>
</tbody>
</table>

The account based on the verb form matching is supported by the ungrammatically of the following patterns:

(4.56)  a.*Henni líkaðir þú.
    her.dat liked.2.sg you.nom.sg

   b.*Henni líkuðum við.
    her.dat liked.1.pl we.nom

   c.*Henni líkuðuð þið.
    her.dat liked.2.pl you.nom.pl
d. *Henni leiddumst þið.
her.DAT bored.1.PL we.NOM

The verb forms found in (4.56) are not homophonous to the default form as shown in the paradigms (4.55). Therefore, those examples containing a first or second person NP object are unacceptable. One marginal case is the second person plural of leiddast:

(4.57) Henni leiddust þið.
her.DAT bored.2/3.PL you.2.PL

Siguðsson judges this sentence as ungrammatical, so do 4 of his informants. At the same time, however, 5 out of 9 informants judge it as more or less acceptable (1 for OK and 4 for ?).

Finally, there is another Dat-Nom frame. Most of the Icelandic raising verbs can take an optional dative experiencer as a matrix subject and if that NP is added, the subject of the embedded clause cannot be raised. As a result, the sentence shows the Dat-Nom frame:

(4.58) a. Hafði Ólafur virst vera gáfaður?
had Olaf.NOM seemed be intelligent
‘Did Olaf seem intelligent?’

b. Hafði þeim virst Ólafur vera gáfaður?
had them.DAT seemed Olaf.NOM be intelligent
‘Did it seems to them that Olaf was intelligent.’

(4.58a) is a normal raising-to-subject construction where the subject of the infinitive clause is positioned in the matrix clause. In (4.58b), however, the dative experiencer hafði is placed in the matrix subject position and the infinitival subject stays within the infinitival clause.

As Sigurðsson (1996) reports, the matrix raising verb either agrees with the nominative infinitival subject or is in the default form, although some speakers only accept the default form:

me.DAT seemd.3.PL/DFT they.NOM work well
‘It seemed to me that they were working well.’

b. Mér höfðu/hafði fundist þer vera gáfaðar.
me.DAT had.3.PL/DFT found they be intelligent
‘I had found them intelligent.’

The person constraint on the nominative object is less restricted than the other Dat-Nom pattern we have looked at. The first and second person nominative can appear in the infinitival subject position provided that the raising verb does not agree with them:

(4.60) þeim hefur/*höfum alltaf fundist við vinna vel.
them.DAT has/*have always found we.NOM work well
4.5 Previous LFG analyses

Amongst the LFG literature on Icelandic morphosyntax, Andrews (1982, 1990) provide the most detailed analysis on Icelandic case and agreement. His proposal contains mainly the following four points:

- ACC, DAT and GEN appear both as a grammatical function (GF) and as a value of CASE attribute.
- An argument with an oblique case comprises a composite GF.
- Nominative is not a value of CASE, but an absence of CASE.
- A composite GF ‘protects’ the grammatical features of an NP.

4.5.1 Composite GFs

The innovation of his analysis is an introduction of layered GFs. As stated in Andrews (1982:741), the basic idea of this layered GF is similar to the treatment of English prepositional phrases where the value of PCase introduced by a preposition is identified with the GF of the whole PP as we have looked at in Chapter 3. Andrews (1982, 1990) propose Icelandic non-canonical case markings where he identifies the CASE value of an NP to its embedded GF. The initial step is to introduce a composed grammatical function as a part of PRED value in the lexical entry of a predicate like (4.61) (cf. Andrews 1982:472):

(4.61)  

- **a. batna** (↑PRED) = ‘BATNA ((SUBJ DAT), (OBJ))’
- **b. vanta** (↑PRED) = ‘VANTA ((SUBJ ACC), (OBJ ACC))’
- **c. gæta** (↑PRED) = ‘GÆTA ((SUBJ GEN))’
- **d. bjarga** (↑PRED) = ‘BJARGA ((SUBJ), (OBJ DAT))’
- **e. kyssa** (↑PRED) = ‘KYSSA ((SUBJ), (OBJ))’

Note that only the oblique subject and object have a composite GF. Thus, **kyssa** that takes a nominative subject and an accusative subject does not contain a composite GF as shown in (4.61e). **Batna** takes just OBJ for an object while it also has a composite GF, SUBJ DAT, for a subject as in (4.61a). **Vanta** has composite GFs for both subject and object as in (4.61b), since it takes the accusatives for a subject and an object.

The resultant f-structure would be like (4.62b):
   the.child.dat recovered from the.disease.nom

   ‘The child recovered from the disease.’

b. \[
\begin{array}{c}
\text{PRED} \quad \text{‘BATA (SUBJ DAT, OBJ)’} \\
\text{SUBJ} \quad \text{DAT} \quad \text{PRED} \quad \text{‘BARN’} \\
\text{OBJ} \quad \text{PRED} \quad \text{‘VEIK’} \\
\end{array}
\]

In (4.62), the subject noun phrase contributes the case value DAT, which is also the value of the grammatical function subj. As a result, the subj has a composed gf, namely subj DAT, which matches the specification of the pred value of batnaði.

Andrews’ analysis contains a similar machinery as the pcase identification with a gf. Following the line of Siegel (1974), he proposes a PS rule like (4.63) (Andrews 1982:477,484):

(4.63) \[ NP’ \to NP \left\{ \begin{array}{c}
\uparrow = \downarrow \\
(\uparrow ( \downarrow \text{CASE})) = \downarrow
\end{array} \right\} \]

Siegel argues that an NP in general has a structure of the form NP’ \to NP (C) where C is a case marker.\footnote{This kind of approach is incorporated into KP projection headed by K(ase) both in derivational and non-derivational frameworks.} What Andrews proposes is adding an extra phrasal node without assigning a node to a case marker. Those NP’s are under an S in the PS rule and mapped onto subj and obj in the f-structure. NP’ contains only one daughter, NP. This NP has functional equation (\(\uparrow (\downarrow \text{CASE})\) = \(\downarrow\)), which is parallel to the equation on a PP in English, that is, the case value of an NP also functions as gf of the NP. Crucially, the case value must be one from the acc, dat and gen. Otherwise, \(\uparrow = \downarrow\) applies. Thus, nom is not included in the functional identification. The PS rule (4.63) combined with the PS rule for S and NP gives us the following c-structure:
Since baruninu is in the dative, it has (↓ case) = dat. This case value is identical to the mother NP due to ↑ = ↓. Accordingly, the functional equation (↑ (↓ case)) = ↓ on the NP becomes (↑ dat) = ↓. (↑ sub) = ↓ maps the NP' onto the value of the sub, and the NP and the N are mapped onto the value of the dat embedded into sub as indicated by the arrows. The nominative object NP, on the other hand, does not have the identification of case with the gf, namely ↑ = ↓ applies to the NP. As a result, the NP', NP and N are all mapped onto the value of the obj.

As mentioned, Andrews claims that case values in Icelandic contain dat, gen and acc. Since acc can appear as a value of an obj/obj2, he proposes the following constraints (Andrews 1982:485):

\[(4.65) \ (↑ α\ case) \Rightarrow c\ acc \text{ if } (↑ sub\ pred) \& (↑ α\ pred), \text{ where } α = obj/obj2\]

(4.65) states that if the sub and the gf (either obj or obj2) in the same f-structure contain pred, that gf must take acc as its case attribute. Thus, in (4.64) for example, if the object is an accusative NP, i.e. (↓ case) = acc, it cannot be mapped onto obj in the f-structure since the sub does not contain pred — it is sub dat. When the subject is direct, however, an obj must have an acc as its case value:

\[(4.66) \ a. \ Strákurinn \ kitlaði\ stelpuna. \]
\[\text{the.boy.nom tickled the.girl.acc}\]

‘The boy tickled the girl.’
In (4.66), both the subj and the obj have a pred, according to (4.65), therefore, the obj must have \((\text{case, acc})\). The resultant f-structure (4.66b) is well-formed. If \((↑ \downarrow \text{case})\) applies to the object NP, it would violate the Coherence condition. Thus, \(↑ = \downarrow\) applies, so that the obj does not have a composite gf.

In Andrews’ case theory, the nominative is not a value of case, due to the following assumption (Andrews 1982:485):^5

\[(4.67) \quad \text{case Convention}\]

\text{case appears in a functional structure only if there is a rule or constraint which requires it.}\]

Since nom is not required to satisfy the lexical entries like (4.61), the equation in (4.63) or the constraint (4.65), (4.67) rules out the introduction of nom as one of the values of case. Therefore, the case of obj in (4.64) is undefined rather than nom.

As clarified in Andrews (1990:214–5), there is no technical problem for the composite grammatical functions in a pred value. He states that “[t]he argument list in the value of a pred-function in a F-structure should not be seen as containing a grammatical function label, but an actual F-structure.”^6 Therefore, more straightforward notation of f-structure would be something like (4.68):

\[(4.68) \quad \begin{bmatrix}
\text{subj} & \ldots \\
\text{pred} & '\text{EAT}(−,−)' \\
\text{obj} & \ldots
\end{bmatrix} \quad \begin{bmatrix}
\text{subj} & \Box \ldots \\
\text{pred} & '\text{EAT}(\Box \Box)' \\
\text{obj} & \Box \ldots
\end{bmatrix}
\]

Here the values of subj and obj are token-identical to the list value of the pred as indicated by the line connections or the boxed indices. Thus, the correct statement for the composite gf found in (4.61d), for example, is that the argument list of the semantic form of gæta contains the subj f-structure that takes another function gen as its argument. If those

---

^5 The formulation is as follows (Andrews 1982:503):

\[(i) \quad (↑ \alpha \text{case}) \text{ is undefined unless a case constraint requires it to be defined, for } \alpha = \text{subj/obj/obj2.}\]

^6 This point would be clearer by comparing with subcat list or subj/comps list in Head-driven Phrase Structure Grammar (Pollard and Sag 1994).
f-structure requirements are correctly satisfied by the argument NPs, i.e. there is no violation of Completeness and Coherence, the structure is well-formed. The mechanism to satisfy the constraints is the NP’ rule with \((↑(↓\text{case}))=↓\).

In sum, Andrews’ case theory treats non-canonical case marking patterns as specifications in the lexical entries of verbs by introducing a composite gf. A composite gf is attained by the functional equation annotated in the PS rule of NP’. The canonical accusative marking on an object is done by the accusative marking constraint. Finally, according to the case convention, the nominative does not appear as a value of case.

### 4.5.2 Agreement

The upshot of the case theory summarised in the previous section is reflected in Andrews’ (1982) treatment of agreement. The starting point of his approach to agreement is to set up undefined values for person, number and gender as well as he does for case.

In LFG, agreement in general is captured either by constraints or co-specifications of the agreement features enforced by the agreement target element. That is, if a finite verb participates in agreement with the first person plural number subject NP, for example, the inflected verb that can appear with that subject has either constraining equations \((↑\text{subj pers})=1\) and \((↑\text{subj num})=c\text{pl}\) or defining equations \((↑\text{subj pers})=1\) and \((↑\text{subj num})=\text{pl}\). In the former case, the equations themselves do not introduce pers and num features in \((↑\text{subj})\), but they impose the existence of them, i.e. they require the NP corresponding to the subj to have given attribute-value pairs. In the latter case, the verb can only occur with the subject NP that contribute the same agreement features due to the uniqueness condition.

In the case theory, Andrews proposes that the nominative is not a value of case, but a lack of case. In the same vein, third person, singular number and neuter gender are not a value of person, number and gender respectively, rather they are undefined for those attributes. So, for example, Andrews (1982:494) illustrates the well-formed f-structure (4.69b) for the sentence (4.69a):

\[(4.69)\quad \text{a. Drengina vantar mat. the.boys.acc lacks food.acc}\
\]

‘The boys lacks food.’
Notice that no third person, singular number and neuter gender appear in the f-structure. As observed in section 4.4, when the subject is marked by a non-canonical case, the finite verb is in the default third person singular number form. In Andrews’ agreement system, this means that the agreement controller lacks PERSON and NUMBER in the place where the finite verb’s lexical entry specifies. And this is what we see in the f-structure (4.69b), namely PERS and NUM are embedded in the ACC rather than the value of the SUBJ, so that it is inaccessible for the finite verb.

One problem of this assumption is that it would allow the default verb form to appear almost everywhere. That is, since the default form lacks constrains on PERS and NUM values of the SUBJ, it would not cause a violation with any NP, for instance it could appear with a subject NP in the first person, plural number and nominative case. Obviously, it is ill-formed. Only the first person and plural number form finite verb, i.e. the verb with (↑ SUBJ PERS) = ε 1 and (↑ SUBJ NUM) = ε PL, can appear with such a subject NP. To overcome this problem, Andrews (1982:495) proposes the following constraint based on Elsewhere Principle (or Pāṇini’s Principle):

(4.70) Morphological Blocking Condition

If the constraint equations of a form A are a subset of those of a form B from the same paradigm, and the equations of B are satisfied at a position X, then A may not be inserted at X.

The morphological blocking condition states that the form with constraints which match the agreement controller most narrowly always appears with that controller, i.e. it blocks the less specified forms. For example, let us look at the following inflectional paradigm (Andrews 1982:495):

(4.71) elska (↑ SUBJ PERS) = ε 1 elska (↑ SUBJ PERS) = ε 1
elkum (↑ SUBJ NUM) = ε PL
elkar (↑ SUBJ PERS) = ε 2 elku (↑ SUBJ PERS) = ε 2
elkar elsa (↑ SUBJ NUM) = ε PL
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If we have a first person and plural number subject in a clause, then according to (4.70) the finite verb appearing under that condition is *elskum*. Although *elska* or *elskar* would not cause a feature clash with the first person and plural number subject due to their *pers* and *num* constraint equations, their constraint equations are less specific than *elskum*. Therefore, *elskum* blocks *elska* and *elskar* from appearing in that situation. Turning back to (4.69), the *pers* and *num* in the *subj* are undefined as we have observed. In this situation, a form which has constraints on *pers* and *num* values in *subj* is ruled out. Therefore, the Elsewhere Principle selects the default form with no constraints on the subject’s agreement feature.

For predicative adjectives and participles, what we need is to add *gender* feature. Parallel to the other agreement features, *masc* and *fem* are the marked values and *neut* is not, i.e. *neut* does not appear as a value of *gen*. So, the singular number, neuter gender and nominative form is the default form lacking agreement feature constraints on its subject.

As mentioned in Andrews (1982:495), this mechanism crucially refers to the notion ‘paradigm’. Which form can appear depends on the complex feature matrix of the inflectional paradigm. The paradigm contains inflected forms of the same lexeme. In LFG, this means that every member has the same *pred* value. And all the member of the paradigm must be visible and available under the Elsewhere Principle. This paradigmatic approach is rather unusual (but promising) in the unification grammar like LFG where most of ill-formed structures are ruled out by feature mismatches or additional constraints.

This approach to agreement combined with the case theory account for the agreement patterns under raising and equi sentences. LFG has two distinct types of control: functional control and anaphoric control. The former involves a token identification of the two f-structure values, whereas the latter involves a indexation. For example, (4.72a) is a raising-to-object sentence and the corresponding f-structure is like (4.72b) (Andrews 1982:445,8):

(4.72) a. Þeir segja hana vera vinsæla.
   they.nom say her.acc to be popular.acc

   ‘They say she is popular.’
The matrix predicate takes subj, xcomp and non-thematic obj and as it is a raising-to-object verb, it contains the functional identification (↑ xcomp subj) = (↑ obj), namely its xcomp’s subj is identified with the obj. This token identification is represented by the line connection between two values of the gfs. Similarly, Andrews regards a copula as one type of raising verb taking xcomp and non-thematic subj. The lexical entry of a copula has (↑ xcomp subj) = (↑ subj) that links the matrix subj and the subj in the embedded f-structure. As a result, in (4.72b), three gfs share the same f-structure. Crucially, the case value of subj of vinsæl is acc according to the accusative constraint (4.65). Note that although vinsæl takes a nominative form NP as its subject in a simplex clause, it is not specified as (↑ subj case) = nom as nom is not a value of case in Andrews’ case theory. So, (4.65) places an accusative marking on that NP. Accordingly, vinsæl is in the accusative form vinsæla since the case value of its subj is acc.

An anaphoric control does not induce a token-identification and, as a result, the agreement pattern is different:

(4.73) a. Hún bað hann að vera góður.
    she.nom requested him.acc to be good.nom
    ‘She requested him to be good.’
As Andrews argues in his later work (Andrews 1990:208–9), those constructions are thought to take a dative NP as in (4.74b):

\[
\begin{aligned}
\text{b. } & \quad \text{SUBJ} \quad \begin{array}{|c|}
\hline
\text{PRED} & \text{‘PRO’} \\
\text{GEN} & \text{F} \\
\text{NUM} & \text{SG} \\
\hline
\end{array} \\
\text{PRED} & \text{‘BÍĐÅA(SUB1,OBJ,COMP)’} \\
\text{OBJ} \quad \begin{array}{|c|}
\hline
\text{PRED} & \text{‘PRO’} \\
\text{GEN} & \text{M} \\
\text{NUM} & \text{SG} \\
\text{CASE} & \text{ACC} \\
\text{REF} & i \\
\hline
\end{array} \\
\text{COMP} \quad \begin{array}{|c|}
\hline
\text{SUBJ} \quad \begin{array}{|c|}
\hline
\text{PRED} & \text{‘PRO’} \\
\text{REF} & i \\
\hline
\end{array} \\
\text{XCOMP} \quad \begin{array}{|c|}
\hline
\text{SUBJ} \quad \begin{array}{|c|}
\hline
\text{PRED} & \text{‘GOÐ(SUBJ)’} \\
\hline
\end{array} \\
\end{array}
\end{aligned}
\]

In (4.73), the matrix verb BÍĐÅA takes a SUBJ, an OBJ and a COMP. The copula VERA links its SUBJ and its XCOMP’s SUBJ by functional control as observed in the raising example. Unlike (4.72), however, the matrix OBJ and the embedded SUBJ are not identical. They are co-indexed by the same value i of the REF attributes, so they are still distinct f-structure objects. This accounts for the fact that GOÐ is in the nominative form goður since its SUBJ, which is identical to VERA’s SUBJ, is the nominative.

One of the intriguing agreement patterns in Icelandic is found in secondary predications as we saw in (4.44) and (4.45). In those constructions, a secondary predicate agrees with a matrix oblique NP. If the matrix object is in the dative plural form, for instance, the secondary predicate takes the dative plural form as in (4.74a). If the sentence is passivised and the object is promoted to the subject keeping its dative marking, the secondary predicate still agrees with its dative NP as in (4.74b):

\[
\begin{aligned}
\text{(4.74) a. } & \quad \text{Lögreglan lýsti glæpamönnunum sem stórhættulegum.} \\
& \quad \text{the.police described the.criminals.DAT.PL as very dangerous.DAT.PL} \\
& \quad \text{‘The police described the criminals as extremely dangerous.’} \\
\text{b. } & \quad \text{Glæpamönnunum var lýst sem stórhættulegum.} \\
& \quad \text{the.criminals.DAT.PL was SG described.SG as very dangerous.DAT.PL} \\
& \quad \text{‘The criminals were described as extremely dangerous.’}
\end{aligned}
\]

As Andrews argues in his later work (Andrews 1990:208–9), those constructions are thought to indicate a performance issue.

---

7 Some other approaches to binding in LFG assume that an anaphoric control is treated in a distinct (semantic)-structure (e.g. Dalrymple 1993, 2001).

8 (4.46) in section 4.4 shows that GOÐ can be in the accusative form due to the case attraction, but as I mentioned, Andrews argues it is a performance issue.
to involve XCOMP or XADJUNCT in LFG. Thus, the f-structures for (4.74a, b) would be like (4.75a, b) respectively:

(4.75) a.  

```
[SUBJ [PRED 'LOGREGLAR']
  [PRED 'LYSA(SUBJ,OBJ DAT,XCOMP)'
    [OBJ DAT CASE DAT
      [NUM PL]
    ]
  ]
]
```

b.  

```
[SUBJ [PRED 'VERA(XCOMP)'
  [SUBJ DAT CASE DAT
    [NUM PL]
  ]
  [PRED 'LYSA(SUBJ DAT,XCOMP)'
    [SUBJ]
    [XCOMP AFORM SEM
      [PRED 'STORHÆTTULEGUR(SUBJ)']
    ]
  ]
]
```

In (4.75a), LÝSA takes a composite GF (OBJ DAT) and only the second layer is identified with the SUBJ of the XCOMP due to the functional equation specified in the lexical entry, i.e. $(\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{OBJ DAT})$. As a result, the SUBJ of the XCOMP has a single layer GF rather than a composite one, so that the CASE and NUM values in the SUBJ are DAT and PL respectively. The secondary predicate, namely the predicate in XCOMP, agrees with the SUBJ and as found in (4.74a) it is in the dative plural form stórhaettulegum. In (4.75b), due to the passivisation, LÝSA takes SUBJ DAT instead of OBJ DAT — we will look at the details of passivisation in the next subsection. As we have already seen in (4.72) and (4.73), a copula identifies a non-thematic SUBJ with an XCOMP’s SUBJ. Thus, the composite GF (SUBJ DAT) is structurally shared by the matrix SUBJ and XCOMP’s SUBJ.9 Parallel to (4.75a), the SUBJ of stórhaettulegur is identified with the second layer of the composite GF via $(\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{SUBJ DAT})$. Therefore, the secondary predicate is in the dative plural due to the agreement with the CASE and NUM of the SUBJ, whereas LÝSA and veður are in the default singular form because of the composite SUBJ DAT.

---

9I place the composite GF in the SUBJ of XCOMP in the f-structure, rather than the matrix SUBJ, for expository purpose. Since the SUBJ DAT in the two places is the same object, the position does not make any difference.
As summarised in section 4.4, when the subject is in the dative, a finite verb or a predicative adjective/participle is not always in the default form, rather it agrees with the object. To explain this object agreement pattern, Andrews (1990:212) proposes feature copying rules. Let us look at the example and the corresponding f-structure first:

(4.76) a. Honum voru gefnír peningarnir.
   him.dat were.pl given.nom.m.pl the.money.nom.m.pl
   ‘He was given the money.’

   
   As indicated by the dashed lines, the agreement features of the obj2 are copied onto the subj. This is attained by the following equations:

   (4.77) \[
   \uparrow \text{subj case} = \uparrow \text{obj2 case} \\
   \uparrow \text{subj gend} = \uparrow \text{obj2 gend} \\
   \uparrow \text{subj num} = \uparrow \text{obj2 num}
   \]

   By applying those rules, the first layer of the composite gf has the same agreement features as the obj2. Since the case, num and gen features inherently associated with the subject NP belong to the second layer of the composite gf, no clash occurs by the copying.

   As a result, Andrews argues, the copula and the participle agree with the features in the subj rather than those in the obj2. The copula becomes the plural form and the participle becomes the nominative, masculine and plural form as shown in (4.76a).\(^{10}\)

\(^{10}\)It is inconsistent with Andrews (1982) in that nom is a value of case in the feature copying, although removing nom in the structure does not seem to affect the argument.
4.5.3 Passive

Passivisation in Classic LFG is a shift of the \( gf \) by a lexical rule.\(^{11}\) Since a lexical case marking on an object is preserved under passivisation, the second layer of the composite \( gf \) must not be changed. Hence, Andrews (1982) proposes lexical rules for passivisation along the line of (4.78):

\[
(4.78) \quad \begin{align*}
(\text{subj}) & \mapsto (\text{af dat})/\emptyset \\
(\text{obj}) & \mapsto (\text{subj})
\end{align*}
\]

In Icelandic, an NP which is a subject in an active voice becomes \( af \) + dative form of NP or it is not overtly expressed in the passive counterpart. At the same time, \( obj \) is promoted to \( subj \). (4.78) reflects these points. \( subj \) in an active voice becomes \( af \) dat and \( obj \) becomes \( subj \). If a predicate takes a composite \( gf \) as its \( obj \), e.g. \( obj \) dat, it changes to \( subj \) dat, namely only the first layer of the \( gf \) undergoes the change keeping the second layer unchanged.\(^{12}\) This accommodates the fact that a dative object preserves its dative marking when it is promoted to a subject under passivisation.

This assumption predicts that a predicate that has a composite \( gf \) in the \( subj \) of its \( pred \) value cannot be passivised, and this seems to be true as shown in (4.79) (Andrews 1982:476):

\[
(4.79) \quad \text{(a)} \quad \text{*Veikin var bóttað (af öllum börnum).} \\
\quad \text{the.disease.nom was recovered from (by all the.children)} \\
\quad \text{(b)} \quad \text{*Peningar er vantað (af öllum stuðendum).} \\
\quad \text{money.acc is lacked (by all students)} \\
\quad \text{(c)} \quad \text{*Peningir eru vantaðir (af öllum stuðendum).} \\
\quad \text{money.nom is lacked (by all students)}
\]

\( batna \) has \( (\text{dat subj}), (\text{obj}) \) in its \( pred \) value. If we apply the passive lexical rule to it, we get \( (\text{dat af dat}), (\text{subj}) \). Andrews claims that neither Completeness nor Coherence conditions can be satisfied because no c-structure rules would map an NP or a PP into ‘\( \text{dat af dat} \)’.\(^{13}\)

Therefore, as shown in (4.79a), the passivisation of \( batna \) is not allowed. Similarly, \( vanta \) takes a composite \( subj \) and \( obj \) like \( \langle \text{subj acc}, \text{obj acc} \rangle \). (4.79b, c) suggest that the passivisation is impossible.

\(^{11}\) Passive in most of the current LFG works is analysed in terms of Lexical Mapping Theory (LMT) (Levin 1986, Bresnan and Kanerva 1989) where the mapping between argument-structure and \( gf \)s is defined. In LMT, passivisation is regarded as a suppression of of the highest argument in the a-structure level, so that the shift of \( gf \) is considered to be an epiphenomenon of the change of the a-structure. As Andrews (1990:230) admits, it is unclear how to integrate his composite \( gf \) into LMT.

\(^{12}\) Andrews (1990:196) argues that the passive rule application to a composite \( gf \) differs depending on languages. He claims that German and Latin do not allow the alternation from \( obj \) dat to \( subj \) dat whereas Ancient Greek does not retain the second layer, i.e. the alternation is from \( obj \) dat to \( subj \).

\(^{13}\) The passivisation can also change \( su\) into \( \emptyset \) in Andrews’ proposal. It is then unclear to me why even the \( \emptyset \), i.e. an omission of the \( af \) phrase under passivisation, causes the ungrammaticality.
To account for the passivisation of a ditransitive verb, Andrews adds another lexical rule to (4.78) (Andrews 1982:483):

\[
(4.80) \quad \begin{cases}
\text{(SUBJ) } \mapsto (\text{AF DAT})/\emptyset \\
\text{(OBJ) } \mapsto (\text{SUBJ}) \\
\text{(OBJ2) } \mapsto (\text{SUBJ}) \text{ only if OBJ2 is direct}
\end{cases}
\]

In addition to the demotion of \text{SUBJ} and the promotion of \text{OBJ}, (4.80) states that \text{OBJ2} can be promoted to \text{SUBJ} only when it is direct. That is, if \text{OBJ2} has a composite \text{GF} such as \text{OBJ2 DAT}, it cannot be \text{SUBJ} under passivisation. So, if a verb takes \langle \text{(SUBJ), (OBJ DAT), (OBJ2)} \rangle as its \text{GF}s, for instance, the application of the passive lexical rule gives us two patterns: \langle (\text{AF DAT})/\emptyset, (\text{SUBJ DAT}), (\text{OBJ2}) \rangle and \langle (\text{AF DAT})/\emptyset, (\text{OBJ DAT}), (\text{SUBJ}) \rangle. This is true as shown in (4.81) (Andrews 1982:481):

\[
(4.81) \quad \begin{array}{l}
a. \text{Henni var sýndur bíllinn.} \\
\text{her.DAT was showed the.car.NOM} \\
\text{‘She was shown the car.’}
\end{array}
\]

\[
\begin{array}{l}
b. \text{Bíllinn var sýndur henni.} \\
\text{the.car.NOM was showed her.DAT} \\
\text{‘The car was shown to her.’}
\end{array}
\]

In (4.81a), the \text{OBJ DAT} is promoted to the subject. The rule (4.80) ensures that the \text{DAT} is in the second layer of the \text{GF}. \text{OBJ2} remains as \text{OBJ2} under this passivisation. The resultant structure shows that the subject is in the dative and the object (\text{OBJ2}) is in the nominative. Since the accusative constraint (4.65) is not applicable to this \text{OBJ2} due to the composite \text{GF} ‘\text{SUBJ DAT}’ and the case convention (4.67) blocks introducing any case feature to this object, the NP corresponding to \text{OBJ2} is in the nominative form. (4.81b), on the other hand, illustrates the other pattern of passivisation where the \text{OBJ2} is promoted to the \text{SUBJ} and the \text{OBJ DAT} is unchanged. The sentence shows that the promoted \text{SUBJ} is in the nominative by the mechanism just mentioned.

### 4.5.4 Problems

Although Andrews’ case theory and its consequence for agreement seem to explain the agreement patterns in Icelandic, there are at least two points to be considered in his proposal. One is theoretical status of composite \text{GF}s and the other is related to the \text{LFG}’s approach to agreement in general.

\text{F-structure} is a level of representation of grammatical relations and supposedly nearly invariant across languages. The composite \text{GF} clearly deviates from this theoretical assumption. Following Siegel’s (1974) claim that an \text{NP} in general has a structure of the form \text{NP’ } \rightarrow \text{NP}
C where C is a case marker, Andrews (1982:477) and Andrews (1990:215–6) suggest that the composite $\gamma f$ approach is applicable to the languages signaling the grammatical relations by particles, postpositions or similar sorts. In other words, the proposal reflects the phrase structure configuration to the f-structure embedding. Based on that assumption, however, languages like Japanese would always have composite $\gamma f$s. Or if the claim is a more general application of the compositional $\gamma f$s to lexical case markings cross-linguistically, it would require very complex functional equations since the manifestations of Case vary significantly across languages (or even within the same language) (Blake 1994, 2001). For instance, there are at least four possibilities:

(4.82) a. marking on the head N
b. marking on the edge of/the last member of the NP (e.g. clitic)
c. marking on any member of the NP
d. marking on all the members of the NP

(4.82a) and (4.82b) allow composite $\gamma f$s relatively straightforwardly by Andrews’ proposed PS rule (4.63) and the treatment of English PP arguments found in Kaplan and Bresnan (1982) respectively. In the latter case, however, the marker attached to the edge of the NP would be treated as having $\gamma f$ as a value of its case-like attribute. If we assume that the attribute is $p_{\text{case}}$, we may try to apply composite $\gamma f$s to languages like Urdu. As shown in (4.83), an auxiliary and main verbs agree with the highest NP whose case is nominative (or direct). When an NP is followed by a clitic element such as ne and ko, which are often referred to as ergative and accusative case markers, the head noun is in the oblique case form and that NP cannot be a controller of the agreement. So, the verbs agree with the object $gari$ rather than the subject Adnan ne in (4.83a). In (4.83b), both subject and object are followed by clitics and the head nouns are in the oblique forms, so the verbs appear as the default forms:

(4.83) a. Adnan ne gari tfjala-ya h-\text{-}\text{i}.
   Adnan car.nom.f drive-perf.f.sg be-pres.3.sg
   ‘Adnan has driven a car.’

b. Nadya ne gari ko tfjala-ya h-\text{-}\text{i}.
   Nadya car.f drive-perf.m.sg be-pres.3.sg
   ‘Nadya has driven the car.’

To account for those agreement patterns with composite $\gamma f$s, we would need the following c-/f-structures for (4.83):\footnote{‘Case’ here simply means overt formal signals of grammatical relations.\footnote{See Butt and King (2004, 2003) and Butt and Sadler (2003) for the application of Nordlinger’s (1998) constructive morphology to the data. See Chapter 5 for an alternative analysis of Hindi-Urdu.}}
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(4.84) a. 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{(\uparrow (\downarrow \text{PCASE})) = \downarrow} \\
\text{NP'}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{(\uparrow \text{OBJ}) = \downarrow} \\
\text{NP'}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V'}
\end{array}
\end{array}
\] 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{(\uparrow \text{OBJ}) = \downarrow} \\
\text{NP}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{Cl}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{NP}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V}
\end{array}
\end{array}
\] 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{Adnan}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{ne}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{gari}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{tfala-ya}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{h-\text{\varepsilon}i}
\end{array}
\end{array}
\] 

\[
(\uparrow \text{PCASE}) = \text{SUBJ}
\] 

b. 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{PCASE} \\
\text{SUBJ}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{PRED} \\
\text{\textsc{‘ADNAN’}}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{NUM} \\
\text{SG}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{OBJ} \\
\text{PERS} \\
\text{3}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{GEND} \\
\text{M}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{CASE} \\
\text{OBL}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{NUM} \\
\text{SG}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{OBJ} \\
\text{PERS} \\
\text{3}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{GEND} \\
\text{F}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{CASE} \\
\text{NOM}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{PRED} \\
\text{\textsc{‘CAR’}}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{NUM} \\
\text{SG}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{OBJ} \\
\text{PERS} \\
\text{3}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{GEND} \\
\text{F}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{CASE} \\
\text{NOM}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{PRED} \\
\text{\textsc{‘DRIVE(SUBJ OBJ,OBJ)’}}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{TENSE} \\
\text{PRES}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{ASPECT} \\
\text{PERF}
\end{array}
\] 

(4.85) a. 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{(\uparrow (\downarrow \text{PCASE})) = \downarrow} \\
\text{NP'}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{NP'}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V'}
\end{array}
\end{array}
\] 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{(\uparrow \text{OBJ}) = \downarrow} \\
\text{NP}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{Cl}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{NP}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{Cl}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{\uparrow = \downarrow} \\
\text{V}
\end{array}
\end{array}
\] 

\[
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{Nadya}
\end{array}
\end{array}
\begin{array}{c}
\vspace{0.5cm}
\begin{array}{c}
\text{ne}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{gari}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{ko}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{tfala-ya}
\end{array}
\vspace{0.5cm}
\begin{array}{c}
\text{h-\text{\varepsilon}i}
\end{array}
\end{array}
\] 

\[
(\uparrow \text{PCASE}) = \text{SUBJ} \\
(\uparrow \text{PCASE}) = \text{OBJ}
\]
One of the objections of this type of analysis is the complexity of the feature copying. Since *ne* attachment is sensitive to the clause aspect and *ko* is sensitive to the specificity of an NP in Urdu (see Chapter 5 for the details), we cannot specify the equations for feature copying in the lexical entry of a predicate. If object agreement were explained in terms of feature copying from a bare NP to an NP with *ne*, we would have to assume that the copying mechanism is associated with clausal aspect and specificity of the object NP. It is unclear how to define such equations.

With respect to the other two patterns ((4.82c, d)), it seems that the mechanism of the LFG’s functional equation cannot construct composite GFS.16

The second objection is that the only motivation for an operation like the feature copying found in Andrews’ analysis of object-predicate agreement is to keep agreement only between a subject and a predicate. The descriptive data, however, suggest that Icelandic allows agreement controller change according to the various syntactic environments including the case marking patterns. In addition, an adjective agrees with its head noun when it is used as an attributive modifier:17

\[
\begin{array}{ll}
\text{gulir} & \text{hestar} \\
\text{yellow.NOM.M.PL} & \text{horses}
\end{array}
\]
4.5. PREVIOUS LFG ANALYSES

‘yellow horses’

b. Þessir hestar erum gulir.  
   these horses are yellow.nom.m.pl  
   ‘These horses are yellow.’

In (4.86a), *gulir* modifies *hestar* and it is the nominative masculine plural form of *gulur* due to the agreement with the head noun *hestar*. In (4.86b), *gulur* is in the same form as (4.86a) by a different reason, i.e. agreement with the subject. The f-structure of (4.86a) is shown in (4.87). To account for those patterns, therefore, we would need additional constraints as in (4.88):

\[
(4.87) \begin{array}{c|c}
\text{PRED} & \text{HESTUR'} \\
\text{NUM} & PL \\
\text{GEND} & M \\
\text{CASE} & NOM \\
\text{ADJ} & \{\text{PRED 'GULUR'}\}
\end{array}
\]

\[
(4.88) \quad \text{gulir} \quad A \quad \{ \quad (\uparrow \text{PRED}) = \text{‘GULUR(SUBJ)’} \\
(\uparrow \text{SUBJ NUM}) = c, PL \\
(\uparrow \text{SUBJ GEND}) = c, M \\
| \quad (\uparrow \text{PRED}) = \text{‘GULUR’} \\
((\text{ADJ} \in \uparrow) \text{ NUM}) = c, PL \\
((\text{ADJ} \in \uparrow) \text{ GEND}) = c, M \\
\}
\]

In addition to the constraints on *subj* we have seen in Andrews’ analysis, (4.88) has equations to require the head noun to have certain values of the agreement features when it is used as an attributive modifier. So, even though we can limit the agreement between *subj* and a predicate by the feature copying, we still need to capture the change of *gf* of the agreement.

\footnote{Alternatively, Butt et al. (1999:107) propose the following PS rule for the XLE (Xerox Linguistics Environment) grammar to capture the agreement between an attributive adjective and a head noun in German:

\[
(i) \quad \text{NP} \rightarrow \text{AP N} \\
\downarrow \in (\uparrow \text{ADJUNCT}) \quad \uparrow = \downarrow \\
(\uparrow \text{GEND}) = (\downarrow \text{GEND}) \\
(\uparrow \text{NUM}) = (\downarrow \text{NUM}) \\
(\uparrow \text{CASE}) = (\downarrow \text{CASE}) \\
(\mu M^* \text{ ADJ-AGR}) = (\mu^* \text{ ADJ-AGR})
\]

The annotations under the AP identify the values of GEND, NUM, CASE and ADJ-AGR (weak/strong adjective distinction in the m-structure) between the NP and the daughter AP. Since the N is the f-structure head of the NP, the agreement features of the N are identified with those of the AP accordingly. The resultant f-structure contains the same attribute-value pairs of agreement features in two places: the one corresponding to the NP and the ADJUNCT. However, linguistically speaking it is implausible to state that the adjective itself has the agreement features identical to those of the head noun.

\footnote{The value change of PRED can be captured by a lexical rule (Lexical Predication Template) (Bresnan 2001:293).}
controller. Therefore, it would be more advantageous if we can propose a way to capture the agreement controller change.

Further, as far as the inflectional morphology of the agreement target is concerned, the $gf$ of the agreement controller is irrelevant. That is, whatever morphological architecture is assumed, e.g. realisational or morpheme-based, the morphology does not need to refer to whether the agreement target is subj or obj. For instance, *gulir* is the nominative plural masculine ‘form’ regardless of its agreement controller (cf. Butt and Sadler 2003). Thus, what the morphology needs to access is only the agreement features.

4.6 Analysis

My analysis differs from Andrews’ in two points. Firstly, I propose a path approach to agreement. Dalrymple (1993) analyses anaphoric binding by introducing off-path constraints. I adopt it to the analysis of agreement. This proposal solves the second problem in the previous section. Secondly, the path approach allows us to remove the composite $gf$, so that the first problem mentioned in the previous section would not arise. I start with a discussion of the status of case feature in Icelandic grammar.

4.6.1 Case

According to Beard’s criterion introduced in Chapter 1, it is clear that the Icelandic grammar requires case features for the inflectional morphology and the syntax. Icelandic has five noun declension classes and the class is identifiable by looking at the endings of genitive singular and nominative plural forms as shown in Table 1 (See Einarsson (1945:47–8) for the complete paradigm of noun inflection). Therefore, if the grammar were not able to refer to case, it would discard the predicatability of the declension classes:20

(4.89) Icelandic noun declensions (Thráinsson 1994:153)

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen</td>
<td>Sg</td>
<td>Pl</td>
<td>Gen</td>
<td>Nom</td>
<td>Gen</td>
<td>Nom</td>
</tr>
<tr>
<td>I</td>
<td>-s</td>
<td>-ar</td>
<td>-ar</td>
<td>-ar</td>
<td>-a</td>
<td>-ar</td>
</tr>
<tr>
<td>II</td>
<td>-ar</td>
<td>-ar</td>
<td>-ir</td>
<td>-s</td>
<td>-a</td>
<td>-ir</td>
</tr>
<tr>
<td>III</td>
<td>-s</td>
<td>-ir</td>
<td>-ar</td>
<td>-ur</td>
<td>-a</td>
<td>-ur</td>
</tr>
<tr>
<td>IV</td>
<td>-ar</td>
<td>-ir</td>
<td>-ur</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>irregular</td>
<td>irregular</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20 Besides, Einarsson (1945:45–7) shows 18 properties predictable from case of noun.
4.6. ANALYSIS

With respect to agreement, we have already looked at the contrast between a subject-predicate agreement in a simplex clause and that in a raising-to-object construction where a predicative adjective/participle changes its form according to which case form the agreement controller is in:

(4.90)  

a. Hún er vinsæl.  
   she.nom is popular.sg.nom  
   ‘She is popular.’

b. Þeir segja hana vinsæla.  
   they.nom say her.acc popular.sg.acc  
   ‘They say she is popular.’

The reason that the lexeme vinsæl takes the form vinsæl in (4.90a) is that its subject is in the third person singular nominative form. On the other hand, it becomes vinsæla in (4.90b) as its subject is in the accusative form. Without assuming that the case feature is associated with each subject NP in (4.90), it would be very difficult to capture this alternation. Thus, the inflectional morphology for adjectives and participles needs to access the case of the agreement controller in Icelandic. The effect of case on agreement is also found between a head noun and adjective modifiers as observed in (4.86a).

Another motivation to postulate case is the fact that many verbs require NPs in a certain case form as their arguments and prepositions also take a certain case form of NP. We have already looked at a number of instances where a verb takes non-canonical NPs. Although the fact that a verb takes a certain form of NP itself does not confirm the status of case — it is not the case that English has case based on the fact that *depend* requires an NP with *on* as its argument, in Icelandic we would lose the generalisation significantly by stating that *batna* requires a subject with -i ending for a masculine class I/III singular strong noun and a subject with -a ending for a masculine weak noun, rather than stating *batna* requires a dat NP subject, for example.

4.6.2 CASE assignment and flat f-structure

The next question is where the case comes from. Although the case feature is a part of nominal inflectional properties, its nature is different from such features as person, number and gender. Those features are inherently associated with a noun itself, but case is a property of NP as it is defined in terms of the NP’s relation to the clause or other NPs (cf. Spencer 2003c). Hence, the theory of case should reflects this property as well as a part of the nominal inflectional feature. In LFG, the phrase structure hierarchy between NP and N is not represented in the f-structure where morphosyntax properties such as case belong to, that is an N and its
mother NP are mapped onto the same f-structure unless a special rule is postulated. There-
therefore, a natural consequence is that the case appears in the same level of f-structure as features like person, number, gender and pred which are properties of an N. It seems that the only way to differentiate case from other nominal features is to assume that a case feature is provided from an external source, not from a noun itself.

Before discussing the source of case, let us consider the status of a noun in a certain case form. According to the above assumption, the dative case form of a noun does not provide \( \langle \text{case, dat} \rangle \). Instead, I assume that it requires \( \langle \text{case, dat} \rangle \) in the f-structure of its mother node (NP). That is, the case requirement is specified by a constraining equation in each case form of a noun. For instance, (4.91) is a partial paradigm of barn ‘child’:

\[
\begin{align*}
\text{barn} & \quad N \quad (\uparrow \text{pred}) = \text{‘child’} & \quad \text{barni} & \quad N \quad (\uparrow \text{pred}) = \text{‘child’} \\
& \quad (\uparrow \text{num}) = \text{sg} & \quad (\uparrow \text{num}) = \text{sg} \\
& \quad (\uparrow \text{pers}) = 3 & \quad (\uparrow \text{pers}) = 3 \\
& \quad (\uparrow \text{gend}) = \text{n} & \quad (\uparrow \text{gend}) = \text{n} \\
& \quad (\uparrow \text{case}) = c. \text{nom} & \quad (\uparrow \text{case}) = c. \text{dat} \\
\text{barns} & \quad N \quad (\uparrow \text{pred}) = \text{‘child’} & \quad \text{börn} & \quad N \quad (\uparrow \text{pred}) = \text{‘child’} \\
& \quad (\uparrow \text{num}) = \text{sg} & \quad (\uparrow \text{num}) = \text{pl} \\
& \quad (\uparrow \text{pers}) = 3 & \quad (\uparrow \text{pers}) = 3 \\
& \quad (\uparrow \text{gend}) = \text{n} & \quad (\uparrow \text{gend}) = \text{n} \\
& \quad (\uparrow \text{case}) = c. \text{gen} & \quad (\uparrow \text{case}) = c. \text{nom}
\end{align*}
\]

This proposal naturally leads to another assumption that wherever case is realised formally within an NP (cf. (4.82)), it simply requires the existence of that case value in the f-structure corresponding to the NP. Thus, even if a language represents genitive case by a form change on a determiner, the determiner itself has \( (\uparrow \text{case}) = c. \text{gen} \), not \( (\uparrow \text{case}) = \text{gen} \).

The standard LFG has two options for assigning case to an NP externally (cf. Andrews 1990:219). One approach is found in Bresnan (1982a) and Neidle (1982). They assume that structural case marking is done by annotating an equation onto an NP of the PS rule. For example, \( (\downarrow \text{case}) = \text{nom} \) is paired with \( (\uparrow \text{subj}) = \downarrow \) and \( (\downarrow \text{case}) = \text{acc} \) is with \( (\uparrow \text{obj}) = \downarrow \), so that a set of equations is annotated to the same NP along the following line:

\[
\begin{align*}
\text{a.} \quad S & \rightarrow \quad \text{NP} \quad \text{VP} \\
& \quad (\uparrow \text{subj}) = \downarrow \quad (\uparrow \text{obj}) = \downarrow \\
& \quad (\downarrow \text{case}) = \text{nom} \quad (\uparrow \text{xcomp}) = \downarrow \\
\text{b.} \quad \text{VP} & \rightarrow \quad \text{V} \quad \text{NP} \quad \text{VP} \\
& \quad \uparrow = \downarrow \quad (\uparrow \text{obj}) = \downarrow \quad (\downarrow \text{case}) = \text{acc} \quad (\uparrow \text{xcomp}) = \downarrow
\end{align*}
\]

However, this approach faces a problem with lexical (or quirky) case assignments. Simple

\footnote{An exception is Andrews and Manning’s (1999) Information Spreading.}
lexical case assignment can be obtained with a minor modification of the annotation. With the following conditional constraints, an NP can get the correct case value:

(4.93) a. \( S \rightarrow NP \rightarrow VP \) 
\[ \begin{align*}
\uparrow \text{subj} &= \downarrow \\
\downarrow \text{case} &= \text{nom} \\
\uparrow \text{pred} &= \text{DSPred} \\
\implies (\downarrow \text{case}) &= \text{DAT}
\end{align*} \]

b. \( VP \rightarrow V \rightarrow NP \rightarrow VP \) 
\[ \begin{align*}
\uparrow \text{obj} &= \downarrow \\
\uparrow \text{xcomp} &= \downarrow \\
\downarrow \text{case} &= \text{acc} \\
\uparrow \text{pred} &= \text{DSPred} \\
\implies (\downarrow \text{case}) &= \text{nom}
\end{align*} \]

Here the DSPred is a meta-value equivalent to the pred values of predicates taking a dative subject. Therefore, it is formalised as DSPred \( \equiv \{ \text{recover-from}(\text{subj, obj}) \} \). The conditional equation under the NP in (4.93a) states that if the f-structure corresponding to an S has a pred value of a predicate requiring a dative subject, then the case value of that NP’s f-structure is dat. If the f-structure of an S does not satisfy that condition, then the first equation applies (Elsewhere Principle), namely the case value is nom. The mechanism is the same in (4.93b). This conditional equation approach works well for a simple lexical/structural case assignment. However, examples like (4.94) are still problematic where the raised subjects are marked by lexical cases by the requirement of the embedded predicate.

(4.94) a. Hana virðist vanta peninga. 
her.acc seems lack money

‘She seems to lack money.’

b. Barninu virðist hafa batnað veikin. 
the.child.dat seems have recovered from the.disease

‘The child seems to have recovered from the disease.’

c. Verkjanna virðist ekki gæta. 
the.pains.gen seems not noticeable

‘The pains don’t seem to be noticeable.’
(4.95) is c-/f-structures of (4.94a). As we have observed in section 4.4, the reason that the matrix subject is in the accusative form *hana* is that the verb *vanta* in the embedded clause requires a subject to be the accusative — note that *virðist* in the matrix clause is not a verb taking an accusative subject. In the c-structure, *hana* is located under the S of the matrix clause, not embedded clause. As a result, (4.93a) wrongly predicts that it would receive *nom* as its case value since the pred value of the f-structure corresponding that S is ‘vîrtur(...),’ not an accusative subject taking verb’s pred.

The other option for case assignment is proposed by Simpson (1983). She assumes that verbs and other predicates directly define the case values of their arguments. Thus, the case is defined in the verb’s f-description as in (∈ OBJ case) = acc. One of the problems of this approach arises in ECM constructions as in (4.96). Since the subj of the embedded clause is identified with the obj of the matrix clause in that construction, i.e. a raising-to-object verb has (∈ XCOMP subj) = (∈ obj), we would expect a case feature clash. For instance, (4.97) is the f-structure for (4.96a):
(4.96) a. Þeir telja hana (vera) vinsæla.
    they.NOM believe her.ACC to be popular.SG.F.ACC
    ‘They believe her to be popular.’

    b. Þeir telja hana (vera) sagða (vera) vinsæla.
    they.NOM believe her.ACC to be said.SG.F.ACC to be popular.SG.F.ACC
    ‘They believe her to be said to be popular.’

(4.97) \[
\begin{array}{c}
\text{PRED} \quad \text{BELIEVE(SUBJ,XCOMP)OBJ} \\
\quad \text{PRED} \quad \text{PRO} \\
\quad \text{NUM} \quad \text{PL} \\
\quad \text{PERS} \quad 3 \\
\quad \text{GEND} \quad \text{N} \\
\quad \text{CASE} \quad \text{NOM} \\
\end{array}
\]

\[
\begin{array}{c}
\text{SUBJ} \\
\text{OBJ} \\
\text{XCOMP} \\
\text{PRED} \quad \text{POPULAR(SUBJ)} \\
\quad \text{PRED} \quad \text{PRO} \\
\quad \text{NUM} \quad \text{SG} \\
\quad \text{PERS} \quad 3 \\
\quad \text{GEND} \quad \text{F} \\
\quad \text{CASE} \quad \text{NOM/ACC} \\
\end{array}
\]

In (4.97), the matrix predicate telja specifies (↑ OBJ CASE) = ACC whereas the embedded predicate vinsæla specifies (↑ SUBJ CASE) = NOM. They must be identical due to the equation (↑ XCOMP SUBJ) = (↑ OBJ) in the lexical entry of telja, so the case value clash occurs where ACC is supposed to be assigned.\(^{22}\)

We may avoid this problem by using a conditional equation with Inside-Out Functional Uncertainty in the lexical entry of a verb. For instance, (↑ SUBJ) ≠ ((XCOMP↑) GF) ⇒ (↑ SUBJ CASE) = NOM makes sure that CASE of the SUBJ is defined as NOM only when the clause is not embedded in a raising sentence. However, specifying whether the clause is embedded in a raising sentence or not in the lexical entry of every verb is undesirable. Besides, the opposite problem is found when the raised NP is in a lexical case form required by the embedded predicate such as (4.94), namely the CASE clash is found where the CASE specified by the embedded predicate, not by the matrix raising predicate, is supposed to be assigned.\(^{23}\)

To sum up, neither a pure PS rule approach nor a pure lexical one can account for the case marking patterns in Icelandic. The solution I propose in this chapter is to combine the two

\(^{22}\)It might be argued that a non-finite verb does not define the CASE of SUBJ, so that the CASE would be specified only by the matrix predicate as ACC. However, the lexical case preservation under raising suggests that both finite and non-finite verbs can assign CASE in Icelandic.

\(^{23}\)One potential solution to those problems is to imitate Sag et al.’s (1992) analysis in hpsg which introduces two types of attribute for case: CASE and dCASE (default case). I do not pursue this line of analysis here.
approaches. That is, quirky case assignments are defined in the lexical entry of verbs whereas structural \textit{nom} and \textit{acc} assignments are defined on the PS rules.

The quirky case specifications are straightforward. Let us start with a list of case marking patterns in Icelandic (I ignore ditransitives) (cf. Yip et al. 1987:288ff):

\begin{equation}
\begin{aligned}
(4.98) & \quad \text{a. Intransitive (subj)} \\
& \quad \text{Nom, Dat, Gen, Acc}
\end{aligned}
\end{equation}

\begin{equation*}
\begin{aligned}
& \quad \text{b. Transitive (subj-obj)} \\
& \quad \text{Nom-Nom (Acc-Nom) (Gen-Nom) Dat-Nom} \\
& \quad \text{Nom-Acc Acc-Acc} \\
& \quad \text{Nom-Dat Acc-Gen} \\
& \quad \text{Nom-Gen (Acc-Gen)}
\end{aligned}
\end{equation*}

The cases in italics are quirky. In intransitives, a subject with the non-nominatives must be lexically specified. In transitives, all the nominative subjects are structural and not specified in the lexical entries. As for accusative objects, Icelandic seems to have a lexical accusative marking on object in addition to a structural one as discussed in section 4.1.2. I do not discuss it in detail here and take them as structural marking. Dative subjects must be lexically specified and the object is always in the nominative. If a subject is the lexical accusative, the object must be the accusative as well except for idiomatic nominative objects and only one Acc-Gen pattern (Yip et al. 1987:230). Genitive subjects are extremely rare. Lexically specified nominative, dative and genitive objects are all found with a structural nominative subject.

According to the case patterns, we can postulate four types of verbs. They constitute of variables of \texttt{pred}, namely each is equivalent to the \texttt{pred} values of that type:

\begin{equation}
\begin{aligned}
(4.99) & \quad \text{a. } \text{DSPred:} \\
& \quad (\uparrow \text{subj case}) = \text{dat} \\
& \quad (\uparrow \text{obj case}) = \text{nom}
\end{aligned}
\end{equation}

\begin{equation*}
\begin{aligned}
& \quad \text{b. } \text{GSPred:} \\
& \quad (\uparrow \text{subj case}) = \text{gen} \\
& \quad (\uparrow \text{obj case}) = \text{nom}
\end{aligned}
\end{equation*}

\begin{equation*}
\begin{aligned}
& \quad \text{c. } \text{ASPred:} \\
& \quad (\uparrow \text{subj case}) = \text{acc}
\end{aligned}
\end{equation*}

\begin{equation*}
\begin{aligned}
& \quad \text{d. } \text{QOPred:} \\
& \quad \{ (\uparrow \text{obj case}) = \text{dat} \mid (\uparrow \text{obj case}) = \text{gen} \mid (\uparrow \text{obj case}) = \text{nom} \}
\end{aligned}
\end{equation*}

\texttt{DSPred (DativeSubjectPredicate)} is a category of predicates that take a dative subject if they are intransitive and a dative subject and a nominative object if they are transitive.\textsuperscript{24} In the same vein, \texttt{GSPred (GenitiveSubjectPredicate)} is a category taking a genitive subject and

\textsuperscript{24} Passivised verbs of some ditransitives are also in this type.
accordingly a nominative object in transitive. ASPred (AccusativeSubjectPredicate) only specifies the case of subj, since acc assignment on obj is not specified in the lexical entry. Finally, QOPred (QuirkyObjectPredicate) is a category of predicates taking quirky objects. Structural nom on subj is not specified. Notice that all the equations are defining rather than constraining unlike Andrews’ case theory. The predicate itself is the source of case, it is not that it requires the existence of case on a noun.

As for the structural nom and acc assignments on subj and obj, what we need to state is the conditions where nom/acc must NOT be assigned due to a predicate taking a quirky subj/obj. One case is simply where the governing pred in the local f-structure requires a quirky subj and/or obj. The second case is that (i) the f-structure corresponding to an NP is in a raising structure and identified with the value of a subj in the embedded xcomp clause and (ii) there is a predicate taking a quirky subj and/or obj in the embedded xcomp clause or even more deeply embedded xcomp clause. To rule out those cases, conditional equations are defined by the annotations on the PS rules as in (4.100):

\[
\begin{align*}
(4.100) & \quad \text{a. } S \rightarrow NP \quad \text{VP} \\
& \quad \quad (\uparrow subj) = \downarrow \\
& \quad \quad \{ \neg [(\uparrow pred)=[DSPred | GSPred | ASPred]] \\
& \quad \quad \quad \quad \neg [(\uparrow subj) = (\uparrow xcomp subj)] \\
& \quad \quad \quad \quad \land (\uparrow xcomp^+ pred)=[DSPred | GSPred | ASPred]] \\
& \quad \quad \Rightarrow (\downarrow case) = \text{nom}
\end{align*}
\]

\[
\begin{align*}
& \quad \text{b. } VP \rightarrow V \quad NP \quad VP \\
& \quad \quad \uparrow = \downarrow \\
& \quad \quad \{ \neg [(\uparrow pred)=[DSPred | GSPred | QOPred]] \\
& \quad \quad \quad \neg [(\uparrow obj) = (\uparrow xcomp subj)] \\
& \quad \quad \quad \land (\uparrow xcomp^+ pred)=[DSPred | QOPred]] \\
& \quad \quad \Rightarrow (\downarrow case) = \text{acc}
\end{align*}
\]

In (4.100), the conditional equation is defined by the negation of the equations. The first negation of the disjunct conditions under the NP in (4.100a) states that a pred whose value is one of the categories requiring a quirky case subject must not exist in the f-structure corresponding to the mother S. If it is true, nom is assigned to the f-structure corresponding to the NP, i.e. (\downarrow case) = nom.

---

25 The same effect can be obtained by assuming an attribute-value pair for the case classes. For instance, if we postulate (c-class, \{datsubj | gensubj | accsubj | quirkobj\}) for each verb, we can refer to verb’s case taking properties by (\uparrow c-class) = datsubj, (\uparrow c-class) = quirkobj and so on.

26 The use of functional IP projections instead of the traditional phrase structures presented here would not affect the arguments in this chapter (cf. Sells 2003:271).

27 Negation is defined as follows (Dalrymple 2001:112):

\[\text{(i) Negation:}\]
\[\text{A negated f-description } \neg d \text{ holds of an f-structure } f \text{ if and only if the description } d \text{ does not hold of } f.\]
The second negation scoping over the conjunction is to stop a raised NP that is assigned a quirky case by the embedded predicate from being assigned nom. The two conjuncts state that (i) the value of subj of an f-structure corresponding an S is equal to the value of xcomp subj, i.e. subject raising structure, and (ii) there is a pred whose value is one of the categories having a quirky case subject. Since the conjunct statement is negated, unless both of those two conditions are satisfied, the f-structure corresponding to the NP has (↓ case) = nom.

The equations under the NP in (4.100b) are very similar. The only differences are the set of pred and the value of gf, namely the categories are pred taking a quirky object and the gf is obj. Thus, (↓ case) = acc applies unless a governing predicate/a predicate in the embedded clause is one taking a quirky case object in a simplex clause or a raising-to-object structure.

Based on the proposed case assignment mechanism, the problematic cases for the pure PS rule-based or pure lexical-based assignments are accounted for. The first one is a raising-to-object sentence where a raised NP receives acc:

(4.101) Þeir telja hana sagða vinsæla.
they.nom believe her.acc said popular
‘They believe her to be said to be popular.’

It is problematic for the pure lexical approach as shown in (4.97), while it is not for the pure PS rule approach. Since the structural nom and acc are defined by the PS rules in my proposal, there is no problem for acc marking on the raised NP. (4.102) is the c-/f-structures:

(4.102)

\[
\begin{aligned}
\text{S} & \quad \uparrow \text{subj} = \downarrow \\
\text{NP} & \quad \uparrow = \downarrow \\
\text{VP} & \quad \uparrow = \downarrow \\
\text{V} & \quad \uparrow = \downarrow \\
\text{NP} & \quad \uparrow = \downarrow \\
\text{VP} & \quad \uparrow = \downarrow \\
\text{V} & \quad \uparrow = \downarrow \\
\text{AP} & \quad \uparrow = \downarrow \\
\text{sagða} & \quad \uparrow = \downarrow \\
\text{vinsæla} &
\end{aligned}
\]

---

28 Kleene plus (\+) means “at least one.”
29 A potential problem is a treatment of the embedded subj in an anaphoric control structure such as (4.46) where the subj appears to have (case, nom) though it lacks a corresponding NP in the c-structure. The allowance of case attraction may suggests that the status of nom is less conclusive. I leave this issue open.
In the f-structure, the obj of the matrix clause is identical to the subj of the first xcomp due to the object raising verb telja, i.e. it specifies (↑ obj) = (↑ xcomp subj). Further, that subj is identified with the subj of the second xcomp because the predicate of the first xcomp is a subject raising verb sagða, namely it has (↑ subj) = (↑ xcomp subj). As a result, the f-structure of the matrix obj functions as subj in the two embedded clauses. Still, the case value of this f-structure is specified as acc, that is no clash occurs between acc and nom, since nom and acc are defined in the PS rules and the NP corresponding to this f-structure only appears under the topmost VP. Therefore, according to (4.100b), the f-structure’s case value is specified as acc.

The second example is the cases where a quirky NP is raised to the matrix subject or object retaining its case:

(4.103) a. Barninu er talin sógð hafa batnað veikin.
the.child.dat is believed said to have recovered from the.disease.nom
‘The child is believe to be said to have recovered from the disease.’

b. Þeir telja barninu sagða hafa batnað veikin.
they.nom believe the.child.dat said to have recovered from the.disease.nom
‘They believe the child to have recovered from the disease.’

As shown in (4.94) and (4.95), those are problematic for a pure PS rule approach as well. Again, my proposal can explain the case preservation. The followings are the c-/f-structures for (4.103):
(4.104) a. 

```
(↑ SUBJ) = ↓
NP
barninu
↑ = ↓
AUX
er
↑ = ↓ (↑ XCOMP) = ↓
V
V
talin
↑ = ↓ (↑ XCOMP) = ↓
V
V
sögð
↑ = ↓ (↑ OBJ) = ↓
V
NP
batnæð
veikin
```

b. 

```
(↑ SUBJ) = ↓
NP
peir
↑ = ↓ (↑ OBJ) = ↓ (↑ XCOMP) = ↓
V
V
telja
barninu
↑ = ↓ (↑ XCOMP) = ↓
V
V
sagða
↑ = ↓ (↑ OBJ) = ↓
V
NP
batnæð
veikin
```
(4.104a) involves two subject raising verbs, namely a passive verb *talin* and *sögð*. Thus, the *subj* in the outmost f-structure is also the *subj* of the two embedded *xcomps*. However, the *case* is specified by the predicate of the most deeply embedded *xcomp*, i.e. *batnад*. In my proposal, a quirky *case* is lexically defined, that is *batnад* has (↑ subj *case*) = dat and (↑ *obj case*) = nom. Therefore, the *subj* of the second *xcomp* has ⟨*case*, dat⟩ and it is the same for the *subjs* of the two higher f-structures. Although the *np* corresponding to the *subj* of the outmost f-structure is placed under the S, (↓ *case*) = nom does not apply. This is due to the second equation of the disjunction in (4.100a), i.e. the structure satisfies the two conditions in the negation as highlighted by bold faces. The *np* corresponding to the *obj* of the second *xcomp* is under the VP. But again due to the first equation of the disjunction in (4.100b), which prohibits the existence of the predicate taking a quirky object in the local f-structure, (↓ *case*) = acc does not apply.

In sum, the proposed *case* theory correctly specifies both lexical and structural *case* onto an f-structure of an *np* even in the structures involving raising. Since a head noun of an *np* has a constraining equation for *case*, it can only appear under the *np* whose f-structure satisfies the requirements. Most importantly, the *gfs* no longer have layered structures. Thus, the next task is to account for the agreement patterns without resort to composite *gfs*.
4.6.3 Agreement path

As pointed out in section 4.5.4, LFG’s view of agreement is that an agreement target constrains or co-specifieds the features of the agreement controller and it is formulated as constraining or defining equations in the target’s f-description. According to the constraining equation approach, English verb *runs*, for example, has the following f-description:

\[(4.105) \quad \text{runs} \quad V \quad (\uparrow \text{pred}) = \langle \text{run} (\text{subj}) \rangle \]
\[\quad (\uparrow \text{tense}) = \text{pres} \]
\[\quad (\uparrow \text{subj pers}) = c \quad 3 \]
\[\quad (\uparrow \text{subj num}) = c \quad \text{sg} \]

If a non third singular subject appears with *run*, it does not satisfy the requirements, that is it violates the constraints. Therefore, it would be ungrammatical.

Although this approach works well in simple cases, I have already pointed out the problems for treating more complex patterns of agreement and in the inflectional morphology of the target. Here, I make some modifications to this approach. Firstly, I propose the following lexical entry of *runs*:

\[(4.106) \quad \text{runs} \quad V \quad (\uparrow \text{pred}) = \langle \text{run} (\text{subj}) \rangle \]
\[\quad (\uparrow \text{tense}) = \text{pres} \]
\[\quad (\uparrow \text{PAgrPath}) = \%\text{AGR} \]
\[\quad (\%\text{AGR pers}) = c \quad 3 \]
\[\quad (\%\text{AGR num}) = c \quad \text{sg} \]

In (4.106), a path to the agreement controller named PAgRPath (Predicative Agreement Path) is introduced. It is given the local name \%AGR (Kaplan and Maxwell 1996:89), so that whatever the PAgRPath is equated to, the constraining equations refer to the same controller’s gf. The way that PAgRPath is specified is similar to Dalrymple’s (1993, 2001) analyses of anaphoric binding and long-distance dependencies. In English, the subject is the only target of the predicative agreement, so the following path must be postulated:

\[(4.107) \quad \text{English PAgRPath:} \quad \text{subj} \]

(4.107) means that subj is the only gf for a predicate to agree with. Hence, PAgRPath in (4.106) is equated to subj, i.e. \((\uparrow \text{subj}) = \%\text{AGR} \). In effect, the two constraining equations require the subj to have \(\langle \text{pers}, 3 \rangle \) and \(\langle \text{num}, \text{sg} \rangle \).

The situation is more complicated in Icelandic as summarised in section 4.4. But the basic idea is unchanged. I propose the following schematic lexical entries for verbs and adjectives:
The agreement controller of a verb and a predicative use of adjective is represented as variable PAGrPath. In addition, I postulate AAGrPath (Attributive Agreement Path) for the attributive use of adjectives. Each is given the local name %agr. In the same way as in (4.106), the local name is attached to the attributes of the agreement features, i.e. pers and num in a verb and num, gend and case in an adjective. Therefore, the inflectional morphology only refers to those agreement features such as (%agr pers) and (%agr num), so that it properly specifies the third person singular form of a verb, for instance, without resort to the gf of the agreement controller. In the rest of the chapter, I will discuss what gf is allowed as PAGrPath and AAGrPath in Icelandic.

4.6.3.1 Subject agreement

The default agreement controller in Icelandic is subj. As shown in (4.39) and (4.40) (repeated here as (4.109)), when a subject is not marked by a lexical case, the predicate always agrees with that subject:

\[(4.109)\]
\[
a. \text{Við látum bókina.} \quad \text{we.nom read.1.pl the.book.acc} \\
\quad \text{‘We read the book.’}
\]
\[
b. \text{Stelpurnar voru duglegar.} \quad \text{the.girls.nom were efficient.nom.f.pl} \\
\quad \text{‘The girls were efficient.’}
\]

In my flat f-structure analysis, it means that when the local subj has \(\langle \text{case, nom} \rangle\), PAGrPath of the governing predicate is substituted for by subj. (4.110) is the f-structures for (4.109):
The constraints for a path to subj is stated by off-path constraints introduced in Chapter 1 (repeated here as (4.111)) (Dalrymple 2001:151):

(4.111) Off-path constraints:
In an expression like $\langle \rightarrow a \rangle$, $\leftarrow$ refers to the f-structure of which $a$ is an attribute.
In an expression like $\langle \rightarrow a \rangle$, $\rightarrow$ refers to the value of the attribute $a$.

The off-path constraints are used to state constraints on an f-structure attribute by referring to another attribute or value in the f-structure. Therefore, to describe the condition where the agreement controller becomes subj, we need the following statement:

(4.112) Icelandic PAgrPath (first approximation):

\[
\text{SUBJ} = \langle \rightarrow \text{CASE} \rangle = \text{NOM}
\]

$\rightarrow$ corresponds to $f_1$ and $f_2$ in (4.110a, b) respectively. Since $f_1$ and $f_2$ takes $\langle \text{CASE}, \text{Nom} \rangle$ as their values, they satisfy the constraint in (4.112). Hence, the PAgrPath is specified as subj.

However, we have observed that there is a case where a predicate agrees with an accusative NP when it is placed in the object position in the matrix clause of a raising-to-object sentence. I repeat the example:

(4.113) Peir telja hana vinsæla.
they.NOM believe her.ACC popular.SG.F.ACC
‘They believe her to be popular.’
(4.114) PRED 'BELIEVE(SUBJ,XCOMP)OBJ'

\[
\begin{array}{c}
\text{PRED 'PRO'} \\
\text{NUM PL} \\
\text{PERS 3} \\
\text{GEND N} \\
\text{CASE NOM}
\end{array}
\]

\[
\begin{array}{c}
\text{SUBJ} \\
\text{OBJ} \\
\text{XCOMP}
\end{array}
\]

\[
\begin{array}{c}
\text{PRED 'POPULAR(SUBJ)'} \\
\text{PRED 'PRO'} \\
\text{NUM SG} \\
\text{PERS 3} \\
\text{GEND F} \\
\text{CASE ACC}
\end{array}
\]

\[f_1 \quad f_2\]

Since the matrix predicate is the object raising verb *telja*, it identifies its OBJ with the embedded SUBJ, namely \(\uparrow \text{xcomp SUBJ} = \uparrow \text{OBJ}\). Hence, as shown by the functional control in (4.114), the f-structure corresponding to *hana* functions as the OBJ of the main clause and the SUBJ of the embedded XCOMP clause. \(\langle \text{case}, \text{acc} \rangle\) is assigned to that f-structure by the PS rule (4.100b). Thus, within the XCOMP, the SUBJ has ACC as its case value and the predicate agrees with that SUBJ. Crucially, a predicate does not agree with an accusative subject if \(\langle \text{case}, \text{acc} \rangle\) is assigned lexically such as a subject of *vanta* ‘lack’. So, we need to exclude that case. The following is the formulation:

(4.115) Icelandic PAGRPath (second approximation):

\[
\begin{align*}
\text{SUBJ} & : \\
\ (\rightarrow \text{case}) = \text{nom} & \\
\ (\rightarrow \text{case}) = \text{acc} & \\
\neg[(\leftarrow \text{pred}) = \text{ASPred}] &
\end{align*}
\]

The second off-path constraints in the disjunction state that if the SUBJ has \(\langle \text{case}, \text{acc} \rangle\) and the PRED value of the governing predicate is not a member of ASPred, then the agreement target becomes that SUBJ. In (4.114), for instance, \(\rightarrow\) refers to \(f_2\) and \(\leftarrow\) to \(f_1\). \(f_2\) has \(\langle \text{case}, \text{acc} \rangle\) and the PRED value of \(f_1\), ‘POPULAR(SUBJ,OBJ)’, is not a member of ASPred. Therefore, the two constraints are satisfied and the local SUBJ is selected as the controller of the agreement.

Under those SUBJ agreement contexts, *lásum* in (4.109a) and *vinsela* in (4.113) are paired with the following f-descriptions. Both of them place the constraining equations onto the agreement features of SUBJ due to \(\uparrow \text{SUBJ} = \%\text{AGR}\).
One of the intriguing properties in Icelandic agreement is that it allows object agreement when the case frame is DAT-NOM. Andrews analyses this pattern as a copying of the agreement features from the OBJ to the first layer of the composite SUBJ. In my approach, this is explained by setting PAgrPath to OBJ under this particular case frame. I repeat the example as (4.117) with the f-structure (4.118):

(4.117) Henni leiddust strákarnir.
her.DAT bored.3.PL the.boys.NOM
‘She found the boys boring.’

(4.118) \[
\begin{array}{c}
\text{PRED 'BORED-OF(SUBJ,OBJ)'} \\
\text{PRED 'PRO'} \\
\text{NUM SG} \\
\text{PERS 3} \\
\text{GEND F} \\
\text{CASE DAT} \\
\end{array}
\]

According to the f-structure, what we need to state is the existence of the two case values in SUBJ and OBJ. Thus, the PAgrPath must be revised as follows:

(4.116) a. lásum V (↑PRED) = 'READ(SUBJ,OBJ)'
(↑TENSE) = PAST
(↑SUBJ) = %AGR
(%AGR NUM) = c PL
(%AGR PERS) = c 1

b. vinsæla A (↑PRED) = 'POPULAR(SUBJ)'
(↑SUBJ) = %AGR
(%AGR NUM) = c SG
(%AGR GEND) = c F
(%AGR CASE) = c ACC

4.6.3.2 Object agreement
Icelandic PAgrPath (third approximation):

\[
\{ \\
\text{SUBJ} & | \text{OBJ} \\
(\rightarrow \text{CASE}) = \text{NOM} & (\leftrightarrow \text{SUBJ CASE}) = \text{DAT} \\
(\rightarrow \text{CASE}) = \text{ACC} & (\rightarrow \text{CASE}) = \text{NOM} \\
-[(\leftrightarrow \text{PRED}) = \text{ASPRED}] & \\
\}
\]

The off-path constraints under the obj state that an f-structure taking an obj as its value must have a subj that contains (case, dat). (\rightarrow \text{CASE}) = \text{NOM} under the obj requires that (case, nom) within the obj.\textsuperscript{30} In (4.118), \(f_1\) corresponds to \(\leftarrow\) and \(f_2\) to \(\rightarrow\) and both have case features required by (4.119).

Although (4.119) accounts for simple object agreement, there is another interesting object agreement pattern in Icelandic as illustrated in (4.50) (repeated as (4.120a)). In (4.120a), honum placed in the subject position of the matrix clause is also the subject of gefnir, which is the dative case assigner, in the embedded clause. The agreement between gefnir and the nominative object peningarnir is predicted by (4.119). (4.120a), however, shows that the matrix verb taldir agrees with the embedded object as well. This point become clearer in contrast with the cases where a dative NP is positioned in an object position of a matrix clause as in (4.120b). In that case, since the matrix subject is in the nominative, the matrix predicate telja agrees with that nominative subject, rather than the embedded object. (4.121) is the f-structure for (4.120a):

\[
(4.120) \quad \begin{aligned}
\text{a. Honum eru taldir hafa verið gefnir} \\
\text{him.DAT are.PL thought.NOM.M.PL have been given.NOM.M.PL} \\
\text{peningarnir.} \\
\text{the.money.NOM.M.PL}
\end{aligned}
\]

‘He is thought to have been given the money.’

\[
\begin{aligned}
\text{b. Þeir telja barninu hafa batnað veikin.} \\
\text{they.NOM believe.3.PL the.child.DAT to have recovered from the.disease.NOM}
\end{aligned}
\]

‘They believe the child to have recovered from the disease.’

\textsuperscript{30}This constraint may not be necessary since a predicate taking a dative subject always requires a nominative object. The same effect can be obtained by annotating \((\leftrightarrow \text{PRED}) = \text{DSPRED}\), which essentially states the same constraints as in (4.119).
To account for this pattern, Icelandic PAGrPATH must be allowed to extend the path to a deeply embedded xcomp’s obj. (4.122) is the revised formulation:

(4.122) Icelandic PAGrPATH (final version):

\[
\begin{align*}
\text{(subj)} & \quad \text{(xcomp*)} & \quad \text{(obj)} \\
\{ & \quad \{ & \quad \{ \\
(\rightarrow \text{case}) = \text{nom} & \quad (\leftarrow \text{subj case}) = \text{dat} & \quad (\leftarrow \text{subj case}) = \text{dat} \\
(\rightarrow \text{case}) = \text{acc} & \quad (\leftarrow \text{subj case}) = \text{dat} & \quad (\rightarrow \text{case}) = \text{nom} \\
\neg[(\leftarrow \text{pred}) = \text{ASPred}] & \quad & \quad
\end{align*}
\]

Notice that multiple xcomps are added in the path.\(^{31}\) \(\leftarrow \text{subj case}) = \text{dat}\) under xcomp* prohibits a matrix predicate from incorrectly agreeing with an embedded object when a nominative subject exists in the matrix clause as in (4.120b). In (4.121), \(f_1\) is the f-structure corresponding to \(< \) under the xcomp, \(f_2\) and \(f_3\) correspond to \(< \) and \(\rightarrow \) under the obj respectively. The f-structures contain the required values for case, so the matrix predicate obtains the path xcomp obj to agree with the embedded nominative object.

The reason that the path allows any number of xcomp is that technically a sentence can have a number of subject raising verbs between a dative subject and a nominative object. I repeated the example as (4.123):

(4.123) Barninur talin sögð hafa batnað veikin.

‘The child is believed to have recovered from the disease.’

\(^{31}\)Kleene star (*) means “any number” (including null).
The subject barninu is given ⟨case, dat⟩ by the most deeply embedded verb veikin. The two subject raising verbs, excluding er and hafa, are positioned between the dative subject and the nominative object and they agree with the embedded nominative object. For talin to reach the agreement controller, its PAGrPATH must be xcomp xcomp obj (see (4.104a) for the f-structure). Thus, we need xcomp* in the path.

The remaining patterns are the rather idiosyncratic cases found in (4.47) and (4.58). With regard to the former, it is unclear which θ the complement is mapped onto in the f-structure. If we assume that it is an obj, we only need to add idiosyncratic lexical information of þad and þetta under the obj in (4.122), e.g. (← subj pred) = ‘pro’, (← subj pers) = 3 and so on. As for the latter, we might be able to argue that the controller of long-distant agreement can be subj as well as obj. However, the fact that only the default form is available for some speakers suggests that it is another instance of case attraction. Thus, I do not try to incorporate those two idiosyncratic patterns in the PAgrPATH in the current study.

(4.122) is the final version of the Icelandic PAgrPATH. Icelandic allows either subject-predicate or object-predicate agreement. The agreement target of the latter can be deeply embedded. The syntactic environments of each agreement are properly stated by off-path constraints. I shall discuss the non-agreement pattern in the next section.

4.6.3.3 Default form

As shown in (4.41), (4.42) and (4.69), Icelandic also allows non-agreement in addition to the patterns we have analysed so far. I repeat them here as (4.124):

\[ (4.124) \]

a. Strákunum leiddist. the.boys.dat.m.pl bored.dft
‘The boys were bored.’

b. Strákunum var ilt. the.boys.dat.m.pl was.dft bad.dft
‘The boys were bad.’

c. Gluggunum var lokað. the.windows.dat.m.pl was.dft closed.dft
‘The windows were closed.’

d. Drengina vantart mat. the.boys.acc lack.dft food.acc
‘The boys lacks food.’

Leiddist, ilt, lokað and vantart are all in the default forms due to the lexical dative and accusative subjects. Those default forms are identical to the third singular in verbs and the singular nominative neuter in adjective/participles.
In my proposal, the appearance of the default forms in the above contexts is naturally captured. Firstly, I assume that the default form of a predicate lacks constraining equations to the agreement controller. Hence, for the lexeme illur ‘bad’, the followings are the partial paradigmatic entries — notice that the constraining equations for agreement are not stated in the default form (4.125d):

\[(4.125)\]

a. illur
\[\begin{align*}
\text{(↑ pred)} & = \{\text{‘bad’ | ‘bad(subj)’}\} \\
(\text{↑ PAgRPath}) & = \%\text{agr} \mid (\text{AAgrPath ↑}) = \%\text{agr} \\
(\%\text{agr num}) & = c \text{ sg} \\
(\%\text{agr gend}) & = c \text{ m} \\
(\%\text{agr case}) & = c \text{ nom}
\end{align*}\]

b. illri
\[\begin{align*}
\text{(↑ pred)} & = \{\text{‘bad’ | ‘bad(subj)’}\} \\
(\text{↑ PAgRPath}) & = \%\text{agr} \mid (\text{AAgrPath ↑}) = \%\text{agr} \\
(\%\text{agr num}) & = c \text{ pl} \\
(\%\text{agr gend}) & = c \text{ f} \\
(\%\text{agr case}) & = c \text{ dat}
\end{align*}\]

c. illa
\[\begin{align*}
\text{(↑ pred)} & = \{\text{‘bad’ | ‘bad(subj)’}\} \\
(\text{↑ PAgRPath}) & = \%\text{agr} \mid (\text{AAgrPath ↑}) = \%\text{agr} \\
(\%\text{agr num}) & = c \text{ pl} \\
(\%\text{agr gend}) & = c \text{ m} \\
(\%\text{agr case}) & = c \text{ acc}
\end{align*}\]

d. illt
\[\begin{align*}
\text{(↑ pred)} & = \{\text{‘bad’ | ‘bad(subj)’}\}
\end{align*}\]

Secondly, when none of the conditions specified in (4.122) is satisfied, the PAgRPath does not take any path. This is the case of the syntactic environments which requires the default form of a predicate. In (4.124b), for instance, although the subj has ⟨case, dat⟩, the f-structure lacks an obj. Therefore, the PAgRPath cannot be obj. Similarly, in (4.124d), the subj has ⟨case, acc⟩, but the pred is a category ASPred, namely the acc is assigned lexically, so again the PAgRPath cannot be subj.

As a result of those assumptions, the only lexical entry in (4.125) that can appear in the environment (4.124b) is illt since it does not have any requirement for the agreement features. Following Andrews (1982) or more general assumptions of Word-and-Paradigm model of morphology, I assume that only the most narrowly matched entry can appear in the syntax, which stops the default form from appearing with any type of argument NP.

4.6.3.4 Attributive adjective and secondary predication

Finally, I discuss the agreement found in secondary predication. To this end, I start with a discussion on agreement in an attributive use of adjectives. As illustrated in (4.86), an adjective agrees with its head noun in number, gender and case when it is used as an attributive
modifier. Therefore, *gulir* is in the nominative masculine plural form due to the agreement with *hestar* in (4.126a). (4.126b) is the f-structure of this NP.

(4.126)  a. gulir  hestar yellow.nom.m.pl horses
        'yellow horses'

          \[ \begin{array}{|c|c|c|}
          \hline
          \text{PRED} & \text{HORSE}' \\
          \text{NUM} & \text{PL} \\
          \text{GEND} & \text{M} \\
          \text{CASE} & \text{NOM} \\
          \text{ADJ} & \{\text{PRED 'YELLOW'}\} \\
          \hline
        \end{array} \]

        \( f_1 \)

The mechanism that allows the path to be specified for agreement with a head noun is already stated in (4.108b). An adjective has another path \text{AAPath} in its lexical entry and it is equated as \((\text{AAPath} \uparrow) = \%\text{AGR} \). I propose the following path for Icelandic \text{AAPath}:

(4.127)  Icelandic \text{AAPath}:

\[
\text{ADJ} \in
\]

According to this path specification, *gulir* is paired with the following f-description:

(4.128)  \( \text{gulir} \ A \ (\uparrow \text{PRED}) = \text{'YELLOW'} \)

\( \text{(ADJ} \in \uparrow) = \%\text{AGR} \)

\( \text{(\%AGR NUM)} = _c \text{PL} \)

\( \text{(%AGR GEND)} = _c \text{M} \)

\( \text{(\%AGR CASE)} = _c \text{NOM} \)

Since the inside-out path (\text{ADJ} \in \uparrow) refers to the f-structure containing \text{ADJ} as its value, it is the f-structure corresponding the whole NP in (4.126b), i.e. \( f_1 \).

An interesting consequence of this approach is its relation to secondary predication. We have looked at the cases where a secondary predicate agrees with an NP with lexical case marking ((4.45) and (4.74) are repeated as (4.129) here):

(4.129)  a. Strákunum verður kalt svona fáklæddum.
        the.boys.dat will be cold.dat so few clothed.dat.pl
        'The boys will freeze, so scantily dressed.'

        b. Lögreglan lýsti glæpamönnum sem stórhaettulegum.
        the.police described the.criminals.dat.pl as very dangerous.dat.pl
        'The police described the criminals as extremely dangerous.'

        c. Glæpamönnum var lýst sem stórhaettulegum.
        the.criminals.dat.pl was.sg described.sg as very dangerous.dat.pl
        'The criminals were described as extremely dangerous.'
Andrews (1982) argues that each sentence involves an \textit{xcomp} to which the secondary predicate is mapped. He allows the \textit{subj} of the \textit{xcomp} to be identified with the second layer of the matrix \textit{subj}. For instance, he claims that \textit{lýsti} has the equation \((\uparrow \text{xcomp subj}) = (\uparrow \text{obj dat})\) in its f-description as in (4.75). It is clearly inconsistent with his analysis of the other constructions involving an \textit{xcomp} where a \textit{subj} of an \textit{xcomp} is always identified with the whole composite \textit{gf}. Further, the agreement target of a secondary predicate is not necessarily marked by a lexical case, that is the agreement controller can be a non-composite/single layer \textit{gf}. There is no motivation to expect the identification to the second layer of the composite \textit{gf} only in sentences like (4.129). A more serious problem is that it is doubtful that a secondary predicate in a sentence like (4.129a) is specified as \textit{xcomp} in the lexical entry of a matrix predicate. To make Andrews’ proposal work, we would ought to assume that \textit{kalt} ‘cold’ has a \textit{pred} value ‘\text{FREEZE}(\text{subj dat},\text{xcomp})’ and equation \((\uparrow \text{xcomp subj}) = (\uparrow \text{subj dat})\). This does not seem to be a sound assumption considering the argument structure of the predicate.\(^{32}\) Therefore, I reject the assumption that a kind of secondary predications in Icelandic found in (4.129) involves an \textit{xcomp}.

I assume that seemingly secondary predicates in (4.129) are actually modifiers of nouns. Therefore, the agreement pattern is the same type as the one between a head noun and a modifier. One piece of suggestive evidence of this assumption is found in (4.130) and (4.131) (Andrews 1982:449):

\begin{enumerate}
\item[(4.130)]
\begin{enumerate}
\item a. \textit{Ég vil hann dauðan.}
\textit{I.nom want him.acc dead.sg.m.acc}
‘I want him to be dead.’
\item b. * \textit{Ég vil hann vera dauðan}
\textit{I.nom want him.acc to be dead.sg.m.acc}
\end{enumerate}
\item[(4.131)]
\begin{enumerate}
\item a. \textit{Við kusum Höskuld skipstjóra.}
\textit{We.nom chose Höskuldur.acc captain.sg.m.acc}
‘We chose Höskuldur as a captain.’
\item b. * \textit{Við kusum Höskuld vera skipstjóra.}
\textit{We.nom chose Höskuldur.acc to be captain.sg.m.acc}
\end{enumerate}
\end{enumerate}

(4.130) illustrates that the agreement between adjective \textit{dauðan} and pronoun \textit{hann} is available only if \textit{dauðan} appears without non-finite copula \textit{vera}. Similarly, in (4.131) the agreement between the two nouns, \textit{skipstjóra} and \textit{Höskuld}, is only found without \textit{vera}.\(^{33}\) Those ex-

\(^{32}\)If the f-structure corresponding to the secondary predicate is \textit{xadj}, we could propose that \((\uparrow \text{xadj subj}) = (\uparrow \text{subj dat})\) in the f-description of \textit{kalt}. However, it is conceptually implausible to regulate the functional identification of a non-term \textit{gf}.

\(^{33}\)Andrews (1982) attributes those differences in grammaticality to the \textit{acompl}/\textit{xcomp} and \textit{vcomp} distinction. Those categorial distinctions of open complements are abandoned in the current \textit{lfg}, although technically we could refer to a syntactic category in the c-structure from the corresponding f-structure by \(\Phi^{-1}\) and \(\Lambda\).
amples suggest that the relation between dauðan and hann in (4.130a) does not seem to be clausal.

I propose that dauðan in (4.130) and skipstjóra in (4.131) are a kind of dislocated modifiers of hann and Höskuld, so they are mapped onto inside of the f-structure corresponding to the NPs. Thus, (4.129a) has the following f-structure:

\[
\begin{array}{c}
\text{PRED} '\text{BOY}' \\
\text{NUM} \quad \text{PL} \\
\text{PERS} \quad 3 \\
\text{GEN} \quad \text{M} \\
\text{CASE} \quad \text{DAT} \\
\text{ADJ} \{\text{PRED} '\text{FEW}-\text{CLOTHED}'\}
\end{array}
\]

Since how NP-internal grammatical relations are represented is an under-studied area in LFG, the only plausible option for the gf of the dislocated modifier is \textit{adjunct}. Although it is feasible to postulate a new \textit{gf} to describe various types of NP-internal modifying relations, it is beyond the scope of the current study. So, I provisionally assume that fáklæddum is mapped onto \textit{adjunct} in (4.132). If we introduce a new \textit{gf}, it would be added to the path of \textit{AA\textsc{g}r\textsc{p}ath}. The crucial point is that the agreement found in (4.129) can be explained in terms of \textit{AA\textsc{g}r\textsc{p}ath} and the constraining equations on the agreement features. This treatment gives us a unified account of clausal and NP internal agreement.

### 4.7 Summary

This chapter advocates two points. The first one is a rejection of a mechanism like composite \textit{gf} in LFG to account for the Icelandic data. The second point is the proposal of a new approach to agreement in LFG. I have proposed the \textit{case} theory which not only can capture the diverse case marking patterns in Icelandic, but also reflects the properties of \textit{case}. The complex agreement is explained by the path approach. It reflects the fact that the agreement is sensitive to \textit{case} in Icelandic. The path approach yields the unified account for an NP internal agreement as well. Moreover, it allows us to maintain the standard flat \textit{gf} in the f-structure. It also provide a clear advantage for the inflectional morphology. Most importantly, both the \textit{case} assignment mechanism and the path approach proposed in this chapter are general theories and applicable to other languages which will give us the same advantages as we have observed in Icelandic.
Chapter 5

Case and Postposition in Hindi-Urdu

Hindi-Urdu have a set of postpositional elements whose functions are primarily encoding grammatical relations of marked NPs as well as other syntactic and semantic properties. Based on the assumption that case is formal marking to distinguish one dependent from the others in a clause, those postpositions are often referred to as case markers such as ergative, accusative, dative and instrumental. In this chapter, however, I shall argue that there is no empirical ground to support the assumption that those postpositional formatives introduce case features to the Hindi-Urdu grammar. Instead, they are simply formal signals of various syntactic and semantic features. Further, I claim that according to the discussion we have made so far, the real case is introduced as a part of nominal inflectional properties which also plays a crucial role in agreement. I shall present how those two points can be formalised under the theoretical proposals the current thesis advocates.

This chapter is organised as follows. In section 5.1, the nominal inflectional patterns in Hindi-Urdu are summarised. Section 5.2 presents various uses of postpositional elements. I shall discuss the phrase structural properties of postpositional elements in section 5.3. Section 5.4 is devoted to the description of agreement in the language including the basis of verbal inflection. I summarise the proposal found in Butt and King (2004) and point out some difficulties in section 5.5. Section 5.6 presents an alternative analysis based on the current theoretical architecture.

5.1 Nominal inflection

Hindi-Urdu nouns inflect for number, gender and case: the number is either singular or plural; the gender is either masculine or feminine; and the case is either direct, oblique or vocative. The masculine nouns are divided into ā-ending group and non ā-ending group according

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to their inflectional patterns, while the feminine nouns are divided into ō/iyā-ending and the others. (5.1) and (5.2) show inflectional patterns of each gender (McGregor 1995:1–3, Schmidt 1999:1–12). If the masculine singular direct form ends in ā, the singular oblique and the plural direct are identical as in (5.1a). In the other endings of masculine nouns, the singular direct, the singular oblique and the plural direct are all identical as illustrated in (5.1b). In both groups, -ō is added to the stem in the plural oblique. But if the stem ends in a long vowel ū, it is shortened into ū before the suffix (hindū → hinduō ‘Hindu’); and if the stem ends in ū, the suffix attaches to the shortened ū followed by the semi-vocalic glide y (ādmi → ādmiyō ‘man’). The singular vocative is always identical to the singular oblique, while the plural vocative is identical to the plural oblique without the nasalisation of the ending.1

(5.1) a. Masculine ā-ending: kamrā ‘room’

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
<th>Vocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>kamrā</td>
<td>kamre</td>
<td>kamre</td>
</tr>
<tr>
<td>Pl</td>
<td>kamre</td>
<td>kamrō</td>
<td>kamro</td>
</tr>
</tbody>
</table>

b. Masculine non ā-ending: din ‘day’

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
<th>Vocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>din</td>
<td>din</td>
<td>din</td>
</tr>
<tr>
<td>Pl</td>
<td>din</td>
<td>dinō</td>
<td>dino</td>
</tr>
</tbody>
</table>

In feminine nouns, the direct and the oblique forms are always identical in the singular. The plural oblique and the vocative formations are the same as the masculine nouns, so are the vowel shortening and the glide insertion:

(5.2) a. Feminine ū-ending: laṛkī ‘girl’

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
<th>Vocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>laṛkī</td>
<td>laṛkī</td>
<td>laṛkī</td>
</tr>
<tr>
<td>Pl</td>
<td>laṛkiyō</td>
<td>laṛkiyō</td>
<td>laṛkiyo</td>
</tr>
</tbody>
</table>

b. Feminine iyā-ending: ciriyyā ‘bird’

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
<th>Vocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>ciriyyā</td>
<td>ciriyyā</td>
<td>ciriyyā</td>
</tr>
<tr>
<td>Pl</td>
<td>ciriyyō</td>
<td>ciriyyō</td>
<td>ciriyo</td>
</tr>
</tbody>
</table>

c. Other endings: mez ‘table’

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
<th>Vocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sg</td>
<td>mez</td>
<td>mez</td>
<td>mez</td>
</tr>
<tr>
<td>Pl</td>
<td>mezō</td>
<td>mezō</td>
<td>mezo</td>
</tr>
</tbody>
</table>

There are also a set of pronouns. Pronouns do not exhibit the gender distinction. That is, there is no formal distinction between ‘he’ and ‘she’, though it is often indicated by the

---

1Since the descriptive grammars of Hindi and Urdu show differences in some part of transcriptions, basically I follow their traditions. The high-mid vowels and low-mid vowels are distinguished as ‘e, o’ and ‘ai, au’ in Hindi examples, but may not be in Urdu ones.
verbal agreement. Pronouns also show the morphological case distinction between direct and oblique. The third person further distinguishes distance to the referent. The proximate form is used only when the referent is present. Since the third person pronouns are used as demonstratives as well, the proximate and the distant correspond to ‘this/these’ and ‘that/those’ respectively. (5.3) is the inflectional paradigm of pronouns (McGregor 1995:12, Schmidt 1999:15–18):

\[(5.3)\]

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Oblique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sg</td>
<td>māï</td>
<td>mujh</td>
</tr>
<tr>
<td></td>
<td>ham</td>
<td>ham</td>
</tr>
<tr>
<td>2 Sg</td>
<td>tū</td>
<td>tujh</td>
</tr>
<tr>
<td></td>
<td>tum</td>
<td>tum</td>
</tr>
<tr>
<td>3 Sg</td>
<td>vah/vo</td>
<td>us</td>
</tr>
<tr>
<td></td>
<td>yah/ye</td>
<td>(distant)</td>
</tr>
<tr>
<td></td>
<td>yah/ye</td>
<td>(proximate)</td>
</tr>
<tr>
<td>Pl</td>
<td>ve/vo</td>
<td>un</td>
</tr>
<tr>
<td></td>
<td>ye</td>
<td>in</td>
</tr>
</tbody>
</table>

Hindi-Urdu, like many other languages, have a set of postpositional formatives whose primary function is to encode grammatical relations. They attach to a noun phrase even when it is a term grammatical function such as subject and object, which shows a contrast to Germanic/Romance preposition marking we have briefly observed in Chapter 2 and 3. The following is the list of postpositional elements in Hindi-Urdu:

\[(5.4)\]

<table>
<thead>
<tr>
<th>Form</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ne</td>
<td>transitive subject in perfective</td>
</tr>
<tr>
<td>ko</td>
<td>direct specific object/dative object</td>
</tr>
<tr>
<td>kā/ke/kī</td>
<td>of, ‘s</td>
</tr>
<tr>
<td>se</td>
<td>from, by, with</td>
</tr>
<tr>
<td>mē</td>
<td>in</td>
</tr>
<tr>
<td>par</td>
<td>on, at</td>
</tr>
<tr>
<td>tak</td>
<td>till, until</td>
</tr>
</tbody>
</table>

One of the morphosyntactic restrictions enforced by those postpositional elements is the case of an NP to which they are attached. They occur only with the oblique case form as shown in (5.5):

\[(5.5)\]

a. rām ne baccō ko sambālā.  
\[Ram children.M.PL.OBL take care of\]
5.1. NOMINAL INFLECTION

‘Ram took care of the children.

b. ham abhī rāste mē hāī.

We are now road. M. SG. OBL. be

‘We are on the way now.’

Pronouns show slightly different combinatorial properties when they are followed by *ne*. The first and second person pronouns must be in the direct form occurring with *ne*. The third person, on the other hand, must be oblique in the singular like an ordinary NP, while it is in the special form in the plural (cf. McGregor 1995:19, Schmidt 1999:22):

\[
\begin{array}{ccc}
\text{Pronoun} + ne & \\
1 & Sg & māṭ ne (direct) \\
 & Pl & ham ne (direct) \\
2 & Sg & tū ne (direct) \\
 & Pl & tum ne (direct) \\
3 & Sg & us ne (oblique) \\
 & is ne (oblique) \\
 & Pl & unhō ne (special) \\
 & inhō ne (special) \\
\end{array}
\]

When the postposition *ko* follows pronouns including personal, demonstrative, interrogative and relative pronouns except āp, it may be replaced by the suffix *-e ~ -(h)ē*, which is common in the spoken language (Schmidt 1999:21):

\[
\begin{array}{ccc}
\text{Pronoun} + ko & \text{Pronoun} + -e ~ -(h)ē & \\
1 & Sg & mujh ko mujhe \\
 & Pl & ham ko hamē \\
2 & Sg & tujh ko tujhē \\
 & Pl & tum ko tuhnē \\
3 & Sg & us ko use \\
 & is ko ise \\
 & Pl & un ko unhē \\
 & in ko inhē \\
\end{array}
\]

The possessive postposition has three forms *kā ~ ke ~ kī*. This is because it agrees with a possessed noun in gender, number and case (McGregor 1995:9):

\[
\begin{array}{ccc}
\text{(5.8)} & \text{a.} & \text{us strī kā beṭā} \\
 & \text{that woman} & \text{son. M. SG. DIR} \\
 & \text{‘that woman’s son’} & \\
\text{b.} & \text{us strī ke beṭe} \\
 & \text{that woman} & \text{sons. M. PL. DIR} \\
\end{array}
\]

\[4\]This can be regarded as a type of incorporation. A similar kind of incorporation of postposition to pronouns is found in focus postposition *ḥī* (Sharma 2003:65).
‘that woman’s sons’
c. us ādmi qī bahnō kā makān
    that man’s sisters’.f.pl.oobl house.m.sg.dir
    ‘that man’s sisters’ house’

This vowel ending alternation of kā is the same pattern as agreement between a noun/pronoun and an attributive adjective with -ā ending as summarised in (5.9):

(5.9)   -ā  direct masculine singular
       -e  direct masculine plural/oblique masculine
       -ī  feminine

Similarly, possessive forms of the first and second person pronouns are also morphologically adjectives, namely they agree with the head nouns in number, gender and case. (5.10) is the list of ā-ending forms and (5.11) is the examples. The third person pronouns are constructed by the combination of the oblique form + kā/ke/qī like ordinary nouns.

(5.10) Possessive pronoun

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>merā/e/i</td>
<td>hamā/e/i</td>
</tr>
<tr>
<td>2</td>
<td>terā/e/i</td>
<td>tumhā/e/i</td>
</tr>
</tbody>
</table>

(5.11) a. merā bhāī ‘my brother’
       meri bahan ‘my sister’
       mere vālidain ‘my parents’

b. tumhārā bhāī ‘your brother’
   tumhārī bahan ‘your sister’
   tumhāre vālidain ‘your parents’

c. us kā bhāī ‘his/her brother’
   us kī bahan ‘his/her sister’
   us ke vālidain ‘his/her parents’

5.2 Grammatical function encoding

In this section, we shall look at the details of the postpositional formatives. Those are often referred to as case markers in the generative literature (e.g. Mahajan 1990, Mohanan 1994, Butt 1995), since the primary role of those formatives in the grammar is to encode grammatical functions (grs) of the marked NPs in a clause. But as correctly observed in Mohanan (1994) and Butt and King (2004), the gr encoding is not the sole property of those formatives. They are reflections of complex syntax and semantic information.
5.2. GRAMMATICAL FUNCTION ENCODING

5.2.1 ne

Firstly, *ne* is attached to the subject of transitive verbs in the perfective (Schmidt 1999:73):

(5.12) a. ahmad ne sāre samose khāe hāī.
    Ahmad all samosas eaten.PERF be
    ‘Ahmad has eaten all the samosas.’

b. ahmad sāre samose khāegā.
    ‘Ahmad will eat all the samosas.’

(5.12a) is a sentence in the present perfect, which is realised by the past participle form verb + the present tense form auxiliary — I shall discuss Hindi-Urdu verbal inflections in more detail below. Thus, the subject *ahmad* is followed by *ne*. In (5.12b), on the other hand, the subject is in the bare direct form, since the sentence is in the future tense, which is realised by the subjunctive form of verb followed by -*ga* suffix that itself inflects like an adjective.

Although almost all transitive verbs take a *ne* marked subject in the perfective, there is a small number of verbs, such as *lānā* ‘bring’, *bhūlnā* ‘forget’, and *bolnā* ‘speak’, which take a direct case NP even in the perfective (McGregor 1995:81):

(5.13) vah do pustkē lāyā.
    he two books brought.PERF
    ‘He brought two books.’

Unlike transitive verbs, subjects of intransitive verbs do not exhibit any variation with respect to aspect. In both the perfective and the imperfective, they take a direct form NP as their subject (Comrie 1984:858):

(5.14) a. larkī sōfī hai.
    girl sleeping.IMP be
    ‘The girl is sleeping.’

b. larkī soī.
    girl slept.PERF
    ‘The girl slept.’

However, a small number of intransitive verbs such as *nahānā* ‘bathe’, *chīknā* ‘sneeze’ and *khāsnā* ‘cough’ behave like transitive verbs in the perfective, namely they require a subject followed by *ne* as in (5.15) (Comrie 1984:858). Further, Mahajan (1990:74) states that *ne* is mostly optional in unergative intransitive verbs (see also Mohanan 1994:71–2). Butt and King (1991) observe that the alternation between a direct form NP and a *ne* marked NP reflects volitionality (or ‘Conscious Choice: CC’ in their terminology) as indicated by the contrast in (5.16):
(5.15) larki ne nahayaa.
    girl bathed.PERF
    ‘The girl bathed.’

(5.16) a. ram ne khasa.
    Ram cough.PERF
    ‘Ram coughed (purposefully).’

b. ram khasa.
    Ram cough.PERF
    ‘Ram coughed.’

5.2.2 ko

The postposition ko is used to mark various term argument NPs such indirect objects in
(5.17) (McGregor 1995:54), animate/specific direct objects in (5.18) (Mohanan 1994:79–80)
and experiencer subjects in (5.19) (Schmidt 1999:71, Comrie 1984:859):

(5.17) a. us admi ko tihn pustke dijie.
    that man three books give
    ‘Please give that man three books.’

b. mujhe patr likhie.
    me letter write
    ‘Please write me a letter.’

(5.18) a. ilaa ne ek bacce ko uthayaa.
    Ila one child lift
    ‘Ila lifted a child.’

b. ilaa ne haar ko uthayaa.
    Ila necklace lift
    ‘Ila lifted the/*a necklace.’

(5.19) a. akram ko samose pasand hai.
    Akram samose like be
    ‘Akram likes samosas.’

b. ram ko syam kiyad aai.
    Ram Shyam remembrance came
    ‘Ram remembered Shyam.’

In (5.17), the verbs require a direct object and an indirect object. The indirect object is marked
by ko in (5.17a) and it is in the pronominal shorter form mujhe in (5.17b). (5.18) illustrates the
semantic properties of object NPs marked by ko, namely it is either animate or specific. The
object in (5.18a) is animate, so it is followed by ko. In (5.18b), since the inanimate object
is marked by ko, the only interpretation is specific as indicated by the translation. (5.19)
shows examples of experiencer subjects with *ko*. This construction tends to involve an N-V complex containing *honā* ‘be, become’, *ānā* ‘come’ and *lagnā* ‘be applied’. Thus, the literal translation of (5.19b) would be ‘to Ram Shyam’s remembrance came’, although *rām ko* is the subject of the clause.\(^5\)

It is worth noting that a careful observation reveals that the term ‘experiencer subject’ is a rather misleading generalisation. A subject of *milna* ‘receive’, for example, is given *ko* marking, even though it is not an experiencer. Conversely, a number of subjects that may be categorised as experiencers receive different markings. Therefore, Mohanan (1994:141–4) argues that more accurate statement is that the *ko* marked subject is associated with abstract semantic notion of *goāl*. She proposes the semantic representations (5.21) to explain the contrast between the two sentences in (5.20):

\[(5.20)\]
\[\begin{array}{l}
\text{a. } \text{tuśār ko khuśī huī.} \\
\text{Tushar happiness happen} \\
\text{‘Tushar became happy.’} \\
\text{b. } \text{tuśār khuś huā.} \\
\text{Tushar happy become} \\
\text{‘Tushar became happy.’}
\end{array}\]

\[(5.21)\]
\[\begin{array}{l}
\text{a. } [ \text{Y moves to } X ] \\
\text{HAPPINESS} \\
\text{b. } [ \text{X moves to } Y ] \\
\text{STATE} \\
\text{[X HAPPY]}
\end{array}\]

The two variables *X* and *Y* in (5.21) correspond to the subject and the object in (5.20) respectively. (5.21a) is the semantic representation of (5.20). It shows that *X*, i.e. the subject, is the destination of *HAPPINESS*, namely it is the *goāl*. This is the case where *X* receives *ko* marking. In (5.21b), which is the semantic representation of (5.20b), it is *X* that moves to the state of happiness. In this semantic environment, Mohanan argues, *X* is in the direct case form. Clearly, the correlation between *goāl* and *ko* marking is common to the *ko* marking on the indirect objects we have just looked at in (5.17).

The passive construction optionally allows the passivised animate subject to appear with *ko* instead of the direct case. Hence, the subject is either in the direct case form as in (5.22a) or in the oblique case form followed by *ko* as in (5.22b) (Gair and Wali 1989:51):

\[(5.22)\]
\[\begin{array}{l}
\text{a. } \text{laṛki pakṛī gaī.} \\
\text{girl caught go} \\
\text{‘The girl was caught.’}
\end{array}\]

b. laṛki ko pakṛā gayā.
girl caught go
‘The girl was caught.’

*Ko* is also used to encode various adverbial functions of NPs. The usage is mainly to show a direction or a destination of movement or to represent a temporal setting. In (5.23a), *apne des ko* is the goal or destination of the movement. In (5.23b, c), *ko* attaches to the temporal expressions (McGregor 1995:54, Shukla 2001:324).

(5.23) a. vah apne des ko laut gayā.
he own country return go
‘He went back to his country.’
b. budhvār ko āo.
Wednesday come
‘Come on Wednesday.’
c. ādmī rāt ko āyā.
man night came
‘The man came at night.’

### 5.2.3 se

Another postposition that signals both core argument and adjunct NPs is *se*. The most salient functions of *se* are ablative (‘from, since’) and instrumental (‘with, by’) uses as illustrated in (5.24) and (5.25) (Schmidt 1999:73, Shukla 2001:324, McGregor 1995:32):

(5.24) a. ye bas kahā se āṭī hai?
this bus where come be
‘Where does this bus come from?’
b. māi do din se bīmār hū.
I two days sick be
‘I have been sick for two days.’

(5.25) a. cāku se phal kāṭo.
knife fruit cut
‘Cut the fruit with a knife.’
b. māi moṭar se yahā āyā.
I car here came
‘I came here by car.’

(5.24a, b) denote spatial movement away from something and lapse of time respectively. In (5.25), both *cāku se* and *moṭar se* function as instruments for the actions. As another adjunct use, *se* marks a demoted agent NP in passive as in (5.26) (Mohanan 1994:183):
With respect to term argument encoding, *se* marks a direct object of certain verbs. In (5.27a), the object of meeting is marked by *se*. The object can also be marked by *ko*. With that marking, however, the sentence indicates that the meeting is a coincidental event as shown in (5.27b) (Schmidt 1999:75):

(5.27) a. adīb risāle ke mudīr se milā.
writer journal editor met
‘The writer met the editor of the journal.’

b. āj mārī hamsāe ko bas ke aḍde par mil gayā.
today I neighbour bus stop met go
‘Today I met the neighbour at the bus stop.’

Object NPs followed by *se* also appear with verbs denoting speaking or telling such as *bolnā* ‘speak’, *kahānā* ‘say’ and *pūchnā* ‘ask’ as in (5.28) (Schmidt 1999:75, McGregor 1995:23):

(5.28) a. mārī āp se kuch kahānā cāhtī hū.
you something tell want be
‘I would like to tell you something.’

b. vah us se savāl pūch rahī hai.
she him question ask stay be
‘She is asking him a question.’

Further, *se* also marks a subject expressing incapacity or involuntary action as follows (Schmidt 1999:74, 158):

(5.29) a. mujh se aisī davā khāi nahī jāū.
I such medicine take not go
‘I can’t possibly take such medicine.’

b. bacce se camca gir gayā.
baby spoon fall go
‘The baby dropped the spoon (accidentally).’

5.2.4 *mē, par and tak*

The usage of the other postpositional elements is relatively straightforward. As indicated by the rough translation in (5.4), *mē, par* and *tak* are all attached to locational or temporal adverbial NPs. Firstly, examples of *mē* are as follows (Shukla 2001:325):
(5.30) a. sonā uske hāth mē hai.
gold his hand be
‘The gold is in his hand.’
b. vah rāt mē corsī kartā hai.
he night theft do be
‘He steals during the night.’
c. makān ek sāl mē taiyār huā.
house one year ready be
‘The house was constructed in one year.’
d. hāthī pacās hazār mē milā.
elephant fifty thousand be obtained
‘The elephant was purchased for fifty thousand.’

In most of the cases, mē corresponds to in, into or within in English as shown in (5.30a–c). One idiosyncratic use is found in (5.30d) where mē marks cost of exchange. This postposition is also used to encode time of travel.

(5.31) shows various uses of par. (5.31a, b) are the locative adverbial use and (5.31c) is the temporal one (Shukla 2001:325):

(5.31) a. zamān par baitho.
ground sit
‘Sit on the ground.’
b. vah darvaze par kharā hai.
he door stand be
‘He is standing at the door.’
c. samay par ānā.
time come
‘Come on time.’

As idiosyncratic use, it also follows an object of certain verbs. This is similar to idiosyncratic prepositional argument in English (Schmidt 1999:79):

(5.32) gāō vāle buzurgō par etibār karte hāī.
village people elders rely do be
‘The villagers rely on the elders.’

Finally, the following is the examples of tak (Shukla 2001:326):

(5.33) a. yah rāh šahar tak jātī hai.
this path city go be
‘This path goes as far as the city.’
b. mãē kal tak yahā rahūgā.
I tomorrow here remain
‘I shall remain here until tomorrow.’
5.3 Surface phrase structure

Although we have referred to the CF markers such as ne, ko and se as postpositional elements, their phrase structural properties reveal that they are different from what we normally call adpositions in that they are clearly bound to the hosts and cannot stand alone in the configurational syntax. For instance, postposition stranding or any kind of dislocation of those formatives from the hosts is disallowed in Hindi-Urdu. Still, they are not purely inflectional suffixes. Despite the limitation of their mobility in the phrase structure, Mohanan (1994), Butt and King (2004) and among others show that some degree of separability is allowed. Their separability becomes clearer in comparison with genuine suffixes like the masculine oblique case ending -e. Firstly, -e cannot scope over co-ordinated NPs as in (5.35), whereas postpositional formatives can as in (5.36) (Butt and King 2004:17):

(5.35) a. *[kutt or ghorg] -e
    dog and horse -obl

5.2.5 Bare oblique locative

We have observed that postpositions signal locative functions of NPs. However, Hindi-Urdu also allow bare oblique case NPs to function as locatives. According to McGregor (1995:54), this normally happens when the given place is a geographical locality denoted by a place-name, or is otherwise felt as a specific destination. Hence, both kalkatte and ghar in (5.34) can occur in the oblique forms indicating that they are the destinations of the action denoted by the verbs:

(5.34) a. vah kalkatte laut gaya.
    he Calcutta return go
    ‘He went back to Calcutta.’

b. vah apne ghar laut gaya.
    he self home return go
    ‘He returned to his home.’
b. kutt-e or ghor-e
dog-obl and horse-obl

(5.36) a. yasin ne [ kutt-e or ghor-e ] ko dekha hai.
Yassin dog and horse see be
‘Yassin saw the dog and the horse.’
b. nadya [ lahor or karachi ] se hai.
Nadya Lahore and Karachi be
‘Nadya is from Lahore and Karachi.’

In (5.35a), the two stems are co-ordinated and followed by the oblique ending -e, which is ungrammatical. If the stem-suffix combinations are co-ordinated, it is grammatical as in (5.35b). In (5.36), on the other hand, ko and se appear only once after the co-ordinated NPs, but clearly they function as object markers of the co-ordinated phrase altogether.

Another test is intervention of emphatic marker hū between the host and the postpositional formatives. As expected from the true affix status, hū cannot occur between the stem and the oblique suffix -e or the verbal perfective suffix -a as illustrated in (5.37). But it can intervene between the host and the postpositional elements as in (5.38) (Butt and King 2004:17):

(5.37) a. *kutt-hū-e
dog-foc-obl
b. *khel-hū-a
play-foc-perf.m.sg

(5.38) a. tujh hū ko diya.
you foc give
‘I gave it to you (and not to anyone else).’
b. mã vahā saikal hū se pahūch sakti hū.
I there bicycle foc reach able be
‘I can get there with just a bike.’

Based on those observations, Mohanan (1994), Butt and King (2004) and many others assume that the postpositional formatives are clitics or phrasal affixes, namely they are morphologically bound requiring the host, while since the host is phrasal, it can show limited mobility from the host (see also section 3.6 in Chapter 3).

5.4 Agreement

5.4.1 Verbal inflection

Another aspect that interacts with grammatical functions, GF markers, and other clausal properties in the Hindi-Urdu grammar is agreement. A predicate in Hindi-Urdu mainly shows
subject agreement, object agreement and non-agreement. Before discussing those agreement patterns, let us look at the verbal inflectional system in Hindi-Urdu.

A main verb can be the following forms (omitting imperative and conjunctive):

\[(5.39)\]

a. Infinitive: \(-nā\)

b. Imperfective

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c. Perfective

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d. Subjunctive

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The infinitive form is root + \(-nā\) as shown in (5.39a). (5.39b) shows the endings of the imperfective participles, perfective participles and subjunctive participles. The imperfective and perfective participles inflect for number and gender exactly like adjectives, whereas the subjunctive inflects for number and person. If they are used alone without an auxiliary, they represent the simple past, irrealis, and conditional respectively. (5.40) is the examples of \(ānā\) ‘come’. (Schmidt 1999:88–9):

\[(5.40)\]

a. vo āyā.

\(\text{he come.PERF.SG.M}\)

‘He came.’

b. (agar) vo ātā.

\(\text{(if) he come.IMPF.SG.M}\)

‘(if) he had come.’

c. (agar) vo āe.

\(\text{(if) he come.SUBJUNCT.3.SG}\)

‘(if) he comes.’

Notice that the perfective and the imperfective agree with the subject vo ‘he’ in number and gender, while the subjunctive agrees with the subject in person and number.

The perfective participle and imperfective participle are followed by a copula \(honā\) that inflects for person and number in the present and for number and gender in the past as in (5.41):

\[(5.41)\]

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<td>hai</td>
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<td>hai</td>
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The combination with participles yields the following tense and aspect:

\[\text{The perfective form of } ana \text{ is } aya \text{ with the semi-vocalic glide, not } aa. \text{ The following morphophonological alternations apply when the suffixes attach to the root ending with a vowel: } ā + ā \rightarrow āyā, a + ā \rightarrow ayā, o + ā \rightarrow oyā, ĩ + ā \rightarrow iyā, ĩ + ĩ \rightarrow ĩ, ĩ + ĩ \rightarrow ĩ, ĩ + ĩ = ĩ.\]
(5.42) a. Immediate past (perfective + present)
   vo áyá hai.
   he come.PERF.SG.M be.PRES.3.SG
   ‘He has come.’

   b. Remote past (perfective + past)
   vo áyá thá.
   he come.PERF.SG.M be.PAST.SG.M
   ‘He had come/he came.’

(5.43) a. Habitual present (imperfective + present)
   vo átá hai.
   he come.IMPF.SG.M be.PRES.3.SG
   ‘He comes.’

   b. Habitual past (imperfective + past)
   vo átá thá.
   he come.IMPF.SG.M be.PAST.SG.M
   ‘He used to come.’

The two participles agree with vo in number and gender. The auxiliary hona agrees with it in person and number in the present as in (5.42a) and (5.43a) and in number and gender in the past as in (5.42b) and (5.43b). In other word, the agreement features differ in a verbal complex in the present.

The formation of future is slightly different. It is constructed by the subjunctive participle followed by suffix gá. This suffix itself inflects like an adjective, i.e. gá ~ ge ~ gí with respect to number and gender. Since the subjunctive participle inflects for person and number, two parts in the same word inflect for different agreement features, namely the participle base inflects for person and number, while the suffix does so for gender and number. Therefore, the following paradigm is obtained:

(5.44) Future (āná ‘come’)

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<td>Sg</td>
<td>Pl</td>
</tr>
<tr>
<td>1</td>
<td>áugá</td>
<td>aège</td>
</tr>
<tr>
<td>2</td>
<td>áegá</td>
<td>áoge</td>
</tr>
<tr>
<td>3</td>
<td>áegá</td>
<td>aège</td>
</tr>
</tbody>
</table>

The progressive aspect is constructed by adding the perfective participle of rahñá ‘remain, stay’ to the root followed by hona. Other modal expressions are obtained by various auxiliaries. For instance, if the future form of hona, i.e. the subjunctive form of hona + gá, follows participles, it yields the presumptive mood. I do not discuss the details of modality in this thesis.
5.4.2 Agreement variation

In the previous section, we have only looked at subject agreement. However, Hindi-Urdu, like Icelandic, exhibit agreement controller change as well. Roughly, the selection of agreement controller is sensitive to the ‘form’ of argument NPs. As summarised in (5.2), both subject and object are marked by clitics such as ne, ko and se under certain syntactic and semantic environment. Those marked NPs can never be an agreement controller. So, for instance, since the subject of a transitive verb is in the direct case form not followed by clitics in the imperfective, that subject is the controller of agreement. Thus, in (5.45a) the main verb dekhtā and the auxiliary hai are in the singular masculine form and the third singular form respectively due to the agreement with direct case subject larkā. On the other hand, the perfective requires ne to mark the subject. In (5.45b), therefore, the subject larke is in the oblique case form followed by ne, while the object kitāb is in the direct case form that indicates it is unspecific. The verb participates in agreement with this direct case form object and is in the feminine singular form (Gair and Wali 1989:46, 49):

(5.45) a. larkā sītā ko dekhtā hai.
  boy.sg.m.dir Sītā.sg.f.obl look.impf.sg.m be.pres.3.sg
  ‘The boy looks at Sita.’
b. larke ne kitāb paṛhī.
  boy.sg.m.obl book.sg.f.dir read.perf.sg.f
  ‘The boy read the book.’

If both subject and object are in the direct case form, the subject must be the agreement controller as in (5.46a). If both subject and object are marked by clitics and are in the oblique case forms, the predicate does not exhibit agreement, and instead it is in the default form, which is identical to the singular masculine form as shown in (5.46b) (Gair and Wali 1989:46, 49):

(5.46) a. larkā kitāb paṛhtā hai.
  boy.sg.m.dir book.sg.f.dir read.impf.sg.m be.pres.3.sg
  ‘The boy reads a book.’
b. larkiyō ne sītā ko dekhā.
  girl.pl.f.obl Sītā.sg.f.obl look.perf.dft
  ‘The girls looked at Sita.’

As shown in section 5.2.1, some intransitive verbs require a ne marked subject in the perfective and some others optionally take a ne marked subject in the perfective suggesting the action is volitional. This marking affects the agreement pattern:
(5.47) a. lar kiyyā royī.
girl.PL.DIR CRY.PERF.PL.
'The girls cried.'
b. lar kiyyō ne royā.
girl.PL.ERG CRY.PERF.PERF
'The girls cried (on purpose).'

In (5.47a), the subject is not marked by ne and is in the direct case form, so that the verb agrees with it. In (5.47b), on the other hand, the subject is followed by ne suggesting that crying action is the girls’ conscious choice. Under this environment, since there is no NP for the verb to agree with, the verb turns out to be the default form.

The same agreement blocking effect is found in clauses with ko and se marked subjects. The experiencer subjects appear with ko irrespective of perfectivity as in (5.48). In both sentences, the main verb, auxiliary and predicative adjective all agree with the object kitāb (Gair and Wali 1989:50):

(5.48) a. rām ko apnī kitāb acchī lagī
dir
Ram.SG.OBL self’S BOOK.SG.DIR GOOD.SG.F APPEAR.IMPF.SG.F
hai.
be.pres.3.sg
‘Ram’s book appears good to him. (lit. to Ram his book appears good)’
b. rām ko apnī kitāb acchī lagī.
dir
Ram.SG.OBL self’S BOOK.SG.DIR GOOD.SG.F APPEAR.PERF.SG.F
‘Ram’s book appeared good to him. (lit. to Ram his book appeared good)’

In (5.49), the subjects’ incapability of the actions are expressed by se marking. Due to this marking, the verb and auxiliary show agreement with the direct case form object in (5.49a). (5.49b) is an example of an intransitive verb, in which the verb and auxiliary have nothing to agree with and are in the default forms:

(5.49) a. mujh se aisī davā khāī nahī jāī.
l.ERG such medicine.SG.DIR TAKE.IMPF.SG.F NOT go.IMPF.SG.F
‘I can’t possibly take such medicine.’
b. us se calā nahī jāegā.
(s)he.OBL walk.PERF.DFT NOT go.FUT.DFT
‘(S)he can’t possibly walk.’

The data we have looked at so far appear to suggest that agreement in Hindi-Urdu is regulated by purely surface properties of NPs and in fact a proposal based on that assumption is made by Saksena (1981):

(5.50) Saksena’s Rule A:
The verb agrees with the leftmost phonologically null instance of case marking.
The rule refers to the surface linear order, i.e. ‘leftmost’, and the form of NP, i.e. ‘phonologically null instance of case marking’ where case marking in her term means peaker bearing clitics. However, as Comrie (1984), Gair and Wali (1989), Khan (1989) and among others point out, the rule is inadequate in many respects. On descriptive side, for instance, the following examples cannot be captured in Saksena’s rule (Khan 1989:73–77):

(5.51) a. subāh ali ne nāštā nahī kiyā.
    morning.SG.F.OBL Ali.SG.M breakfast.DFT not do.PERF.DFT

    ‘Ali didn’t take breakfast this morning.’

b. is vaqt tum ne kyā kiyā.
    this.SG.OBL time.SG.M.OBL you.OBL what.SG.DIR do.PERF.SG.M

    ‘What did you do at this time?’

(5.52) ∅ dādar se āyā hū.
    PRO Dadar from come.PERF.M.SG be.PRES.1.SG

    ‘(I) have just come from Dadar.’

As we have seen in section 5.2.5, a bare oblique case form NP can stand alone as locative expression. (5.51) is the further examples of that use. In (5.51a), subāh is placed at the beginning of the sentence and since it is not marked by clitics, we would expect it to be the agreement controller according to Saksena’s rule. But the default forms of the main verb and auxiliary suggest that they do not participate in agreement. The determiner in Hindi-Urdu inflects for number and case with a head noun. Thus, is in (5.51b) is in the singular oblique form due to the agreement with the head noun vaqt, so the whole NP functions as oblique locative without any clitic. Again, Saksena’s rule would predict that this NP is the controller of the agreement. But the verb form shows that it agrees with the interrogative pronoun object. (5.52) is an example of pro drop. As indicated by ∅, the subject is not overtly expressed in this sentence. Still, the intransitive perfective verb and the auxiliary exhibit agreement with the dropped first singular subject. Since no phonologically overt controller exists in the sentence, Saksena’s rule cannot identify the dropped first person pronoun as the agreement controller.

In sum, the correct account of the seemingly surface agreement phenomena in Hindi-Urdu requires a reference to clausal and grammatical function information as well as the formal aspect of the agreement controller. I shall show an analysis of Hindi-Urdu agreement alongside the discussion on case below.
5.5 Previous LFG analyses

In LFG, Butt and King (2003, 2004) analyse the Urdu case, and based on those works, Butt and Sadler (2003) illustrate how Urdu agreement pattern is accounted for. With regard to case, they all assume that the clitics such as ne and ko introduce features like ⟨case, erg⟩, ⟨case, acc⟩ and ⟨case, dat⟩ and so forth. But crucially in their analyses, those clitics contribute not only the case, but also other syntactic and semantic properties. This obviously reflects the diverse range of properties the clitics exhibit as observed in section 5.2. In this section, I shall summarise the main points of their analyses.

5.5.1 Phrase structure

As shown in section 5.3, the Hindi-Urdu gf markers morphologically require hosts, i.e. morphologically bound elements, while at the same time they show some degree of separability in the configurational syntax. Butt and King propose that the case clitics are located in the functional category K(ase) that takes an NP as its complement and projects to KP as shown in (5.53). The standard LFG’s c-structure to f-structure correspondence ensures that the functional head K and the complement NP are f-structure co-heads:

(5.53)

\[
\begin{array}{c}
\text{KP} \\
\uparrow = \downarrow \\
\text{NP} \\
\uparrow = \downarrow \\
\text{N}
\end{array}
\]

According to this proposal, the following structure is obtained for the sentence containing clitic marked NPs:

(5.54) a. lāṛkiyō ne sīṭā ko dekhā.
girl.PL.F.OBL Sīṭā.SG.F.OBL look.PERF.DFT
‘The girls looked at Sīṭā.’

b.
In (5.54), the subject is marked by *ne* because of the transitive perfective verb *dekhā*. The object is followed by *ko* as it is an animate NP. Both *ne* and *ko* occupy the K positions and the two noun phrases end up with KPs positioned under the S.

A Hindi-Urdu sentence may also take a direct case form NP both for a subject and an object. In (5.55a), the main verb is in the imperfective, so that the subject is in the direct case form. The object is also in the direct form suggesting that it is inanimate and non-specific. Since on the phrase structure level, no distributional differences between clitic marked NPs and direct form NPs are observed, there is no reason to make a categorial distinction between the two. Butt and King propose that the direct form NPs are also dominated by KP, but without the functional head K. Thus, the c-structure for (5.55a) would be like (5.55b):

(5.55)  

a. larkā kitāb parhtā hai.  
> boy.sg.m.dir book.sg.f.dir read.impf.sg.m be.pres.3.sg

‘The boy reads a book.’

b.  
\[
\begin{array}{c}
\text{S} \\
\text{KP} \quad \text{KP} \\
\text{NP} \quad \text{NP} \\
\text{N} \quad \text{N} \\
\end{array}
\]

parhtā hai  
larkā kitāb

In (5.55b), both the subject and the object are KPs, so that there is no categorial difference between the two bare direct form arguments in (5.55) and the two clitic marked arguments in (5.54).

Another instance of bare NPs is oblique case form locatives. Butt and King also assume that they are a KP and dominating an NP without having a head as shown in (5.56b):

(5.56)  

a. rām zu gaiyā hai.  
> Ram.sg.m.dir zoo.sg.m.obl go.perf.sg.m be.pres.3.sg

‘Ram has gone to the zoo.’

b.  
\[
\begin{array}{c}
\text{S} \\
\text{KP} \quad \text{KP} \\
\text{NP} \quad \text{NP} \\
\text{N} \quad \text{N} \\
\end{array}
\]
gaiyā hai  
rām zu
5.5.2 Case

Butt and King use a tripartite case distinction often found in the literature: structural case, inherent case and semantic case. Structural case is assigned based on pure syntactic properties; in Hindi-Urdu, it is correlated with grammatical function and the assignment is attained by default principles. Inherent case is unpredictable and often specified by the governing predicate. Icelandic quirky case we have looked at in Chapter 4 is categorised in this type. Hindi-Urdu also have instances of inherent case. Finally, according to Butt and King, the characteristics of semantic case are predictability via the formulation of generalisations across predicates and constructions and a subjection to syntactic restrictions such as only appearing on certain grammatical functions.

5.5.2.1 Semantic case

For Butt and King, ne and ko are instances of semantic case. The former is regarded as ergative case and the latter is accusative and dative cases. They propose the lexical entry (5.57) for ne and the f-structures ne alone constructs are shown in (5.58) (Butt and King 2004:188):

\[
(5.57) \quad ne \quad (\uparrow \text{case}) = \text{ERG}
\]
\[
(\text{SUBJ} \uparrow) \quad [ (\uparrow \text{SEM-PROP CONTROL}) = \text{INT} \quad \lor \quad ((\text{SUBJ} \uparrow) \text{OBJ}) \quad ((\text{SUBJ} \uparrow) \text{VFORM}) = \text{PERF} ]
\]

\[
(5.58) \quad \begin{align*}
\text{a.} & \quad f_1 \left[ \begin{array}{c}
\text{SUBJ} \\
\text{f_2} \\
\text{SEM-PROP} \\
\end{array} \right] \left[ \begin{array}{c}
\text{CASE} \\
\text{ERG} \\
\text{CONTROL} \\
\text{INT} \\
\end{array} \right] \\
\text{b.} & \quad f_3 \left[ \begin{array}{c}
\text{SUBJ} \\
\text{f_4} \\
\text{CASE} \\
\text{ERG} \\
\end{array} \right] \\
& \quad f_5 \left[ \begin{array}{c}
\text{OBJ} \\
\text{VFORM} \\
\text{PERF} \\
\end{array} \right]
\end{align*}
\]

The first equations in (5.57) is straightforward, i.e. it contributes \langle \text{CASE, ERG} \rangle to the f-structure corresponding to KP. In (5.58a, b), \(f_2\) and \(f_4\) correspond to \(\uparrow\) and they have \langle \text{CASE, ERG} \rangle as their values. With regard to the second equation \(\langle \text{SUBJ} \uparrow \rangle\), we have already looked at how the inside-out application works in Chapter 3. It states that the f-structure to which the \(ne\) marked KP is mapped is the value of \text{SUBJ}. Hence, \(f_2\) and \(f_4\) are the values of \text{SUBJ} in (5.58a, b). What follows is a disjunctive description. The first one is about a semantic property of \text{SUBJ} of an
intransitive verb, namely subj is the internal causer of the event (Levin and Rappaport Hovav 1995). This can also be stated by reference to the semantic-structure as $(\uparrow_{\sigma} \text{CONTROL}) = \text{INT}$ or $(\uparrow_{\sigma} \text{VOLITIONALITY}) = +$ (Butt and King 2003:79). The second set of equations states that the f-structure $(\text{subj} \uparrow)$ must have obj and $(\text{vform, perf})$ as its values. In (5.58 b), $f_3$ has the required values.

Other semantic cases are acc and dat, both of which are introduced by ko. Against the claim that ko is the inherent dative case often found in the literature (e.g. Mahajan 1990), Butt and King claim that the motivation for postulating acc and dat for the same formative comes from distinct behaviours of ko depending on the instantiation of the acc and dat features, such as possibility and impossibility of passivisation of acc objects and dat indirect objects and the semantic properties associated with acc objects (Butt 1995:17–9). Therefore, Butt and King (2004:188,9) propose the lexical entry for ko as in (5.59). It yields the f-structures as in (5.60):

\begin{align*}
(5.59) & \quad \text{ko} \quad [\text{(case)} = \text{acc} \\
& \quad \quad \text{(obj} \uparrow) \\
& \quad \quad \text{(sem-prop specific)} = + \\
& \quad \quad \lor \\
& \quad \quad \text{(case)} = \text{dat} \\
& \quad \quad \text{(obj}_g \uparrow) \lor (\text{subj}_e \uparrow) \\
& \quad \quad \text{(sem-prop control)} ]
\end{align*}

\begin{align*}
(5.60) & \quad \text{a.} \quad \text{OBJ} \quad \begin{bmatrix}
\text{case} & \text{acc} \\
\text{sem-prop} & \{\text{specific}, +\}
\end{bmatrix} \\
& \quad \text{b.} \quad \text{SUBJ}_g \quad \begin{bmatrix}
\text{case} & \text{acc} \\
\text{sem-prop} & \{\text{control}\}
\end{bmatrix} \\
& \quad \text{c.} \quad \text{OBJ}_e \quad \begin{bmatrix}
\text{case} & \text{acc} \\
\text{sem-prop} & \{\text{control}\}
\end{bmatrix}
\end{align*}

The first disjunct in (5.59) states that the f-structure of a ko marked KP has $(\text{case, acc})$ and is the value of obj. It also has semantic property $(\text{specific, +})$, which may also be stated via semantic projection as in $(\uparrow_{\sigma} \text{specific}) = +$ (Butt and King 2003:81). The resultant f-structure is (5.60a). The second set of equations is the cases where ko introduces $(\text{case, dat})$. As discussed in section 5.2.2, both subjects and indirect objects marked by ko are abstract semantic category goal. Although it is abbreviated as subscripts go and exp, more precise description is attained by a reference to the argument structure (Butt and King 2004:fn33).
5.5.2.2 Structural case

Structural case assignment is attained by more general default principle applications. For Butt and King, the direct form not followed by any clitic element has \((\text{case, nom})\). They propose the following constraints (Butt and King 2004:24):

\[
\begin{align*}
(5.61) & \quad \text{a. Wellformedness principle: KP: } (\uparrow \text{case}) \\
& \quad \text{b. Default: } (\uparrow \text{subj case}) = \text{nom} \\
& \quad \text{c. Default: } (\uparrow \text{obj case}) = \text{nom}
\end{align*}
\]

They claim that for languages which require that all NPs have case, (5.61a) applies. It is not explicitely stated in their analysis how this constrain applies in the grammar. If it is a statement over a KP node in c-structure or an annotation on KP in the PS rule, it should be written as KP: \((\downarrow \text{case})\) or KP: \((\uparrow \text{gf case})\). In any case, their aim is to require every KP to have case in the corresponding f-structure. (5.61b, c) are \((\text{case, nom})\) assignment to subj and obj respectively. Butt and King argue that in languages in which all subjects have nominative case, (5.61b) would be obligatory. Since Hindi-Urdu allows non-nominative subjects, it is optional as indicated by the parentheses, which ensures that (5.61b) only applies when case is unspecified by other means. Likewise, obj also has \((\text{case, nom})\) in some cases as in (5.61c). Again, it is unclear where those constraints are placed. But if it is over a KP node, it yields the results they want.

5.5.2.3 Quirky case

Finally, Butt and King assume that only the unpredictable case assignment is treated as quirky case and specified in the lexical entries of the governing predicates. For instance, a small number of verbs, such as \(\text{lānā ‘bring’}, \text{bhālnā ‘forget’}, \text{and bolnā ‘speak’}\) take a direct case NP even in the perfective as observed in (5.13). They posit the following specification in the lexical entry of \(\text{lā}\) (the root of \(\text{lānā}\)) (cf. Butt and King 2004:187):

\[
(5.62) \quad \text{lā ‘bring’ } (\uparrow \text{pred}) = \langle \text{ag}[-\text{o}] \text{th}[-\text{r}] \rangle \\
(\uparrow \text{subj case}) = \text{nom}
\]

As stated in the second equation, the verb itself defines \((\text{case, nom})\) in its governing subj, so that it is only compatible with the direct form KP subject.

---

This equation assumes that the argument structure projects from the f-structure, which is different from the architecture Butt and King (2004:fn26) illustrate based on Butt et al. (1997). According to their architectural proposal, the description would be \((\text{goal} \, ^{\alpha} \text{w})\) or \((\text{goal} \, \alpha M^+)\) where \(\alpha\) is a function from c-structure to argument-structure (see Chapter 2 for those functional applications).
5.5.3 Problems

I agree with Butt and King in their claim that the clitic marking is tightly associated with the syntactic and semantic feature complex, and their insight is nicely formalised by the f-descriptions in the clitics’ lexical entries. However, I will evaluate the proposal on the basis of the theme the current thesis advocates. The result highlights rather questionable status of case in their proposal.

5.5.3.1 KP

Firstly, let us look at the status of KP Butt and King propose. As summarised in the previous section, they assume that every nominal projection reaches to KP. Some are headed by the functional category K that is instantiated by overt clitic elements such as ne, ko and se. But some other KPs such as direct case phrases and bare locative phrases dominate the complement NPs without clitics. This type of KP projection violates the Economy of Expression. It may be exempt from that constraint by stating that the PS rules in Hindi-Urdu allow only KPs, not NP, to appear in the c-structure or that case assignment operates only over KP. But notice that those escape hatches too are based on the postulation of KP. The reason that they take this costly assumption of KP is that there is no distributional difference between the two. For instance, PP/NP and VP/IP in English clearly show different properties in the c-structure as we have looked at in Chapter 3, but no such positional differences are observed between the clitic marked NPs and the bare NPs in Hindi-Urdu. This leads Butt and King to posit KP for every nominal projection. However, a straightforward alternative is to treat both types as NPs. As shown in section 5.3, the postpositional formatives are clitics or phrasal affixes and it is often the case that those small particles behave like non-projecting words either adjoined to X0 or XP (Toivonen 2003; see also Chapter 3 and 6). So, the question is why they do not take this option.

5.5.3.2 Case and marking

Their aim of positing K may be to reserve a homogeneous position for case bearing elements in the phrase structure of Hindi-Urdu in the same way as D is the position for definiteness in English. So, let us consider the status of case in their proposal. Butt and King regard ne as the ⟨case, erg⟩ bearing element, ko as the ⟨case, acc⟩ and ⟨case, dat⟩, and ⟨case, nom⟩ is

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9 In fact, this is the line of analyses found in Mohanan (1994) and Butt (1995). Sharma (2003) also assumes that a focus clitic h̄t is a non-projecting word adjoined to DP, although she follows the KP projection for the clitics in question.
associated with the direct form via the default principle. This assumption is closely linked to
the marking patterns in Hindi-Urdu.

Firstly, let us consider ne and ergative. Ne marks a subject of a transitive verb in the
perfective, and at the same time the transitive object can be in the direct form, which is also
the unmarked form of the intransitive subject. Further, under that structure, the transitive
verb agrees with the direct form object. If the same direct form NP appears as the subject
of an intransitive, it is the agreement controller in that sentence. That is, the object in the
transitive and the subject in the intransitive behave in the same way with respect to marking
(or form) and agreement, while the ne marked subject in the transitive is distinct from those
two. Hence, Hindi-Urdu exhibit ergativity in a certain environment. It may lead us to assume
that the ne marked NP is in the ergative and the direct form NP is in the absolutive.

In the imperfective, on the other hand, the subject of a transitive verb is not marked by
ne, rather it is in the direct form. The object of that sentence can be marked by ko, if it is
either animate or specific. This time, the transitive subject and the intransitive subject are in
the same form, i.e. the direct form, while the transitive object receives the distinct marking
ko. It means that Hindi-Urdu show the nominative-accusative pattern in this case. One may
claim that Hindi-Urdu exhibit split-ergativity and consider the direct form as the nominative
and the ko marked object as the accusative.

Finally, ko is also used to mark indirect objects invariably. It also marks an experi-
encer/goal subject. This pattern is found in many languages (see Icelandic in Chapter 4
and Japanese in Chapter 6) and this marking is normally given the name, dative. Thus, we
may argue that the ko marked NPs in those environments are the datives.

If we transfer those names of marking into grammatical feature ⟨case, erg⟩, ⟨case, nom⟩,
⟨case, acc⟩ and ⟨case, dat⟩, the grammar would be like Butt and King’s. However, as men-
tioned in Chapter 1, the formal marking does not directly license introductions of the gram-
matical features. One possible argument for case might be that introducing ⟨case, erg⟩ in the
grammar would help us to capture the ergativity found in Hindi-Urdu. But since the ergativity
is a term for typological descriptions, the situation is not straightforward. Let us look at two
examples and their implications.

**Ergativity** Marwari, a dialect of western Rajasthani, has lost the ergative marking almost
completely (Magier 1985:245):

(5.63) a. mhāi āthe ī sovū.
I.DIR here right sleep.PRES.1.SG
‘I sleep right here.’ (intransitive, imperfect)
b. mhāḍ ero pāṇī nī pīvū.  
I.DIR such water not drink.PRES.1.SG  
‘I don’t drink such water.’  
(transitive, imperfect)

c. mhāḍ kāle aṭhe pūggo.  
I.DIR yesterday here reach.PAST.SG.M  
‘I arrived here yesterday.’  
(intransitive, perfect)

d. mhāḍ kām kariyo.  
I.DIR work do.PAST.SG.M  
‘I did work.’  
(transitive, perfect)

(5.64) a. vo aṭhe ī sove.  
he.DIR here right sleep.PRES.3  
‘He sleeps right here.’  
(intransitive, imperfect)

b. vo ero pāṇī nī pīve.  
he.DIR such water not drink.PRES.3  
‘He doesn’t drink such water.’  
(transitive, imperfect)

c. vo kāle aṭhe pūggo.  
he.DIR yesterday here reach.PAST.SG.M  
‘He arrived here yesterday.’  
(intransitive, perfect)

d. vo / uṇ kām kariyo.  
he.DIR / he.OBL work do.PAST.SG.M  
‘He did work.’  
(transitive, perfect)

(5.63) and (5.64) show that the subject always appears in the direct form regardless of transitivity and perfectivity. The only exception is (5.64d) that allows both the direct and the oblique subject as free variations. Magier (1985) states that Marwari allows the oblique subject only when the subject happens to be a third person pronominal and the object is inanimate/unspecific — and even then only as free variation. Thus, we can conclude that Marwari does not exhibit ergativity in this respect.

However, if we look at the agreement patterns, the picture will get complicated. Marwari shows the perfect ergative pattern both in the simple past ((5.65)) and the remote past, i.e. perfective participle + past auxiliary ((5.66)) (Magier 1985:248):

(5.65) a. rām aṭhe kāle āiyo.  
Ram.SG.M here yesterday come.PERF.SG.M  
‘Ram came here yesterday.’

b. sītā aṭhe kāle āi.  
Sita.SG.F here yesterday come.PERF.SG.F  
‘Sita came here yesterday.’

c. rām lāpsī jīmli.  
Ram wheat-gruel.SG.F eat.PERF.SG.F  
‘Ram ate wheat-gruel.’
d. sītā ek sogro jīmlīyo.
   Sita one millet-bread.sg.m eat.perf.sg.m
   ‘Sita ate one piece of millet-bread.’

(5.66) a. rām atē āiyō ho.
   Ram.sg.m here come.perf.sg.m be.past.sg.m
   ‘Ram had come here.’

b. sītā atē āī hī.
   Sita.sg.f here come.perf.sg.f be.past.sg.f
   ‘Sita had come here.’

c. rām ghanī lāpsī jīmlī hī.
   Ram lots wheat-gruel.pl.f eat.perf.pl.f be.past.pl.f
   ‘Ram had eaten lots of wheat-gruel.’

d. sītā ghanā sogrā jīmlījā hā.
   Sita lots millet-bread.pl.m eat.perf.pl.m be.past.pl.m
   ‘Sita had eaten lots of millet breads.’

The agreement controllers are italicised and the agreement targets are in bold. Both (5.65) and (5.66) show that the main verbs and the auxiliaries always agree with the subjects in intransitives and the objects in transitives. Hence, Marwari is more ergative than Hindi-Urdu in terms of agreement.10 The pattern is unchanged even if the object is marked by clitics (Magier 1985:249):

(5.67) a. mhe ek film dekhī hī.
   We one film.sg.f see.perf.sg.f be.past.sg.f
   ‘We had seen a film.’

b. mhe sītā ne dekhī hī.
   We Sita see.sg.f be.sg.f
   ‘We had seen Sita.’

Marwari clitic ne corresponds to Hindi-Urdu ko marking an animate/specific object NP as found in (5.67b). Even in this case, the marked object is still the controller of the agreement.

The way of capturing the type of ergativity Marwari exhibits in the grammar is clearly not by postulating ⟨case, erg⟩. What the grammar needs to state is simply the fact that transitive verbs agree with objects, while intransitive verbs agree with subjects regardless of the clitic marking.

The next example is Marathi. Marathi shows the same agreement pattern as Hindi-Urdu, e.g. transitive verbs agree with subjects in the imperfective and with objects in the perfective,

---

10Interestingly, in the transitive immediate past, which is realised by the combination of the transitive past participle + the present copula, the verb agrees with the object in number and gender and the auxiliary agree with the subject in person and number. See Magier (1985) for the discussion on the relation between person feature and this agreement pattern.
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and it exhibits almost the same clitic marking patterns. But crucially, the first and second person pronouns do not have clitic marking as in (5.68) (Comrie 1984:861):

(5.68)  a. mī kāme kēlī.
       I.DIR jobs.3.PL.N do.PERF.3.PL.N
       ‘I did the jobs.’

       b. mī tyā lā pāhyla.
       I.DIR him see.PERF.DFT
       ‘I saw him.’

In (5.68a, b), the subjects are in the direct form even though the verbs are in the perfective. However, despite the lack of clitic marking, the verbs still do not agree with these direct form subjects. Instead the agreement controller is the object in (5.68a). In (5.68b), since the object is marked by clitic lā, the verb cannot agree with it either and turns out to be the default form, i.e. no agreement is observed.

Now, Marathi exhibits the same type of ergativity as Hindi-Urdu with respect to the clitic marking except for the first and second person pronouns. However, it shows exactly the same type of ergativity as Hindi-Urdu in terms of agreement in that the transitive objects are the agreement controllers in the perfective, i.e. the lack of clitic marking does not affect the agreement pattern. The question is whether or not the assumption that the clitic has ⟨case, erg⟩ would help us capture the ergativity Marathi shows. Clearly not. To describe Marathi ergativity in the grammar, we need to state two things: i) the marking of subject NP in the perfective except for the first and second person pronouns (ergative marking); and ii) the agreement pattern in the perfective regardless of the marking (ergative agreement). To state those facts, there is no room for ⟨case, erg⟩ to work in the Marathi grammar.

The conclusion drawn from the above discussion is that the way capturing ergativity in the grammar cannot be done by simply introducing ⟨case, erg⟩ in Marwari and Marathi, though it may be the case in other languages. The situation is not different in Hindi-Urdu. I will show that in the proposal in section 5.6.

Morphosyntactic category  It is often found that case plays a crucial role in defining the nominal inflectional paradigm in the morphology as we observed in the Icelandic morphology in Chapter 4. But it is not the case for nom, erg, acc and dat in Hindi-Urdu. As summarised in section 5.1, the case we need in the morphology is not nom, erg, acc and dat, but direct, oblique and vocative. Butt and King (2004) also remark this point “[w]e do not follow this analysis [Masica’s (1991) analysis of the oblique as Layer I of three possible layers of case marking — RO], but see this [oblique form] remnant of the Sanskrit system as ensuring syn-
chronic morphological wellformedness.” (p. 168) and “[i]n sum, the original Sanskrit case
morphology has been almost completely lost. The oblique marker is a last vestige of the original morphemes. It still fulfills a locative function in restricted contexts, but now primarily serves as a morphological wellformedness checker similar to the weak/strong agreement pattern of German adjectives and determiners.” (p. 173). So, it is clearly true that reference to the oblique is necessary in the morphology. More specifically, the three values for case, i.e. \texttt{dir}, \texttt{obl} and \texttt{voc}, define the inflected forms of a Hindi-Urdu noun interacting with \texttt{num}, \texttt{pers} and \texttt{gend}. On the other hand, there is no room in the morphology for \texttt{⟨case, erg⟩}, \texttt{⟨case, acc⟩} and \texttt{⟨case, dat⟩}, since it is not the case that the clitic form changes according to the \texttt{gend}, \texttt{num} and \texttt{pers} features of the host noun.

The \texttt{dir}, \texttt{obl} and \texttt{voc} distinction is crucial in the syntax as well, namely the interaction with modifiers in the NP. As seen in (5.9), the adjective ending is sensitive to whether the modified head noun is in the direct or the oblique/vocative in the masculine:

(5.69) a. barā makān
   big house.sg.m.dir
   ‘a big house’

b. bare makān\hspace{1em} mē
   big house.sg.m.obl
   ‘in the big house’

Due to the agreement with the head noun makān, the adjective is in the direct masculine singular form in (5.69a), while it is in the oblique masculine form in (5.69b). Without referring to the \texttt{dir/obl} distinction, this pattern cannot be captured. The same ending pattern is found in the clitic \textit{ka} as observed in (5.8) and demonstratives.

**Subcategorisation** Finally, we might argue that syntactic subcategorisation requires us to posit \texttt{case} features associated with the clitic formatives. For instance, Butt and King propose that quirky \texttt{case} is specified in the verb’s lexical entry as in (5.62). However, this does not necessarily license \texttt{case} in the grammar. In some cases, we would lose the generalisation without reference to \texttt{case} to describe the subcategorisation, of course. I mentioned such an instance in Icelandic in Chapter 4. That is, it is nonsense to state that \textit{batna} requires a subject with -\textit{i} ending for a masculine class I/III singular strong noun and a subject with -\textit{a} ending for a masculine weak noun, rather than stating \textit{batna} requires a \texttt{dat} NP subject.

The situation is different in Hindi-Urdu. As we recall from the discussion in English subcategorisation in Chapter 3, those idiosyncratic subcategorisation can be stated as formal requirements. For instance, \textit{cope} requires an object to be marked by \textit{with}, which is stated via the formal constraint ($\uparrow \texttt{obj pcase})\cdashright_\mathcal{e}$ \textit{with} (cf. Chapter 3 and Gazdar et al. 1985:23). It is highly undesirable to introduce \texttt{⟨case, instr⟩} for English \textit{with}. The same argument is
applicable to the Hindi-Urdu clitics. There is no need to introduce \(\langle \text{case, erg} \rangle\), \(\langle \text{case, acc} \rangle\) and \(\langle \text{case, dat} \rangle\) to state the formal constraint of an argument NP.

Crucially, this argument supports the necessity of \(\langle \text{case, dir} \rangle\) and \(\langle \text{case, obl} \rangle\) in the grammar I mentioned immediately above. As repeatedly stated, the clitics must attach to the oblique form NPs. To enforce this formal requirement, it is essential for the grammar to refer to \(\langle \text{case, obl} \rangle\) of the NP. The idiosyncratic direct form requirement of pronouns by \textit{ne} is also stated by the reference to \(\langle \text{case, dir} \rangle\). Those are not about the form, but about the inflectional property of a noun.

In summary, although Butt and King’s insight that the clitic marking requires the reference to complex syntax and semantic properties is correct, their proposal for the phrase structure and \textit{case} features is worth re-formulating. I shall present an alternative analysis under the general architecture and theme of this thesis.

5.6 Proposal

The discussion in the previous section reveals two problems found in Butt and King’s proposal: i) the KP projection is not desirable with regard to LFG’s theoretical assumptions of c-structure and empirical data of Hindi-Urdu; and ii) the association between \textit{case} features and clitics cannot be maintained as a part of the grammatical system or the descriptive device for Hindi-Urdu. Instead, I argue that a simple NP structure can be applicable to the nominal projection in Hindi-Urdu regardless of the existence of clitics. Further, morphosyntactically, the distinction between direct and oblique case is crucial in the grammar. On the other hand, Butt and King’s insight of the complex association between the clitic marking and syntactic and semantic properties of a clause and NPs is correct and must be incorporated in the analysis. I shall formalise those observations immediately below.

5.6.1 Phrase structure

5.6.1.1 Argument NP

As I mentioned briefly, I assume that the clitics such as \textit{ne} and \textit{ko} are non-projecting postpositions in the c-structure (see Spencer 2005 for the same proposal). Thus, the following PS rule is postulated to regulate the distribution of NPs and clitics:

\[
(5.70) \quad \text{NP} \rightarrow \text{NP} \uparrow \quad \hat{P} \\
\uparrow = \downarrow \\
\]
(5.70) allows the c-structure of a sentence containing a *ne* marked subject and a *ko* marked object to be (5.71):

\[
\begin{array}{c}
\text{(5.71)} \\
S \\
\text{NP} \rightarrow \text{NP} \text{ NP} \quad \text{V} \\
\text{NP} \quad \text{NP} \quad \text{V} \\
\text{N} \quad \text{N} \quad \text{V} \\
\text{lar} \text{kiyō} \quad \text{sūtā} \quad \text{dekhā} \\
\end{array}
\]

Both *lar*kiyō and *sūtā* project to NP as usual, and the clitics are adjoined to the NPs. Due to the non-projecting postposition status, they do not project further. The distribution of NPs not marked by clitics is the same as the NPs in (5.71). This fact naturally comes from the adjunction status of the non-projecting postposition, namely the NP simply lacks an adjoined \( \hat{P} \). Thus, the direct case form arguments and the oblique case form locatives are both NPs as follows:

\[
\begin{array}{c}
\text{(5.72)} \\
S \\
\text{NP} \rightarrow \text{NP} \quad \text{V} \\
\text{N} \quad \text{N} \quad \text{V} \\
\text{lar}kā \quad \text{kitāb} \quad \text{parhtā} \quad \text{hai} \\
\end{array}
\]

\[
\begin{array}{c}
\text{(5.73)} \\
S \\
\text{NP} \rightarrow \text{NP} \quad \text{V} \\
\text{N} \quad \text{N} \quad \text{V} \\
\text{rām} \quad \text{zu} \quad \text{gaiya} \quad \text{hai} \\
\end{array}
\]

### 5.6.1.2 *kā* puzzle

Amongst the clitics we have observed, *kā* shows distinctive morphosyntactic behaviours. Although phonologically it attaches to the preceding NP, it agrees with the modified noun. It inflects exactly like an adjective. Despite its appearance with term arguments, its marking seems to be regulated by syntactic nominal category domain (cf. Mohanan 1994:177–82). So, the role of *kā* is more like a nominal linker and it may require a separate analysis from the other clitics. Although I do not analyse *kā* and its relation to the NP internal grammatical relations in the current study, I briefly look at its use in compound postpositions focusing on the phrase structural category.
Mohanan (1994:62–3) and Butt and King (2004) state that the clitics are not postpositions by showing that genuine postpositions exist in Hindi-Urdu. Butt and King argue that they belong to a syntactic category P and heads PPs taking NP complements. This syntactic category distinction, they claim, is motivated by the distributional differences between the clitic marked phrase and the postposition marked phrases, namely the former can occur as subjects while the latter cannot. The genuine postpositions Mohanan (1994) and Butt and King (2004) illustrate are often referred to as compound postpositions analog to simple postpositions such as ne, ko and se (McGregor 1995:36–7, Schmidt 1999:81–4). In most cases, they take a format of an oblique form of kā followed by a content word. For instance, ke sāth, ke pās and kī taraf mean ‘with’, ‘near, beside’ and ‘towards’ respectively.

(5.74)  
a. gāv ke pās  
‘near the village’  
b. dostō ke sāth  
‘with friend’

As shown in (5.10), the first and second person pronouns have possessive forms instead of being followed by kā. Hence, the possessive pronouns are used when the compound postpositions follow the first and second person pronouns as in (5.75) (McGregor 1995:36):

(5.75)  
a. tumhāre pās  
‘near you/in your possession’  
b. mere sāth  
‘with me’  
c. hamārī taraf  
‘in our direction’

In (5.75a), the second person pronoun is in the possessive form tumhāre, so in a sense a part of the compound postposition ke pās is incorporated into the pronoun. (5.75b, c) illustrate the same point with the first person singular and plural pronouns.

The content words following kā can mainly be oblique nouns ((5.76)), oblique adjectives ((5.77)) and adverbs ((5.78)) (Schmidt 1999:82–3):

(5.76)  
ke sāth  ‘with’ (sāth ‘company’ m)  
ke vāste  ‘for, in order to’ (vāsta ‘connection, reason’ m)  
kī taraf  ‘towards’ (taraf ‘direction, way, side’ f)  
kī jagah  ‘in place of’ (jagah ‘place’ f)

(5.77)  
ke mutābiq  ‘according to’ (mutābiq ‘comformable, similar’)  
ke barābar  ‘equal to, similar to’ (barābar ‘even, level, equal’)
(5.78) ke bād ‘after’ (bād ‘afterwards, later’)
ke pīche ‘behind, after’ (pīche ‘behind, after’)
ke ūpar ‘above’ (ūpar ‘above, up, over’)
ke pās ‘near, shows possession’ (pās ‘near, side’)

(5.76) shows that kā agrees with the following oblique nouns. When it is followed by adjectives or adverbs, it takes ke form as shown in (5.77) and (5.78). Interestingly, if the oblique feminine noun is modified by an adjective, kā becomes ke instead of kī (McGregor 1995:37):

(5.79) ke dāhinī taraf ‘on the right-hand side of’

In (5.79) the adjective dāhinī modifies the oblique feminine noun of the compound postposition. This modification alters the form of the clitic from kī to ke.

There are some cases where the compound postpositions are separated. For instance, In the compounds like ke bīnā ‘without’, ke māre ‘because of’ and ke sivā ‘except for’, the content words can be positioned in front of the NP complements, which otherwise precede the compounds (McGregor 1995:163):

(5.80) a. āp kī sahāytā ke bīnā ham saphal na ho sake.
   your help we successful not be able
   ‘We couldn’t have been successful without your help.’

b. bīnā āp kī sahāytā ke ham saphal na ho sake.

c. āp ke sivā merā koī mitr nahī hai.
   you my some friend not be
   ‘I have no friend but you.’

d. siva āp ke merā koī mitr nahī hai.

In (5.80a, c), the compounds follow āp kī sahāytā ‘your help’ and āp ‘you’ as usual. In (5.80b, d), on the other hand, the content words bīnā and siva in the compounds are preposed leaving kī and ke behind. Sometimes, simply the order between kā and the content words can be swapped. For instance, ke mutāllīq ‘about’ can also appear as mutāllīq ke.

In sum, it is clear that semantically the compound postpositions are interpreted as single units, and they must be stored as such in the lexicon. Morphosyntactically, however, they cannot be treated as single units. For instance, kā clearly follows the regular morphology in many respects such as the possessive pronoun forms and agreement with the following oblique nouns, even when it is a part of the compound postpositions. In addition, an oblique noun constituting a part of a compound can be modified. And finally, two parts of the compounds can be separated in the syntax. Those facts suggest that their semantic idiosyncrasy does not tie the elements of the compounds together morphosyntactically, which is very typical in phrasal idioms. Hence, the above observations highlight rather questionable assumption
in Butt and King (2004), namely they are Ps which head a PP in the c-structure, since that assumption leaves the morphosyntactic properties involved in the compound postpositions unexplained.

Their assumption of PP and KP becomes even more problematic in the following examples, which they cite to show the same distribution pattern between the locative clitics and the compound postpositions (Butt and King 2004:178):

(5.81)  
\[ \begin{align*} 
  & \text{a. un lõgõ mē se tīn} \\
  & \quad \text{that people in from three} \\
  & \quad \text{‘three from among those people’} \\
  & \text{b. almārī ke pīche se} \\
  & \quad \text{cupboard behind from} \\
  & \quad \text{‘from behind the cupboard’} 
\end{align*} \]

In (5.81a), \( \text{se} \) attaches to the clitic marked phrase \( \text{un lõgõ mē} \). In (5.81b), \( \text{se} \) attaches to the whole phrase preceding it. If \( \text{se} \) and \( \text{mē} \) are Ks, we need to allow a K either to take another KP as its complement or to be adjoined to another K forming a compound K to account for the distribution found in (5.81a). Moreover, if \( \text{ke pīche} \) is a P heading a PP in (5.81b), \( \text{se} \) must be able either to take a PP complement as well as an NP or to be adjoined to P to form a P-K complex.

To argue against postulating a PP for the clitic marked phrase based on (5.81), Butt and King (2004:178) state as follows: “the relevant generalization is over locatives, not over a particular syntactic class (case clitics vs. \( \text{ke} \) postpositions). It would therefore be a mistake to base the identification of case clitics with postpositions on this one argument, especially as the case clitics can all appear on subject noun phrases, while noun phrases with \( \text{ke} \) postpositions do not mark subjects […]” This statement is however controversial. On the one hand, they postulate a PP based on its function, namely whether or not a phrase can appear as a subject is determined by the KP vs. PP distinction. In other words, the function of a given phrase is tightly linked to its syntactic category. On the other hand, they claim that the data like (5.81) must be explained based on the locative function rather than the syntactic categories. If such a separation between category and function is necessary, their function-based postulation of PP does not hold.

The main source of the problems is the introduction of unnecessary category distinctions in c-structure, i.e. KP and PP. I have already argued that there is no morphosyntactic motivation behind KP projection and regarding both the clitic marked phrases and the bare direct and oblique form phrases as NPs gives a simple and unified treatment. Likewise, the puzzles can be solved by assuming that a phrase containing a compound postposition is an NP.
this end, we can claim that $kā$ is semantically a part of the adverbial markers (compound postpositions in traditional term) but syntactically it is a formative to link the head noun and the following content words. The following c-structures can be posited for (5.81):

(5.82)  

\[
\begin{align*}
\text{a.} & \quad \begin{array}{c}
\text{NP} \\
\text{NP} \\
\text{NP} \\
\text{un lõgõ} \\
\text{mē}
\end{array} \\
\text{b.} & \quad \begin{array}{c}
\text{NP} \\
\text{NP} \\
\text{NP} \\
\text{N} \\
\text{ke pîche} \\
\text{almārī}
\end{array}
\end{align*}
\]

(5.82a) is the multiple locative clitic marking example. The first layer of clitic is adjoined to the NP. Since it is a non-projecting P, the category is unchanged. The $mē$ marked NP attracts the further clitic marking $se$. Those are regulated by the regular PS rule. (5.82b) involves the compound postposition. The head NP and the content adverb of the compound is linked by $ke$. I leave the question where $ke$ is placed in the c-structure open, although the content word fronting examples and the appearance of possessive pronouns suggest that it is adjoined to the head NP rather than the content word. This adjunction adds an adverbial function to the NP just like the $mē$ marking does so in (5.82a). The resultant NP hosts the $se$ marking.\(^\text{11}\)

The content word modification is also captured by this c-structure principle. For instance, gāv $ke$ dāhīn taraf ‘on the right-hand side of the village’ where dāhīn modifies a part of the compound postposition can be represented as follows:

(5.83)

\[
\begin{array}{c}
\text{NP} \\
\text{NP} \\
\text{N} \\
\text{gāv} \\
\text{ke} \\
\text{dāhīn} \\
\text{taraf}
\end{array}
\]

In (5.83), the adjective modifier is placed in the Spec-NP, but it can also be treated as an adjunction to the NP. The modified content word is linked to the head by $ke$ adding an locative property to it.

5.6.2 Extended nominal inflection

In this section, we shall look at how the clitic marking can be defined in the Hindi-Urdu morphosyntax. It is clear from the discussion so far and the argument in Mohanan (1994) and

\(^{11}\)Of course, some additional constraints are necessary to ensure that $se$ attaches to the right edge of an NP.
5.6. PROPOSAL

Butt and King (2003, 2004) that the marking involves more than $gf$ encoding of the phrase. However, it is not a good design of grammar if the morphology directly accesses those complex set of properties to specify the marking. Instead, I assume that the nominal inflectional paradigm is defined by a set of nominal features as usual and the linkage between a set of syntactic and semantic information and the inflectional features is established separately in the lexicon.\(^{12}\)

5.6.2.1 Featural linkage

As we recall from the discussion in Chapter 3, each lexical entry in a given paradigm is paired with a set of equations (f-description) to be workable in the syntax. The pair of form and f-description is defined by the function $P\mathcal{F}$. In other words, the paradigm itself is constructed via a complete set of features with which the entries can work in the syntax. This is an optimistic view of the paradigmatic morphology and the syntactic features, however. It is normally the case that a fully inflected form can be defined by a simple set of inflectional properties associated with that form, yet the form needs to carry more properties to work in the syntax and semantics. To establish the association between a set of inflectional features and syntactic properties, I postulate the featural linkage that allows us to assign a set of equations necessary to the syntax and other levels to an item in the paradigm via feature dependency.

The linkage is formulated in a similar fashion to the FCRs in GPSG. For the Hindi-Urdu nominal features, the dependency can be defined over the $gf$ whose value is the f-structure corresponding to a given noun and associated syntactic and semantic properties. Following Gazdar et al. (1985:28), I illustrate them with material conditionals as in (5.84) – (5.86):

\[
\begin{align*}
(5.84) & \quad (\text{SUBJ} \uparrow) \quad (i) \quad ((\text{SUBJ} \uparrow) \text{OBJ}) \\
& \quad \quad \quad \quad \quad ((\text{SUBJ} \uparrow)_\mu \text{VFORM}) = \text{PERF} \\
& \quad \quad \quad \quad \quad \quad (\uparrow \sigma \text{CONT}) = \text{INT} \\
& \quad \quad \quad \quad \quad \quad (\text{GOAL} \hat{=} \alpha) \\
& \quad \quad \quad \quad \quad \quad (\uparrow \sigma \text{CONT}) = \text{NO} \\
& \quad \quad \quad \quad \quad \quad (i) \text{ and } (ii) \supset (\uparrow \text{PFORM}) = \text{NE} \\
& \quad \quad \quad \quad \quad \quad (iii) \supset (\uparrow \text{PFORM}) = \text{KO} \\
& \quad \quad \quad \quad \quad \quad (iv) \supset (\uparrow \text{PFORM}) = \text{SE} \\
& \quad \quad \quad \quad \quad \quad \text{Elsewhere} \supset (\uparrow \text{CASE}) = \text{DIR}
\end{align*}
\]

\(^{12}\)The idea behind this proposal is close to Nordlinger and Sadler’s (2004) morphological-feature to f-description mapping (see also Andrews 2005). The introduction of distinct featural system may be required to handle the case stacking data they analyse. I do not discuss this issue in detail here.
(5.85)  (OBJ ↑)
\[
\{ (↑_{σ} \text{SPECIFIC}) = + \mid (↑_{σ} \text{ANIM}) = + \} ⊃ (↑ \text{PFORM}) = \text{KO}
\]
Elsewhere ⊃ (↑ \text{CASE}) = \text{DIR}

(5.86)  (OBJ_{go} ↑) ⊃ (↑ \text{PFORM}) = \text{KO}

(5.84) lists the cases where a given noun and its projection is mapped onto the value of \text{SUBJ} in the f-structure as represented by the existential constraint (\text{SUBJ ↑}). The additional features are listed from (i) – (iv). (i) adds another existential constraint ((\text{SUBJ ↑} \text{OBJ}) that places OBJ in the f-structure (\text{SUBJ ↑}). (i) also requires ⟨vform, perf⟩ in the m-structure corresponding to the f-structure (\text{SUBJ ↑}).\footnote{If we assume that \text{vform} belongs to f-structure, the equation would be simply written as (\text{SUBJ ↑} \text{vform}) = c. \text{PERF}.} The statement below is the featural linkage, namely an entry that has the set of equations (i) need to co-occur with a set of noun inflectional properties (↑ \text{PFORM}) = \text{NE}. This is the way tying up the \text{GF} bearing property (and other information) with a certain inflectional features, so that each entry in the paradigm is correctly picked up with respect to the required syntactic and semantic features. (ii) is a set of features that also requires (↑ \text{PFORM}) = \text{NE}. This is the case where a \text{SUBJ} of an intransitive verb receives \text{ne} marking. In (iii), the entry has (\text{SUBJ ↑}) and (\text{GOAL} \sim_{\ast}), namely the corresponding f-structure is a value of \text{SUBJ} and the corresponding a-structure is a value of \text{GOAL}. With those features, the inflectional features of the entry is (↑ \text{PFORM}) = \text{KO}, i.e. this is the case of \text{ko} marking on a so-called experiencer subject. (iv) is for a \text{se} marked subject. ⟨\text{CONT}, \text{NO}⟩ in the corresponding s-structure suggests that the subject has no control over the event. Such a subject noun must have (↑ \text{PFORM}) = \text{SE}. Finally, in all the other cases, the entry with (\text{SUBJ ↑}) has (↑ \text{CASE}) = \text{DIR}.\footnote{This can also be stated as Feature Specification Defaults (FSDs) (Gazdar \textit{et al.} 1985:29ff).}

(6.92) is straightforward. It states the linkage where the item is mapped onto the value of \text{OBJ} in the f-structure. If it has either (↑_{σ} \text{SPECIFIC}) = + or (↑_{σ} \text{ANIM}) = +, it must have (↑ \text{PFORM}) = \text{KO} as well. That is, an animate and/or specific object NP receives \text{ko} marking. Otherwise, the entry with (\text{OBJ ↑}) must have (↑ \text{CASE}) = \text{DIR}. (5.86) is an obligatorily \text{ko} marking on an indirect object. Following Butt and King (2004), it is written as one type of restricted objects, (OBJ_{go} ↑) (see also Bresnan and Moshi 1990). The items having this feature always require (↑ \text{PFORM}) = \text{KO}.

Note that the locative or other postpositional marking on \text{obl} and \text{adjunct} would be described in the same way, though omitted here. That is, the linkage between semantic features and \text{PFORM} and \text{CASE} over (\text{obl ↑}) and (\text{adj} ∈ ↑) is established.

The linkage we have looked at so far corresponds to semantic case in Butt and King (2004) in that they are regular and predictable correspondences between a set of syntactic
and semantic properties and a certain form of NP. However, in some cases, the formal requirement is enforced idiosyncratically by the governing predicates as in Butt and King’s discussion on lexical case assignment. Such idiosyncratic formal requirements are stated as constraining equations of the governing predicates. For instance, लाना ‘bring’, भूलना ‘forget’ and बोलना ‘speak’ require a direct case form subject even in the perfective. Hence, they have \((↑\text{SUBJ CASE}) = \text{DIR}\), so that only an NP having \((↑\text{CASE}) = \text{DIR}\) can appear as their subject.

5.6.2.2 Morphological paradigm

The head nouns inflect for \(\text{NUM, GEND and CASE}\). In addition, they have another layer for \(\text{PFORM}\).\(^{15}\) Hence, the paradigm is defined by the following set of inflectional features and FCRs:

\[
\begin{align*}
(\text{5.87}) \quad (↑\text{PRED}) &= \{\text{list of PRED values}\} \\
(↑\text{NUM}) &= \{\text{SG | PL}\} \\
(↑\text{GEND}) &= \{M | F\} \\
(↑\text{CASE}) &= \{\text{DIR | OBL | VOC}\} \\
(↑\text{PERS}) &= 3 \\
((↑\text{PFORM}) &= \{\text{NE | KO | SE | ME | PAR | TAK}\}) \\

(\text{5.88}) \quad \text{FCR1: } (↑\text{PFORM}) \supset (↑\text{CASE}) = \text{OBL}
\end{align*}
\]

(5.87) shows the list of attributes and permissible values in the Hindi-Urdu noun inflection. Since an NP can lack \(\text{PFORM}\), I assume that it is optional. Since \(\text{PFORM}\) must co-occur with \((\text{CASE, OBL})\) whatever the value of \(\text{PFORM}\) is, the FCR is stated as in (5.88).

We can propose the \(\mathcal{R}\)s for the first layer endings, i.e. genuine suffixes, as in (5.89) and for the second layer endings, i.e. phrasal suffixes, as in (5.90):\(^{16}\)

\[
\begin{align*}
(\text{5.89}) \quad \text{Block I (Layer I)}
\end{align*}
\]

i. \(\mathcal{R}_L(↑\text{GEND}) = M, \ (↑\text{NUM}) = \text{SG, (↑\text{CASE}) = DIR}|↑\text{A}](\sigma) = \bar{a}
\]

ii. \(\mathcal{R}_L(↑\text{GEND}) = M|↑\text{A}](\sigma) = e
\]

iii. \(\mathcal{R}_L(↑\text{GEND}) = F, \ (↑\text{NUM}) = \text{PL, (↑\text{CASE}) = DIR}|↑\text{A}](\sigma) = \bar{a}
\]

iv. \(\mathcal{R}_L(↑\text{GEND}) = F, \ (↑\text{NUM}) = \text{PL, (↑\text{CASE}) = DIR}|↑\text{A}](\sigma) = \bar{e}
\]

v. \(\mathcal{R}_L(↑\text{GEND}) = F|↑\text{A}](\sigma) = \bar{a}
\]

vi. \(\mathcal{R}_L(↑\text{NUM}) = \text{PL, (↑\text{CASE}) = OBL}|↑\text{N}](\sigma) = \bar{O}
\]

\(^{15}\)A difficulty this proposal faces is that there are cases, though not productive, where multiple clitics appear after an NP as we observed in (5.81a). We may adopt Nordlinger and Sadler’s (2004) analysis of case stacking or place \(\text{PFORM}\) in the m-structure that has \(\text{DEP}\) embedding. Alternatively, we might allow \(\text{PFORM}\) to have a set value, rather than an atomic value (cf. Dalrymple and Kaplan 2000). I leave this issue for future research.

\(^{16}\)The formulation provided below is not meant to be the complete analysis of noun inflectional morphology in Hindi-Urdu. For instance, I omit morphophonological alternations such as semi-vocalic glide insertion.
vii. $\mathcal{R}_L([\uparrow \text{NUM}]) = \text{PL}, ([\uparrow \text{CASE}]) = \text{OBL}, N(\sigma) = o$

(5.90) **Block II (Layer II)**

i. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{NE}, N(\sigma) = \text{ne}$

ii. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{KO}, N(\sigma) = \text{ko}$

iii. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{SE}, N(\sigma) = \text{se}$

iv. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{ME}, N(\sigma) = \text{mē}$

v. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{PAR}, N(\sigma) = \text{par}$

vi. $\mathcal{R}_L([\uparrow \text{pform}]) = \text{TAK}, N(\sigma) = \text{tak}$

Since the inflectional classes of a noun are defined by the endings, I posit $[\pm \text{a}, \pm \text{i}]$, namely masculine nouns with $\text{ā}$-ending ([+A, −I]) and non-$\text{ā}$-ending ([−A, −I]) and feminine nouns with $\text{i}$-ending ([−A, +I]), iy $\text{ā}$-ending ([+A, +I]) and non-$\text{i}$-ending ([−A, −I]). $N$ is a class covering all the combinations of $[\pm \text{a}, \pm \text{i}]$. The linearisation of the Hindi-Urdu exponents are suffixal, so I omit it. (5.89) yields the inflected forms of nouns as summarised in section 5.1.

The exponents of the further suffixation, i.e. phrasal suffixation, are specified by the $\mathcal{R}$s in (5.90). They simply realise $\text{pform}$s as corresponding formatives. The completely inflected expressions further undergo the labelling function $\mathcal{L}$ (cf. Chapter 3 and Luís and Otoguro 2005a, b). They turn out to be a combination of $N$ (stem + block I exponent) and $\hat{P}$ (block II exponent).

Although I do not discuss the inflectional patterns of pronouns, I comment upon some of their peculiar properties and how they are captured. Firstly, as in (5.6), personal pronouns show a different behaviour from ordinary nouns with respect to $\text{ne}$ marking. The first and second person pronouns are in the direct form, not in the oblique, when they are followed by $\text{ne}$ and the third person plural pronouns take special forms. Those can be captured by postulating the following FCRs:\footnote{\text{\((\uparrow \text{pred}) = \text{‘pro’ and (\uparrow \text{protype}) = personal or the like might be added.}\)}}

(5.91) **FCR2:** $([\uparrow \text{pers}]) = \{1 | 2\}$, $([\uparrow \text{pform}]) = \text{NE}$ $\supset$ $([\uparrow \text{case}]) = \text{DIR}$

**FCR3:** $([\uparrow \text{pers}]) = 3$, $([\uparrow \text{num}]) = \text{PL}$, $([\uparrow \text{pform}]) = \text{NE}$ $\supset$ $([\uparrow \text{case}]) = \text{SP}$

FCR2 ensures that the combination of given pers and pform values requires $([\uparrow \text{case}]) = \text{DIR}$. Similarly, FCR3 states that a specific combination of pers, num and case co-occurs with a special case form, i.e. $([\uparrow \text{case}]) = \text{SP}$.

Another intriguing property is the variant forms for the $\text{ko}$ marked pronouns. As shown in (5.7), in addition to the ordinary combination of the oblique case form and $\text{ko}$, the personal pronouns have another synthetic forms in the colloquial setting. Those forms are specified in the morphology by postulating a portmanteau rule block over the Block I and II. If we
introduce an appropriate feature for the colloquial setting in the information structure, an application of the rules in the portmanteau block can be properly regulated.

Now, let us look at how the proposed analysis works. We consider the inflections of two nouns larka ‘boy’ and kitab ‘book’ and their f-descriptions. Their use is illustrated by the following pair of sentences:

(5.92) a. larka kitab ko paarthi hai.
   boy.sg.m.dir book.sg.f.obl read.impf.sg be.pres.3.sg
   ‘The boy reads the book.’

b. larke ne kitab parhi.
   boy.sg.f.obl book.sg.m.dir read.perf.sg.f.
   ‘The boy read a book.’

To construct larka and larke, the PP processes the following stem selections, rule applications and linearisations. The I correctly specifies the stem of the input lexeme as lark. It also gives the inflectional class [+A, −i], namely it is an a-ending masculine noun. In (5.93), according to gend, num, case and the inflectional class, the exponent is selected by the most narrowly matched R (5.89-i) in Block I and the IFD applies in Block II due to the lack of pform in σ. Finally, the strings are labelled by L, that is the block I exponent is treated as a genuine suffix and the whole string is labelled as N. In (5.94), a different ending is select in Block I and (↑ pform) = ne requires ne to be selected in Block II. The Block I exponent is joined together to the stem, while the Block II one is given its own category label P, which allows them to instantiate distinct nodes in c-structure.

(5.93) σ = {(↑ pred) = ‘boy’, (↑ num) = sg, (↑ gend) = m, (↑ case) = dir, (↑ pers) = 3}
   i. $I(⟨\text{boy}, N, σ⟩) = ⟨\text{lark}, N[+A, −i], σ⟩$
   ii. Block I: $R_I[⟨\text{gend}⟩ = m, (↑\text{num}) = \text{sg}, (↑\text{case}) = \text{dir}, [+A]⟩(σ) = a$
       (5.89-i)
   Block II: IFD
   iii. lark < a ⇒ larkaN

(5.94) σ = {(↑ pred) = ‘boy’ (↑ num) = sg, (↑ gend) = m, (↑ case) = obl, (↑ pers) = 3, (↑ pform) = ne}
   i. $I(⟨\text{boy}, N, σ⟩) = ⟨\text{lark}, N[+A, −i], σ⟩$
   ii. Block I: $R_I[⟨\text{gend}⟩ = m, [+A]⟩(σ) = e$
       (5.89-ii)
   Block II: $R_{II}[⟨\text{pform}⟩ = \text{ne}, N(σ) = \text{ne}$
       (5.90-i)
   iii. lark < e < ne ⇒ larken neP

(5.84) allows the following lexical entries for those two expressions:
The f-structure of the direct case form larkā is a value of either subj or obj as in (5.95a). The f-structure of larkā ne, on the other hand, is invariably a value of subj as in (5.95b). If the governing predicate is a transitive verb, larkā ne also constructs obj in the outer f-structure as indicated by the existential constraint ((subj ^) obj). If the governing predicate is an intransitive, the s-structure corresponding to the f-structure of larkā ne has ⟨cont, int⟩. Those are all discussed in Butt and King (2003, 2004).

Likewise, the two forms of kitāb are constructed as in (5.96) and (5.97). It is a non-ı-ending feminine noun, so the stem has [−A, −ı]. The direct case form is identical to the stem as in (5.96). (5.97) shows how ko marks the base:

(5.96) $\sigma = \{(\uparrow \text{PRED}) = \text{‘BOOK’}, (\uparrow \text{NUM}) = \text{SG}, (\uparrow \text{GEND}) = \text{F}, (\uparrow \text{CASE}) = \text{DIR}, (\uparrow \text{PERS}) = 3\}$

i. $\mathcal{R}(\langle\text{BOOK, N, } \sigma\rangle) = \langle\text{kitāb, N}[−A, −ı], \sigma\rangle$

ii. Block I: IFD

Block II: IFD

iii. $\text{kitāb} \Rightarrow \text{kitāb}_N$

(5.97) $\sigma = \{(\uparrow \text{PRED}) = \text{‘BOOK’}, (\uparrow \text{NUM}) = \text{SG}, (\uparrow \text{GEND}) = \text{F}, (\uparrow \text{CASE}) = \text{OBL}, (\uparrow \text{PERS}) = 3, (\uparrow \text{PFORM}) = \text{KO}\}$

i. $\mathcal{R}(\langle\text{BOY, N, } \sigma\rangle) = \langle\text{kitāb, N}[−A, −ı], \sigma\rangle$

ii. Block I: IFD

Block II: $\mathcal{R}_{II}(\uparrow \text{PFORM}) = \text{KO}, N(\sigma) = \text{ko}$

(5.90-ii)

iii. $\text{kitāb} < \text{ko} \Rightarrow \text{kitāb}_N \text{ko}_F$
According to the linkage (5.84) – (5.86), the entries will be listed as in (5.98). The direct case form is the same as larḵā in that its f-structure would either be a value of subj or obj as shown in (5.98a). The f-description of kitāb ko in (5.98b) is slightly more complicated, although it is already discussed in Butt and King. The first member of the disjunction contains (subj ↑) and (obj ↑), so the f-structure of the entry is a value of subj and the a-structure is a value of goal. The second member states that its f-structure can be a value of obj and the s-structure corresponding to it has ⟨specific, +⟩. Finally, the third member says that its f-structure can be a value of objgo:

(5.98) a. kitābkN \[\uparrow \text{PRED} = \text{BOOK}\]
\[\uparrow \text{NUM} = \text{SG}\]
\[\uparrow \text{GEND} = \text{F}\]
\[\uparrow \text{CASE} = \text{DIR}\]
\[\uparrow \text{PERS} = 3\]
\{(subj ↑) | (obj ↑)\}

b. kitābkN ko\[^{\hat{P}}\] \[\uparrow \text{PRED} = \text{BOOK}\]
\[\uparrow \text{NUM} = \text{SG}\]
\[\uparrow \text{GEND} = \text{F}\]
\[\uparrow \text{CASE} = \text{OBL}\]
\[\uparrow \text{PFORM} = \text{KO}\]
\[\uparrow \text{PERS} = 3\]
\{(subj ↑)\}
\{(goal \[^{\hat{s}}_{\alpha}\]) | (obj ↑)\}
\{(↑, specific) = + | (objgo ↑)\}

If those entries are inserted into the syntax, they construct well-formed c-/f-structures (5.99) and (5.100) for (5.92a) and (5.92b) respectively. The category labels N and \(^{\hat{P}}\) ensure that the distributions of the items are correctly constrained by the PS rules in the c-structures. The lexical information are mapped onto the f-structures and the s-/m-structures via the f-structure as indicated by the arrows:
(5.99)
5.6.3 Agreement

Finally, let us look at how the agreement pattern in Hindi-Urdu can be captured under the current proposal. As pointed out above, a correct analysis cannot rely on purely surface properties, i.e. linear order and clitic marking on NPs, as found in Saksena (1981). Instead, the references to the controller’s grammatical function and form are both crucial. In this section, I shall show how the architectural modification for agreement in LFG proposed in Chapter 4 can capture the Hindi-Urdu data combined with the proposal made in the previous section.

5.6.3.1 V-AUX selection

Firstly, let us look at the formulation of verbal inflectional morphology in Hindi-Urdu briefly. I do not aim to provide a full coverage of the inflectional patterns. Instead, I will illustrate how certain combinations of a main verb and auxiliaries are specified in the morphological
component. As we have observed in section 5.4.1, the aspect in Hindi-Urdu can be perfect, imperfect or unmarked. The tense is present, past or future. Hence, the following list of features can be postulated:\textsuperscript{18}

\begin{equation}
\begin{aligned}
(\uparrow \text{pred}) &= \{\text{list of pred values}\} \\
(\uparrow \text{tense}) &= \{\text{pres} \mid \text{past} \mid \text{fut}\} \\
((\uparrow \text{asp perf}) &= \{+ \mid -\}) \\
(\uparrow \text{PAgrPath}) &= \%\text{AGR} \\
(\%\text{AGR num}) &= \{\text{SG} \mid \text{PL}\} \\
(\%\text{AGR gend}) &= \{M \mid F\} \\
(\%\text{AGR pers}) &= \{1 \mid 2 \mid 3\}
\end{aligned}
\end{equation}

\textsc{asp perf} is optional since it can be missing in the f-structure. The agreement path \textsc{PAgrPath} is postulated and given the local name \%\text{AGR} as proposed in Chapter 4. The agreement features are \textsc{num}, \textsc{gend} and \textsc{pers}.

According to the specifications of the values, the \( \sigma \) selects an appropriate set of a main verb and auxiliaries. (5.102) – (5.106) are the examples of stem selection. (5.102) is an example of the simple past, which is represented by (\( \uparrow \text{tense} \)) = past and (\( \uparrow \text{asp perf} \)) = – — I leave the agreement features unspecified at this point. The \( \sigma \) selects the stem of the main verb as \( \bar{a} \) (\(<\ \bar{a}n\ \bar{a} \langle\text{come.INF}\rangle\)’. It has (\( \uparrow_\mu \)) \textsc{vform} = \textsc{perf} and the equations for agreement features \textsc{num} and \textsc{gend}:

\begin{equation}
\begin{aligned}
(\sigma) &= \{\langle \text{come}, V, \sigma \rangle\} \\
\bar{a} \ V &= (\uparrow_\mu \textsc{vform}) = \textsc{perf} \\
(\%\text{AGR num}) &= _c \ldots \\
(\%\text{AGR gend}) &= _c \ldots
\end{aligned}
\end{equation}

The immediate past is shown in (5.103). The tense and aspect information is given the features (\( \uparrow \text{tense} \)) = \textsc{pres} and (\( \uparrow \text{asp perf} \)) = +. This time, the \( \sigma \) selects two stems, the main verb \( \bar{a} \) and the auxiliary \( h \) (\(<\ \bar{h}n\bar{a}\)’. Crucially, the former inflects for \textsc{num} and \textsc{gend}, while the latter does so for \textsc{num} and \textsc{pers}. This is captured by postulating a different set of equations for agreement, namely (\%\text{AGR num}) = \ldots and (\%\text{AGR gend}) = \ldots for the main verb, and (\%\text{AGR num}) = \ldots and (\%\text{AGR pers}) = \ldots for the auxiliary:\textsuperscript{19}

\textsuperscript{18}For ease of exposition, I ignore progressive aspect and other modal features such as conditional, presumptive and irrealis.

\textsuperscript{19}We may postulate the m-structure containing \textsc{dep} embedding to describe the relation for more complex combinations of main verbs and auxiliaries. I leave this option open here.
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(5.103) Immediate past (‘has come’)
\[ \sigma = \{ (\uparrow \text{pred}) = \text{come}(\text{subj}), \ (\uparrow \text{tense}) = \text{pres}, \ (\uparrow \text{asp perf}) = +, \\
(\uparrow \text{PAgrPath}) = \%\text{agr}, \ (\%\text{agr num}) = \ldots, \ (\%\text{agr gend}) = \ldots, \ (\%\text{agr pers}) = \ldots \} \]
\[ \mathcal{S}(\langle \text{come}, V, \sigma \rangle) = \]
\[ \bar{a} \ V \ (\uparrow \mu \text{vform}) = \text{perf} \]
\[ (%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]
\[ h \ \text{AUX} \ (\%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]

The remote past, i.e. (\uparrow \text{tense}) = \text{past} and (\uparrow \text{asp perf}) = +, on the other hand, requires both the main verb and the auxiliary to agree in num and gend. Therefore, the following formulation is posited:

(5.104) Remote past (‘had come’)
\[ \sigma = \{ (\uparrow \text{pred}) = \text{come}(\text{subj}), \ (\uparrow \text{tense}) = \text{past}, \ (\uparrow \text{asp perf}) = +, \\
(\uparrow \text{PAgrPath}) = \%\text{agr}, \ (\%\text{agr num}) = \ldots, \ (\%\text{agr gend}) = \ldots, \ (\%\text{agr pers}) = \ldots \} \]
\[ \mathcal{S}(\langle \text{come}, V, \sigma \rangle) = \]
\[ \bar{a} \ V \ (\uparrow \mu \text{vform}) = \text{perf} \]
\[ (%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]
\[ th \ \text{AUX} \ (\%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]

Similarly, the verb + auxiliary combinations for the habitual present and habitual past can be stated as in (5.105) and (5.106) respectively:

(5.105) Habitual present (‘comes’)
\[ \sigma = \{ (\uparrow \text{pred}) = \text{come}(\text{subj}), \ (\uparrow \text{tense}) = \text{pres}, \ (\uparrow \text{asp perf}) = -, \\
(\uparrow \text{PAgrPath}) = \%\text{agr}, \ (\%\text{agr num}) = \ldots, \ (\%\text{agr gend}) = \ldots, \ (\%\text{agr pers}) = \ldots \} \]
\[ \mathcal{S}(\langle \text{come}, V, \sigma \rangle) = \]
\[ \bar{a} \ V \ (\uparrow \mu \text{vform}) = \text{imperf} \]
\[ (%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]
\[ h \ \text{AUX} \ (\%\text{agr num}) = _c \ldots \]
\[ (%\text{agr gend}) = _c \ldots \]

(5.106) Habitual past (‘used to come’)
\[ \sigma = \{ (\uparrow \text{pred}) = \text{come}(\text{subj}), \ (\uparrow \text{tense}) = \text{past}, \ (\uparrow \text{asp perf}) = -, \\
(\uparrow \text{PAgrPath}) = \%\text{agr}, \ (\%\text{agr num}) = \ldots, \ (\%\text{agr gend}) = \ldots, \ (\%\text{agr pers}) = \ldots \} \]
\[ \mathcal{S}(\langle \text{come}, V, \sigma \rangle) = \]
The endings attached to the stems are specified by $R$s as usual. I omit the descriptions of the $R$s here (see (5.39b) and (5.41)).

The future requires a different treatment from the above cases. As seen in section 5.4.1, it is constructed by the combination of the subjective participle and the suffix $gā$ ($\sim ge \sim gī$). The former inflects for person and number, whereas the suffix inflects exactly like an adjective, i.e. for number and gender. Thus, the morphology must treat them as separated units, each of which undergoes distinct morphological operations. The following specifications are obtained:

$\sigma = \{ (\uparrow \text{Pred}) = \text{COME}(\text{SUBJ}), \; (\uparrow \text{Tense}) = \text{FUT}, \; (\uparrow \text{PAgrPath}) = \text{AGR} \}$

\[ \mathcal{L}((\text{COME}, V, \sigma)) = \]

\[ \vec{a} \; V \; (\uparrow_{\mu} \text{Vform}) = \text{IMPF} \]
\[ (\%\text{AGR Num}) = \ldots, \; (\%\text{AGR Gend}) = \ldots \]

\[ \text{th} \; \text{AUX} \; (\%\text{AGR Num}) = \ldots \]
\[ (\%\text{AGR Gend}) = \ldots \]

$\vec{g} \; A \; (\%\text{AGR Num}) = \ldots \]
\[ (\%\text{AGR Gend}) = \ldots \]

The verb receives the suffixation to be the subjunctive form (see (5.39b)), while $g$ is given the morphological category A and receives a separate suffix according to num and gend. Although those two formatives are two independent morphological tokens in the morphology, they must be treated as a single lexical token, i.e. a single syntactic atom, in the c-structure. Thus, the $L$ gives the following label to the combination:

$\vec{a} \vec{e} \text{ ge} \Rightarrow \vec{a} \vec{e} \text{ge} \nu$

Accordingly, the entry behaves as a single word in the c-structure as shown in (5.109):
5.6.3.2 Path specification

As section 5.4.2 shows, the verbal complex agrees either with the subject or the object according to their case value. That is, the agreement controller must be in the direct case. Crucially, as seen in the failure of Saksena’s (1981) rule (5.50), an NP the verb agrees with must be a term argument, subj or obj. The standard LFG approach to agreement can state those conditions in each lexical entry. For instance, Butt and Sadler (2003:82) show the following lexical entry of the perfective verb cālayi ‘drive’:

(5.110)  
\[
\text{cālayi} \quad (\uparrow \text{ASP}) = \text{PERF} \\
\begin{array}{c}
[ (\uparrow \text{SUBJ CASE}) = \epsilon \text{ NOM} \\
(\uparrow \text{SUBJ GEND}) = F \\
(\uparrow \text{SUBJ NUM}) = \text{SG} ] \\
\vee [ (\uparrow \text{OBJ CASE}) \neq \text{ NOM} \\
(\uparrow \text{OBJ CASE}) = \epsilon \text{ NOM} \\
(\uparrow \text{OBJ GEND}) = F \\
(\uparrow \text{OBJ NUM}) = \text{SG} ]
\end{array}
\]

The f-description contains disjunction ([ ] \vee [ ]). The first disjunct states that (\uparrow \text{SUBJ}) must contain \langle \text{CASE}, \text{NOM} \rangle, and the entry contributes \langle \text{GEND}, F \rangle and \langle \text{NUM}, \text{SG} \rangle to that subj. The second one is slightly more complicated. Firstly, the negative statement says that the local subj must not have \langle \text{CASE}, \text{NOM} \rangle. The second equation, on the other hand, states the requirement of \langle \text{CASE}, \text{NOM} \rangle as a value of the local obj. The agreement features are given to that obj as shown in the last two equations. Although this type of disjunctive descriptions explains the agreement pattern in Hindi-Urdu, it is not easy to figure out how those sets of equations are associated with the form. As I have pointed out in the previous chapter, it is desirable to generalise the agreement pattern found in natural languages.

The proposal I made for the Icelandic data in Chapter 4 can easily capture this agreement pattern in Hindi-Urdu as well. I have already introduced the agreement path (PAGRPATH) in the f-description of lexical entries. So, what we need is the following constraints:
I will show how the substitution takes place with examples. Firstly, let us consider the following two examples with the f-structures:

(5.112)  

a. **larkiyā sitā ko dekhtī hāī.**  
   girl.pl.f.dir Sita.sg.f.obl look.impf.pl.f be.pres.3.pl  
   ‘The girls look at Sita.’  

b. **larkiyā kitāb parhtī hāī.**  
   girl.pl.f.dir book.sg.f.dir read.impf.pl.f be.pres.3.pl  
   ‘The girls read a book.’

(5.113)  

a.  
   **PRED** 'LOOK-AT(SUBJ,OBJ)'  
   **TENSE** PRES  
   **ASP** [PERF ←]  
   | **SUBJ**  
   | [NUM PL]  
   | [GEND F]  
   | [PERS 3]  
   | [CASE DIR]  
   | f₂  
   | **OBJ**  
   | [CASE OBL]  
   | [PFORM KO]  
   | f₃  

b.  
   **PRED** 'READ(SUBJ,OBJ)'  
   **TENSE** PRES  
   **ASP** [PERF ←]  
   | **SUBJ**  
   | [NUM PL]  
   | [GEND F]  
   | [PERS 3]  
   | [CASE DIR]  
   | f₅  
   | **OBJ**  
   | [NUM SG]  
   | [GEND F]  
   | [PERS 3]  
   | [CASE DIR]  
   | f₆
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The two f-structures in (5.113) have two candidates to be substituted for PAgPPath, i.e. subj and obj. According to (5.111), the obj in (5.113a) violates the constraint (→ case) = dir and −[(← subj case) = dir] where → and ← refer to \( f_3 \) and \( f_1 \) respectively. Although the obj in (5.113b) satisfies the first constraint (→ case) = dir, the second one is unsatisfied, i.e. the subj in \( f_4 \) has (case, dir). Thus, in both cases, the objs cannot be PAgPPath. The subs, on the other hand, satisfy the constraint (→ case) = dir where → refers to \( f_2 \) in (5.113a) and \( f_5 \) in (5.113b). Therefore, the PAgPPath is substituted for by the subj. Due to the (↑ PAgPPath) = %agr, the constraining equations in the lexical entries of the governing predicate correctly place the feature requirements onto the subj.

Next, let us look at the object agreement. (5.114) is an example of the simple past that is realised by the perfective main verb alone. The oblique case noun larke is marked by ne suggesting it is a subject of a transitive verb in the perfective form. (5.115) is the f-structure for (5.114):

\[
\begin{align*}
(5.114) & \quad \text{lark\v\_ ne kit\v\_b parh\v\_} \\
& \quad \text{boy.sg.m.obl \: book.sg.f.dir \: read.perf.sg.f} \\
& \quad \text{‘The boy read a book.’} \\
(5.115) & \quad \begin{array}{l}
\text{PRED} & \text{‘READ(subj, obj)’} \\
\text{TENSE} & \text{PAST} \\
\text{ASP} & \text{PERF \: -} \\
\text{SUBJ} & \begin{array}{l}
\text{PRED} \: \text{‘BOY’} \\
\text{NUM} \: \text{SG} \\
\text{GEND} \: \text{M} \\
\text{PERS} \: 3 \\
\text{CASE} \: \text{OBL} \\
\text{PFORM} \: \text{NE} \\
\end{array} \\
\text{OBJ} & \begin{array}{l}
\text{PRED} \: \text{‘BOOK’} \\
\text{NUM} \: \text{SG} \\
\text{GEND} \: \text{F} \\
\text{PERS} \: 3 \\
\text{CASE} \: \text{DIR} \\
\end{array}
\end{array}
\end{align*}
\]

This time, if we substitute for PAgPPath by the subj, it would violate the constraint (→ case) = dir in (5.111), since → corresponds to \( f_2 \) in (5.115) that has (case, dir). The obj does not violate any of the constraints, namely it has (case, dir) as its value and \( f_1 \) that corresponds to ← in (5.111) has a subj in which the value of case is obl, not dir. Thus, this obj is the controller of the agreement.
As shown in (5.46b) and (5.47) (repeated here as (5.116)), sometimes the predicate is in the default form. In (5.116a), the subject of the perfective intransitive verb roya is marked by ne indicating it is volitional action. In (5.116b), the subject is marked by ne requiring a transitive verb to be in the perfective form and the object is marked by ko as it is animate:

(5.116) a. larkiyo ne roya.
   girl,pl,f,obl cry,perf,dft
   ‘The girls cried (on purpose).’

b. larkiyo ne sita ko dekh.
   girl,pl,f,obl Sita,sg,f,obl look,perf,dft
   ‘The girls looked at Sita.’

The occurrence of the default forms is explained in the same way as Icelandic. Consider the f-structures for (5.116):

(5.117) a. [pred ‘cry(subj)’]
    tense past
    asp [perf –]
       [pred ‘girl’]
       num pl
       gend f
       case obl
       pf

b. [pred ‘look-at(subj,obj)’]
    tense past
    asp [perf –]
       [pred ‘girl’]
       num pl
       gend f
       pers 3
       case obl
       pf

In (5.117a), the f-structure for (5.116a), the subj has ⟨case, obl⟩, which is a violation of the constraint (→ case) = dir that requires f₁ to have ⟨case, dir⟩. Since the f-structure does not contain an obj, it is not an option for the PAGrPath. In (5.117b), the subj cannot be PAGrPath
by the same reason as (5.117a). The f-structure has an obj, but it does not have \(\langle\text{case, dir}\rangle\) either. Therefore, nothing can be substituted for the PAgrPath in both examples.

This causes the lexical entries of predicates to be dysfunctional. That is, since the PAgrPath remains unspecified under the syntactic environments in (5.116), the constraining equations for the agreement features are not specified either. To overcome this problem, as we posit for Icelandic, I assume that each lexeme has a default form that has no constraint for the agreement features.\(^{20}\) Hence, we postulate the following lexical entries for the simple past tense verbs:

\[
\begin{align*}
\text{(5.118)} & \quad \text{a. } \text{royā} & \quad V(\uparrow\text{pred}) = \langle\text{cry}\langle\text{subj}\rangle\rangle \\
& & (\uparrow\text{tense}) = \text{past} \\
& & (\uparrow\text{asp perf}) = - \\
\text{b. } \text{dekhā} & \quad V(\uparrow\text{pred}) = \langle\text{look-at}\langle\text{subj, obj}\rangle\rangle \\
& & (\uparrow\text{tense}) = \text{past} \\
& & (\uparrow\text{asp perf}) = -
\end{align*}
\]

The f-description of each entry in (5.118) does not contain any constraining equations. Since the other entries in the same paradigm are not workable for the reasons explained above, only the default entry in (5.118) is available for that lexeme. This is the mechanism that enforces the default form to appear in the syntactic environments found in (5.116). Due to the paradigmatic organisation of the lexical entries, the default form cannot appear when a more specific entry is available in the same paradigm, as we saw in Chapter 4.

Since the path is specified based on the \(gf\) and its case feature, it does not allow an oblique locative to be an agreement controller, which is problematic in Saksena’s rule (see (5.51)). With regard to the pro drop example (5.52) (repeated as (5.119)), since the agreement controller is determined by the properties in the f-structure, not in the surface phrase structure, the proposal correctly predicts that the dropped pronominal subj is substituted for the PAgrPath as illustrated in (5.120):

\[
\begin{align*}
\text{(5.119)} & \quad \emptyset \text{ dādar se āyā } hū. \\
& \text{PRO Dadar from come.perf.m.sg be.pres.1.sg} \\
& \text{‘(I) have just come from Dadar.’}
\end{align*}
\]

\(^{20}\)More specifically, every combination of tense and aspect of a lexeme has a default form.
It is worth mentioning how the grammar can explicate the ‘ergativity’ found in Hindi-Urdu. As discussed in section 5.5.3.2, assigning \( \langle \text{case, erg} \rangle \) to \( ne \) does not help the grammar generalise the ergativity in Hindi-Urdu since \( ne \) can marks both transitive and intransitive subjects. From a descriptive point of view, ergativity is the fact that intransitive subjects and transitive objects exhibit similar behaviours such as agreement and form. In that sense, the ergativity in Hindi-Urdu is the fact that the agreement controller is either an intransitive subject or a transitive object whose form is in the direct case. This fact is clearly reflected in (5.111). Obviously, other languages exhibit ergativity in different ways and they may be reflected differently in the grammars. Marwari, for instance, does not exhibit ergativity with respect to the form or marking, but does so with regard to agreement as shown in (5.65) – (5.67). This type of ergativity can be reflected in the grammar as in (5.121):\(^{21}\)

\[
(5.121) \quad \text{Marwari PAgPath:} \\
\{ \quad \text{subj} \quad | \quad \text{obj} \quad \} \\
-[(\quad \leftarrow \text{obj})] \quad (\quad \leftarrow \text{subj})
\]

(5.121) states that if there is no \text{obj} in the local f-structure, the PAgPath is \text{subj}, while it is \text{obj} with the existence of \text{subj}. Marathi requires another formulation with reference to \( \langle \text{vform, perf} \rangle \) in the m-structure as suggested in (5.68). Hence, ergativity must be reflected in various ways and it is clearly not the case that an introduction of \( \langle \text{case, erg} \rangle \) always gives the straightforward descriptive adequacy to the grammar.

\(^{21}\)This is for illustration purpose, so the details are omitted such as agreement found in the immediate past or existence of other \text{gfs}.
Finally, as we recall from Chapter 4, the current proposal is also applicable to attributive modifier agreement. For that purpose, we have postulated another path $\text{AAgrPath}$. In Hindi-Urdu, adjectives whose ending is either $\bar{a}$ or $\ddot{a}$ in the masculine direct singular forms inflect for number, gender and case, so the agreement paths and the constraining equations for the agreement features are included in the lexical entries:

\begin{align*}
(5.122) \quad A \ (\uparrow \text{PRED}) &= \ldots \\
&\{ (\uparrow \text{PAGRPath}) \mid (\text{AAgrPath}) \} = \%\text{AGR} \\
&\text{(%AGR NUM)} = c \ldots \\
&\text{(%AGR GEND)} = c \ldots \\
&\text{(%AGR CASE)} = c \ldots \\
\end{align*}

The specification of $\text{PAGRPath}$ is unchanged from (5.111). Hence, in the following example, the $\text{PAGRPath}$ is substituted for by $\text{subj}$, so that the adjective $\dddot{u}\dot{c}i$ agrees with that, namely it constraints the agreement features of the controller:

\begin{align*}
(5.123) \quad &\text{a. } \text{d\text{"i}v\text{"a}r } \dddot{u}\dot{c}i \text{ hai.} \\
&\text{wall.sg.f.dir high be.pres.3.sg} \\
&\text{‘The wall is high’} \\
&\text{b. } \begin{bmatrix} \text{PRED} & \text{‘HIGH(SUBJ)’} \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{CASE} & \text{DIR} \end{bmatrix} \\
\end{align*}

On the other hand, we need another specification of $\text{AAgrPath}$ as in (5.124):

\begin{align*}
(5.124) \quad \text{Hindi-Urdu $\text{AAgrPath}$:} \\
&\text{ADJ} \in \\
\end{align*}

With this path specification, we can account for modifier-noun agreement. In the following examples, the adjectives must be able to refer to the agreement features of the head nouns. This is attained because of $(\text{AAgrPath} \uparrow) = \%\text{AGR}$ in the lexical entries. That is, the inside-out path allows the entry to refer to the f-structure whose value is $\text{AAgrPath}$, namely $\text{ADJ} \in$. In (5.125b) and (5.126b), it corresponds to $f_1$ and $f_2$ respectively and the NUM, GEND and CASE of the controllers are constrained by the adjectives via $\%\text{AGR}$.

\begin{align*}
(5.125) \quad &\text{a. } \text{b\text{"a}r\text{"a} mak\text{"a}n} \\
&\text{big house.sg.m.dir} \\
&\text{‘a big house’} \\
\end{align*}
b. \[
\begin{array}{ll}
\text{PRED} & \text{‘HOUSE’} \\
\text{NUM} & \text{SG} \\
\text{GEND} & \text{M} \\
\text{PERS} & 3 \\
\text{CASE} & \text{DIR} \\
\text{ADJ} & \left\{ \text{PRED ‘BIG’} \right\}
\end{array}
\]

(5.126) a. bare makān mē
dig house.sg.m.obl
‘in the big house’

b. \[
\begin{array}{ll}
\text{PRED} & \text{‘HOUSE’} \\
\text{NUM} & \text{SG} \\
\text{GEND} & \text{M} \\
\text{PERS} & 3 \\
\text{CASE} & \text{OBL} \\
\text{PFORM} & \text{ME} \\
\text{ADJ} & \left\{ \text{PRED ‘BIG’} \right\}
\end{array}
\]

5.7 Summary

In this chapter, we have observed that there is no empirical support for postulating \textit{erg}, \textit{nom} and \textit{acc} features introduced by postpositional elements in Hindi-Urdu by considering the syntactic and semantic properties of the formatives in question as well as ergativity, subcategorisation and inflectional morphology of the languages. Instead, I have proposed that case, either \textit{dir} or \textit{obl}, functions as a part of nominal inflectional properties. I have presented the morphological analysis that gives well-formed strings of the base and the postpositions. Further, adopting Toivonen’s (2003) non-projecting word, the surface phrase structure properties are also captured under the current proposal. In addition, this chapter has presented the way that establishes a linkage between a complex set of syntactic and semantic features and a morphological form in the paradigm. It allows us to describe how items in the morphological paradigm can be associated with required information to be fully functional in other levels in the grammar.
Chapter 6

Realisation of Japanese nominal particles

Japanese is well-known for its large set of particles. Some of them are referred to as case particles in the traditional grammars. In modern theoretical works, they are often regarded as phonological manifestations of case features. In this chapter, we shall look at morphological and syntactic aspects of Japanese nominal particles and consider their theoretical status. The investigation reveals that postulating case features is unnecessary either morphologically or syntactically and the full account of the occurrence of particles requires complex interaction between morphological, syntactic, semantic and discourse information. I will present a morphological analysis of particles in the realisational morphology and how they are linked to the complex information in other levels of linguistic structures. This chapter is organised as follows. In Section 6.1, I shall present a descriptive overview of Japanese nominal particles focusing on so-called case particles and adverbial particles. The section contains the discussion of linear ordering amongst particles as well as their syntactic, semantic and discourse functions. Section 6.2 highlights two proposals in LFG made by Ishikawa (1985) and Ohara (2000). In section 6.3, I will present how the morphology construct particle clusters in proper ordering in Japanese. Further, the association between the particle clusters and their functions in syntax, semantics and discourse will be formalised in this section.

6.1 Exploring particles

6.1.1 Number

I start with a discussion of what nominal features are to be postulated in the grammar of Japanese. Japanese nouns exhibit very defective inflection in that no inherent nominal fea-
tures such as number, gender and animacy alter their form. Instead, Japanese has a set of post-nominal particles to overtly realise those properties. Let us look at number particles *ra* and *tati* first:

(6.1) a. yasusi no musuko *ra* wa mada daigakusei *da*.
   Yasusi no son PL top still university student COP
   ‘Yasushi’s sons are still university students.’

b. zyosei *tati* ga ima no seizi no syuyaku *da*.
   woman PL GA now NO politics NO protagonist COP
   ‘Women are the protagonists in the current politics.’

As mentioned in Tsujimura (1996:127), however, the use of those particles are limited to animate nouns and they are in general optional. So, (6.2a) where *tati* and *ra* are attached to the inanimate noun *hon* is ungrammatical. (6.2b) has an example of a bare noun without *tati* or *ra* whose referent is still interpreted as plural (cf. (6.1b)):

(6.2) a. *kinō* *hon* *tati/ra* o katta.
   yesterday book PL o buy.PAST
   ‘(I) bought books yesterday.’

b. zyosei ga ima no seizi no syuyaku *da*.
   ‘Women are the protagonists in the current politics.’

The optionality suggests that Japanese animate nouns lack a formal contrast between singular and plural. The impossibility of *tati* and *ra* marking on inanimate nouns also means that inanimate nouns display no formal distinction between singular and plural. Those facts suggest that number is not a part of nominal features in the Japanese grammar. That is, number plays no morphological or syntactic (see below) role in the grammar, though semantic plurality of animate nouns is optionally marked. Hence, the number particles are more like overt quantificational makers in Japanese.

One place where number and some other features appear to be active is pronoun system. Shibatani (1990:371) shows a set of singular pronouns according to the sex of the speaker and the person in the gradable speech level as in (6.3):

---

1. Animacy affects the lexical selection of two verbs of existence *aru* and *iru*. The former requires an inanimate subject whereas the latter requires an animate subject.

2. Another number particle is *domo*, which is old fashion and could imply the low social status of the referent.

3. Nakanishi and Tomioka (2004) argue that *tati* means a group represented by the marked noun phrase.

4. The second and third person pronouns must not be used to refer to a person whose social status is higher than the speaker, irrespective to the speech level (cf. Shibatani 1990:372).

---
The gender distinction in the first and second person is not overtly found in the formal speech level, but it is clearly observed in the informal setting. Unlike ordinary nouns, those pronouns are only used for a singular referent. For plural referents, tati and ra must be attached as watakusi tati ‘we’ and omae ra ‘you.pl.’. Based on those facts, it may be the case that number, gender and speech level are part of nominal semantic features for pronouns. However, there are other items which denote plural pronominals. For instance, wareware is used for the first person plural pronouns. Similarly, anatagata is for the second person plural.

Further, syntactically none of the features is active even for pronouns. No agreement in number between the head noun and other words inside the noun phrase or between the noun phrase and an external governor is observed. Therefore, positing syntactic number, gender and other features is implausible in Japanese.

The conclusion drawn from the above observation is that Japanese has a way expressing semantic number of a given noun, namely particle attachment, but it does not seem to introduce a syntactic number feature. In the following section, I shall extend the discussion to other particles, primarily focusing on ones traditionally treated as case particles.

### 6.1.2 Grammatical relations, semantics and discourse

In addition to tati, ra and domo, Japanese has a large number of particles. I show some of them in (6.4) – (6.5) (cf. Kawashima 1999, Chino 2001, Kaiser et al. 2001):

<table>
<thead>
<tr>
<th>(6.4)</th>
<th>Form</th>
<th>Name/function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ga</td>
<td>nominative, exclusive focus</td>
</tr>
<tr>
<td></td>
<td>o</td>
<td>accusative, locative (path)</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>genitive, linker</td>
</tr>
</tbody>
</table>

---

5. There are also third person pronouns aitu and yatu with no gender distinction for informal speech level.

6. Most of the pronouns allow both tati and ra, although the combinations of ??anata ra and *kare tati are normally regarded as ill-formed, i.e. anata tati and kare ra are strongly preferred.

7. I ignore no throughout the chapter for the reason mentioned elsewhere.
6.1. EXPLORING PARTICLES

Form Function
---
ni dative, locative (stative/goal)
de ‘with’, locative (activity)
e, eto ‘towards’, locative (directional)
kara ‘from’
made ‘until’
madeni ‘by’
yori ‘than’
to, ni, ya conjunctive
ka disjunctive

As suggested by the names, the particles in (6.4) are often called (syntactic) case particles in the descriptive grammars of Japanese. Their main function is to mark term arguments and they have less semantic content as we will see immediately below. (6.5) is a list of so-called semantic case particles and conjunctive particles, which are obvious from their functions. Finally, (6.6) shows a set of adverbial particles or discourse particles. Some of the focus particles are often called delimiters because of their semantic nature. With no theoretical implication, I follow four distinctions for expository purpose.

Some of the post-nominal particles listed in (6.4) – (6.6) are also used for clausal markers. For instance, ga is used as a clausal conjunct meaning ‘but’ and kara is attached to a subordinated clause meaning ‘because’. Those cross-categorial properties are typical in Japanese particles as well as functional markers in other languages, e.g. overlap between English prepositions and complementisers (see Chapter 3).

6.1.3 Case particles

6.1.3.1 Basics

The syntactic case particles are closely linked to term grammatical functions. As indicated by the names in (6.4), their canonical uses are illustrated as follows (Shibatani 2001:307–8):

---

8There are other so-called topic particles such as nara, dato, dattara and tte. I ignore them for ease of discussion.
(6.7) a. Ken ga kasikoi.
   Ken smart.pres
   ‘Ken is smart.’
b. Ken ga gakusei da.
   Ken student cop
   ‘Ken is a student.’
c. Ken ga hasitta.
   Ken run.past
   ‘Ken ran.’
d. Ken ga ki kara otita.
   Ken tree from fall.past
   ‘Ken fell from the tree.’

(6.8) a. Ken ga Ai o nagutta.
   Ken Ai hit.past
   ‘Ken hit Ai.’
b. Ken ga hon o yonda.
   Ken book read.past
   ‘Ken read the book.’
c. Ken ga Ai ni hon o yatta.
   Ken Ai book give.past
   ‘Ken gave a book to Ai.’

Through the sentences in (6.7) – (6.8), the subjects are marked by ga. This marking is unaffected whether the marked noun is animate or inanimate, definite or indefinite and so forth.\(^9\) The predicate is a predicative adjective in (6.7a), a predicative noun with a copula in (6.7b), an unergative intransitive verb in (6.7c), an unaccusative intransitive verb in (6.7d), a transitive verb in (6.8a, b) and a ditransitive verb in (6.8c). The canonical marking on a direct object is o as shown in (6.8a, b) and it is nothing to do with animacy or definiteness of the marked noun. The indirect object is normally marked by ni as in (6.8c).

However, Japanese, like many other languages, displays deviations from those canonical particle markings. Some of them are idiosyncratic and some others have semantic basis behind the marking. For instance, there are cases where a direct object is marked by ni (cf. Sadakane and Koizumi 1995:24–29, Shibatani 2001:310):

(6.9) a. Ai ga Ken ni atta.
   Ai Ken meet.past
   ‘Ai met Ken.’
b. Ken ga Ai ni sitagatta.
   Ken Ai obey.past
   ‘Ken obeyed/followed Ai.’

\(^9\)We will look at ga marking in detail in section 6.1.4.
6.1. EXPLORING PARTICLES

c. Ai ga Ken ni katta.
   Ken Ken win.PAST
   ‘Ai won/prevailed over Ken.’

d. Ken ga Tokyo de densya ni notta.
   Ken Tokyo at train ride.PAST
   ‘Ken took a train in Tokyo.’

e. Ken no ronbun ga GB riron ni motozuiteiru.
   Ken paper GB theory based on.PRES
   ‘Ken’s paper is based on GB theory.’

(6.10)  

  a. Ken ga ame ni nureta.
     Ken rain get wet.PAST
     ‘Ken got wet in the rain.’
  
  b. Ken ga hasika ni kakatta.
     Ken measles contract.PAST
     ‘Ken contracted measles.’
  
  c. Ken ga sake ni yotta.
     Ken alcohol get drunk.PAST
     ‘Ken got drunk.’

In (6.9), the direct objects are all marked by ni. Those are examples of idiosyncratic ni marking. (6.10) shows that verbs having an affected/experiencer subject take a ni marked object that functions as a source of the caused state.

The object in (6.9a) can also be marked by to as shown in (6.11) with other examples of to marked direct objects:

(6.11)

  a. Ai ga Ken to atta.
     Ai Ken meet.PAST
     ‘Ai met Ken.’
  
  b. Ai ga Ken to hanasita.
     Ai Ken speak.PAST
     ‘Ai talked with Ken.’
  
  c. Ai ga Ken to kekkon sita.
     Ai Ken marriage do.PAST
     ‘Ai married Ken.’

One of the differences between (6.9a) and (6.11a) is that the encounter is reciprocal in (6.11a) whereas it is unidirectional in (6.9a). Kuno (1973b:104–5) shows the following contrasts between the two:

(6.12)

  a. ?watakusi wa sensei to ai ni Harvard Square ni itta.
     I teacher meet.INF to Harvard Square to go.PAST
     ‘I went to Harvard Square to see the teacher.’
b. watakusi wa sensei ni ai ni Harvard Square ni itta.

(6.13) a. Tom no atama ga Mary no atama to/ni butukatta.

Tom’s head Mary’s head collid.PAST

‘Tom’s head collided with Mary’s head.’

b. Tom no atama ga kabe *to/ni butukatta.

Tom’s head wall collided

‘Tom’s head collided with the wall.’

In (6.12a), to marking on the object is odd if Harvard Square is the agreed meeting point. The natural interpretation of the meeting event is that both went to the square to meet each other, which requires the object to be marked by ni as in (6.12b). If Harvard Square is a resident/working place of the teacher, to may be used. (6.13b) shows that if the object is unmovable, it must be marked by ni, since to marking implies that it also move towards the subject as in (6.13a). This difference suggests that to is associated with a commitative role of the marked NP while ni is with a goal role.

Oblique and adjunct NPs also receive various particle marking. The marking patterns are associated with the semantic properties or roles of the marked NPs in a clause. I summarise their uses briefly. As shown in (6.4) and (6.5), there are three locative particles. Firstly, let us look at the contrast between two locatives represented by ni and de (Shibatani 1978:284):

(6.14) a. boku no ani wa Tokyo ni suru.

my elderly brother TOP Tokyo live be.PRES

‘My brother lives in Tokyo.’

b. boku no hon wa tukue no u e ni aru.

my book TOP desk TOP be.PRES

‘My book is on the desk.’

(6.15) a. boku no ani wa Tokyo de hataraite iru.

my elderly brother TOP Tokyo work be.PRES

‘My brother works in Tokyo.’

b. kodomo tati ga dooro de asonde iru.

child PL road play be.PRES

‘Children were playing on the street.’

The difference between (6.14) and (6.15) is whether the verbs describe state or activity. If the locative encodes a setting of a certain state, it receives ni marking. If the locative represents a place where a given activity takes place, it receives de marking.

When ni is used with verbs of motion, the marked NPs are the goal of the movement.

This is contrasted with a directional locative e:11

---

10See Shibatani (1978:Ch 6) for the details

11As noted in Shibatani (1978:286), e may also express a goal of the movement in Modern Japanese, particularly in colloquial speech. It seems to me that eto still only signals a directional.
The verbal complex in (6.16a) requires a goal argument due to its meaning, so that the destination is more naturally marked by *ni*. In (6.16b), on the other hand, the compound verb emphasises the departing event, so that the destination is normally marked by the directional locative *e*.

The last locative is *o*. As discussed in Kuno (1973b:Ch 5), it represents a path of the movement as in (6.17):

(6.17) a. watakushi wa sono saka *o* nobotta.
I top the slope climb.PAST
‘I climbed up the slope.’

b. watakushi wa koosaten *o* watatta.
I top intersection cross.PAST
‘I crossed the intersection.’

The path encoding can be highlighted in comparison with other two locatives *de* and *ni*. Kuno (1973b:98–9) shows the following examples:

(6.18) a. Ken ga kawa *o* oyoida.
Ken river swim.PAST
‘Ken swam across the river/Ken swam up or down the stream.’

b. Ken ga kawa *de* oyoida.
Ken river swim.PAST
‘Ken swam in the river.’

(6.19) a. watasi wa helicopter de yama *ni/**o* nobotta.
I top helicopter by mountaim climb.PAST
‘I climbed to the top of the mountain by helicopter.’

b. watasi wa Jeep de yama *ni/**o* nobotta.
I top jeep by mountaim climb.PAST
‘I climbed the mountain by jeep.’

In (6.18b), the location is marked by *de*, which indicates that the river is the place where the swimming activity took place as observed in (6.15). If we replace it with *o* as in (6.18a), the sentence means that the agent swam along the river stream. The difference between (6.19a) and (6.19b) is the means of climbing up the mountain. The former lacks the path as the upward movement was done by helicopter, so that *o* cannot mark *yama* and instead only the
goal *ni* is allowed to attach. The latter, on the other hand, allows both *ni* and *o*, since a jeep can have a path to climb up the mountain.

The uses of other semantic case particles such as instrumental *de* and comparative *yori* are straightforward, so I omit them. The *kara* marking, however, exhibits interesting properties in comparison with *ni*. The basic usage of *kara* is to encode the source as follows:

(6.20) a. Ken ga eki  *kara* ie made aruita.  
Ken station house to walk.PAST  
‘Ken walked from the station to the house.’

b. sake wa kome *kara* tukurareru.  
sake top rice make.PASS  
‘Sake is made from rice.’

As noted in Shibatani (1978:297ff), some NPs are allowed to be marked either by *kara* or *ni*:

(6.21) a. Taroo ga Hanako *ni/kara* sono koto o kiita.  
Taro Hanako that thing hear.PAST  
‘Taro heard about that thing from Hanako.’

b. Taroo ga Yamada-sensei *ni/kara* eigo o naratta.  
Taro Yamada-Prof English learn.PAST  
‘Taro learnt English from Prof Yamada.’

c. Taroo ga Yamada-sensei *ni/kara* hon o karita.  
Taro Yamada-Prof book borrow.PAST  
‘Taro borrowed a book from Prof Yamada.’

Shibatani claims that *ni* attaches to an agent when it is not a subject — see also Watanabe (1996), while *kara* simply marks a source. In the following sentence, therefore, only *kara* is permitted:

(6.22) a. Taroo ga sensei no kenkyuusitu *kara*/*ni* hon o karita.  
Taro prof office book borrow.PAST  
‘Taro borrowed a book from the professor’s office.’

b. Taroo ga kokyo  *kara*/*ni* tayori o moratta.  
Taro hometown letter receive.PAST  
‘Taro received a letter from his hometown.’

In (6.22), the oblique arguments are inanimate, which are by definition non-agentive. Since they cannot be agents, they cannot be marked by *ni*. Instead, *kara* makes them interpreted as source. A similar contrast can be found in the marking on demoted subjects in passive:

(6.23) a. sensei wa gakusei tati *ni/kara* present o okurareta.  
prof top student PL present give.PASS.PAST  
‘The professor was given a present by the students.’
b. Ai ga sensei ni/kara homerareta.
   Ai prof praise.PASS.PAST
   ‘Ai was praised by the professor.’

   Akiko bear kill.PASS.PAST
   ‘Akiko was killed by a bear.’

b. Ken wa John ni/*kara yatowarete iru.
   Ken top John employ.PASS be.PRES
   ‘Ken is employed by John.’

In (6.23), the demoted subjects function either as agent or source.\(^{12}\) If they are interpreted as agents, *ni* attaches to them. If they are sources, *kara* marks them. The verbs in (6.24), on the contrary, require agents, namely the source interpretation of the demoted subjects is impossible with those verbs. Hence, they must be marked by *ni*.

6.1.3.2 *Ga* marked objects

Let us move onto non-canonical marking on term grammatical functions. One well-known deviation from the basic particle marking patterns is *ga* marked object in stative predicates that represent the following: possession/existence ((6.25)); psychological state ((6.26)); physiological state ((6.27)); visual/audio perception ((6.28)); necessity/desiderative state ((6.29)); and potentiality/ability ((6.30)) (Shibatani 2001:312–4):

   Ken head big
   ‘Ken has a big head.’

b. Ken ni/ga kodomo ga san-nin iru.
   Ken child three-person be/exist
   ‘Ken has three children.’

   Mami Hata-prof fearful
   ‘Mami is fearful of Prof Hata.’

b. Mami ga/*ni Ken ga suki da.
   Mami Ken like cop
   ‘Mami likes Ken.’

\(^{12}\)Shibatani (1978:303–4) notes that the source expressed by *kara* marking is not restricted to physical movement of objects. It also includes the source of psychological or emotional feeling such as love, praise and accuse. Thus, *sensei* in (6.23b) can be marked by *kara* as a source of praise.
(6.27)  
\begin{align*}
\text{a.} & \quad \text{Taroo ga/*ni atama ga itai.} \\
& \quad \text{Taroo head hurting} \\
& \quad \text{‘Taro has a headache.’} \\
\text{b.} & \quad \text{Mami ga/*ni asi ga tumetai.} \\
& \quad \text{Mami foot cold} \\
& \quad \text{‘Mami has cold feet.’}
\end{align*}

(6.28)  
\begin{align*}
\text{a.} & \quad \text{Ken ni/ga Huzi-san ga mieru.} \\
& \quad \text{Ken Fuji-Mt. visible} \\
& \quad \text{‘Ken can see Mt Fuji.’} \\
\text{b.} & \quad \text{Mami ni/ga sono oto ga kikoe nakatta.} \\
& \quad \text{Mami that sound audible neg.past} \\
& \quad \text{‘Mami didn’t hear that sound.’}
\end{align*}

(6.29)  
\begin{align*}
\text{a.} & \quad \text{boku ni/ga okane ga hituyoo da.} \\
& \quad \text{I money necessity cop} \\
& \quad \text{‘I need money.’} \\
\text{b.} & \quad \text{boku ga/*ni kono hon ga hosii.} \\
& \quad \text{I this book want} \\
& \quad \text{‘I want this book.’}
\end{align*}

(6.30)  
\begin{align*}
\text{a.} & \quad \text{Ken ni/ga eigo ga wakaru.} \\
& \quad \text{Ken English understand} \\
& \quad \text{‘Ken understands English.’} \\
\text{b.} & \quad \text{Ken ga/*ni eigo ga tokui da.} \\
& \quad \text{Ken English good at cop} \\
& \quad \text{‘Ken is good at English.’}
\end{align*}

As shown in the above examples, there are two patterns of this type of predicates. The first one only allows \textit{ga} marked subjects. The other one allows both \textit{ni} and \textit{ga} marked subjects. Shibatani (2001:341) summarises them as follows based on Kuno (1973b:90–1):

(6.31) \textit{Ni–ga}
\begin{align*}
\text{a.} & \quad \text{Verbs: -reru (potential derivatives), dekiru ‘can do’, wakaru ‘understand’, aru ‘have/exist’, nai ‘do not have/non-extent’, iru ‘exist’, mieru ‘visible’, kikoeru ‘audible’} \\
\text{b.} & \quad \text{Adjectives: omosiroi ‘fun/enjoyable’, osorosii ‘fearful’, tanosii ‘enjoyable’, arigatai ‘thankful’} \\
\text{c.} & \quad \text{Adjectival nominals: hituyoo da ‘necessary’, kanoo da ‘possible’, konnan da ‘difficult’, yooi da ‘easy’, nigate da ‘not good at doing something’}
\end{align*}

(6.32) \textit{Ga–ga}
\begin{align*}
\text{a.} & \quad \text{Verbs: iru ‘need’}
\end{align*}


Following Kuno (1973b), it is normally assumed that the first NPs marked either by ni/ga are subjects and ga marked NPs are objects in the above examples. Shibatani (1977) demonstrates the subjecthood of the first NPs based on anaphoric binding and honorification. For instance, the reflexive zibun is only bound by a subject as shown in (6.33a). (6.33b) shows that the ni marked NP exhibits this binding property. Further, the honorific form o V (ni) naru is only used for subject honorification as in (6.34a, b). Again, the ni marked NP in (6.34c) can be honorified (Shibatani 1977:791–2, 800):

(6.33) a. Taroo ga Hanako o zibun ni no heya de sikatta.  
Taro Hanako self room at scold.PAST  
‘Taro scolded Hanako in his own room.’

b. sensei ni (wa) zibun ga wa kara nai.  
teacher (top) self understand NEG  
‘The teacher does not understand himself.’

(6.34) a. sensei ga oikini naru.  
teacher go.HON  
‘The teacher goes.’ (subject honorific)

b. *otooto ga sensei o otazune-ni natta.  
younger brother teacher visit.HON  
‘My younger brother visited the teacher.’

c. sensei ni (wa) eigo ga owakarini naru  
teacher (top) English understand.HON  
‘The teacher understands English.’ (subject honorific)

The above data confirm that the first NPs in this construction are genuine subjects and the second ga marked NPs are objects.\(^\text{13}\)

\(^{13}\)Shibatani (2001) proposes an alternative analysis by assuming that a ga marked object is actually a subject called a small subject. He also assumes that the first NP is a large subject. That is, he claims that this construction is a type of double subject constructions exemplified as follows:

\begin{itemize}
  \item \(zoo\text{ ga hana ga nagai.}\)  
  elephant nose long  
  ‘An elephant has a long nose.’
\end{itemize}

Shibatani argues that in the double subject constructions, the first NP functions as a domain or a reference point in Langacker’s (1993, 1999) Cognitive Grammar terms, about which the following statement is predicated. He shows the following examples to support his argument (Shibatani 2001:322):
Some of the predicates of this type such as *wakaru, suki da, hosii* and *-tai* permit the alternation between *ga* and *o* on objects as in (6.35) (cf. Shibatani 1978:229–32, 255ff, 2001:314–5). (6.35a) suggests that when the object is marked by *o*, the subject can no longer be marked by *ni* (cf. (6.30a)):

(6.35)  
(a) Ken *ga/*ni eigo *o* wakaru.  
Ken    English  understand  
‘Ken understands English.’  

(b) Mami *ga* Ken *o* suki da.  
Mami   Ken    like cop  
‘Mami likes Ken.’  

(c) boku *ga* mizu *o* nomi-tai.  
I      water  drink-DESID  
‘I want to drink water’

Jarkey (1999), cited in Sells (2004), discusses a variety of aspects involved in this alternation such as definiteness, individuatedness and affectedness. I do not discuss the semantic motivations behind this alternation in detail in the current study.

### 6.1.3.3 Oblique subject

Inoue (1998) and Sells (2004) observe that subjects in Japanese are sometimes marked by semantic particles *de* and *kara*. Inoue claims that both *de* and *kara* phrases have two types: agentive *de* phrases ((6.36a)) and partitive *de* phrases ((6.36b)); and agentive *kara* phrases ((6.37a)) and initiating *kara* phrases ((6.37b)).

(6.36)  
(a) ketueki centre *de* ketueki-gata siiru *o* o-hari-si-masu.  
blood centre  blood-type  seal HON-paste-do-POL.PRES  
‘The blood centre will paste the seal of your blood type.’  

(b) min-na *de* sono ryori o tabeta.  
everyone  the  food  eat.PAST  

(ii) a. kimi ni (wa) rippa na go-ryoosin ga oide-ni naru.  
you (top) splendid cop HON-parents exist.HON  
‘You have splendid parents’  

b. Yamada-san, ga okusan, ga zibun,i/ j no kaisya o keiei-nasatte iru.  
Yamada-Mr  wife  self  company management-do.HON be  
‘It is Mr Yamada whose wife is managing her own company.’

(ii-a) is an example of the *ni-ga* combination and it is the *ga* marked NP that is honorified. (ii-b) is the same type of construction as (i) where the *zibun* is bound by the second *ga* marked NP. Shibatani states that if we assume that the second NPs are also subjects, those puzzling phenomena about honorification and anaphoric binding are solved. Although his proposal is worth considering, the double subjects require major theoretical modification. So, I leave it for future research. See also Kuno and Johnson (2005) for counterargument of Shibatani’s (2001) proposal.
Everyone ate the food.

(6.37)  
  a. zikka *kara* kome o okutte kita.  
        home   rice  send  come.PAST  
  'My family sent me some rice.'
  
  b. Taroo *kara* kuzi o hiita.  
        Taro       lot     draw.PAST
  'Taro started to draw a lot.'

She argues that only the agentive *de* and *kara* phrases are the real subjects and the partitive *de* phrases and the initiating *kara* phrases are examples of pro-drop based on the contrast in causativisation, passivisation and nominalisation. That is, there are underlying subjects and those phrases are not real subjects.

Sells (2004) treats all of them as subjects. He calls the *de* phrase found in (6.36a) institutional subjects and the one found in (6.36b) designated group subjects. He also shows another type of *kara* phrases that function as subjects of verbs of communication (cf. Sells 2004:8–9)

(6.38)  
  a. kono koto wa watasi *kara* ano hito ni denwa o kakete okimasu.  
        this   fact  TOP I      that person phone call do.POL
  'Regarding this, let me call that person.'
  
  b. anata ga ie nai nara, watasi *kara* kotowatte okimasu.  
        you       say-INF Neg if,   I       refuse-INF do.POL
  'If you can’t say it, I will refuse him myself.'

Referring to Spencer (2003c), Sells argues that the marking of those non-canonical subjects is best explained by reference to the grammatical and semantic information of the whole clausal, not the marked nouns or the governing predicates. He provides a construction-based HPSG account for a similar data in Korean incorporating a realisational model of morphology. I do not discuss those *de* and *kara* subjects in this thesis, but a similar proposal would be possible under the current approach.

### 6.1.4 Discourse particles

Finally, I shall briefly summarise the uses of adverbial or discourse particles shown in (6.4) and (6.6). Many of the examples we have looked at so far display *wa* marking on the thematic topic expressions. It is also used to express a contrast. The difference between the two can be highlighted by the following examples (Kuno 1973a:27–8):

\[14\] Most of the contrasts between the two types Inoue illustrates are not observable in my judgment.
(6.39) a. Taroo \textit{wa} gakusei desu.
   \hspace{1cm} \textit{Taro} \textit{student cop.pres}
   \hspace{1cm} \textquote{Speaking of Taro, he is a student.}

   b. ame \textit{wa} hutte imasu \textit{ga}, yuki \textit{wa} hutte imasen.
   \hspace{1cm} \textit{rain falling cop.pol.pres but snow falling cop.pol.neg}
   \hspace{1cm} \textquote{It is raining, but it is not snowing.}

In Lambrecht’s (1994:121–2) term, (6.39a) is a topic-comment sentence where the \textit{wa} marking on \textit{John} suggests that it is the topic. In (6.39b), on the other hand, its function is to express the contrast between rain and snow. Lambrecht (1994:291–3) calls it contrastive topic.

The attachment of \textit{wa} is not restricted to subjects. It can mark an object NP as in (6.40a), an oblique locative as in (6.40b) and an adjunct locative as in (6.40c):

(6.40) a. susi \textit{wa} nihonzin ga tukutta.
   \hspace{1cm} \textit{sushi Japanese make.past}
   \hspace{1cm} \textquote{Speaking of sushi, Japanese invented it.}
   \hspace{1cm} \textquote{A Japanese cooked sushi (but not others).}

   b. Tokyo \textit{e} \textit{wa} hikooki de iku.
   \hspace{1cm} \textit{Tokyo loc airplane by go.pres}
   \hspace{1cm} \textquote{Speaking of Tokyo, we go there by plane.}
   \hspace{1cm} \textquote{We go to Tokyo by plane (but not to other places).}

   c. ano daigaku \textit{de} \textit{wa} kenkyuu dekinai
   \hspace{1cm} \textit{that university loc research do.neg}
   \hspace{1cm} \textquote{Speaking of that university, you can’t do research there.}
   \hspace{1cm} \textquote{You can’t do your research at that university (but you can at other places).}

As indicated by the translations, both topic-comment reading and contrastive topic reading are available, although the context may make one of them more natural. (6.40b–d) suggest that semantic case particles are not omitted even when they co-occur with \textit{wa}. We will look at the co-occurrence restrictions in more detail below.

I have already mentioned that subjects are followed by \textit{ga} in canonical sentences. It also marks objects of stative predicates. However, it also signals a focus function of marked nouns, as first pointed out by Kuroda (1965). Kuno (1973b) calls it exhaustive listing. More generally it can be regarded as one type of exclusive focus (or contrastive focus in Lambrecht 1994:292). (6.41a) is an example of the focus \textit{ga}, while (6.41b) is an example of what Kuno calls neutral descriptions (or event-reporting/thetic sentences in Lambrecht (1994:137ff)), which simply signals the subject function of the marked noun phrase (Kuno 1973b:38):

(6.41) a. John \textit{ga} gakusei desu.
   \hspace{1cm} \textit{John} \textit{student cop.pol.pres}
   \hspace{1cm} \textquote{It is John who is a student.}
b. ame ga hutte imasu.
   rain falling cop.pol.pres
   ‘It is raining.’

The neutral description reading of *ga* is only available when it marks a subject of action verbs, existential verbs and adjectives/nominal adjectives that represent changing states (cf. Kuno 1973b:49–50):

(6.42) a. tegami ga kita.
   letter come.past
   ‘Mail has come.’
   ‘It was mail that came’

b. hon ga tukue no ue ni aru.
   book desk top.loc be.pres
   ‘There is a book on the desk.’
   ‘It is a book that is on the desk.’

c. sora ga akai.
   sky red
   ‘The sky is red.’
   ‘It is the sky that is red.’

The sentences in (6.42) are ambiguous in that the *ga* marked NPs are either interpreted as exclusive foci (exhaustive-listing) or neutral descriptions.

When *ga* follows subjects of stative predicate, however, the only available interpretation is focus reading. Kuno (1973b:51–2) shows the following examples:

(6.43) a. saru ga ningen no senzo desu.
   monkey human ancestor cop.pol.pres
   ‘It is the monkey that is the ancestor of man.’

b. John ga nihongo o sitte iru.
   John Japanese know be.pres
   ‘John (and only John) knows Japanese.’

c. John ga nihongo ga dekiru.
   John Japanese able.pres
   ‘John (and only John) can speak Japanese.’

d. boku ga osusi ga tabe-tai.
   ‘I sushi eat-want.pres
   ‘I (and only) I want to eat sushi.’

In (6.43), the predicates are stative, so that the *ga* marked subjects receive only the exhaustive-list readings as indicated by the translations. Therefore, an interesting conclusion can be drawn with respect to the *ga-ga* pattern in (6.32), namely the first *ga* in this marking pattern is a focus marker, rather than a simple subject marker.
As noted in Kuno (1973b:76–7), the exclusive focus *ga* is attached not only to a subject NP, but also to a locative NP:

(6.44)  
\begin{align*}
a. & \text{New York } ni \text{ koosoo-kentiku } ga \text{ oooi.} \\
& \text{New York loc high-rise-building many} \\
& \text{‘In New York, there are many high-rise buildings.’} \\
b. & \text{New York } ga \text{ koosoo-kentiku ga oooi.} \\
& \text{‘It is New York that there are many high-rise buildings in.’}
\end{align*}

In (6.44a), the location NP is marked by the locative *ni*. If it is marked by *ga*, however, it becomes an exclusive focus as in (6.44b). The *ga* marking on a possessor found in (i) of footnote 13 can also be regarded as an exclusive focus.

In sum, if *ga* is used with non-stative predicates, it is either a simple subject marker or an exclusive focus marker. If it attaches to a subject of a stative predicate, it must be an exclusive focus marker.\(^{15}\)

Let us look at uses of other focus markers listed in (6.6).\(^{16}\) Firstly, *mo* is an inclusive focus marker which is attached to a focus expression introducing a new object into a background (cf. König 1991). The focus is placed upon various phrases as shown in the following examples:

(6.45)  
\begin{align*}
\text{Ken } ga \text{ Ai ni gakkoo de kotosi present o watasita.} \\
& \text{Ken to school loc this year present hand} \text{PAST} \\
& \text{‘Ken gave a present to Ai at school this year.’} \\
i. & \text{Ken } mo \text{ Ai ni gakkoo de kotosi present o watasita.} \\
& \text{‘Ken too gave a present to Ai at school this year.’} \\
ii. & \text{Ken } ga \text{ Ai } ni \text{ mo gakkoo de kotosi present o watasita.} \\
& \text{‘Ken gave a present to Ai (as well as to others) at school this year.’} \\
iii. & \text{Ken } ga \text{ Ai ni gakkoo } \text{ de mo kotosi present o watasita.} \\
& \text{‘Ken gave a present to Ai at school (as well as at other places) this year.’} \\
iv. & \text{Ken } ga \text{ Ai ni gakkoo de kotosi } \text{ mo present o watasita.} \\
& \text{‘Ken gave a present to Ai at school this year (as well as other years).’} \\
v. & \text{Ken } ga \text{ Ai ni gakkoo de kotosi present } \text{ (o) mo watasita.} \\
& \text{‘Ken gave a present (as well as other things) to Ai at school this year.’} \\
vi. & \text{Ken } ga \text{ Ai ni gakkoo de kotosi present o watasi mo sita.} \\
& \text{hand do} \text{PAST} \\
& \text{‘Ken gave a present to Ai at school this year (as well as doing other things).’}
\end{align*}

Based on the first sentence, (6.45-i) shows that the subject is focused where the background proposition is ‘X gave a present to Ai at school this year’. In (6.45-ii), the indirect object *Ai*
ni is the focus against the background ‘Ken gave a present to X at school this year’. Notice that the goal particle ni is retained. In the same vein, the focus is placed on the locative phrase in (6.45-iii), the temporal adverbial phrase in (6.45-iv), the direct object in (6.45-v) and the verb in (6.45-vi).

The second type of inclusive focus marker includes datte, demo, sae, sura and made, all of which mean ‘even’. Let us look at an example of sae taken from Noguchi and Harada (1996):

(6.46)  Taroo sae gakkoo ni itta.
        Taro     school to go.past
        ‘Even Taro went to school.’

In (6.46), Taroo sae is the focus and the remaining part is the topic. According to Noguchi and Harada, this sentence has the following implications:

(6.47)  a. Taro went to school.
        b. It was never expected that Taro went to school (Taro was least expected to go to school).
        c. Other students (at least one) went to school.
        d. Everyone (who should go to school) went to school.

(6.47) indicates that Taro is not highlighted, rather it functions as a pivot to convey that other students went to school as a matter of course.\footnote{The same effect can be obtained by mo marking in an appropriate context. Noguchi and Harada (1996) shows the following example:}

We have looked at the exclusive focus use of ga above. Another type of exclusive focus marker is koso, which is more emphatic:

(6.48)  a. kare koso (ga) gityoo ni husawasii.
        he   chairperson   suitable
        ‘He (and only he) is suitable for the chairperson.’

        b. kare wa gityoo ni koso husawasii.
        he   top chairperson   suitable
        ‘He is suitable for a chairperson (not other positions).’

In (6.48a), kare introduced as an exclusive figure on the presupposition ‘X is suitable for the chairperson’. In (6.48b), on the other hand, koso marks gityoo ni, which means that...
the background proposition is ‘he is suitable for X’ and a chairperson is introduced as an exclusive focus filling X.

Another exclusive focus particle is *sika* ‘only’. One intriguing property of this particle is that although it is a negative polarity item (NPI), namely the governing predicate must be in the negative form, semantically the sentence is not negative. The following is the examples:

(6.49) a. Taroo *sika* zyugyoo ni ikanakatta/*itta.
    Taro class to go.neg/past/go.past
    ‘Only Taro went to the class.’

    b. Ken wa susi *sika* tabenakatta/*tabeta.
    Ken top sushi eat.neg/past/eat.past
    ‘Ken ate only sushi.’

    c. Igirisu kara *sika* tegami ga todokanakatta/*todoita.
    UK from letter arrive.neg/past/arrive.past
    ‘Letters arrived only from the UK.’

The sentences in (6.49) show that only the negative forms of the predicates can co-occur with the *sika* marked focus expressions. As indicated by the translations, the literal meaning of the sentences are not negative, though they imply the negative feeling of the speakers.

As non-NPI focus particles, Japanese has *dake* and *bakari* which also mean ‘only’. Hence, the predicates are not in the negative form when they occur with *dake* marked foci:

(6.50) a. Taroo *dake* (ga) zyugyoo ni itta.
    Taro class to go.past
    ‘Only Taro went to the class.’

    b. Ken wa susi *dake* (o) tabeta.
    Ken top sushi eat.past
    ‘Ken ate only sushi.’

    c. Igirisu kara *dake* / *dake* kara tegami ga todoita.
    UK from / from letter arrive.past
    ‘Letters arrived only from/from only the UK.’

(6.50a, b) suggest that *dake* can be followed by case particles *ga* and *o*, which is different from other discourse particles. In (6.50c), the order between *dake* and the semantic case particle *kara* can be swapped. The order reflects the semantic scope difference as indicated in the translations.18

6.1.5 Particle combinations

To complete the description of nominal particles, I discuss the relative order amongst them. We have looked at the uses of a number of case particles and discourse particles. With respect to their functions, we would expect a wide range of co-occurrences, namely functionally the case particles would be compatible with the topic \textit{wa}. However, their distribution is limited as already shown in some examples. The syntactic and semantic case particles are in general mutually exclusive. But some combinations of a semantic case particle and a syntactic case particle is allowed as shown in (6.51):

\begin{itemize}
  \item[(6.51)]
  \begin{enumerate}
    \item mokuyoo \textit{made ga}/*\textit{ga made} teisyutukigen da. \\
      \textit{Thursday until} \textit{deadline} \textit{cop.pred} \\
      ‘The deadline is Thursday.’
    \item sono \textit{siai wa koohan kara ga}/*\textit{ga kara} omosirokatta. \\
      \textit{the match top second half from exciting.past} \\
      ‘The match got exciting from the second half’
    \item sensei \textit{wa dai-5-syo kara o/\textit{o kara} sippitu sita}. \\
      \textit{professor top chapter 5 from writing do.past} \\
      ‘The professor wrote chapter 5 and thereafter.’
  \end{enumerate}
\end{itemize}

We have already observed the co-occurrence between discourse particle \textit{dake} and semantic case particles, that is the order between the two can be swapped as in (6.52). But \textit{dake} can only precede syntactic case particles as in (6.53). A similar focus particle \textit{bakari} exhibits the same ordering constraint:

\begin{itemize}
  \item[(6.52)]
  \begin{enumerate}
    \item Sue \textit{wa John dake kara} tegami o uketotta. \\
      \textit{Sue top John only} \textit{from letter receive.past} \\
      ‘Sue received the letter from only John.’
    \item Sue \textit{wa John kara dake} tegami o uketotta. \\
      ‘Sue received the letter only from John.’
  \end{enumerate}
\end{itemize}

\begin{itemize}
  \item[(6.53)]
  \begin{enumerate}
    \item John \textit{dake ga} sono himitu o sitteiru. \\
      \textit{John only the secret know.pres} \\
      ‘Only John knows the secret.’
    \item *John \textit{ga dake} sono himitu o sitteiru.
  \end{enumerate}
\end{itemize}

With respect to another discourse particle \textit{wa}, it is impossible for syntactic case particles to co-occur with it as illustrated in (6.54). Semantic case particles can precede \textit{wa}, but cannot follow it as shown in (6.55):

\begin{itemize}
  \item[(6.54)]
  \begin{enumerate}
    \item sensei \textit{wa kokuban wa}/*\textit{o wa}/*\textit{wa o tukau}. \\
      \textit{teacher top blackboard use.pres} \\
      ‘The teacher uses the blackboard.’
  \end{enumerate}
\end{itemize}
b. sono gakusei wa/*ga wa/*wa ga marathon ni sanka sita.
   ‘The student participated in the marathon.’

(6.55) a. kono knife de wa/*wa de hito o korosenai.
   this knife human kill.NEG.PRES
   ‘You can’t kill a man with this knife.’

b. Ken wa densya ni wa/*wa ni noru.
   Ken TOP train ride.PRES
   ‘Ken takes a train.’

The above data seem to suggest that the syntactic case particles and the topic particle wa only appear at the right-edge of an NP, whereas the focus particle dake/bakari and the semantic case particles allow other particles to follow them. I call the dake, bakari and the semantic case particles ‘Sem group’ and the case particles and wa ‘Wa group’.

Let us consider other focus and semantic case particles. The exclusive focus koso, the inclusive focus sae, sura and made and the semantic case particle yori behave in the same way with respect to ordering, namely they follow the Sem group particles. For instance, they appear before the semantic case particles as in (6.56a) and the exclusive focus dake as in (6.56b):

(6.56) a. nikugan de sae/*sae de ano UFO wa kakuni de kita.
   naked eyes that UFO TOP recognition able.PAST
   ‘That UFO was visible even with naked eyes.’

b. Naomi wa kono mondai dake sura/*sura dake toki-owaranakatta.
   Naomi TOP this question solve-finish.NEG.PAST
   ‘Naomi didn’t finish even this question only.’

As observed in (6.48a), however, those particles can be followed by ga (repeated here as (6.57a)). Further, they can also be followed by the inclusive focus mo as in (6.57b). Those facts tell us that this group of particles appears between the Sem group and the Wa group. Let us call this type of particles ‘Fc group’.

(6.57) a. kare koso ga gityoo ni husawasii.
   he chairperson suitable
   ‘He (and only he) is suitable for the chairperson.’

b. Naomi wa kono mondai sae mo toki-owaranakatta.
   Naomi TOP this question solve-finish.NEG.PAST
   ‘Naomi didn’t finish even this question.’

One complication is that mo can appear with ga. In that case, mo must precede ga as in (6.58). Hence, mo appears between the Fc group and the Wa group:
6.1. EXPLORING PARTICLES

(6.58) otooto sae mo ga watasi o keibetu sita.
younger brother even I despisement do.PAST
‘Even my younger brother despised me.’

We observed that neither of ga nor o can co-occur with the topic marker wa. However, o does not behave exactly in the same way as ga. As shown in (6.59), o precedes mo. Hence, it follows the same ordering constraint as the Fc group.

(6.59) a. sono syoonen no ensoo wa puro no ensooka o mo
the boy ‘s performance top professional ‘s player
attoo sita.
overwhelming do.PAST
‘The boy’s performance overwhelmed even the professional players.’

b. Taroo wa zibun no sidookyookan o mo nikun da.
Taro top self ‘s supervisor hate cop.PAST
‘Taro hated even his supervisor.’

The semantic case particle yori ‘than’ is also thought to belong to the Fc group. Within the Fc group, the case particle o and the semantic case particle yori can co-occur with the other focus particles. In that case, they precede the focus particle:¹⁹

(6.60) a. sono oo wa musuko o sae syokei sita.
the king top son execution do.PAST
‘The king executed even his son.’

b. seihu wa sono mondai o koso kaiketu subeki da.
government top the problem solution do.should cop.PRES
‘The government should solve that problem.’

Finally, unlike koso, sura, sae, sika, demo and datte cannot be followed by ga or mo:

(6.61) a. *kare sika ga gakkoo ni konakatta.
he school come.NEG.PAST
‘Only he came to school.’

b. *Naomi wa kono mondai datte mo toki-owaranakatta.
Naomi top this question solve-finish.NEG.PAST
‘Naomi didn’t finish even this question.’

(6.61) suggests that those focus particles are in the same group as ga and wa, namely they must appear at the end of particle cluster.

To summarise the ordering constraints among particles, we can divide them into four groups as follows:

¹⁹Some speakers allow o either to precede or follow the focus particles such as sae, sura and koso, although it is at best marginally acceptable for many speakers (cf. Teramura 1991, Ono 1996). Kondo (2000:116) observes that the case particle o in Old Japanese, but not other type of o, allows other particles, such as ba, namo and si, to follow it (for the detail analysis of Old Japanese o, see also Kinsui 1993).
(6.62)  

a. **Group I (= Sem group)**  
   Case particles: *de, e, eto, made, madeni, kara, ni*  
   Discourse particles: *dake, bakari*

b. **Group II (= Fc group)**  
   Case particle: *o, yori*  
   Discourse particles: *sae, sura, koso, made*

c. **Group III**  
   Discourse particle: *mo*

d. **Group IV (= Wa group)**  
   Case/discourse particle: *ga, wa, sika, datte, demo*

### 6.1.6 Case feature?

Turning to the discussion of nominal features, none of the properties summarised above suggests that Japanese grammar needs to refer to *case* features. Morphologically speaking, *case* is absolutely unnecessary, since the case and other particles exhibit no formal alternations depending on the properties of marked nouns. Syntactically, no agreement is observed. The subcategorisations can be stated over the forms of particles. Likewise, the link between semantic properties and semantic case particles can be established without resort to *case*. The focus function of *ga* cannot be naturally derived by positing nominative. The ordering constraints amongst particles cannot be stated in terms of functions of particles, let alone *case*.

What is necessary to capture the properties Japanese nominal particles display is to establish the realisation of particles with respect to a diverse range of syntactic, semantic and discourse information. In section 6.3, I shall present how the morphology defines a well-formed string of particles and how they are linked to required features.

### 6.2 Previous LFG proposals

Having provided a descriptive overview of Japanese nominal particles, I now look at how they have been analysed in the previous works in LFG. I shall first discuss Ishikawa’s (1985) proposal which try to capture the distributions of particles by establishing the association between complex binary features and particle forms. I will then look at more recent proposal by Ohara (2000) that adopts Nordlinger’s (1998) Constructive Morphology to link the GF encoding and particles.
6.2.1 Ishikawa (1985)

Following the analysis of Russian case by Neidle (1982) and Icelandic case by Zaenen and Maling (1984), Ishikawa (1985) associates decomposed features to Japanese particles. For syntactic case particles, he assigns three features, obl, obj and stative; for semantic case particles, he assigns obl and thematic role features. The following is the list of entries (Ishikawa 1985:214):\(^{20}\)

\[(6.63)\]

\[
\begin{align*}
g & \quad P \quad (\uparrow \text{obl}) = - & (\uparrow \text{obj}) = - & (\uparrow \text{stat}) = - \\
o & \quad P \quad (\uparrow \text{obl}) = - & (\uparrow \text{obj}) = + & (\uparrow \text{stat}) = - \\
kara & \quad P \quad (\uparrow \text{obl}) = + & (\uparrow \text{source}) = + \\
de & \quad P \quad (\uparrow \text{obl}) = + & (\uparrow \text{instrumental}) = + \\
no & \quad P \quad (\uparrow \text{mod}) = + \\
w & \quad P \quad (\uparrow \text{topic}) = +
\end{align*}
\]

He assumes the c-structure for particle marked noun phrases as in (6.64). The particles are regarded as nominal suffixes, so the N and P combination in (6.64) is thought to occur in the morphology (cf. Ishikawa 1985:220ff). The feature specifications given to the particles in (6.63) flow into the same f-structure as the head noun due to the f-structure co-head annotations. Hence, John *ga* has the c-structure and the corresponding f-structure as in (6.65):

\[(6.64)\]

\[(6.65)\]

Further, *gf* is defined by feature matrix. Ishikawa (1985:215, 252) proposes the following feature assignment to each *gf*:\(^{21}\)

---

\(^{20}\)His original lexical entries for *kara* and *de* state \((\uparrow \text{obj}) = +\) instead of \((\uparrow \text{obl}) = +\), which I believe is typographical errors.

\(^{21}\)Obviously, this line of proposal is further developed in LMR by defining *gf* in terms of objectiveness ([±o]) and restrictiveness ([±r]).
(6.66) a. Grammatical case-feature assignment

Let \( L \) be a lexical form and \( FL \) its grammatical function assignment. If \( \text{gf} \) is a member of \( FL \), add to the lexical entry of \( L \):

\[
\begin{align*}
(\uparrow \text{gf obl}) &= a \\
(\uparrow \text{gf obj}) &= b \\
(\uparrow \text{gf stat}) &= g
\end{align*}
\]

according to the following table:

<table>
<thead>
<tr>
<th>GF</th>
<th>a</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>subj</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>obj</td>
<td>−</td>
<td>+</td>
</tr>
<tr>
<td>obj2</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

and the value \( g \) of the equation \((\uparrow \text{stative}) = g\) associated with \( L \).

b. Semantic case-feature assignment

If \( \text{gf} \), a member of \( FL \), has the equation \((\uparrow \text{gf q}) = a\) associated with it, add to the lexical entry of \( L \):

\[
(\uparrow \text{gf q}) = c a
\]

If \( \text{gf} \), a member of \( FL \), is \( \text{obl} \) or \( \text{obj2} \), add to the lexical entry of \( L \):

\[
\begin{align*}
(\uparrow \text{gf obl}) &= + \\
(\uparrow \text{gf q}) &= c +
\end{align*}
\]

where \( q \) is the name of the thematic role associated with the \( \text{gf} \) position.

According to the feature assignment principles, the lexical entry of \( \text{syookais} \) ‘introduce’ is given as in (6.67) (Ishikawa 1985:216):

(6.67) \( \text{syookais} \ V \) \((\uparrow \text{pred}) = \text{'syookais(subj, obj2, obj)'\)}

\[
\begin{align*}
(\uparrow \text{stative}) &= - \\
(\uparrow \text{subj obl}) &= - \\
(\uparrow \text{subj obj}) &= - \\
(\uparrow \text{subj stat}) &= - \\
(\uparrow \text{obj obl}) &= - \\
(\uparrow \text{obj obj}) &= - \\
(\uparrow \text{obj stat}) &= - \\
(\uparrow \text{obj2 obl}) &= + \\
(\uparrow \text{obj2 obj}) &= + \\
(\uparrow \text{obj2 stat}) &= - \\
(\uparrow \text{obj2 goal}) &= c +
\end{align*}
\]

The obl, obj and stat features of \( \text{subj} \), \( \text{obj} \) and \( \text{obj2} \) are specified according to (6.66a). Since goal is the associated thematic role with \( \text{obj2} \) of this verb, \( q \) in (6.66b) is substituted for by goal and the equation \((\uparrow \text{obj2 goal}) = c +\) is given to the entry.

The entry (6.67) defines and constrains the obl, obj, stat and thematic role values in each \( \text{gf} \), so the \( \text{subj} \), \( \text{obj} \) and \( \text{obj2} \) must yield the unifiable values according to the particle entries in (6.63). The following is a well-formed sentence with the c-structure and the corresponding
As specified in (6.63), if *ga* and *o* are attached to the subject noun and the object noun respectively, the f-structure of *subj* and *obj* would be well-formed with respect to *obl*, *obj* and state values as in (6.69). We will look at the details of *ni* immediately below, but it is thought to have \((\uparrow \text{obl}) = +\) and \((\uparrow \text{goal}) = +\). Hence, if it attaches to the secondary object noun, the *obl* value would not clash with the one specified by *syookaisita* and the goal value satisfies...
the constraining equation given by the verb.

Let us look at how his proposal captures the occurrence of *ni* marked subjects and *ga* marked objects in stative predicates. According to (6.66b), verbs whose subject has a certain thematic role take an unspecified value for the constraining equation of the subj’s thematic feature. The obl value of subj can also be unspecified. The values of thematic and obl features must be consistent, namely \((↑\text{subj} q) = c + & (↑\text{subj} obl) = + \) or \((↑\text{subj} q) = c - & (↑\text{subj} obl) = -\). Therefore, the lexical entries of *kowa* ‘fearful’ and *ar* ‘exist’, both of which allow *ni* and *ga* marked subjects, will look like (6.70) (Ishikawa 1985:252–3):

\[
\text{(6.70)}\quad \begin{align*}
\text{a.} & \quad \text{**kowa** A} & (↑\text{PRED}) &= \text{‘KOWA\langle subj, obj\rangle’} \\
&A & (↑\text{STATIVE}) &= + \\
&A & (↑\text{subj obl}) &= a \\
&A & (↑\text{subj obj}) &= - \\
&A & (↑\text{subj stat}) &= + \\
&A & (↑\text{subj experiencer}) &= c + a \\
&A & (↑\text{obj obl}) &= - \\
&A & (↑\text{obj obj}) &= + \\
&A & (↑\text{obj stat}) &= + \\
\text{b.} & \quad \text{**ar** A} & (↑\text{PRED}) &= \text{‘AR\langle subj, obj\rangle’} \\
&A & (↑\text{STATIVE}) &= + \\
&A & (↑\text{subj obl}) &= a \\
&A & (↑\text{subj obj}) &= - \\
&A & (↑\text{subj stat}) &= + \\
&A & (↑\text{subj possessor}) &= c + a \\
&A & (↑\text{obj obl}) &= - \\
&A & (↑\text{obj obj}) &= + \\
&A & (↑\text{obj stat}) &= +
\end{align*}
\]

In (6.70a), \((↑\text{subj experiencer}) = c + a\) and \((↑\text{subj obl}) = a\) suggest that they have the same value, namely either + or -. Similarly, \((↑\text{subj possessor})\) and \((↑\text{subj obl})\) must be consistent in (6.70b).

Further, Ishikawa proposes the following list of entries for *ni* (Ishikawa 1985:251):

\[
\text{(6.71)}\quad \begin{align*}
\text{a.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{agent}) &= + \\
\text{b.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{possessor}) &= + \\
\text{c.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{experiencer}) &= + \\
\text{d.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{goal}) &= + \\
\text{e.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{sentient causee}) &= + \\
\text{f.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{inflictor}) &= + \\
\text{g.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{benefactor}) &= + \\
\text{h.} & \quad \text{**ni** P} & (↑\text{obl}) &= + & (↑\text{partner}) &= +
\end{align*}
\]

(6.71c) ensures that a noun can be a subject of *kowa* when it is followed by *ni*. That is, the marked noun is mapped onto the f-structure that contains \langle obl, + \rangle and \langle experiencer, + \rangle, so
that it satisfies the constraint enforced by the verb.

With respect to *ga* marking, Ishikawa assumes that the occurrence of *ga* with stative predicates is always associated with focus. The entries of *ga* and *o* in (6.63) suggest that both only appear with stative predicates, namely they have (↑ stat) = −. Ishikawa proposes the second entry of *ga* as in (6.72) (Ishikawa 1985:246):

(6.72) \[\text{ga } P (\uparrow \text{stat}) = c + (\uparrow \text{focus}) = +\]

Hence, for Ishikawa, *ga* appearing with a stative predicate is (6.72) and the marked noun is always in focus. Since it does not contribute any values for obl or obj, it can mark a subject noun or an object noun. Ishikawa (1985:247) provides the following distribution of markers:

(6.73)

<table>
<thead>
<tr>
<th></th>
<th>non-stative</th>
<th>stative</th>
</tr>
</thead>
<tbody>
<tr>
<td>subj</td>
<td><em>ga</em> focus-</td>
<td><em>ga</em> focus-</td>
</tr>
<tr>
<td>obj</td>
<td><em>o</em> focus-</td>
<td><em>ga</em> focus-</td>
</tr>
</tbody>
</table>

The entries (6.70a), (6.71c) and (6.72) yield the c-structure and the corresponding f-structure for a sentence with a *ni* marked subject and an *ga* marked object as in (6.75). If both the subject and the object are marked by *ga*, the structures would be like (6.76):

(6.74) John *ni/ga* obake *ga* kowai.

John ghost fearful

‘John is fearful of ghost.’

(6.75)

\[
\begin{array}{c}
\text{S} \\
\text{NP} \\
\text{N} \\
\text{P} \\
\text{John} \\
(\uparrow \text{obl}) = + \\
(\uparrow \text{experiencer}) = + \\
\text{NP} \\
\text{N} \\
\text{N} \\
\text{P} \\
\text{obake} \\
\text{ga} \\
(\uparrow \text{stat}) = c + \\
(\uparrow \text{focus}) = + \\
\end{array}
\]

\[\begin{array}{c}
\text{PRED} \text{‘JOHN’} \\
\text{obl} + \\
\text{obj} - \\
\text{stat} + \\
\text{experiencer} + \\
\text{OBJ} \text{‘OBAKE’} \\
\text{obl} - \\
\text{obj} + \\
\text{stat} + \\
\text{focus} + \\
\text{PRED} \text{‘KOWA(SUBJ,OBJ)’} \\
\end{array}\]
When the positive value of experiencer in the subj is given by ni, the value of obl is also positive as shown in (6.75). If the subject is marked by ga, the experiencer value is not specified as +. It is unclear from Ishikawa’s discussion whether it is given – due to the lack of positive value as in (6.76), or it remains unspecified. The obl value in the subj must be the same as that of the experiencer. Since the entry of kowa states (↑ obl stat) = −, o cannot mark the object noun (cf. (6.63b)). Instead, the focus ga occurs with it, which gives the f-structures as in (6.75) and (6.76).

For the predicates that allow both ga and o objects, Ishikawa proposes to make the value of stat in obj unspecified. So, for instance, suki has the following entry (Ishikawa 1985:248):

\[(6.77) \quad \text{suki} \quad \text{NA} \quad (↑ \text{PRED}) = '\text{suki}(\text{subj, obj}')
\]

\[
(↑ \text{stat}) = + \\
(↑ \text{subj obl}) = - \\
(↑ \text{subj obj}) = - \\
(↑ \text{subj stat}) = + \\
(↑ \text{obj obl}) = - \\
(↑ \text{obj obj}) = + \\
(↑ \text{obj stat}) = a
\]

Since the value of stat in obj can either be + or −, the object can be marked either by o that has (↑ stat) = − as in (6.63b) or ga that has (↑ stat) = + as in (6.72).

I share the many of the intuitions with Ishikawa’s analysis in that he assumes that the association between complex features and particles interacts with the lexical properties of the governing predicate. However, there are some questionable aspects in his proposal mainly on the status of decomposed features. Firstly, when a subject of a stative predicate is marked by ga, the value of experiencer in subj is – (or it could be unspecified) in his analysis as shown in (6.76). If the experiencer feature is syntactic (f-structural) encoding of the thematic role,
the negative value or unspecified status would not reflect the fact that the given subject is thematically an experiencer even when it is a focus signaled by *ga*. Secondly, the stat feature is assigned to the *gs* by the governing predicate. Although it is certainly correct that the stative and non-stative distinction is crucial to account for the particle marking patterns in Japanese, it is a questionable proposal to postulate ⟨stat, +⟩ and ⟨stat, −⟩ for each dependent, rather than referring to the stative feature of the governing predicate. In particular, an obj has ⟨stat, −⟩ even with a stative predicate when it receives *o* marking, which makes the status of this feature even more unclear. Thirdly, the *ga* attachment on objects of stative predicates is always associated with focus (exhaustive-listing) in his analysis as suggested by (6.72) and (6.73). We have observed that some stative predicates can have either *ga* or *o* marking on objects, but others can only have *ga* marking. Therefore, Ishikawa’s analysis would claim that the latter type of predicates always has focus on objects unless the topic marker *wa* replaces *ga*, which is clearly not correct. If ⟨focus, +⟩ in the f-structure does not entail that the *gf* is in the focus, again the status of this feature becomes unclear. Finally, the entry of the focus *ga* in (6.72) requires ⟨stat, +⟩ to exist in the f-structure corresponding to the marked noun. This means that *ga* attached to subjects of non-stative predicates cannot be a focus marker. However, as observed in (6.42), the *ga* marking on those subjects signals either a neutral description or an exclusive focus. Ishikawa’s proposal fails to capture the former option.

### 6.2.2 Ohara (2000)

Another LFG analysis on Japanese particles is found in Ohara (2000). Her central claim is to utilise Nordlinger’s (1998) Constructive Morphology for case particles. For instance, *ga* and *o* are given the following entries (Ohara 2000:46):

\[
\begin{align*}
\text{(6.78)} & \quad \text{a.} \quad -ga \quad (\uparrow \text{CASE}) = \text{NOM} \\
& \quad \quad \quad (\text{SUBJ} \uparrow) \\
& \quad \text{b.} \quad -o \quad (\uparrow \text{CASE}) = \text{ACC} \\
& \quad \quad \quad (\text{OBJ} \uparrow)
\end{align*}
\]

As discussed in the preceding chapters, (SUBJ ⇓) and (OBJ ⇓) construct SUBJ and OBJ whose values are the f-structures corresponding to the *ga* and *o* marked NPs.

With respect to the phrase structure of particle marked NPs, she proposes the PS rule as in (6.79). Particles are regarded as phrasal affixes and syntactically attached to an NP. The marked NP and the particle are mapped onto the same f-structure, i.e. annotated as ⇑ = ⇓.

---

22 Of course, it may be true that the unavailability of the inside-out function at that time required this line of proposal.

23 See Sells (1999) for a similar proposal.
According to the entries in (6.78a) and (6.79), the sentence (6.80a) is given the c-structure and the f-structure as in (6.80b):

(6.79) \[ \text{NP} \rightarrow \text{NP Part} \]
\[ \uparrow = \downarrow \quad \uparrow = \downarrow \]

(6.80) a. Hanako ga hona o katta.
\hspace{1cm} \text{Hanako \ book \ buy\_PAST}
\hspace{1cm} ‘Hanako bought a book.’

b. \[ \text{S} \]
\[ (\uparrow \text{GF}) = \downarrow \]
\[ \text{NP} \rightarrow \text{NP Part} \]
\[ \uparrow = \downarrow \quad \uparrow = \downarrow \]
\[ \text{Hanako} \quad \text{ga} \quad \text{(SUBJ \uparrow)} \]
\[ \text{hona \ o} \quad \text{(OBJ \uparrow)} \]
\[ \text{VP} \rightarrow \text{NP Part} \]
\[ \uparrow = \downarrow \quad \uparrow = \downarrow \]
\[ \text{katta} \]

The semantic case particles receive a slightly different treatment in her analysis. She assumes that they introduce a PRED that takes OBJ in its value. For instance, kara has the following entry (Ohara 2000:55):

(6.81) \[ \text{kara} \quad (\uparrow \text{PRED}) = \text{‘FROM(OBJ)’} \]
\[ (\uparrow \text{CASE}) = \text{SOURCE} \]
\[ (\text{ADJ} \uparrow) \lor (\text{OBL} \uparrow) \]

Accordingly, another PS rule is postulated as in (6.82), in which a Part is the f-structure head while an NP is the c-structure head. (6.83) is an example of a kara marked NP when it is used as an adjunct (Ohara 2000:56):

(6.82) \[ \text{NP} \rightarrow \text{NP Part} \]
\[ (\uparrow \text{OBJ}) = \downarrow \quad \uparrow = \downarrow \]
I have already pointed out the disadvantages of having a layered f-structure for an oblique or adjunct function encoded by a particle or a postpositional element in Chapter 3. As shown in the summary of uses of nominal particles in section 6.1.2, the distinction between syntactic and semantic case particles are not clear-cut. Ohara (2000:41) seems to suggest that the linear ordering too can be captured by the distinctions by labels such as syntactic case, semantic case and adverbial particles. However, section 6.1.5 clearly reveals that the linear order amongst particles is rather idiosyncratic and not regulated by their syntactic, semantic and discourse functions.

Still, I agree with the general line of analysis Ohara presents, namely the constructive morphological analysis of nominal particles. In the following section, I present a morphological analysis of particle realisation and how it is linked to the construction of syntactic, semantic and discourse information in the distinct levels of representation.

6.3 Analysis

6.3.1 Phrase structure

As briefly mentioned in section 6.2.1, Ishikawa (1985) treats nominal particles as suffixes. One of the motivations behind his claim is that they exhibit phonetic and phonological characteristic of non-initial segments of words (Ishikawa 1985:221). Firstly, the initial /g/ of an independent word is pronounced as [g], while /g/ within a word becomes intervocalic [i]. Since the initial consonant of ga is pronounced intervocalically, it is not regarded as an independent word. Secondly, non-initial no often becomes n, which never happens on word initial no. The particle no exhibits this alternation. Finally, the particle wa is often merged with the preceding high vowel and becomes [ja]. This property is observed in the verbal suffix ba. Further, the ridged and idiosyncratic order summarised in section 6.1.5 is a common property of morphological objects. Thus, there are plenty of reasons to believe that the nominal particles in Japanese are suffixes.

However, the particles in question display some degree of separability from the host. Most
notably, if a particles are attached to a co-ordinated NPs, it appears only once as shown in (6.84):

(6.84)  a. [ Ken to Naomi ] ga sono keeki o tabeta.
    Ken and Naomi the cake eat.PAST
    ‘Ken and Naomi ate the cake.’

b. *[Ken ga ] to [ Naomi ga ]] sono keeki o tabeta.

c. imooto wa [ Ken to Naomi ] kara present o moratta.
    younger sister top Ken and Naomi from present receive.PAST
    ‘My younger sister received the present(s) from Ken and Naomi.’

d. ??imooto wa [[ Ken kara ] to [ Naomi kara ]] present o moratta.

If we assume that the particles are attached to a noun stem as suffixes, this behaviour cannot be explained.

The conclusion drawn from the above discussion is that the Japanese nominal particles seem to have mixed properties of morphological suffixes and independent syntactic units, i.e. phrasal suffixes or clitics. Ohara (2000:31–40) reaches the same conclusion (cf. Zwicky 1987, Zwicky and Pullum 1983 and Miller 1992). We have already observed similar situations in European Portuguese in Chapter 3 and in Hindi-Urdu in Chapter 5. Therefore, I analyse the particles as bound elements in the morphological component, but non-projecting postpositions (ˆP) in c-structure. The proposed phrase structure is very similar to the one I have proposed for Hindi-Urdu.

6.3.2 Morphological analysis

In the lexicon, the morphological component must yield a well-formed cluster of particles. The combinatorial and ordering constraints summarised in section 6.1.5 may easily be captured by template-based morphological analyses, and Ishikawa (1985) provides such a line of proposal. In this section, I shall show how the realisation of particle strings is modeled in PFM.

As seen in the analysis of Hindi-Urdu in Chapter 5, it is highly undesirable for the morphology to define noun base and particle cluster combinations with respect to the functions of particles or noun phrases as a whole due to the wide range of syntactic, semantic and discourse properties they exhibit. Thus, I propose a set of morphological features for the Japanese noun inflection. Having established an inflectional paradigm with the morphological features, a set of complex equations are assigned to the entries in the paradigm by linkage, so that the entries are usable in the syntax and other parts of the grammar. I postulate the following morphological features:
The three attributes \textsc{gpart}, \textsc{spart} and \textsc{dpart} take values whose names are simply selected from the phonological manifestation of the feature,\footnote{Sells (2004), following Bratt (1996) and Kim (2004), assumes \textsc{gcase}, \textsc{scase} and \textsc{delim} attributes for the Korean noun inflectional morphology, which correspond to \textsc{gpart}, \textsc{spart} and \textsc{dpart} in (6.85) respectively. In his realisational model within hpsg, the values of those attributes are phonological features checked by \textsc{morph}, namely \textsc{morph} takes \textsc{gcase}, \textsc{scase} and \textsc{delim} whose values are structure-shared with members of list value of \textsc{affix} in phon.} but nothing hinges on the choice of feature labels. Since not all combination is possible amongst particles when they are phonologically realised, the FCRs must be stated. One of the crucial restrictions is as follows:

(6.86) FCR1: \( \neg ([\uparrow \textsc{dpart}] = \text{wa} \land ([\uparrow \textsc{gpart}])] \)

As we recall from the descriptive overview, whenever the topic marker \textit{wa} marks an NP, the occurrence of \textit{ga}, \textit{o} and \textit{no} is blocked. This property can be captured as a morphological idiosyncrasy and (6.86) ensures that the paradigm lacks a space of the intersection of those features, which in effect stops yielding the combination of \textit{wa} and the syntactic case particles. With respect to the combination of semantic case particles and \textit{ga/o}, I am only aware of the ones found in (6.51), although some other combinations could be observed in the corpus data or elsewhere — \textit{no} can comfortably co-occur with semantic case particles. So, the following FCR must be stated:

(6.87) FCR2: \( \neg ([\uparrow \textsc{spart}] = \{\text{de} \mid \text{e} \mid \text{eto} \mid \text{made} \mid \text{madeni} \mid \text{yori} \ldots \} \land ([\uparrow \textsc{gpart}]) = \{\text{ga} \mid \text{o}\}] \)

(6.87) constrains the combinations of \textsc{spart} except for \textsc{kara} and \textsc{made} with \textsc{gpart} except for \textsc{no}. Accordingly, the morphology yields only a small number of items that contain both \textsc{spart} and \textsc{gpart} features.

Having posited a set of inflectional features, let us consider the realisation rules. The observation in section 6.1.5 suggests that the group I particles in (6.62) appear the closest to a noun stem. Firstly, let us suppose that Block I contains the following \( R \)s:

(6.88) Block I

\begin{itemize}
  \item i. \( R_{L(\uparrow \textsc{spart}) = \text{de}}, N(\sigma) = \text{de} \)
  \item ii. \( R_{L(\uparrow \textsc{spart}) = \text{e}}, N(\sigma) = \text{e} \)
  \item iii. \( R_{L(\uparrow \textsc{spart}) = \text{eto}}, N(\sigma) = \text{eto} \)
  \item iv. \( R_{L(\uparrow \textsc{spart}) = \text{made}}, N(\sigma) = \text{made} \)
  \item v. \( R_{L(\uparrow \textsc{spart}) = \text{madeni}}, N(\sigma) = \text{madeni} \)
\end{itemize}
vi. $R_{L,[↑ \text{SPART}]} = \text{kara}, N(\sigma) = \text{kara}$

vii. $R_{L,[↑ \text{SPART}]} = \text{ni}, N(\sigma) = \text{ni}$

viii. $R_{L,[↑ \text{DPART}]} = \text{dake}, N(\sigma) = \text{dake}$

ix. $R_{L,[↑ \text{DPART}]} = \text{bakari}, N(\sigma) = \text{bakari}$

The difficulty of this proposal is that it does not capture the fact that a semantic case particle and a discourse particle can appear in different orders. One possible solution is to use reversible rule blocks. In Fula, a subject agreement suffix precedes an object agreement suffix. However, when a first singular subject coincides with a second or third singular (class 1) object in the relative past, the order of agreement suffixes is reversed. To account for that, Stump (2001:154) proposes the following sole stipulated member of the portmanteau rule block:

(6.89) $R_{[IV,III], \{\text{AGR(su)}: \{\text{Per:1, NUM:sg, TNS:relative past, AGR(ob)}: [\text{NUM:sg, GEN:1}], V(\langle X, \sigma \rangle)\}} = \text{def} \ R_{III}(N)R_{IV}((X, \sigma)))$

Block III and IV are for $R$s of subject and object agreement exponents respectively. (6.89) belongs to the portmanteau block of III and IV. When this rule applies according to the morphosyntactic properties described, the order of rule applications in Block III and IV is reversed as shown in $N(R_{III}(N)R_{IV}((X, \sigma))))$.

In Fula, the reverse rule applications occur under a restricted syntactic condition stated above. Hence, postulating a rule in the portmanteau block works well. In Japanese, however, since the relative order between a semantic case particle and a focus particle is not sensitive to certain syntactic properties, a simple transfer of this proposal to Japanese is not possible. Hence, I assume that the following two particle rule blocks are freely reversible:

(6.90) Block I

i. $R_{L,[↑ \text{SPART}]} = \text{de}, N(\sigma) = \text{de}$

ii. $R_{L,[↑ \text{SPART}]} = \text{e}, N(\sigma) = \text{e}$

iii. $R_{L,[↑ \text{SPART}]} = \text{eto}, N(\sigma) = \text{eto}$

iv. $R_{L,[↑ \text{SPART}]} = \text{made}, N(\sigma) = \text{made}$

v. $R_{L,[↑ \text{SPART}]} = \text{madeni}, N(\sigma) = \text{madeni}$

vi. $R_{L,[↑ \text{SPART}]} = \text{kara}, N(\sigma) = \text{kara}$

vii. $R_{L,[↑ \text{SPART}]} = \text{ni}, N(\sigma) = \text{ni}$

(6.91) Block II

i. $R_{II,[↑ \text{DPART}]} = \text{dake}, N(\sigma) = \text{dake}$

ii. $R_{II,[↑ \text{DPART}]} = \text{bakari}, N(\sigma) = \text{bakari}$
(6.90) and (6.91) contain $R$'s realising semantic case particles and focus particles respectively. Since the two blocks are reversible, we can have either $R_I \circ R_{II}(\sigma)$ or $R_{II} \circ R_I(\sigma)$, which allows the morphology to define the two orders between a semantic case particle and a focus particle.

With respect to the group II particles in (6.62), the following two blocks are posited:

(6.92) Block III
i. $R_{III}(\uparrow_{gpart}) = o, N(\sigma) = o$
ii. $R_{III}(\uparrow_{spart}) = yori, N(\sigma) = yori$

(6.93) Block IV
i. $R_{IV}(\uparrow_{dpart}) = sae, N(\sigma) = sae$
ii. $R_{IV}(\uparrow_{dpart}) = sura, N(\sigma) = sura$
iii. $R_{IV}(\uparrow_{dpart}) = koto, N(\sigma) = koto$
iv. $R_{IV}(\uparrow_{dpart}) = made, N(\sigma) = made$

As shown in (6.60), it is more natural to have the particles realised by a $R$ in Block III followed by the one in Block IV. Hence, the canonical pattern is defined by $R_{III} \circ R_{IV}(\sigma)$. As noted in footnote 19, however, the reverse order is marginally acceptable for some speakers. Such a deviation from the canonical pattern can be formulated by allowing the reverse application $R_{IV} \circ R_{III}(\sigma)$.

The inclusive focus particle $mo$ appears after the group II particles. Thus, the block V is defined as follows containing only one $R$:

(6.94) Block V
i. $R_V(\uparrow_{dpart}) = mo, N(\sigma) = mo$

Finally, the group IV particles are mutually exclusive and occur at the end of particle cluster. The following block is postulated:

(6.95) Block VI
i. $R_{IV}(\uparrow_{gpart}) = ga, N(\sigma) = ga$
ii. $R_{IV}(\uparrow_{dpart}) = wa, N(\sigma) = wa$
iii. $R_{IV}(\uparrow_{dpart}) = sika, N(\sigma) = sika$
iv. $R_{IV}(\uparrow_{dpart}) = datte, N(\sigma) = datte$
v. $R_{IV}(\uparrow_{dpart}) = demo, N(\sigma) = demo$

Combined with other functions constituting the $F$ of Japanese, the $R$ applications according to the above blocks will yield well-formed noun stem and particle cluster combinations. Since no stem form change happens in Japanese nominal inflection, the function $F$
simply gives a root form. The particle cluster attached to the noun stem is constructed by the \( R \) application in each rule block. Since Block I and II are reversible as discussed above, the \( PF \) at least have two options for the composite \( R \)s as in (6.96a, b). Further, for some speakers, Block III and IV are reversible. Hence, two other options are added as in (6.96b):

\[
\begin{align*}
(6.96) & \quad \text{a. } R_I \circ R_{II} \circ R_{III} \circ R_{IV} \circ R_V \circ R_{VI}(\sigma) \\
& \quad \text{b. } R_{II} \circ R_I \circ R_{III} \circ R_{IV} \circ R_V \circ R_{VI}(\sigma) \\
& \quad \text{c. } R_I \circ R_{II} \circ R_{IV} \circ R_{III} \circ R_V \circ R_{VI}(\sigma) \\
& \quad \text{d. } R_{II} \circ R_I \circ R_{IV} \circ R_{III} \circ R_V \circ R_{VI}(\sigma)
\end{align*}
\]

The particle clusters are aligned to the right edge of a noun base. As we have seen in the previous chapter on Hindi-Urdu, the function \( L \) gives labels to a noun base as \( N \) and particles \( \hat{P} \), so that their surface configurational properties are regulated by c-structural constraints. The remaining question is how they are functional in the syntax.

### 6.3.3 Functions of particles

#### 6.3.3.1 GF linkage

Having established the way of morphological realisation of nominal particles, we need to link the entries occupying spaces in the inflectional paradigm and their syntactic, semantic and discourse functions. Firstly, the linkage to the subject function is established as follows:

\[
(6.97) \quad \text{(subj \uparrow)}
\]

\[
\begin{align*}
\text{i. } & \quad ((\text{subj \uparrow}_\sigma \text{ stative}) = + \supset (\uparrow \text{ spart}) = \text{ni} \\
\text{ii. } & \quad ((\text{subj \uparrow}_\sigma \text{ stative}) = - \supset (\uparrow \text{ gpart}) = \text{ga}
\end{align*}
\]

(6.97) states the cases where a given noun is mapped onto the value of subj in the corresponding f-structure. If the governing predicate has \((\uparrow_\sigma \text{ stative}) = +\) in the semantic-structure, it requires to be linked to the cell in the paradigm whose spart value is \text{ni} as shown in (6.97-i). For non-stative predicates, (6.97-ii) ensures that the noun is linked to the cell with \((\uparrow \text{ gpart}) = \text{ga} \).

We have observed that some stative predicates do not take a \text{ni} marked subject and if it is marked by \text{ga}, it is always an exclusive focus (cf. (6.32) and (6.43)). I assume that those predicates lexically specify the negative statement of \(\langle \text{spart}, \text{ni} \rangle\). For instance, the lexical entry of \text{suki} 'like' is shown as in (6.98):

\[
(6.98) \quad \text{suki} \quad \text{NA} \quad (\uparrow \text{ pred}) = \langle \text{like}(\text{subj}, \text{obj}) \rangle \\
\quad (\uparrow_\sigma \text{ stative}) = + \\
\quad (\uparrow \text{ subj spart}) \neq \text{ni}
\]
When a *ni* marked NP having the equations constructed by the linkage (6.97-i) occurs with *suki*, the structure will be ill-formed due to \((\uparrow \text{subj sparing}) \neq \text{ni}\) in (6.98). Instead, a well-formed structure would be obtained by having a subject with other particles such as topic *wa* and various focus particles including *ga*. We will look at the linkages for discourse particles below.\(^{25}\)

With respect to *obj*, the equations like (6.99) must be stated. As in (6.97), it is sensitive to the *static* value of the governing predicate. If it has \(<\text{static},+>\) in the corresponding f-structure, the equations must be linked to the cell that has \(<\text{gpart}, \text{ga}>\). Otherwise, \((\text{obj} \uparrow)\) must be associated with the cell with \((\uparrow \text{gpart}) = \varnothing\) as stated in (6.99-ii):

\[(6.99) \quad (\text{obj} \uparrow)\]

i. \(((\text{obj} \uparrow)_{\sigma} \text{static}) = + \supset (\uparrow \text{gpart}) = \text{ga}\]

ii. Elsewhere \(\supset (\uparrow \text{gpart}) = \varnothing\)

In (6.35), we have observed that some stative predicates allow its object to be marked either by *ga* and *o*. And when it is marked by *o*, the subject must not be marked by *ni*. This property is captured by postulating the following lexical specifications in the lexical entries of those predicates:

\[(6.100) \quad \text{wakaru} \quad V \quad (\uparrow \text{pred}) = \text{‘understand(subj,obj)’} \]

\[(\uparrow,_{\sigma} \text{static}) = + \]

\[((\uparrow \text{obj gpart}) = \varnothing \land (\uparrow \text{subj sparing}) \neq \text{ni})\]

The last equations requires the value \text{gpart} in \text{obj} to be \varnothing and the value of \text{sparing} in \text{subj} not to be \text{ni}. Since they are conjoined, they apply together. Further, the equations are optional as indicated be the brackets. This optionality allows the alternation of *ga* and *o*. For example, the verb can also occur with a *ga* marked object as follows when the optional equations do not apply:\(^{26}\)

\[(6.101) \quad \text{Taroo ni eigo ga wakaru.} \quad \text{Taro English understand} \quad \text{pres} \quad \text{‘Taro understands English.’}\]

\[(6.102) \quad \text{a. Taroo}_{\text{ni}} \quad (\uparrow \text{pred}) = \text{‘TARO’} \quad (\uparrow \text{sparing}) = \text{ni} \quad (\text{subj} \uparrow) \quad (((\text{subj} \uparrow),_{\sigma} \text{static}) = + \]

---

\(^{25}\)The *ga* marking on subjects in stative predicates always signal focus, so it is distinct from (6.97-ii).

\(^{26}\)We have seen *ni* and *to* direct objects in (6.9) – (6.13). Since the verbs taking such objects exhibit restricted semantic properties, I assume that they are lexically specified in verbs’ entries.

\(^{27}\)\text{gdf} is a meta-variable covering both \text{gf} and \text{df}.
b. eigo<sub>N</sub> ga<sub>P</sub> (↑ PRED) = ‘English’
(↑ GPART) = GA
(OBJ ↑)
((OBJ ↑)\(\sigma\) STATIVE) = +

(6.103)

\[
\begin{array}{c}
\text{S} \\
\text{(↑ GDF)} = \downarrow \\
\text{NP} \\
\text{↑} = \downarrow \\
\text{NP} \\
\text{P} \\
\text{\text{Taroo}} \\
\text{ni} \\
\end{array}
\begin{array}{c}
\text{↓} \\
\text{NP} \\
\text{P} \\
\text{eigo} \\
\text{ga} \\
\text{V} \\
\text{wakaru} \\
\text{\text{ subj}} \text{[STATIVE } + \text{]} \\
\text{\text{pred}} \text{understand⟨subj, obj⟩} \\
\text{\text{subj}} \text{Taro} \\
\text{\text{gpart spart ni}} \\
\text{\text{pred}} \text{English} \\
\text{\text{gpart GA}} \\
\text{\text{obj}} \text{[stat} \text{] +]} \\
\end{array}
\]

If the equations apply, the OBJ must have \(⟨\text{GPART, o}\rangle\) and the SUBJ must not have \(⟨\text{SPART, ni}\rangle\). So, the c-/f-structures would be as (6.104). Here, the subject is marked by the focus ga, which I will discuss in detail below:

(6.104)

\[
\begin{array}{c}
\text{S} \\
\text{(↑ GDF)} = \downarrow \\
\text{NP} \\
\text{↑} = \downarrow \\
\text{NP} \\
\text{P} \\
\text{\text{Taroo}} \\
\text{ni} \\
\end{array}
\begin{array}{c}
\text{↓} \\
\text{NP} \\
\text{P} \\
\text{eigo} \\
\text{ga} \\
\text{V} \\
\text{wakaru} \\
\text{\text{ subj}} \text{[STATIVE } + \text{]} \\
\text{\text{pred}} \text{understand⟨subj, obj⟩} \\
\text{\text{subj}} \text{Taro} \\
\text{\text{gpart spart ni}} \\
\text{\text{pred}} \text{English} \\
\text{\text{gpart GA}} \\
\text{\text{obj}} \text{[stat} \text{] +]} \\
\end{array}
\]

Let us look at how the linkage for OBL and ADJ functions are formulated:

(6.105) \{ (OBL ↑) | (ADJ ∈ ↑) \} (= %LOCAL)

a. (ACTOR ↑\(\sigma\)) ⊃ (↑ SPART) = NI
b. (SOURCE \↑σσ) ⊃ (↑ SPART) = KARA

c. (LOCATION \↑σσ)
   i. (%LOCAL, STATIVE) = + ⊃ (↑ SPART) = NI
   ii. (%LOCAL, STATIVE) = − ⊃ (↑ SPART) = DE

d. (PATH \↑σσ) ⊃ (↑ GPART) = O

e. (GOAL \↑σσ) ⊃ (↑ SPART) = NI

f. (DIRECTION \↑σσ) ⊃ (↑ SPART) = \{e | etc\}

g. \{(MATERIAL \↑σσ) | (INSTRUMENT \↑σσ) | ... \} ⊃ (↑ SPART) = DE

The crucial linkage for (obl \↑σσ) and (adj ∈ \↑σσ) is the association between an agentive NP and ni marking. This link is stated as in (6.105a), that is if a noun is mapped onto the value of obl or adj in the f-structure and the value of actor in the semantic-structure,\(^{28}\) it must be linked to the cell that has (↑ SPART) = ni. The distinction between the uses of agentive oblique ni and source kara found in (6.21) – (6.24) are captured by further postulating the linkage (6.105b).

With respect to locative, we have observed that a locative NP is marked by de, ni and o depending on semantics or event structure of the clause in (6.14) – (6.19). To capture such a variety of marking patterns, the statements like (6.105c) are posited. Since %LOCAL is a local name given to the f-structure corresponding to the governing predicate, (6.105c-ii) and (6.105c-iii) capture the ni and de locative marking depending on the stativity of the predicate. (6.105d) states that if a given noun is mapped onto the value of path in the semantic-structure, it must be an item in the cell whose gpart value is o. Likewise, the differential marking between directional and goal NPs can be formulated as in (6.105e) and (6.105f). The other links to semantic features are stated in the same way. I do not discuss the details of them.

The following is the examples of three locative expressions with their f-structures and the corresponding semantic-structures built from the lexical entries of the particle marked nouns.

(6.106) a. ani wa Tokyoo ni sunde iru.
   elderly brother top Tokyo loc live be,pres
   ‘My brother lives in Tokyo.’

b. Tokyoo\(_{ni}\) ni\(_{p}\) \(^{(↑ PRED)}\) = ‘Tokyo’
   \(^{(↑ SPART)}\) = NI
   \{(%obl \↑σσ) | (adj ∈ \↑σσ)\} (\(= %\text{LOCAL}\))
   (%LOCAL, STATIVE) = +
   \(^{(↑σ REL)}\) = Tokyo
   (LOCATION \↑σσ)

\(^{28}\)Here, I am assuming the attribute-value matrix for semantic-structure along the line of Matsumoto (1996). It may be stated in terms of argument-structure role as (agent \¬\(_{a}\)).
c. \[
\begin{array}{ccc}
\text{PRED} & \text{LIVE(SUBJ, OBL)} & \text{REL LIVE} \\
\text{TOPIC} & \text{BROTHER} & \text{FIGURE REL BROTHER} \\
\text{SUBJ} & \text{WA} & \text{LOCATION REL TOKYO} \\
\text{OBL} & \text{Tokyo} & \text{STATIVE +} \\
\end{array}
\]

(6.107) a. kodomo ga dooro de asonde iru.
child road loc play be, pres
‘Children are playing on the street.’

b. \[\text{dooro}_N \text{ de}_{\text{P}} \ (\uparrow \text{PRED}) = \text{‘STREET’} \]
\[ (\uparrow \text{GPART}) = \text{DE} \]
\[\{(\text{OBL } \uparrow) \mid (\text{ADJ } \uparrow)\} = \% \text{LOCAL} \]
\[\{(\text{OBL } \uparrow) \mid (\text{ADJ } \uparrow)\} \]
\[(\uparrow, \sigma \text{ REL}) = \text{STREET} \]
\[(\text{LOCATION } \uparrow, \sigma) \]

c. \[
\begin{array}{ccc}
\text{PRED} & \text{PLAY(SUBJ)} & \text{REL PLAY} \\
\text{SUBJ} & \text{CHILD} & \text{ACTOR REL CHILD} \\
\text{ADJ} & \text{STREET} & \text{LOCATION REL STREET} \\
\end{array}
\]

Ken mountain climb,PAST
‘Ken climbed up the mountain.’

b. \[\text{yama}_N \text{ o}_{\text{P}} \ (\uparrow \text{PRED}) = \text{‘MOUNTAIN’} \]
\[ (\uparrow \text{GPART}) = \text{O} \]
\[\{(\text{OBL } \uparrow) \mid (\text{ADJ } \uparrow)\} \]
\[(\uparrow, \sigma \text{ REL}) = \text{MOUNTAIN} \]
\[(\text{PATH } \uparrow, \sigma) \]

c. \[
\begin{array}{ccc}
\text{PRED} & \text{CLIMB(SUBJ, OBL)} & \text{REL CLIMB} \\
\text{SUBJ} & \text{Ken} & \text{ACTOR REL Ken} \\
\text{OBL} & \text{MOUNTAIN} & \text{PATH REL MOUNTAIN} \\
\end{array}
\]

6.3.3.2 DF linkage

Let us consider the linkages involving discourse functions. As discussed in section 6.1.4, some of the particles are closely tied with topic and focus status of marked NPs. Firstly, since
topic is associated with wa marking, the following equations are stated:

\[(6.109) \quad (\text{topic} \uparrow) \quad (\uparrow \text{type}) = \{\text{contr} \mid \text{thematic}\} \supset (\uparrow \text{dpart}) = \text{wa}\]

As suggested in (6.39), there are two types of topic wa, so the type attribute can take either CONTRASTIVE or THEMATIC as its value.

According to the types of focus, we can postulate the linkages as in (6.110). The exhaustive-listing or exclusive focus is realised by ga attachment to an NP. This is attained by (6.110-i). Another type of exclusive focus is signalled by koso marking. This implies a more emphatic exclusivity, which is represented as the subtype excl_emph. The other exclusive focus particles involve explicit quantificational property ‘only’. Hence, I assume that it is associated with (quant, only) in the corresponding semantic-structure as in (6.110-iii, iv). Further, sika can only occur with a negative form of a predicate, which is represented by the constraining equation \(((\text{gf} \uparrow) \text{pol}) = \epsilon \text{ neg})\). Finally, the inclusive focus is encoded by various particles. The unmarked one is the mo marking, which is shown in (6.110-v). The other particles imply a negative attitude of the inclusivity, so I propose a subtype incl_neg as in (6.110-vi):

\[(6.110) \quad (\text{focus} \uparrow) \quad \begin{align*}
\text{i.} & \quad (\uparrow \text{type}) = \text{excl} \supset (\uparrow \text{dpart}) = \text{ga} \\
\text{ii.} & \quad (\uparrow \text{type}) = \text{excl_emph} \supset (\uparrow \text{dpart}) = \text{koso} \\
\text{iii.} & \quad (\uparrow \text{type}) = \text{excl} \\
& \quad (\uparrow \sigma \text{quant}) = \text{only} \supset (\uparrow \text{dpart}) = \{\text{dake} \mid \text{bakari}\} \\
\text{iv.} & \quad (\uparrow \text{type}) = \text{excl} \\
& \quad (\uparrow \sigma \text{quant}) = \text{only} \\
& \quad ((\text{gf} \uparrow) \text{pol}) = \epsilon \text{ neg} \supset (\uparrow \text{dpart}) = \text{sika} \\
\text{v.} & \quad (\uparrow \text{type}) = \text{incl} \supset (\uparrow \text{dpart}) = \text{mo} \\
\text{vi.} & \quad (\uparrow \text{type}) = \text{incl_neg} \supset (\uparrow \text{dpart}) = \{\text{datte} \mid \text{demo} \mid \text{sura} \mid \text{sae} \mid \text{made}\}\]

\[29\text{Alternatively, we can postulate an independent level of representation for information-structure. For instance, the topic linkage can be defined as follows where } \iota \text{ is a function from f-structure to i-structure:}\]

\[(i) \quad (\text{topic} \uparrow) \\
(\iota, \text{type}) = \{\text{contr} \mid \text{thematic}\} \supset (\uparrow \text{dpart}) = \text{wa}\]

If we assume that \((\uparrow \text{pred}) = (\uparrow \text{pred})\) applies globally to lexical entries, topic and focus take the pred of marked nouns as their values in the information-structure.

\[30\text{Since the negative form of a verb does not encode semantic negation occurring with sika, the constraint may be stated over the m-structure as in } ((\text{gf} \uparrow) \mu \text{pol}) = \epsilon \text{ neg}\]
6.3.3.3 **GF and DF interaction**

Since the DFs are functionally or anaphorically controlled by one of the GFs in the f-structure (Extended Coherence Condition), we expect the GF linkage and DF linkage to interact with each other. For instance, an NP can construct *topic* and *subj* at the same time. That is, (6.97) and (6.109) can be combined and give the following complex linkages:

\[(6.111)\]

\[\begin{align*}
\text{a.} & \quad (\text{subj} \uparrow) \\
& \quad ((\text{subj} \uparrow)_r \text{ static}) = + \\
& \quad (\text{topic} \uparrow) \\
& \quad (\uparrow \text{ type}) = \{\text{contr} \mid \text{thematic}\} \\
& \quad \supset (\uparrow \text{ spart}) = \text{ni}, (\uparrow \text{ dpart}) = \text{wa}
\end{align*}\]

\[\begin{align*}
\text{b.} & \quad (\text{subj} \uparrow) \\
& \quad ((\text{subj} \uparrow)_r \text{ static}) = - \\
& \quad (\text{topic} \uparrow) \\
& \quad (\uparrow \text{ type}) = \{\text{contr} \mid \text{thematic}\} \\
& \quad \supset (\uparrow \text{ gpart}) = \text{ga}, (\uparrow \text{ dpart}) = \text{wa}
\end{align*}\]

(6.111) is the case where a subject of a stative predicate is topicalised. Those functional equations are linked to a cell in the paradigm with (\uparrow \text{ spart}) = \text{ni} and (\uparrow \text{ dpart}) = \text{wa}, that is a noun followed by the particle cluster *ni* and *wa*. This pattern is exemplified as follows:

\[(6.112)\]

\[\begin{align*}
\text{a.} & \quad \text{Taroo ni wa eigo ga wakaru.} \\
& \quad \text{Taro English understand_pres} \\
& \quad \text{‘Taro understands English.’}
\end{align*}\]

\[\begin{align*}
\text{b.} & \quad \text{Taroo}_N \text{ ni}_P \text{ wa}_P \quad (\uparrow \text{ pred}) = \text{‘Taro’} \\
& \quad (\uparrow \text{ spart}) = \text{ni} \\
& \quad (\uparrow \text{ dpart}) = \text{wa} \\
& \quad (\text{subj} \uparrow) \\
& \quad ((\text{subj} \uparrow)_r \text{ static}) = + \\
& \quad (\text{topic} \uparrow) \\
& \quad (\uparrow \text{ type}) = \text{thematic}
\end{align*}\]

\[\begin{align*}
\text{c.} & \quad \text{S} \\
& \quad (\uparrow \text{ gdf}) = \downarrow \quad (\uparrow \text{ gdf}) = \downarrow \quad \uparrow = \downarrow \\
& \quad \text{NP} \quad \text{NP} \quad V \\
& \quad \uparrow = \downarrow \quad \uparrow = \downarrow \quad \uparrow = \downarrow \\
& \quad \text{NP} \quad \text{NP} \quad \text{P} \\
& \quad \uparrow = \downarrow \quad \uparrow = \downarrow \quad \text{wa} \quad \text{eigo} \quad \text{ga} \\
& \quad \text{wakaru} \\
& \quad \text{Taroo} \quad \text{ni} \\
\end{align*}\]
(6.111b), on the other hand, shows the cases where a subject of a non-stative predicate is topicalised, i.e. (6.97-ii) and (6.109). This requires (\( \uparrow \text{gp} \)) = \text{GA} and (\( \uparrow \text{dp} \)) = \text{WA}. However, morphologically the FCR1 in (6.86) prohibits this feature co-occurrence, that is there is no cell in the paradigm where the linkage (6.111a) can be established. It is clear that a subject of a non-stative predicate can be topicalised. So, the crucial question is what happens in that case. Since (6.111b) cannot be established, only available option is to have (6.109) without a \( \text{gf} \) linkage. For instance, we have the entry like (6.113a). When this is inserted into the syntax in a sentence like (6.113b), the c-structure and the corresponding f-structure would be (6.113c):

(6.113) a. John \text{wa} \text{musuko o nagutta}.
   \text{hit.past}
   'John hit his son.'

b. John \text{wa} musuko o nagutta.
   \text{hit.past}
   'John hit his son.'

c. \( \uparrow \text{gdf} \) = \( \downarrow \)
   \( \uparrow \text{gdf} \) = \( \downarrow \)
   \( \uparrow \) = \( \downarrow \)
   \( \uparrow \) = \( \downarrow \)
   \( \uparrow \) = \( \downarrow \)
   \( \uparrow \) = \( \downarrow \)
   \text{nagutta}
   \text{hit}

\text{John wa} is mapped onto the value of the \text{topic}. Unlike (6.112c), however, the \text{topic} is unbound, which violates the Extended Coherence Condition in (6.113c). Further, the f-structure is incomplete lacking the value of the \text{subj}.

\footnote{Note that the \text{subj} and \text{obj} in the \text{pred} value is not just members of the subcategorisation list, but actual f-structures, namely the \text{pred} value constructs \text{subj} and \text{obj} in the local f-structure (see Andrews 1990:214 for the discussion on this point).}
Hence, Japanese must have a way of rescuing this ill-formed f-structure. I assume that dfs are freely controlled by available dfs in the f-structure in Japanese. In (6.113c), therefore, the subj is the only candidate to functionally control the unbound topic, so the grammar identify the value of the topic with that of the subj, which yields a well-formed f-structure. In fact, (6.112) is still grammatical when ni is omitted. This is because the wa marked NP is mapped onto topic in the f-structure and it is functionally controlled by the subj, which is the sole candidate to be structure-shared. This is illustrated as follows:

(6.114)

In (6.115), the sentence contains NPs marked by discourse particles but lacking case particles. Thus, it has two readings depending on how the two NPs marked by the discourse particles are associated with dfs. The two f-structures in (6.116) illustrate this point:

(6.115) Hanako sae John wa nagutta.
       Hanako foc John top hit.past
     a. ‘Even Hanako hit John.’
     b. ‘John hit even Hanako.’
The **focus** and **topic** have two candidates to be structure-shared, namely the **subj** and the **obj**. In (6.116a), the **focus** is functionally controlled by the **subj** while the **topic** is by the **obj**, which gives the (6.115a) reading. (6.116b) displays the opposite pattern, which gives the (6.115b) reading.

The conclusion drawn from the above discussion is that although **ga**s can be explicitly constructed by the case particles, it is not the sole way of **ga** encoding (see Ohara 2000:49 for the discussion on a similar point). For instance, particles are often dropped completely and bare NPs are used in the colloquial speech. So, the **ga**s of bare NPs are identified by some ways.32

Finally, let us consider how the focus **ga** interact with the subject **ga**. We have observed that the **ga** marking on a subject of a non-stative predicate either express the exhaustive-listing reading or the neutral description as in (6.42a) (repeated below as (6.117)). We regard the former as an exclusive focus marker and the latter as a simple subject marker. This ambiguity arises since **tegami ga** can be either (6.118a) or (6.118b). The former is established by a simple **ga** linkage (6.97-ii), while the latter is by a complex of (6.97-ii) and (6.110-i). If those two entries are inserted into the syntax, two distinct f-structures will be obtained as in (6.119). (6.119a) and (6.119b) yield the neutral description reading and the exhaustive-listing reading in (6.118) respectively:33

(6.117) tegami ga kita.
letter come.past
‘Mail has come.’
‘It was mail that came’

32Of course, how far such recovering effects are allowed requires further investigations.
33The latter reading may be obtained by assuming that the **ga** is a mere focus marker and the functional control is established in the same way as (6.113).
(6.118) a. \textit{tegami} \text{ga} \quad (\uparrow \text{PRED}) = 'LETTER'  
 (\uparrow \text{GPART}) = \text{GA}  
 (\text{SUBJ} \uparrow)  
 (\text{(SUBJ)} \sigma \text{ STATIVE}) = -  

b. \textit{tegami} \text{ga} \quad (\uparrow \text{PRED}) = 'LETTER'  
 (\uparrow \text{GPART}) = \text{GA}  
 (\text{SUBJ} \uparrow)  
 (\text{(SUBJ)} \sigma \text{ STATIVE}) = -  
 (\text{FOCUS} \uparrow)  
 (\uparrow \text{TYPE}) = \text{EXCL}  

(6.119) a. \begin{bmatrix} \text{PRED} & '\text{COME(SUBJ,OBJ)}'$ \end{bmatrix}  
 \begin{bmatrix} \text{SUBJ} \end{bmatrix}  
 \begin{bmatrix} \text{PRED} & '\text{LETTER}' \end{bmatrix}  
 \begin{bmatrix} \text{GPART} & \text{GA} \end{bmatrix}  

b. \begin{bmatrix} \text{PRED} & '\text{COME(SUBJ,OBJ)}'$ \end{bmatrix}  
 \begin{bmatrix} \text{FOCUS} \end{bmatrix}  
 \begin{bmatrix} \text{PRED} & '\text{LETTER}' \end{bmatrix}  
 \begin{bmatrix} \text{GPART} & \text{GA} \end{bmatrix}  
 \begin{bmatrix} \text{TYPE} & \text{EXCL} \end{bmatrix}  
 \begin{bmatrix} \text{SUBJ} \end{bmatrix}  

6.4 \textbf{Summary}  

In this chapter, we have started with a discussion of nominal features in the morphology and syntax in Japanese. I have argued that there are no conclusive linguistic phenomena that require nominal features such as number, gender and case. I have extended the investigation into the detailed uses of nominal particles. The behaviours of syntactic case, semantic case and adverbial particles reveals that a simple postulation of case and other relevant features associated with particles would not provide a full account of their occurrences. I have presented how the realisations of particles are captured under the current model of morphology. The analysis is further extended to the linkage of syntactic, semantic and discourse features with the particles clusters following the proposal we made in the previous chapter. The interaction between the $gf$ and $df$ linkage and the morphology has provided a neat and unified account of rather complex behaviours of particles.
Concluding remarks

The central issue of research in the preceding chapters is a theoretical status of case feature. To this end, I have introduced Beard’s Criterion in Chapter 1 based on Spencer and Otoguro (2005). We have then looked at four languages: Icelandic, Hindi-Urdu and Japanese. As discussed in Chapter 4, Icelandic undoubtedly requires case features. In the domain of morphology, five noun declension classes are recognised and each class exhibits different inflectional endings depending on the strong/weak distinction, gender, number and case. This is clearly the case where a one-to-one relationship between endings and cases cannot be established. In the domain of syntax, case plays an important role in two respects. Firstly, when participles and adjectives predicate or modify a noun, their form varies depending on the case feature of the noun. Secondly, the selection of agreement controller is sensitive to case features of argument NPs. Hence, this is another place where case plays a role in the syntax. To account for the interaction between case and agreement controller selection, Andrews (1982, 1990) argues for a rather radical proposal that the NPs in the lexical cases are mapped onto the composite $\mathfrak{g}_S$ whose second layer is identified with the value of case of the $\mathfrak{N}$. After pointing out the difficulties in his proposal, I have presented an alternative analysis. I adopt Dalrymple’s (1993) off-path constraints to state the association between case features and $\mathfrak{g}_S$ of agreement controllers. The advantage of this approach is that it can handle agreement controller changes in a flexible way. Further, since the $\mathfrak{g}_S$ of the agreement controller is not specified in the lexical entry of the target, the inflectional morphology straightforwardly defined the inflected ‘form’ of the target.

In Chapter 5, we looked at Hindi-Urdu case and postpositions. In the generative literature, the postpositions are often regarded as ergative, accusative, dative and genitive case markers. I have argued against introducing those features in the grammar of the languages. I have also stated that those labels are inadequate even for the descriptive purpose, namely they do not help to describe the ergativity Hindi-Urdu exhibit. Careful observations have revealed that Hindi-Urdu require both (1.7) and (1.9) types in the grammar. With respect to postpositions, we only need links between forms and functions. However, the languages also exhibit prop-
erties of genuine case. The three cases, direct, oblique and vocative, clearly play an important role in the inflectional morphology, namely they are encoded by cumulative formatives interacting with number and gender. In the syntactic domain, the direct case form functions as subjects and objects, and the oblique case form can be locatives and complements of post-positions. Further, when an adjective modifies a noun in a certain case, they participate in agreement in case, number and gender. Therefore, according to Beard’s Criterion, those case features must be posited. I further discussed the interaction between case and agreement by applying the new proposal made in the previous chapter.

Finally, in chapter 6, we have considered a large number of nominal particles in Japanese. Some of them are called case particles and are often assumed to introduce case features. I argued that those formatives exhibit none of the properties of case, namely Japanese is the (1.9) type language. The remaining question is how the associations between the forms and very complex syntactic, semantic and discourse features are defined. I have illustrated the way the linkage between the form and a set of functional equations is established by further developing the proposal made for Hindi-Urdu. A particularly interesting aspect is observed in the interaction between the discourse particles and case particles, and the study shows that particle marking is not the sole way of encoding grammatical relations in the language.

There are many questions which still remain unanswered. Amongst them, the issue of genitive and grammatical relations inside an NP is the most relevant to the current study. Throughout the investigations, I mostly ignore the genitive case in Icelandic, kā (~ ke ~ kī) in Hindi-Urdu and no in Japanese. As briefly mentioned in section 5.6.1.2 in Chapter 5, formatives like Hindi-Urdu kā show very interesting morphosyntactic behaviours. For instance, it agrees with a modified noun, not with a noun it attaches to, in case, number and gender, and its inflectional pattern is exactly like adjectives. Therefore, it is essential to analyse the occurrence of kā in comparison with other nominal modifiers. Further, we have observed that secondary predicates in Icelandic exhibit the same agreement pattern as attributive adjective and participle modifiers. Although I present an analysis treating a secondary predicate as an adjunct of a head noun, the analysis is not detailed enough. The direction of research those issues are pointing is that the framework requires a detailed investigation of grammatical relations inside an NP. That is, the further study is needed to allow the theory to have a full set of gfs which are detailed enough to accommodate various morphosyntactic properties nominal modifiers exhibit.
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