Nominals: Inside and Out

edited by
Miriam Butt & Tracy Holloway King

Studies in Constraint-Based Lexicalism

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Contents

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Preface and Acknowledgements

This volume continues the Studies in Constraint Based Lexicalism series created by CSLI Publications. It comprises a number of recent papers examining problems in the analysis of nominals from the perspective of Lexical-Functional Grammar (LFG).

We would like to thank all of our contributors, especially those who had papers ready from the outset and waited patiently for this volume to be completed.

In editing this volume, we received extensive help from a number of sources. First of all, no volume would be complete without the work of anonymous reviewers, whom we have to thank for timely, thorough, and efficient work. Secondly, Christine Kaschny at the Universität Konstanz proved yet again to be an extremely capable editorial assistant; she provided invaluable and extensive help with the editing and proof reading of the manuscript. Finally, we would like to thank Christine Sosa and Tony Gee (welcome back, Tony) of CSLI Publications, and in particular, as always, Dikran Karagueuzian.

1

Introduction

Miriam Butt and Tracy Holloway King

Nominals are janus-faced syntactic creatures: they can have a rich internal structure but must also obey the constraints put on them as dependents of a higher predicate.[1] Both these internal and external aspects and the interaction between them have fascinated and frustrated syntacticians. This volume provides a snapshot of how this fascination is articulated within Lexical-Functional Grammar (LFG) (see Bresnan 2001b, Dalrymple 2001, and Falk 2001 for overviews of LFG theory).

The role a nominal plays in the clause as a whole determines its case-marking, its agreement pattern, and its form (full NP, pronoun, clitic, null). Internally to the NP, we find a structure that can be as complex as that of a verbal clause and that often has many aspects in common with verbal clauses. This results in the theoretical necessity to articulate the commonalities and the differences between the two.

The papers in this volume represent the first collection of work within LFG which focuses exclusively on nominals. The feasibility of organizing such a collection, the kinds of issues which are addressed by the authors, and the conclusions being drawn show that work on nominals is gathering momentum and that a closer investigation of their properties is forcing changes to some established theoretical postulates.

1.1 Nominals from the Outside

As is well known, nominals can interact with other elements in the clause in complex ways. Case, agreement, and position are among the standard

[1]We would like to thank Mary Dalrymple and Annie Zaenen for their help with this introduction.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

factors to be considered in analyzing the role of nominals. In this volume, four papers investigate case, agreement, and the form of NPs in the clause. This is a relatively well-studied set of phenomena, especially within LFG, where some of the first papers dealt explicitly with case, word order, and agreement (e.g., Andrews 1982, Neidle 1982, Mohanan 1982, Zaenen and Maling 1983).

However, despite a sustained crosslinguistic effort into the dependencies and interactions between nominals and the head of a clause, the last word has not yet been spoken, as the issues brought forth in these papers show. In particular, the integration of new ideas and techniques, such as Optimality Theory and inside-out functional uncertainty, into the theory have led to new insights.

For example, one characteristic of recent LFG approaches to case marking has been the use of *inside-out functional uncertainty* (IO-FU) to model the idea that case markers themselves contribute information to the syntax and semantics of a clause. Butt and King 1991 use IO-FU to model the distribution of variable case in Urdu by showing that case is used to mark semantic factors such as volitionality and specificity. Nordlinger 1998 uses the same formal device to model the idea of *Constructive Case* or, more broadly, *Constructive Morphology*. Under this analysis, (stacked) case markers in Australian languages are shown to help determine the structure of a clause by defining the grammatical relations of the arguments in the clause. In this volume, Devyani Sharma extends this idea to a treatment of discourse clitics in Hindi, showing that morphological markings on nominals are not only due to their status as verbal arguments but can also be due to their discourse functions.

The incorporation of Optimality Theory (OT) into LFG to form OT-LFG (Bresnan 2000) has led to a fresh perspective on variable case marking and argument alternations based on universal, violable constraints. Apparently idiosyncratic case alternations and language-internal distributional facts can be derived from the same constraint interactions that are motivated by crosslinguistic typological generalizations. This approach accounts for similarities in case marking patterns between split ergative/accusative languages and pure nominative/accusative languages, moving beyond the traditional dichotomy of ergative vs. accusative systems. In this volume, Hanjung Lee examines variable case marking of nominals in Hindi and Korean from an OT-LFG perspective (e.g., Asudeh 2001, Sharma 2001). Anna Siewierska takes on Bresnan's 2001a idea that constraint interactions within OT can predict the distribution and morphophonological realization of pronominals crosslinguisti-

cally and shows that the OT-based predictions do indeed (mostly) correlate with data surveyed from a typological perspective.

Finally, even parts of the theory which were felt to be relatively well understood, such as subject-verb agreement, can turn out to need significant further investigation. Agreement patterns between verbs and their arguments can take various forms. A verb may agree with its subject, object, indirect object, or some combination thereof. However difficult it may be to account for these agreement patterns crosslinguistically, agreement with coordinated noun phrases often displays even more varied patterns (Wechsler and Zlatić 2003, King and Dalrymple 2003). These patterns are difficult to describe perspicuously and even more difficult to analyze. In this volume, Sadler takes on Welsh asymmetric agreement in coordination constructions and shows that current intuitions about the nature of agreement in conjuncts cannot be maintained.

1.1.1 Lee: The Typology of Case Systems

Hanjung Lee's paper examines the role of prominence hierarchies in linguistic theory, focusing on the types of case systems that are predicted to be found across languages. In particular, she establishes a typology of case systems by formulating a system of interacting constraints. Lee seeks to move away from language particular specifications of case and case alternations by letting the constraint-based OT-system predict what kinds of case alternations are possible in a given language.

Lee's OT-LFG approach to case explores the interactions between the lexicon and syntax. It adapts the OT ideas of output-to-output correspondence and a lexicalized theory of faithfulness to case marking. Under this approach, the well-formed mapping between semantic properties such as specificity or animacy, grammatical functions, and the language specific morphosyntactic realization of case is not stipulated at the level of individual lexical entries; rather, it is the result of an interaction of markedness and faithfulness constraints. Lee's approach allows a radical simplification of the language-particular lexicon because the pattern of case alternations falls out from a collection of constraints which are universally applicable, although the ranking of these constraints differs at a language particular level.

Treating case patterns as the result of constraint interaction further means that apparently idiosyncratic case alternations and language-internal distributional facts can be derived from the same constraint interactions that are motivated by crosslinguistic typological generalizations. When coupled with stochastic evaluations, this approach accounts for similarities in case marking patterns between split ergative/accusative languages and pure nominative/accusative languages, moving beyond

the traditional dichotomy of ergative vs. accusative systems. This ability to account for a broader range of languages argues that constraint violability and constraint ranking increase the generality of the entire system and create a more integrated theory of morphosyntax.

1.1.2 Sharma: Discourse Markers

Devyani Sharma's paper extends the existing accounts of Constructive Case (Nordlinger 1998) to include discourse markers. She provides an account of the status of discourse clitics in Hindi, arguing that they are parallel in many ways to the Hindi case clitics. Under her analysis, case and discourse clitics share similar constructive annotations, through which they identify the clause-level syntactic (grammatical or discourse) function of their host nominal. This analysis accounts for the restrictions on multiple foci, particularly in examples where clause-internal functional-structures allow embedded focus markers to be visible at the clause level. The more restricted distribution of case clitics is due to differences in the structural cliticization possibilities of case and discourse clitics.

Like case clitics, discourse clitics can contribute semantic information which is mapped independently from their nominal's syntactic function. While scope distinctions for discourse clitics are more fine-grained and need to be independent of functional-structure, syntactic discourse function identification is established at functional-structure by constructive morphology. Thus, Sharma shows that the basic analysis of case markers can extend to that of discourse markers in nominals.

1.1.3 Sadler: Single Conjunct Agreement

Louisa Sadler's agreement paper focuses on the representation of nominals that is necessary to account for a range of agreement phenomena. In particular, her data concern agreement under coordination in Welsh and raise questions about approaches to asymmetric agreement in coordinate structures. Sadler shows how certain analyses of agreement are untenable because it is impossible to posit a constituent-structure that satisfies all the necessary requirements. In particular, if agreement is done either via the spec-head relationship or the head-complement relationship, then it is impossible to have two types of agreement with the same noun phrase, even though this agreement pattern is found in Welsh and other languages with single conjunct agreement. Another proposed approach provides the coordinate structure with a set of features appropriate for head-argument agreement, but at the cost of being unable to analyze other phenomena involving agreement features such as predicate

nominal agreement and anaphora. As such, this approach is untenable in its basic form.

A third approach expresses the intuition that heads simply agree with first conjuncts in Welsh. This approach is favored by the author and finds support from agreement patterns crosslinguistically. She proposes that agreement features exist both at functional-structure and at m(orphosyntactic)-structure, and treats Welsh head-argument agreement as a morphosyntactic matter. However, this analysis raises questions about the appropriate level for the statement of agreement generalizations, the number and motivation of projections in LFG, and about the general nature of the mapping between morphology and the syntax. Regardless of which approach is chosen, a simple and homogeneous view of agreement phenomena cannot be maintained and the theory must be adapted to encompass these data.

1.1.4 Siewierska: Pronominalization and the GF Hierarchy

Anna Siewierska examines the correlation between the degree of pronominalization of an argument and its possible grammatical function realizations as predicted by Bresnan's 2001a OT-based approach to explaining paradigmatic gaps and suppletion in pronominal systems. Bresnan assumes a hierarchy of personal pronouns which is based on their phonological and morphological substance. This hierarchy is shown in (1) whereby the most reduced form (i.e., zero) of the pronoun is to the left.

(1) zero > bound > clitic > weak > pronoun

Full forms of a pronoun can generally be used to pick out any referent. However, human referents tend to be preferred. Reduced pronominal forms, in contrast, tend to have a more restricted distribution and to be found only with certain grammatical functions. For instance, in some languages the only grammatical function realized by a zero pronominal is the subject. In many other languages, bound pronominals are restricted to subjects and objects. In yet other languages, clitics may be used for arguments, but not for adjuncts. Bresnan 2001a suggests that restrictions such as these are a reflection of a relationship between reduced pronominals and argument prominence in that reduced pronominals are most commonly found with subjects, but decrease in use the more oblique an argument is.

Siewierska examines five possible interpretations of Bresnan's claim from both crosslinguistic and language-internal perspectives. In particular, she evaluates it against a sample of 402 languages from a wide range of families. This kind of careful typological work is rarely seen in the LFG literature, despite the generally typological nature of the claims. Under

one interpretation, any proposal about linguistic theory is potentially a proposal about linguistic universals: what affects one language is generally assumed to be indicative of a larger set of phenomena. Modifications to the theory should be compatible with analyses of all languages. However, very little work leaps beyond the one or two languages examined in order to take a truly typological perspective. One of the difficulties encountered in attempting such a leap is the problem of translating across categories: Is a subject in one language the same as a subject in another? Is a clitic in one language the same as a clitic in another? As part of her paper, Siewierska presents a thoughtful discussion of what constitutes a clitic, a bound form, a full pronominal, etc., and provides illustrative examples from a range of languages before establishing the typological relationships in terms of prominence hierarchies, where she shows that while most of Bresnan's proposed correlations between pronominals and argument realization hold, others do not.

1.2 Nominals from the Inside

Derived nominals, especially deverbal nominalizations, have long been fundamental to syntactic theory building (Chomsky 1970). Do the derived nominals lose the subcategorization requirements of their base verb? Or do they retain them? Or do they only retain a version of the subcategorization information? One insight has been that the subcategorization requirements of predicational elements (e.g., verbs, nouns, adjectives) are better stated at a more abstract level rather than in terms of purely syntactic subcategorizational requirements such as NP vs. PP. This more abstract level has generally been couched in terms of a predicate-argument structure, variously encoded by thematic roles (e.g., agent or patient), via feature specifications such as [±o,r] (Bresnan and Zaenen 1990), via Dowty's 1991 proto-roles (Zaenen 1993, Alsina 1996), or by abstractions over structural hierarchies which are able to pick out internal vs. external arguments (e.g., Grimshaw 1990).

Within LFG in particular, the foundational paper on the syntax and argument structure of derived nominals is Rappaport 1983, who shows that subcategorization requirements must be stated in terms of a predicate-argument structure rather than specific positional or categorial requirements. That is, the argument structure specifications of a predicational element remain constant, regardless of whether it is realized verbally (e.g., *destroy, present*) or nominally (e.g., *destruction, presentation*).

(2) a. John's presentation of a medal to Mary (Rappaport 1983:118)
b. John presented a medal to Mary.

The precise appearance and realization (position, case marking, etc.) of the arguments depend on language particular factors, but they are assumed to be subject to crosslinguistic generalizations. In LFG these crosslinguistically valid generalizations were subsequently formulated in terms of *Linking* or *Mapping Theory* (Bresnan and Kanerva 1989, Bresnan and Moshi 1990, Bresnan and Zaenen 1990, Alsina and Mchombo 1993).

Mapping Theory has proven to have significant explanatory power in the verbal domain. However, determining the licensing factors which govern argument realization in the nominal (rather than verbal) domain has continued to be the subject of research and debate. In this volume, Carmen Kelling, Tibor Laczkó, and Erika Chisarik and John Payne take on complex data from nominals and nominalization in French and Hungarian. Their work points towards the conclusion that the mapping or linking principles which have been established for the argument realization of verbal predicates cannot be applied straightforwardly to the nominal domain. Rather, more complex factors such as discourse prominence, aktionsart, and the semantics of events must be taken into account.

1.2.1 Kelling: Mapping Proto-Roles in Psych Verbs

Carmen Kelling looks at the nominalization of French psych verbs and provides a detailed proposal of how Dowty-style proto-roles can be incorporated into Mapping Theory in order to account for psych verb nominalizations. She argues that the correct mapping of the participants of psych verbs and their nominalizations onto syntactic structure can be predicted via an elaboration of LFG's mapping theory with Dowty's 1991 proto-role approach, as proposed by Zaenen 1993. For the nominalizations, she introduces a nominal argument realization principle whereby the nominal arguments are obliques, i.e. restricted functions. Under her analysis, optionality of the nominal's arguments follows from the assumption that optionality is a default property of obliques (Alsina 1996).

She proposes that the question of whether the nominal inherits the verb's arguments or not can be answered in the following way: verbs and nominals share semantic argument structure, represented as proto-role properties. However, assignment of features and mapping onto syntactic structure are different for verbs and their derived nouns, and hence the same principles of Mapping Theory cannot apply.

1.2.2 Chisarik and Payne: Possessors vs. Subjects

Beyond the question of whether the same kind of Mapping Theory can account for arguments of nouns as well as verbs, a more general question can be posed: are the arguments of nominals actually exactly like the arguments of verbally headed clauses? The answer appears to be that it is sometimes so, but not always.

Of particular contention is the role of the "possessor" argument of nominals. Erika Chisarik and John Payne argue that there is not a unique grammatical function POSS in LFG, as has often been assumed. Instead, some languages have SUBJ arguments for this relation, while others have both SUBJ and a new grammatical function they propose, called ADNOM (for adnominal). Their argument is based in part on the fact that the "possessor" can embody a large number of semantic rules, similar to the situation with SUBJs. Their ADNOM is similarly unrestricted, but does not have the grammaticalized discourse functions associated with clausal and nominal SUBJ. They argue that the existence of structurally distinct possessor constructions in languages such as English and Hungarian necessitates the postulation of more than one possessor function. They identify the structurally higher position of the possessor with the SUBJ function and postulate a new function ADNOM for the structurally lower position. English and Hungarian differ in that SUBJ and ADNOM can co-occur in English, but are mutually exclusive in Hungarian. Chisarik and Payne account for this by an Asymmetrical Possessor Parameter, an extension to nominals of the Asymmetrical Object Parameter (Bresnan and Moshi 1990). When SUBJ and ADNOM co-occur, as in English, the superordinate nature of SUBJ is reflected by the operation of the thematic hierarchy.

1.2.3 Laczkó: Arguments of Event Nominals

Tibor Laczkó examines another traditional but recalcitrant issue in nominalization: the realization of arguments in event nominals. He provides a comprehensive analysis of the three ways of expressing oblique arguments and adjuncts of event nominals in Hungarian. In the first and most productive type, the arguments and adjuncts preceding the head are adjectivalized by means of either the adjectivizing suffix or a participial form of the copula. Under his analysis, the participle is not an argument-taking predicate, but a formative element carrying combinatorial information. He argues that it simultaneously adjectivalizes more than one constituent by modifying the entire VP.

In the second type of expression of oblique arguments and adjuncts of event nominals, the oblique argument preceding the head is not adjectivalized. Laczkó draws a parallel between a special verbal constituent,

which dominates a particular VM (verbal modifier) and the V head, and a corresponding nominal constituent, which dominates the same VM constituent and the nominal head. These nominals inherit the distinguishing feature of the input verb which requires the VM position to be filled by the designated oblique argument.

In the third type, the oblique argument or adjunct follows the head and must not be adjectivalized. This type is limited to cases in which the post-head constituent can be clearly identified as belonging to the noun phrase headed by the nominal. Because of these limitations, Laczkó proposes that the post-head constituents are right-adjoined to the DPs in which their nominal heads occur and get integrated into their noun phrase by outside-in functional uncertainty. Thus, even within a given language, there are several ways to realize arguments of nominals.

Laczkó's examination of event nominals in Hungarian demonstrates that phrase structural considerations are of central importance for a comprehensive treatment of nominals. Indeed, as LFG analyses have progressed, syntacticians have increasingly been concerned with the details of the constituent-structure and the constraints on mapping from constituent-structure to the functional-structure (Bresnan 2001b).

1.3 Nominals: Inside and Out

The analysis of gerunds has proved particularly challenging within syntactic theory as they exhibit a mixed set of properties: some indicate a clearly verbal nature, others indicate a clearly nominal nature (e.g., Horn 1975, Milsark 1988, Pullum 1993) not just in English, but also crosslinguistically (e.g., Butt 1993, Manning 1993). This combination of verbal and nominal behavior has led to the positing of mixed categories and hence modifications to the existing theory (see Bresnan 1997 for LFG and Malouf 1999 for HPSG). In this volume, John Mugane examines some extremely complex mixed categories in Gĩkũyũ and shows how head sharing can be used to analyze theses constructions.

1.3.1 Mugane: Head-sharing in Nominals

Mugane argues that deverbal nominals in Gĩkũyũ involve head sharing: one lexical item may correspond to two nodes in the tree. This allows for mixed category structures, thus capturing the verbal and nominal behavior of nominal gerunds. In particular, Mugane contrasts two types of deverbal nominals: agentive nominals and infinitive-gerunds. Agentive nominalization constructions pose the familiar challenge to the view that a phrase should be consistently of a single category, as determined by the lexical head of the phrase. The infinitive-gerunds are yet more complex in that they pose difficulties for claims about lexical and phrasal coherence

because they allow the interleaving of constituents, thus appearing to violate phrasal constituency. Both constructions can be analyzed as head sharing constructions, but the infinitive-gerunds are argued to combine exocentricity with multiple head sharing.

In the internal syntax, Gĩkũyũ agentive nominals take the same complements as the verb from which they are derived. They can be modified by adverbs, as might be expected, but can also simultaneously take nominal modifiers in the internal syntax. That is, agentive nominals have a verbal "inside" and nominal "outside" which makes them exhibit coherently mixed internal properties (VP within NP) and an external distribution that is typical of noun phrases. Infinitive-gerund constructions also take the same complements as the verb they are derived from and can also be modified by both adverbs and nominal modifiers simultaneously. However, infinitive-gerund constructions are "multiply interspersed hybrids in which verbal elements are variably placed within the nominal (DP) projection" (Mugane, this volume:237).

Mugane therefore proposes an analysis by which the head of the infinitive-gerund construction is the verbal word itself. This projects a verbal phrase above which there is an exocentric noun phrase (Bresnan and Mchombo 1995). The nominal projections within the infinitive-gerund construction also have the verbal word as head. However, as a limited amount of head sharing cannot handle these deverbal nominals, Mugane instead proposes that Gĩkũyũ infinitive-gerunds be treated as hybrids with more than one head (up to four) in the phrase structure.

1.4 Summary

Proposed changes to the theory of LFG make claims about the typology of languages in that the analysis proposed for one language should be crosslinguistically valid. Lee and Siewierska make explicit crosslinguistic typological claims. The claims and analyses of the other papers in the volume are more indirect. For example, Sadler's paper uses data from a variety of unrelated languages to argue that an extension must be made to LFG's treatment of agreement with coordinate structures. In particular, she shows that single conjunct agreement is typologically wide spread and yet is not adequately accounted for by current LFG theory. Sharma extends the analysis of constructive case proposed for Australian languages to discourse markers in Hindi, arguing that they identify the clause-level syntactic function of their host nominal. Chisarik and Payne's paper looks at English and Hungarian possessor phrases and proposes the need for a new grammatical function ADNOM which fits in with existing grammatical function divisions (e.g., (un)restricted,

(non)discourse-oriented). Similarly, Mugane shows that Gĩkũyũ deverbal nominals involve head sharing and mixed categories. Since such structures are necessary for one language family, this suggests that similar structures may be found in other languages for other phenomena. In the realm of deverbal nominals, Laczkó discusses the realization of arguments and adjuncts as obliques. Although his proposal is specific to Hungarian, similar realization restrictions are found in other languages. Kelling proposes an approach to nominalizations of psych verbs which involves the use of proto-roles. Again, the French particular approach she develops looks promising for a treatment of nominalized psych verbs crosslinguistically.

Thus, the papers in this volume show the range of ways in which the analysis of nominals can enhance our understanding of linguistic theory and, in turn, of language as a whole.

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2

Parallel Optimization in Case Systems

Hanjung Lee

2.1 Prospects for a New Theory of Case

The conception of morphological case has two dimensions.[1] In the abstract conception, the term 'case' is used to refer to the *system of abstract features*, which can be defined by their basic distribution and their interaction with other features. The traditional usage of this notion is reflected in terminologies such as the nominative-accusative system and the ergative-absolutive system. The second dimension is a concrete one. Morphological case in this conception is understood as the actual morphological realizations of the abstract case features. These two dimensions of case do not stand in a one-to-one correspondence, yet are systematically related (Wierzbicka 1981, Goddard 1982, Mohanan 1994). Given this, it is essential to separate three problems: (i) describing the feature system; (ii) describing the marking system; (iii) accounting for the way the two systems are related.

[1]Parts of this paper were presented at the Workshop on Minimal Link Effects in Minimalist and Optimality Theoretic Syntax at the University of Potsdam (March 2002), the Syntax Workshop at Stanford University (April 2002), the 38th Meeting of the Chicago Linguistic Society (April 2002), and at the colloquium at the University of North Carolina at Chapel Hill (April 2002). I am grateful for feedback from the audiences at all occasions of presentation, and to Joan Bresnan, Randy Hendrick, Peter Sells, Devyani Sharma, two anonymous reviewers and the editors of the volume, Miriam Butt and Tracy Holloway King. Any errors of fact or interpretation are due to my own shortcomings.

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Nevertheless, current theories of case have often assimilated the account of the second problem to that of the first one. This tendency is particularly dominant in analyses of so-called "split case marking", in which nominal arguments get case-marked under certain conditions, but not in others. Crosslinguistically, the split is often triggered along the lines of referential properties of nominals such as animacy and definiteness. Since the seminal papers by Silverstein (1976) and Dixon (1979), it is standard to assume that nominals on the left of the scale in (1) tend to be overtly marked by so-called "ergative" case, whereas nominals on the right tend to be overtly case-marked by so-called "accusative" case. The standard example of this system (so-called "split ergativity") is from Dyirbal, in which 1st and 2nd person are overtly case-marked by the accusative case when they function as objects, but are not overtly marked as subjects (Dixon 1972, 1979). Conversely, third persons are overtly case-marked by the ergative case when they function as subjects of transitive verbs, but are not overtly-marked as objects.

(1) **Referentiality Scale**:
1st person pronoun > 2nd person pronoun > 3rd person pronoun/demonstratives > proper nouns > human nouns > animate nouns > inanimate nouns

The close alignment between overt marking and the accusative case is underscored by languages like Hindi (Mohanan 1994) and Spanish (Torrego 1998) which exhibit so-called "split accusativity", in which objects which correspond to the left of the scale in (1) are overtly case-marked by the accusative case, whereas objects on the right are not overtly case-marked. The ending-less objects are often analyzed as bearing the nominative case in the literature.

In what follows, I present data from Korean that challenge the long-standing practice in case theories that identifies case marking splits with splits in case features ("split ergativity" or "split accusativity"). The fact that we find effects similar to case splits of many familiar ergative languages in Korean, a pure nominative-accusative language, provides initial motivation for a theory which recognizes the separation of form from function or feature.

Korean has been described as a language in which all subjects and objects are case-marked, and in which case marking is optional in colloquial speech. Ellipsis of the accusative case marker, which normally indicates the object of canonical transitive verbs, is illustrated in (2).

(2) Ecey Myoungsoo-ka meykcwu manhi masyesse.
Yesterday Myoungsoo-NOM beer-(ACC) a lot drink-PAST
'Myoungsoo drank a lot of beer yesterday.' (Korean)

However, it is not fully informative to say that use of case markers is optional. When data from naturally-occurring colloquial speech are taken into account, it becomes obvious that variability in case marking in Korean is not random.

I have conducted an extensive analysis of the ellipsis of case markers (ELLCM), as found in the CallFriend Korean (CFK) corpus of telephone speech collected by the Linguistic Data Consortium (LDC). The 1996 release used in this study consists of 60 unscripted telephone conversations spoken by 200 native speakers of Korean, lasting between 5 and 30 minutes. Of 60 telephone conversations, 35 conversations were transcribed by two native speakers of Korean. Each transcript was then scanned for all instances of overt subject and object NPs regardless of whether they occurred with a case marker. For each token, factors that have been claimed in the literature to affect case marking patterns crosslinguistically were coded (person, animacy and definiteness), in addition to the grammatical function of the NP (subject and object). These factors are listed in (3). Criteria for coding were established and reviewed. The reliability of coding indicated by the Kappa statistic (Carletta 1996) greater than 0.80 was achieved for all these dimensions (see Lee (2002c) for discussion of methodological issues).

(3) a. Grammatical function: subject or object

b. Person: first, second or third

c. Animacy: human, animate or inanimate

d. Definiteness: personal pronoun, proper name or other

The sampling method yielded a total of 1956 overtly expressed subject and object NPs. The breakdown of NPs by the presence and absence of following case markers is given in Table 1.

(4) Table 1. Frequency of tokens by the presence and absence of case markers

	Subject	Direct object
ELLCM	355 (28.1%)	326 (46.8%)
N-CASE	489 (38.9%)	175 (25.2%)
N-¬CASE	416 (33%)	195 (28%)
Total	1260 (100%)	696 (100%)

ELLCM indicates the ellipsis (or absence) of case markers (nominative and accusative) following nouns; N-CASE and N-¬CASE refer to nouns that are marked by case markers and other particles that are not case markers (e.g., focus and discourse markers) respectively.

Now let us see whether person, animacy and definiteness correlate with ELLCM in subjects and direct objects in the CFK data.[2] Table 2 shows the effect of person on ELLCM. The leftmost column gives the three categories of person. We estimate the number of times each person feature was expressed in non-case marked and case-marked forms. These numbers are given with the rates of ELLCM and case marking.

(5) Table 2. Interaction of case marking and person in CFK

	subject		Direct object	
Pers.	ELLCM	N-NOM	ELLCM	N-ACC
1	47 (52.2%)	43 (47.8%)	11 (55%)	9 (45%)
2	51 (46.8%)	58 (53.2%)	16 (53.3%)	14 (46.7%)
3	257 (39.8%)	388 (60.2%)	299 (66.3%)	152 (33.7%)

Although the percentage of first and second person pronouns in spoken conversational Korean is very small,[3] the person/subject marking effects are significant. In particular, the rate of ELLCM for third person subjects is significantly lower than the rate for local person (first and second person) subjects ($\chi^2 = 37.55$, $p < 0.001$). In the case of direct objects, the ELLCM rate for third person objects is higher than the rate for local person objects, although this difference is not significant ($\chi^2 = 2.98$). Now let us turn to animacy. As Table 3 shows, human and (non-human) animate subjects exhibited the higher rate of ELLCM than inanimate subjects.

(6) Table 3. Interaction of case marking and animacy in CFK

	subject		Direct object	
Animacy	ELLCM	N-NOM	ELLCM	N-ACC
Human	221 (52.7%)	224 (47.3%)	88 (54.7%)	73 (45.3%)
Animate	68 (36%)	126 (64%)	35 (50.7%)	34 (49.3%)
Inanimate	66 (28%)	170 (72%)	203 (74.9%)	68 (25.1%)

Once again, the results for direct objects are the converse: human and animate objects are overtly marked by the accusative more often than inanimate objects. For both argument roles, the interaction of case marking and animacy was significant in the CFK data. In particular, the rate of ELLCM for human and animate subjects is significantly higher than the rate for inanimate subjects ($\chi^2 = 26.72$, $p < 0.001$). Conversely, for direct objects, the ELLCM rate for human and animate NPs is significantly lower than the rate for inanimate NPs ($\chi^2 = 25.14$, $p < 0.001$).

[2]The results of the corpus study reported here are taken from Lee (2002c).

[3]This is due to the strong tendency to omit first and second person references in Korean.

These results are consistent with the findings of Fry's (2001) study of ELLCM in the CallHome Japanese corpus. Fry found that subject marking and object marking in Japanese exhibit a reversed pattern with respect to animacy, although in his data the animacy effect is significant in subjects but not in objects.[4] We also found that definiteness interacts with the choice of case-marked and unmarked forms of subjects and direct objects in the CFK data. See Lee (2002c) for further details.

In sum, the relative frequency of the choice of unmarked forms over case-marked forms in the CFK data increases with subjects high in person, animacy and definiteness and objects low in those dimensions, and decreases with low-prominence subjects and high-prominence objects.

These results strongly suggest that the tendency to case-mark non-canonical argument types is not specific to split ergative/accusative languages and that it is also present in the grammars of pure nominative-accusative languages. In other words, it can be said that in terms of *case marking* patterns (rather than case feature systems), nominative-accusative languages like Korean and Japanese are much more similar to split ergative/accusative languages than generally recognized. This paper presents a new theory of case within Optimality Theoretic Lexical-Functional Grammar (OT-LFG; Bresnan 2000) that can account for the striking parallel between the two language types. A key feature of this theory is that it treats case patterns as correspondence between two parallel feature structures in LFG, i.e., f(unctional)-structure and m(orphological)-structure (featural optimization) and between f-structure and c(onstituent)-structure (formal or expressive optimization). This theory makes it possible to model the interplay between the two dimensions of case in an elegant way, while at the same time incorporating functionalist principles such as iconicity and economy into a formal model as violable constraints on the relation between form and function.

The remainder of this paper proceeds as follows. In section 2.2, I present my framework for case and argue that categorical and variable split case marking phenomena can be explained within Optimality Theory with stochastic evaluations (Boersma 1998, Boersma and Hayes 2001) in a unified way in terms of the same system of typologically motivated constraints on case marking developed by Aissen (1999, 2002). In addition to integrating quantitative variation in case marking systems, the present OT-LFG account is also able to provide an explanation

[4] Fry's results are consistent with the results of a study by Minashima (2001) on the the ellipsis of the direct object marker *-o* in conversations in Japanese novels and comics. Minashima (2001) found that objects that are explicitly marked with *-o* tend to be high in animacy and definiteness.

for why categorical differential case marking systems are found mostly in split ergative/accusative languages and why functionally driven case marking patterns are violated as a whole in some languages or in part in others. In sections 2.3, 2.4 and 2.5, I demonstrate how the new OT-LFG approach to case provides an explanatory account for these problems, concentrating on an analysis of case alternations in Hindi. Section 2.6 concludes the paper.

2.2 A Parallel Correspondence-based OT Model

The OT-LFG theory of case I propose in this paper is one that attempts to provide an account of the systematicity and variability of case systems by appealing to the same explanatory apparatus — the interaction of ranked, violable constraints of crosslinguistic generality.

In OT, a grammar is a function mapping each linguistic input to its correct structural description or output. Within OT-LFG (Bresnan 2000), inputs are taken to be an underspecified feature structure (f-structure) which semantically subsumes the candidate f-structures, an assumption justified by considerations of decidability and learnability (Kuhn 2001a,b). The candidates for a given input are quadruples consisting of c(onstituent)-structures (lexical strings and trees), f-structures, m(orphological)-structure and their correspondence functions. That is, the input is purely abstract information about predicate-argument structure, and the outputs show how that information is structurally realized morphosyntactically in a given language. The correspondences between the input f-structure (with (2) being the optimal realization in Korean) and the output pair of f- and c-structure are illustrated in (7).

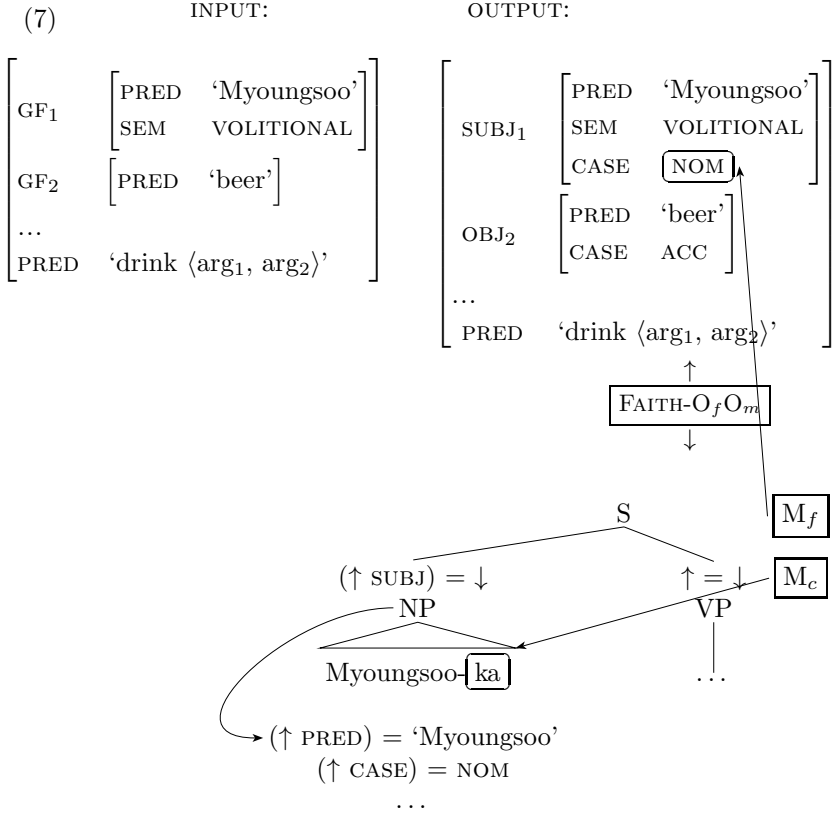
OT-LFG Parallel Optimizations in Case Systems

A leading idea of the present approach is that case patterns can be treated as the result of the interaction of two types of constraints fundamental to OT: faithfulness constraints, which minimize mismatches between feature specifications in two output feature structures, and markedness constraints, which prohibit certain case features and forms. Following Kuhn (2001a,b), I assume that the output has faithfulness relations between the global f-structure and m-structure (featural specifications projected from the preterminal node of c-structure): grammatical information associated with the word in the c-structure must match the information in the global f-structure. This is the relation that constitutes Faith-$O_f O_m$.

Markedness constraints are divided into two types: ones that refer to information in the global f-structure of a candidate (e.g., being in the nominative case) (M_f), and ones that refer to information about surface

properties of the terminal string of the c-structure of a candidate (e.g., the property of being overtly realized) (M_c).

(7)



A benefit of postulating the two sets of conflicting constraints between parallel structures is that functionalist principles like iconicity (between content and form) and economy (Haiman 1985) can be naturally translated into a formal model. Bresnan (1997) is the earliest among OT-LFG studies on morphosyntactic markedness which suggests that iconicity is easily statable within an LFG as opposed to a GB/Minimalist architecture, namely as a constraint on the correspondence between different structures (f-structure and c- or m(orphological)-structure). She argues that its variable presence in languages is due to its OT-style interaction with other potentially conflicting constraints such as economy of expression or the avoidance of marked structure. This is an elegant way of modeling conflict resolution, and it translates very straightforwardly into the domain of case.

Categorical and Variable Differential Case Marking

As mentioned in the previous section, it is well-known that the case marking in different classes of nominals is often differentiated according to the hierarchies of animacy and definiteness, where the cut-off point is taken to vary from language to language:

(8) a. **Animacy hierarchy**: Human > Animate > Inanimate

b. **Definiteness hierarchy**: Personal pronoun > Proper noun > Definite NP > Indefinite specific NP > Non-specific NP (Aissen 2002:2; cf. Silverstein 1976)

Aissen (2002), following Bossong (1985), refers to splits in subject and object marking as differential subject marking (DSM) and differential object marking (DOM) respectively. Here we briefly review her OT account of DOM.

The basic generalization is: if a given object O can be case-marked in language A, then objects which are more prominent than O on one or both of the hierarchies in (8) can also be marked in A. Aissen (2002) formalizes this generalization using markedness constraints resulting from the operation of *harmonic alignment* in conjunction with iconicity and economy constraints pertaining to case. The formal definition of harmonic alignment is given in (9) (from Prince and Smolensky 1993:136).

(9) Suppose a binary dimension D_1 with a scale X > Y on its element {X, Y}, and another dimension D_2 with a scale a > b > ... > z on its elements. The harmonic alignment of D_1 and D_2 is the pair of Harmonic scales:

H_X: X/a $\succ$ X/b $\succ$ ... $\succ$ X/z

H_Y: Y/z $\succ$ ... $\succ$ Y/b $\succ$ Y/a

The *constraint alignment* is the pair of constraint hierarchies:

C_X: *X/z $\gg$ ... $\gg$ *X/b $\gg$ *X/a

C_Y: *Y/a $\gg$ *Y/b $\gg$ ... $\gg$ *Y/z

Harmonic alignment of two prominence scales associates the high-ranking elements on the two scales (e.g., vowels with peaks), as well as the low-ranking elements (obstruents with margins). Thus the definition of harmonic alignment above formalizes the idea that elements on the high end of one prominence scale tend to occur together with elements on the high end of another scale, while elements on the low end of one scale tend to align with the low end of the other. Aissen (1999, 2002) proposes that the phenomenon of harmonic alignment is not limited to

phonology, but also occurs in various morphosyntactic systems. Here the relevant dimensions are grammatical function, animacy and definiteness.

If the GF hierarchy 'Subj(ect) > Obj(ect)' and the animacy hierarchy (8a) are harmonically aligned, we obtain the pair of harmony (markedness) scales in (10):

(10) Harmony scales (GF/Animacy):
  a. Subj/Hum(an) ≻ Subj/Anim(ate) ≻ Subj/Inan(imate)
  b. Obj/Inan ≻ Obj/Anim ≻ Obj/Hum

The hierarchies in (10) express the idea that human subjects are (universally) less marked than inanimate subjects; and conversely, that inanimate objects are (universally) less marked than human objects. Inverting the hierarchies in (10) and prefixing the Avoid operator ("*") yields the constraint subhierarchies in (11):

(11) Constraint subhierarchies (*GF/Animacy):
  a. *Subj/Inan ≫ *Subj/Anim ≫ *Subj/Hum(an)
  b. *Obj/Hum ≫ *Obj/Anim ≫ *Obj/Inan

The high-ranking constraints in (11a,b) penalize inanimate subjects and human objects respectively. Crucially, constraint hierarchies derived by harmonic alignment, including (11a,b), are universal subhierarchies, which are hypothesized to be present in every grammar in the same relative order and must be interleaved with other constraints.

In DSM/DOM languages, marked configurations like those penalized by the high-ranking constraints are marked or flagged as atypical, but not excluded entirely. Aissen (2002) implements this flagging by the formal operation of constraint conjunction (Smolensky 1995). Conjunction of the iconicity constraint $*\emptyset_{case}$ ("Avoid null expression of case feature") with the subhierarchies in (11) results in two new subhierarchies of iconicity constraints, which have the effect of favoring case marking:

(12) Iconicity constraints:
  a. *Subj/Inan & $*\emptyset_{case}$ ≫ *Subj/Anim & $*\emptyset_{case}$ ≫ *Subj/Hum & $*\emptyset_{case}$
  b. *Obj/Hum & $*\emptyset_{case}$ ≫ *Obj/Anim & $*\emptyset_{case}$ ≫ *Obj/Inan & $*\emptyset_{case}$

The subhierarchy in (12a) penalizes null expression of an inanimate referring subject over null expression of an animate or human referring subject. The subhierarchy in (12b) penalizes null expression of a human referring object over null expression of an animate or inanimate referring object. These hierarchies logically entail implicational universals. That is, they predict that if a human referring subject is case-marked,

inanimate or non-human subjects must also be case-marked; and if an inanimate referring object is case-marked, so must be human or non-human animate objects case-marked. The effects of the subhierarchy in (12a) can be clearly seen in a DSM system like that of Fore, where only inanimate subjects must be case-marked, while case marking of animate subjects is (sometimes) possible, but not obligatory, and human subjects are rarely marked (Scott 1978, Donohue 1999). A wide typological range of object marking splits is also surveyed in Aissen (2002). Her survey includes DOM systems which are predicted by interactions of iconicity constraints including those in (12a,b) and the economy constraint in (13). See Aissen (2002) for a detailed discussion.

(13) Economy constraint: *Struc$_{case}$ ("Avoid case structure")

One limitation arising as a consequence of OT's architectural decisions is the predicted absence of variation and gradiency of grammatical judgement. The standard OT grammar is deterministic, in the sense that each input is mapped onto a single output. This is tenable in some areas of linguistics, but it goes against widespread variation in the use of language. How can variation be reconciled with the deterministic nature of grammar? An alternative that is being actively pursued, especially functionally-oriented OT phonology (Boersma 1998, Boersma and Hayes 2001), is to replace the strict ranking system with a stochastic evaluation system in which constraints are weighted numerically, and in which these numerical weights have uncertainty. For example, in the system of Boersma and Hayes (2001), probabilistic noise at evaluation time allows multiple outputs. So closely ranked constraints can give variable outputs. Pioneering work in this direction within the area of OT syntax has been done by Bresnan, Dingare and Manning (2001), who present an interesting application of stochastic OT to person/voice interaction in English and Lummi. They demonstrate convincingly that in stochastic OT, frequential preferences in usage and categorical grammatical rules can be explained in a unified way in terms of the same typologically motivated constraint system.

Lee (2002c) has shown that the statistical patterning of the CFK data discussed in section 2.1 can be analyzed within the stochastic OT framework in a way analogous to Aissen's account of the categorical DSM and DOM: non-categorical, quantitative variation follows when the same iconic and economy constraints that are motivated for an account of crosslinguistic DSM/DOM are ranked closely on a continuous ranking scale with stochastic evaluation.

This section has presented the results of my explorations of the CFK corpus suggesting that "split ergativity/accusativity" is not a necessary

feature of DSM and DOM. Rather, they favor the analysis of DSM/DOM as a phenomenon arising from general constraints on language use, which for the most part are in no way specific to case. Categorical DSM/DOM found in split ergative/accusative languages is therefore viewed as conventionalization of the pragmatic tendency to mark disharmonic elements (e.g., high-prominence objects and low-prominence subjects),[5] which is also present in the grammars of pure nominative-accusative languages.[6]

The fact that we find similar DSM/DOM phenomena in Korean bolsters Aissen's claim that her iconicity constraints (see (12)) represent universal linguistic constraints within OT. Nevertheless, Aissen's account of DSM/DOM is not without limitations. First, the iconic interpretation of markedness subhierarchies explains why case morphology appears on disharmonic elements (like pronoun objects or indefinite subjects), but it does not provide an explanation for why categorical DSM/DOM systems are found mostly in split ergative/accusative languages. Moreover, in many DSM/DOM languages, the iconicity constraints are systematically violated in certain environments involving syntactically or semantically definable classes of predicates. The challenge, then, is to account for the special affinity between the presence of case and particular case features (e.g., ergative and accusative) and the variable presence of iconicity in the morphosyntax of a language.

The remainder of this paper (sections 2.3, 2.4 and 2.5) is devoted to an OT-LFG account that provides a solution to these problems. I will illustrate the major aspects of the account with an analysis of case alternations in Hindi. Given the parallel-correspondence theory of case, the crucial idea is that iconicity between content and overt form is not an inviolable constraint, but just one among factors affecting case marking. The importance of iconicity in the optimal outputs of a language will vary with its ranking with respect to other constraints such as faithfulness to semantic features and the avoidance of marked case features.

2.3 Basic Facts about Case Alternations in Hindi

This section presents basic facts about case alternations in Hindi.

2.3.1 Two-dimensional DOM

Direct (or primary) objects in Hindi either bear accusative case (marked with *-ko*) or nominative, which has no phonological realization. The

[5] This view has also been argued for by Zeevat and Jäger (2002).

[6] The process of conventionalization can be naturally modeled in stochastic OT by the movement in strength of Aissen's iconicity and economy constraints along the continuous ranking scale (Bresnan, Dingare and Manning 2001).

choice between accusative and nominative is determined by both animacy and definiteness. According to the literature on object case in Hindi, Hindi distinguishes three categories of direct (or primary) objects:[7] (i) those which must be accusative, (ii) those which are either nominative or accusative, and (iii) those which can only be nominative but not accusative. Obligatorily accusative objects are those object NPs referring to humans. The categories of objects that can be either nominative or accusative are human-referring non-specifics and inanimate definites; inanimate-referring non-specifics and specifics can only be nominative.

A question arises as to whether we should treat the objects without overt case marking in Hindi as uninflected accusative or as nominative. There are several strong arguments in favor of that the two object nominal forms reflect different case features. Specifically, evidence that objects without overt marking are in the nominative rather than the zero-marked accusative comes from verb agreement. As argued in Mohanan (1994:86–90), verbs in Hindi can agree with the object in the nominative, if the subject is not nominative. Verbs do agree with inanimate objects that are not overtly marked, suggesting that they are in the nominative. That objects without overt marking must be treated as nominative rather than accusative is further endorsed by facts of modifier agreement and coordination. See Mohanan (1994:87–90) for further details and examples.

A fundamental difference between stylistically-conditioned ellipsis in Korean and DOM would thus be that ELLCM in Korean is a purely surface phenomenon, while DOM in Hindi is indeed "deep" in the sense of marking different classes of objects with different cases (accusative and nominative).

2.3.2 Ergative/Nominative Alternation on the Subjects

Hindi is a language with an aspectually-based split ergative case system, such that ergative case is restricted to the agentive subject in a perfective clause. Otherwise, it is nominative.[8] Conditions on ergative marking in Hindi make crucial reference to the semantic property of agency or volitionality (which Mohanan (1994) refers to as 'conscious choice') (Mohanan 1994, Butt 2001, Butt and King 2002). The verb *uṭʰaa* 'lift' in (14) takes only an ergative subject, given the required aspectual condition. The action referred to must be deliberate (Mohanan 1994:73).

[7] See Masica (1982, 1991), Butt (1993), Mohanan (1993, 1994), Aissen (2002) and references cited therein for further details and examples.

[8] Ignoring oblique case-marked subjects here.

(14) a. raam-ne bacce-ko uṭʰaayaa.
Ram-ERG child-ACC lift-PERF
'Ram lifted the/a child.'

b. *raam bacce-ko uṭʰaayaa.
Ram-NOM child-ACC lift-PERF
'Ram lifted the/a child.'

In contrast, the action referred to by the class of verbs that take only nominative subjects such as unaccusative intransitive verbs is largely non-deliberate, as shown in (15) (adapted from Mohanan (1994:71)).

(15) raam/*raam-ne giraa.
Ram-NOM/Ram-ERG fall-PERF
'Ram fell hard.'

Furthermore, when nominative subjects co-occur with verbs that can choose between nominative and ergative subjects (e.g., unergative intransitive verbs), the action must be non-deliberate. This can be seen in the contrast between examples like (16a) and (16b) (taken from Mohanan (1994:72)). Whereas sentences like (16a) containing the nominative subject denote actants engaged in non-deliberative activities, sentences like (16b) containing the ergative subject denote actants engaged in intentional activities.

(16) a. raam-ko acaanak šer dikʰaa.
Ram-DAT suddenly lion-NOM appear-PERF.
vah/*us-ne cillaayaa.
he-NOM/he-ERG scream-PERF
'Ram suddenly saw a lion. He screamed.'

b. us-ne/*vah jaanbuujʰ kar cillaayaa.
he-ERG/he-NOM deliberately shout-PERF
'He shouted deliberately.'

As Mohanan (1994:70–74) notes, ergative case is not restricted to transitive verbs in Hindi. The same verb, whether transitive or intransitive, can take a nominative or ergative subject depending on the semantic environment.[9] Therefore, based on these facts, I assume that ergative case is conditioned by the semantic property of *volitional* participation in the action, not transitivity.

[9]Mohanan (1994:71) states that more transitive verbs belong to the class that takes only an ergative subject in perfect clauses than to the class of verbs that take (i) only nominative subjects or (ii) either nominative or ergative subjects, and more intransitives to the class that take only nominative subjects.

To summarize, Hindi verbs can be grouped into four classes, based on the case marking displayed by subjects. This is illustrated by Table 4 (Class 4 verbs are discussed in section 2.3.3).

(17) Table 4. Subject case and classification of Hindi verbs (based on Mohanan 1994 and Kachru 1980)

Verb type	Subject case	
	Perfective	Imperfective
Class 1 (e.g., agentive trans. verbs)	erg	nom
Class 2 (e.g., unergative intrans. verbs)	erg/nom	nom
Class 3 (e.g., unaccusative intrans. verbs)	nom	nom
Class 4 (e.g., unaccusative trans. verbs)	dat	dat

2.3.3 Volitionality, Logical Object and Object Case

I now consider case marking on the (primary) objects. Interestingly, DOM in Hindi is restricted to transitive clauses with 'agentive' subject. If a verb does not take a subject agentive argument, the case on the object is invariably nominative. An example of a verb class that take such objects is 'unaccusative transitives' or 'non-volitional transitives' (Mohanan 1994, section 4.3.3). Of the two arguments of the non-volitional transitives, one is sentient and the other may be sentient or non-sentient. The obligatory sentient argument of these verbs always has dative case, as in (18). Note that the object nominals are nominative, even if human.

(18) a. anuu-ko caand dik^{h}ii.
Anu-DAT moon-NOM appear-PERF
'Anu saw the moon.'
(Lit. 'To Anu the moon appeared/became visible.')

b. vijay-ko ravii milaa.
Vijay-DAT Ravi-NOM find/encounter-PERF
'Vijay met Ravi unexpectedly.'

Mohanan (1994) analyzes the constructions in (18) in depth; for the purpose of this paper, the important observation is that the accusative case in Hindi is available only to the grammatical object which has the property of 'logical object' (L-OBJ). The definition of L-OBJ that Mohanan gives is as follows: "an argument structure construct which is associated with an entity toward which an action or event is directed by an independent inceptor of the action or event in semantic structure"

(Mohanan 1994:40). The objects in (18) do not have this property and hence cannot be accusative.

The close link between the agentivity of subjects and accusative objects seen in Hindi is part of a larger pattern, which was formulated by Burzio (1986) as follows:

(19) **Burzio's Generalization** (BG): All and only the verbs that can assign an external theta role to the subject can assign accusative Case to an object (Burzio 1986:178).

As (19) suggests, the original version of Burzio's Generalization links the ability of a verb to assign accusative case to its ability to assign an external (agent) theta role. Much subsequent literature (e.g., contributions in Reuland 2000) has attempted to derive the genaralization from some other principles of grammar, shifting attention to principles which block accusative case assignment and instead require a nominative case (see Woolford 2001a for a recent review of the literature).

There are problems with both the original formulation and the revised view of the generalization. First, there are many exceptions to the original formulation. To list just two examples from Hindi, agentive ergative subjects in Hindi can occur with inanimate-referring nominative objects, and certain experiencer verbs (e.g., volitional psych verbs) can take accusative objects. While exceptions like these are expected under the revised, currently dominant view, it still remains to be explained why accusative assignment should be blocked and nominative licensing should have a special status in grammar.

In section 2.5, I show that these apparently unrelated phenomena — the independent alternations for subjects and objects (accusative vs. nominative) and the correlation between object case and the property of the subject (BG) — can be captured by the interaction of correspondence constraints that are motivated by typological generalizations.

2.4 Markedness and DOM in OT

The OT-LFG analysis of case marking of Hindi to be developed here incorporates the constraints of Aissen (2002). They are reinterpreted here as markedness constraints on the morphological expression of case, not on the case features, which apply to the lexical string of the c-structure (M_c). As mentioned above, the markedness effects in two-dimensional DOM make reference to the grammatical function (GF) hierarchy and the hierarchies of animacy and definiteness (repeated from (8)):

(20) Universal scales:
   a. GF: Subj > Obj
   b. Animacy: Human (Hum) > Animate (An) > Inanimate (In)

c. Definiteness: Personal pronoun (Pro) > Proper noun (PN) > Definite NP (Def) > (Indefinite) Specific (Sp) > Non-specific (NS)

The constraint hierarchies which form the basis of Aissen's account of DOM are derived by a direct and an inverse alignment of the GF hierarchy (20a) with the hierarchies of animacy (20b) and definiteness (20c), respectively:

(21) Constraint subhierarchies (*GF/ANIMACY):
a. *Subj/In ≫ *Subj/An ≫ *Subj/Hum
b. *Obj/Hum ≫ *Obj/An ≫ *Obj/In

(22) Constraint subhierarchies (*GF/DEFINITENESS):
a. *Subj/NS ≫ *Subj/Sp ≫ *Subj/Def ≫ *Subj/PN ≫ *Subj/Pro
b. *Obj/Pro ≫ *Obj/PN ≫ *Obj/Def ≫ *Obj/Sp ≫ *Obj/NS

The constraint subhierarchies in (21) and (22) do not yet account for the two-dimensional DOM systems like that seen in Hindi, in which both animacy and definiteness play a role. To derive the ranking of a set of constraints pertaining to the dimensions of animacy and definiteness simultaneously, Aissen employs local conjunction of the two subhierarchies on object markedness in (21b) and (22b). The pairwise conjunction of the members of these subhierarchies yields an expanded set of partially ordered constraints shown in (23). Partial ordering of constraints is illustrated by their encapsulation in braces. (*Obj/Anim & *Obj/Def is written as *O/AnimDef.)

(23) Conjunction of subhierarchies:

*O/HumPro
{*O/HumPN, *O/AnPro}
{*O/HumDef, *O/AnPN, *O/InPro}
{*O/HumSp, *O/AnDef, *O/InPN}
{*O/HumNS, *O/AnSp, *O/InDef}
{*O/AnNS, *O/InSp}
*O/InNS

Recall that these conjoined constraints represent configurations that, if realized, must be avoided in some way. In order to formalize the idea that in DOM languages, marked animacy-definiteness combinations are morphologically marked rather than prohibited, the constraint $*\emptyset_{case}$ is appended to all the constraints in (23). The resulting iconicity constraints are listed in Figure 1. Interpolating the economy constraint

*Struc$_{case}$ at any point in these subhierarchies leads to a pattern where object marking indicates disharmony. The Hindi pattern, for instance, corresponds to the constraint ranking in Figure 1.

In Hindi, the six constraints in the shaded upper third of the structure are strictly ranked above *Struc$_{case}$. This guarantees obligatory case marking for humans, animate pronouns and names. The constraints in the middle zone, which favor case marking for non-specific humans, low definite animates, and strongly definite inanimates, float (rerank) with *Struc$_{case}$. This yields optional case marking for such objects. The two constraints in the shaded bottom zone which favor case marking for inanimate indefinite objects are strictly dominated by *Struc$_{case}$. Hence, case marking for such objects is precluded.

Different approaches to case splits within OT have been proposed by Kiparsky (2001) and scholars working in Lexical Decomposition Grammar (Wunderlich 1997) (e.g., Wunderlich 2000 and Stiebels 2000). Space limitations prevent me from discussing these other approaches here. The interested reader is referred to Lee (2002b) for a detailed review.

Before closing this section, I discuss additional constraints on case marking that are relevant to DSM/DOM systems. In the majority of DSM/DOM languages, the nominative is morphologically unmarked and other cases involve a non-zero expression.[10] I take this as a significant fact about the morphosyntax of DSM/DOM languages rather than treating case forms as an accident of whether abstract case features are actually spelled out or not.

To characterize the predictable relation between case features and their formal expression seen in many DSM/DOM languages, we can formulate two markedness constraints, shown in (24):

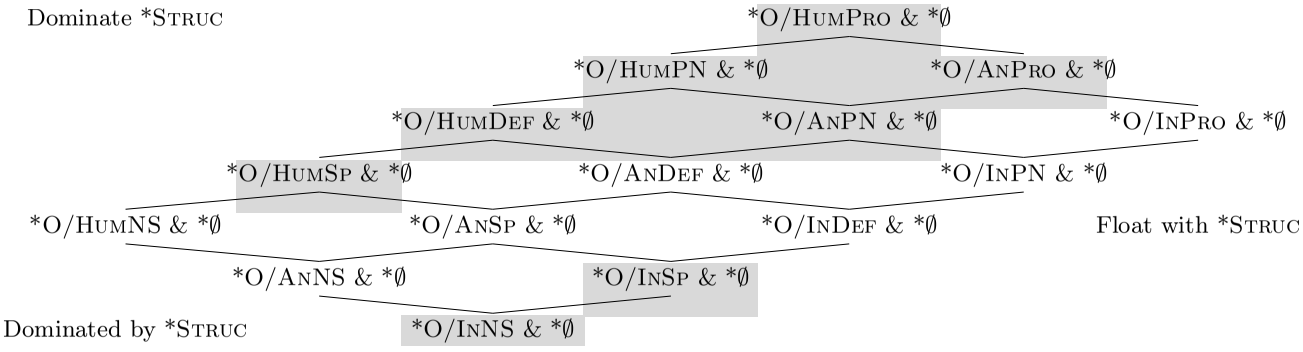
(24) a. *Overt/nom

b. *Zero/∼nom

In functional terms, (24a,b) can be viewed as 'iconicity' constraints, which prohibit the non-isomorphic mapping between case features and case forms: the mapping of the general, featurally least specific case

[10] A notable exception to this pattern is found in some members of the Cushitic family from Northeast Africa, the related Omotic family and the Berber family, which have the marked nominative and the zero-form accusative. It is interesting to note that some of those Cushitic languages use the zero *accusative* only for *indefinite* objects (Dixon 1994:64). It is not clear from Dixon's description, though, which case marker is used for other objects. If they are case-marked with the marked nominative, then this pattern is a counterexample to the widely accepted generalization that high-prominence objects are marked with the accusative and low-prominence objects with the nominative.

FIGURE 1 Subhierarchies of iconicity constraints and two-dimensional DOM in Hindi (adapted from Aissen (2002:23))



(nominative) onto a more complex, longer form; the mapping of more marked cases onto a simpler (zero) form.

The Hindi pattern can now be described by the ranking in (25), where the *Overt/nom dominates *Zero/∼nom, which in turn dominates Aissen's constraints *Struc$_{case}$ and *$\emptyset_{case}$.

(25) *Overt/nom ≫ *Zero/∼nom ≫ *Struc$_{case}$, *$\emptyset_{case}$

This ranking predicts that the nominative is morphologically unmarked, while other cases have a morphological exponence. A language that adopts this ranking prefers an iconic mapping between case forms and features, the featurally unmarked case (i.e., nominative), onto a formally unmarked case (i.e., zero exponence). A deviation from the isomorphism between case forms and features is found in languages in which all cases are morphologically realized and in languages which have the marked nominative and the unmarked accusative (see fn. 10). The former pattern can be described by the ranking in (26), which gives a general preference to expressivity over economy:

(26) *Zero/∼nom, *$\emptyset_{case}$ ≫ *Overt/nom ≫ *Struc$_{case}$

Formal written Japanese and Korean are known as examples which adopt this ranking. In less formal speech, the probability of case marking decreases, a fact which can be expressed in stochastic ot by allowing the ranking values of style-sensitive markedness and faithfulness constraints to covary with the speech style.

So far, I have discussed markedness constraints on case forms that are relevant to dsm/dom systems. I have also argued that the existence of substantial variation in the surface realization of case features and nominal properties both within and across languages motivates the approach to case which recognizes the mapping between case forms and features as an essential component of case theory. In the following section, we turn to an ot-lfg account of the case feature system of Hindi.

2.5 Parallel Optimization in the Hindi Case System

The previous section has focused on the distinguishing function of case marking. Dixon and others, especially Comrie (1978), hold the view that the primary function of case marking of core arguments in a transitive clause is simply to discriminate between different syntactic and semantic categories, especially where these are most likely to be confused. An equally important role of case marking is what can be called the semantic or indexing function. The appearance of various non-nominative cases on subjects in Hindi provides a clear instance of case categories which have a positive semantic content, in addition to their possible

distinguishing role (a point most strongly argued by Wierzbicka (1980, 1981)). In this section I argue that a full description of case systems is possible only in a coherent theory encompassing both the distinguishing and semantic/indexing functions, and show that the OT-LFG framework with a parallel correspondence-based architecture provides such a theory.

2.5.1 Lexical Representations of Case Markers

To get the analysis of the Hindi facts off the ground, we first need to characterize the content of the lexical representations for the case markers. In the OT-LFG approach adopted here, case is not viewed as being licensed by any particular formal feature or lexical item. Rather they are seen as active elements which contribute to the construction of a clausal analysis by carrying lexically specified information, in line with the recent proposals for *Constructive Case* formulated by Nordlinger (1998). For instance, the universal content of the ergative case, independently of their forms of expression, can be characterized as follows:

(27) Ergative case marker:
$(\uparrow \text{CASE}) = \text{ERG}$
$(\text{L-SUBJ} \uparrow_{arg-str})$
$(\uparrow_{sem-str} \text{VOL}) = +$
$(\uparrow_{sem-str} \text{CAUS}) = +$

In addition to the regular case feature information, the ergative case marker carries two pieces of information: (i) information about the higher a(rgument)-structure within which it is contained, i.e., L(OGICAL)-SUBJ (the highest argument role),[11] via inside-out function application (Nordlinger 1998); (ii) the semantic properties of the nominal to which it belongs (the agentive properties associated with volitional agents/causers (Dowty 1991)). The information in (27) thus corresponds to the characterization of ergative case as the lexical marker of agentivity.[12]

Likewise, the accusative case marker specifies the higher a(rgument)-structure and f-structure within which it is contained, i.e., L-OBJ and objective functions (indicated by the feature [+o] (Bresnan and Kanerva 1989)), as well as the case feature. Whether this function is the primary

[11] Whether this argument is mapped onto the grammatical subject (syntactically accusative languages) or other function (syntactically ergative languages) is determined by the constraint ranking of particular languages.

[12] Not all languages have ergative case which expresses all the content available, shown in (27). In some languages (e.g., the Australian language Dyirbal), for instance, the use of the ergative is purely structural and is not tied to the semantic features listed in (27). This non-semantic use of the ergative can be modeled as a case of unfaithfulness in a way analogous to the expletive *do* in English (Grimshaw 1997, Bresnan 2000).

(or unrestricted) object or the secondary (or restricted) object is not stipulated in the lexicon, but is the result of constraint interaction. The accusative case is also associated with the feature P(roto-)P(atient), with its value unspecified in the lexicon. The information in (28) thus corresponds to the often expressed idea that accusative is the unmarked case for patientive objects.[13]

(28) Accusative case marker:
($\uparrow$ case) = acc
(l-obj $\uparrow_{arg-str}$)
(gf([+o]) $\uparrow$)
($\uparrow_{sem-str}$ PP)

Dative case is crosslinguistically associated with a goal, a recipient or a locative destination. (In some cases the notion of goal must be construed in an abstract sense.) I take it that there is a core meaning that is common to all uses of dative case. For convenient reference, I use the annotation (goal $\uparrow_{arg-str}$) (Butt 2001) to refer to this common core meaning. In addition to this information, the dative case which marks an experiencer or a sentient goal is assumed to be positively specified for the feature sent(ience) and negatively for the features vol and caus. These specifications reflect the idea that datives are generally associated with atypical Proto-Agents lacking primary agentive properties.

(29) Dative case marker (on sentient goal):
($\uparrow$ case) = dat
(gf $\uparrow$)
(goal $\uparrow_{arg-str}$)
($\uparrow_{sem-str}$ sent) = +
($\uparrow_{sem-str}$ vol) = −
($\uparrow_{sem-str}$ caus) = −

It is possible that case morphemes are unspecified for the grammatical and semantic features, as in (30), and unspecified case is what is conventionally called 'nominative'.[14] In the present analysis, the nominative

[13]In some languages case affixes are not separated from the stem. For these languages, the information in (28) would be part of the morphological structure of case-inflected words.

[14]This featureless default case is called "absolutive" if it contrasts with ergative case. Postulation of "absolutive" as a separate case, though useful at a descriptive level, has for some time been recognized as inadequate, because it obscures generalizations that cut across ergative/absolutive and nominative/accusative paradigms. Goddard (1982), who shows that positing two separate case oppositions (ergative

is the least marked case, being most general in the featural specification. Its meaning and distribution arise from constraint interaction.

(30) Nominative case marker:
$(\uparrow \textsc{case}) = \textsc{nom}$

The simple lexical representations for case markers above contrast with complex lexical entries assumed in much work in LFG. Compare, for example, the entry for the ergative case marker in (27) with that assumed in Butt (2001:131), shown in (31).

(31) $(\uparrow \textsc{case}) = \textsc{erg}$
$(\textsc{subj}\ \uparrow)$
$(\textsc{ext-arg}\ \uparrow_{arg-str})$
`Possibility 1`
$(\uparrow_{sem-str}\ \textsc{control}) = +$
`Possibility 2`
$((\textsc{subj}\ \uparrow)\ \textsc{obj})$
$((\textsc{subj}\ \uparrow)\ \textsc{tense}) = \textsc{perf}$

As the entry in (31) clearly shows, the lexical representation of morphemes has two important roles in the constructive case model. First, it expresses linguistically significant generalizations across lexical items (here case markers) that in large part reflect tendencies observable within and across many languages, e.g., the fact that the ergative in Hindi appears with subjects but not with nonsubjects. The lexical entries of morphemes also specify language-particular instantiations of such universal tendencies. For example, the ergative case in Hindi says that it can appear in perfective contexts; the accusative case marker encodes the fact that the objects to which it belongs refer to animate-specific entities. However, it is not obvious on this view why splits such as these occur this way. A further complication is that in Hindi the accusative/nominative alternation is not found in unaccusative transitive verbs (see examples in (18)). Therefore, in addition to the information in (28), the accusative case marker in Hindi would need to carry this information as well.

In addition to such conceptual and descriptive problems, which concern obscuring the distinction between that which is universal and that which is language-particular in a single complex lexical entry, there is a formal problem. The constructive morphology model overgenerates a massive number of expressions of the same information, some of which are never found (Nordlinger 1998:166–167, Joan Bresnan, lectures, fall

vs. absolutive and nominative vs. accusative) is incorrect for Australian languages, proposes to eliminate "absolutive" as a category. Following this proposal, I treat so-called "absolutive case" as the same case as nominative.

1999). In order to make clearer predictions about possible patterns of crosslinguistic variation, the model must have some mechanism to filter out the large number of overgenerated possibilities. In this paper, I suggest constructive case as the component of the candidate morphological structures in OT-LFG, which correspond to the global feature structures and the c-structures of the candidates. It is possible in this way to keep the insight of classical LFG that both morphological and syntactic constituents may contribute the same types of information to f-structure, while not lexically stipulating generalizations derivable from universal principles of markedness. The fact that in OT-LFG the majority of systematic lexical properties are derived from interaction of universal constraints rather than stipulated in the lexicon shifts the explanatory burden from the representations to the constraints, and makes constructive case less important. It would be interesting to see what consequences this change in the conception of case patterns will have for an account of a variety of extended functions of case marking in Australian languages, for which constructive case has been shown to be particularly well motivated.

2.5.2 Case Meanings, Case Features and OT Constraints

Having characterized the content of the lexical entries of the case morphemes, let us now define our constraint set. Based on the lexicalized theory of faithfulness (Bresnan 2000, Kuhn 2001a,b), I will assume that an input f-structure semantically subsumes the candidate f-structures and that purely grammatical features such as CASE are introduced by GEN to candidate structures. Since there is no case information in the input in this model, the licensing of case cannot be modelled by a faithfulness relation between the input and the output. Instead, it can be modeled as a faithfulness relation between the *output* morpholexical structure and the syntactic f-structure (Lee 2001, 2002a). The following faithfulness constraints implement the OT-LFG mechanism for the licensing of "semantic" case (adapted from Lee 2001):[15]

(32) **$O_f O_m$-Faithfulness constraints I**:

a. IDENT-$O_f O_m$(SENT): If the output f-structure and morphological feature structure both have a SEM feature (VOL, CAUS and SENT), the values are identical (e.g., IDENT-$O_f O_m$(VOL), IDENT-$O_f O_m$(CAUS), IDENT-$O_f O_m$(SENT)).

[15] Originally, Prince and Smolensky (1993) proposed two types of faithfulness constraints: FILL and PARSE. In the context of the 'Correspondence Theory of Reduplication', McCarthy and Prince (1995) extend the set of faithfulness constraints to IDENT(ITY), MAX(IMALITY) and DEP(ENDENCE) constraints.

b. Max-O_fO_m(sent): If the output f-structure has a sem feature, its corresponding morphological feature structure also has a sem feature (e.g., Max-O_fO_m(vol), Max-O_fO_m(caus), Max-O_fO_m(sent)).
c. Dep-O_fO_m(sent): If the morphological feature structure has a sem feature, its corresponding f-structure has a sem feature (e.g., Dep-O_fO_m(vol), Dep-O_fO_m(caus), Dep-O_fO_m(sent)).

The Ident-O_fO_m(sem) constraints check the semantic compatibility between a case marker and the meaning of a verb or clause, and the Max-O_fO_m(vol) and Dep-O_fO_m(sem) constraints check the specificity of semantic features. These constraints are relevant for the choice between ergative and dative cases (Ident-O_fO_m(sem)) and between nominative and more specific cases (Max-O_fO_m(vol) and Dep-O_fO_m(sem)).

Besides the Faith-O_fO_m(sem) constraints, the following faithfulness constraints play an important role in case licensing. These constraints are relevant for cases such as accusative and dative which are lexically associated with particular argument functions such as l-obj and goal (see (28) and (29)):

(33) **O_fO_m-Faithfulness constraints II**:
a. Max-O_fO_m(af): If the output f-structure has an af feature, its corresponding morphological feature structure also has an af feature.
b. Dep-O_fO_m(af): If the morphological feature structure has an af feature, its corresponding f-structure also has an af feature.

Generally, marking of an argument by a less specific case or a more specific case leads to Max and Dep violations respectively, whereas the use of a semantically incompatible case marker leads to Ident violations. Since semantic incompatibility is generally not allowed, the Ident-O_fO_m(sem) constraints should not be violated and are therefore among the highest-ranked constraints. The faithfulness constraints in (32) and (33) are ranked as shown in (34) in Hindi, in which semantic notions such as volitionality, logical subject/object and goal are central in the distribution of cases.

(34) **Ranking for Hindi**: Ident-O_fO_m(sem) $\gg$ Max-O_fO_m(af), Dep-O_fO_m(af) $\gg$ Max-O_fO_m(sem), Dep-O_fO_m(sem)

The OO-faithfulness constraints mentioned above are in conflict with the markedness constraints which penalize the featural complexity of candidates (i.e., case features):

(35) **Markedness Constraints** (*Feature):
*ergative, *dative, *accusative $\gg$ *nominative

These constraints were proposed in Woolford (2001b), who suggests the universal hierarchy of *ERG, *DAT ≫ *ACC ≫ *NOM. My approach here also uses the notion of a case subhierarchy; in this analysis, however, I simply assume that nominative is universally the least marked case, without assuming an absolute markedness hierarchy for other cases.

The markedness constraints in (35) are context-free, since they apply to case-marked nominals of any kind, regardless of their association with particular grammatical functions or their occurrence in particular morphosyntactic contexts. The interaction of these simple markedness constraints and the faithfulness constraints predicts the distribution of semantic case with respect to meaning, specifically Proto-Agent properties in Dowty's (1991) sense. We also need context-sensitive markedness constraints to derive the distribution of case with respect to grammatical function. The following markedness constraints, which hold of arguments of particular grammatical functions, were proposed in Lee (2001).

(36) **Contextual Markedness Constraints I**
(GF/CASE correspondence):
a. *SUBJ/NON-NOM (*SUBJ/DAT, *SUBJ/ACC)
b. *OBJ/NOM

The markedness of non-canonical case-grammatical function associations (i.e., non-nominative subjects and nominative objects) assumed here is relatively uncontroversial and has been modeled in various frameworks. The constraints in (36) are especially comparable to the case/grammatical function alignment in the case-in-tiers theory (Yip, Maling and Jackendoff 1987, Maling 1993), in which case assignment is seen as the alignment of a case hierarchy with a hierarchy of grammatical functions.

An additional contextual markedness constraint that I assume here is an a-structure/case correspondence constraint, shown in (37):

(37) **Contextual Markedness Constraints II**
(AF/CASE correspondence):
*∼L-OBJ/ACC

Constraint (37) prohibits the association of accusative case with arguments without the logical object property. It has been extensively motivated in Joshi (1993) and Mohanan (1994) and is among the highest-ranked constraints in many South Asian languages, including Hindi.

Finally we come to the contextual markedness constraints on the ergative case:

(38) **Contextual Markedness Constraints III**:
a. ERG_{perf}: The highest argument role in a perfective clause must be in the ergative.

b. ERG$_{trans}$: The highest argument role of a transitive verb must be in the ergative.

In functional terms, these positive markedness constraints can be viewed as 'naturalness' constraints stating the relation between marking of the prominent argument (ergative) and the clausal contexts in which it is most preferred (perfective and transitive contexts).

The markedness constraint in (38a) is abundantly supported by functional and typological observations. Much work on perfective-split languages suggests that the prevalence of perfective splits in ergative marking is not accidental. Masica (1991:646) suggests that such splits reflect a universal tendency towards greater transitivity and more complete affectedness of the patient in perfective predications (see also Hopper and Thompson (1980) and Givón (1984)).

DeLancey (1981) addresses the issue of the interaction of aspect with case marking. Specifically, he proposes an account based on deixis and a spatial metaphor. The agent-patient relation can be viewed metaphorically as motion from the agent to the patient. Likewise, perfective aspect focuses on the end-point of the event and its effect on the patient, while imperfective focuses on the activity of the agent rather than its outcome. DeLancey (1981) interpretes the correlation between the marking of agents and the perfective aspect as representing the speaker's viewpoint on the event: moving from agent to patient in the event is metaphorically interpreted as moving away from the speech situation. The imperfective aspect is therefore associated with an unmarked A argument, and the perfective aspect is associated with an unmarked P argument:[16]

(39) a. subject (A) → object (P)
b. imperfective → perfective

[16]Sharma (2001) derives the constraints that can capture this markedness tendency through harmonic alignment of the perfectivity scale (Nonperf > Perf) with grammatical function (Subj > Obj), from which the markedness rankings in (i) and (ii) follow.

(i) *SUBJ/PERF ≫ *SUBJ/NONPERF
(ii) *OBJ/NONPERF ≫ *OBJ/PERF

Each constraint resulting from harmonic alignment is conjoined with *$\emptyset_{case}$:

(iii) *SUBJ/PERF & *$\emptyset_{case}$ ≫ *SUBJ/NONPERF & *$\emptyset_{case}$
(iv) *OBJ/NONPERF & *$\emptyset_{case}$ ≫ *OBJ/PERF & *$\emptyset_{case}$

Ranking *STRUC$_{case}$ above the two higher constraints in the subhierarchies in (iii) and (iv) leads to a pattern where perfective subjects must be marked and nonperfective objects must be marked. A problem with these subhierarchies, as Sharma herself admits, is whether the component constraint hierarchies (i) and (ii) are independently motivated. In other words, do languages actually prohibit perfective subjects and nonperfective objects altogether? I know of no such languages.

Woolford (2001b) develops an OT account of aspectually based split ergativity in Hindi, based on faithfulness constraints that are contextually restricted to transitives and the perfective aspect in conjunction with markedness constraints and general faithfulness constraints. In her view, aspectually based splits in Hindi result when the markedness constraint against ergative case is ranked between the contextually restricted faithfulness constraint and the general faithfulness constraint. Using this approach Woolford (2001b) gets very interesting results in both split ergativity and split dativity. But, there are two major problems with her approach. The first concerns the treatment of ergative case as "lexical/quirky". Woolford's account assumes, along with much work in the Minimalist Program, a structural distinction between structural Case and inherent Case. Structural Case is assumed to be licensed on an argument in a purely configurational way, i.e., in the proper structural relationship with the licensing head, whereas inherent Case (also called lexical or quirky case) is assigned to arguments associated with a particular theta-role in possible dependence on the governing predicates' lexical properties. Thus, Woolford regards ergative (associated with agents), dative (associated with goals and experiencers), and accusative (associated with themes) as inherent Cases licensed by verbs that carry the specification of inherent Case licensing feature (called 'lex' in Woolford (2001b)) in their lexical entry.

Woolford carries over this conception to her OT approach to Case. Let me make a few brief remarks about the way the licensing of inherent Case works. In Woolford's system, licensing inherent Case involves faithfulness to lexical requirements, specifically inherent Case features of lexical items that are present in OT inputs. While it is true that the association of the ergative case with volitionality or conscious choice and of the dative case with sentience/perception, for example, is not absolute and exceptionless, the view that ergative and dative case as lexical cases are "quirky" and therefore must be specified in the lexical entry of each verb is problematic. It is clearly undesirable to treat cases that are predictable on the basis of semantic information as involving faithfulness to the inherent Case licensing feature 'lex' of the verb, which is a purely abstract diacritic feature without substantive basis. Such an approach that relies on lexical stipulation is not extendable to other instances of semantic case that are sensitive to the aspectual property of the VP (e.g., the Finnish partitive), or quantificational properties. The conception of lexically determined inherent Case somewhat also departs from the spirit of OT that the crosslinguistic variation in surface realization of underlying arguments must be derived (as much as possible) as an effect of constraint interaction.

Now let us examine the different types of ergative languages that are predicted, based on the possible rankings of violable markedness and faithfulness constraints. First, the classic type of ergative system, in which ergative is restricted to transitive clauses, can be described by the ranking in (40). If ERG$_{trans}$ is ranked higher than *ERG, as in (40), the ergative must occur in transitives, because ERG$_{trans}$ requires the use of the ergative feature only for the highest argument role of transitives. The relative ranking of *ERG with respect to other constraints makes ergative case unavailable in other contexts (i.e., intransitives).

(40) Classic type of ergative languages:
ERG$_{trans}$ $\gg$ *ERG $\gg$ FAITH-O$_f$O$_m$(SEM) $\gg$ *NOM, ERG$_{perf}$

This purely structural (non-semantic) use of ergative is a case of unfaithfulness (see fn. 12). More precisely, this use of ergative incurs a violation of DEP-O$_f$O$_m$(VOL), since the feature [VOL] present in the m-structure of the ergative case marker has no correspondent in the output global f-structure (reflecting the clausal meaning).

Promotion of FAITH-O$_f$O$_m$(SEM) above *ERG as in (41) would yield the active-stative type ergative language, where the ergative surfaces in intransitives (taking agentive subjects) as well as transitives.

(41) Active-stative type of ergative languages:
FAITH-O$_f$O$_m$(SEM) $\gg$ *ERG $\gg$ *NOM, ERG$_{trans}$, ERG$_{perf}$

If *ERG dominates all the other constraints, as in (42), then the ergative is eliminated from the inventory of cases altogether.

(42) Non-ergative:
*ERG $\gg$ all other constraints

Lastly, the aspectually based split ergative pattern in Hindi can be described by the ranking in (43):

(43) Aspectually-based split ergative case system:
ERG$_{perf}$ $\gg$ *ERG $\gg$ FAITH-O$_f$O$_m$(SEM), *ACC $\gg$ *NOM

The sandwiching of the constraint against ergative case between the contextual markedness constraint ERG$_{perf}$ and the general faithfulness constraint captures the widely observed case preemption pattern: when more than one case is available for one argument, indirect or semantic case often takes priority over direct or structural case. The ranking in (43) makes the correct prediction that ergative case surfaces in perfective clauses due to the priority of the contextual markedness constraint ERG$_{perf}$ (favoring semantic case) to *ERG; but outside that context, featural markedness takes over, and the subject is nominative, producing the aspectually-conditioned split ergative system.

With the faithfulness constraints already proposed (see (34)) added to the constraints in (43), we are able to account for the distribution of subject case in Hindi. The full array is presented in (44) and discussed in the following subsection.

(44) **Ranking for Hindi**:
IDENT-$O_f O_m$(SEM) $\gg$ MAX-$O_f O_m$(AF), DEP-$O_f O_m$(AF) $\gg$ ERG$_{perf}$ $\gg$ *ERG $\gg$ MAX-$O_f O_m$(SEM) $\gg$ MARKEDNESS

2.5.3 Constraint Interaction in Case Alternations in Hindi

In this subsection, I show that the apparently idiosyncratic case alternations in Hindi as well as deviations from the canonical perfective-ergative pattern can be accounted for in terms of the interaction of the same markedness and faithfulness constraints that determine the crosslinguistic inventory of cases.

The Input-Candidate Relation

This subsection discusses the form of the inputs and the candidates, before moving on to a detailed OT account of the Hindi data.

I follow Bresnan (2000) and Kuhn (2001a,b) in assuming the input to be a partially underspecified f-structure, stripped of grammatical function labels. I further assume that a-structure, representing, among other things, argument function (AF) information (e.g., L-SUBJ, L-OBJ, etc.) and the Proto-Agent and Proto-Patient properties of arguments (e.g., volitionality, causation, affectedness. etc.), is also part of the OT-LFG input for syntax (cf. Asudeh 2001). Therefore, the input representation is a pair of underspecified f-structure and a-structure. As an illustration, the input for the Hindi sentence in (14) would be (45). This abbreviated format represents only the part of the f-structure and a-structure that is relevant for my analysis.

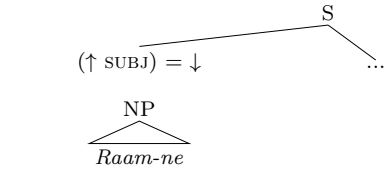
(45) Input f-structure

$$\begin{bmatrix} \text{GF}_1 & \begin{bmatrix} \text{PRED} & \text{`Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \end{bmatrix} \\ \text{GF}_2 & \begin{bmatrix} \text{PRED} & \text{`child'} \\ \text{AF} & \text{L-OBJ} \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{`lift } \langle \text{arg}_1, \text{arg}_2 \rangle \text{'} \end{bmatrix}$$

The candidates and outputs are quadruples consisting of c-structures, fully specified f-structures, m-structures and their correspondence functions. As for formal representation of the relationship between these, I adopt Kuhn's (2001a,b) formalization of the input-candidate relation,

whereby each candidate f-structure contains the same and more non-conflicting information relative to the input. Under this view, the licensing of semantic case can be modeled as a faithfulness relation between the output m-structure and the syntactic f-structure (Lee 2001, 2002a). The correspondence between these two output structures can be checked by comparing the relevant semantic feature in a candidate's syntactic f-structure and that in the m-structure of a case-marked NP. The idea is illustrated for the candidate analyses in examples (46).

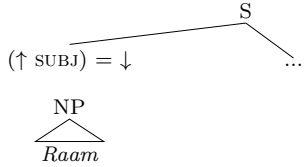
(46) a. Ergative subject



$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \\ \text{CASE} & \text{ERG} \end{bmatrix} \end{bmatrix}$$

$$\begin{bmatrix} \text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \\ \text{CASE} & \text{ERG} \end{bmatrix} \\ \text{OBJ}_2 & \begin{bmatrix} \dots \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{'lift } \langle \text{arg}_1, \text{arg}_2 \rangle \text{'} \end{bmatrix}$$

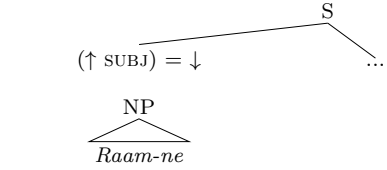
b. Nominative subject: Violation of Max-$O_f O_m$(sem)



$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{CASE} & \text{NOM} \end{bmatrix} \end{bmatrix}$$

$$\begin{bmatrix} \text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \\ \text{CASE} & \text{NOM} \end{bmatrix} \\ \text{OBJ}_2 & \begin{bmatrix} \dots \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{'lift } \langle \text{arg}_1, \text{arg}_2 \rangle \text{'} \end{bmatrix}$$

c. Dative subject:
Violation of Ident-$O_f O_m$(sem) and Dep-$O_f O_m$(af)



$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & - \end{bmatrix} \\ \text{AF} & \text{GOAL} \\ \text{CASE} & \text{DAT} \end{bmatrix} \end{bmatrix}$$

$$\begin{bmatrix} \text{SUBJ}_1 & \begin{bmatrix} \text{PRED} & \text{'Raam'} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \\ \text{CASE} & \text{DAT} \end{bmatrix} \\ \text{OBJ}_2 & \begin{bmatrix} \dots \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{'lift } \langle \text{arg}_1, \text{arg}_2 \rangle \text{'} \end{bmatrix}$$

Candidate (a) is the optimal way of expressing the input (45) in Hindi. Here the feature [VOL +] (lexically associated with the ergative case marker) belonging to the SUBJ argument of the candidate f-structure is present in the m-structure of that argument; but we do not find the [VOL] specification in the m-structure of candidate (b). In other words, the nominative marking of a subject which is a volitional agent is unfaithful to the input, leading to the MAX-O_fO_m(VOL) violation. The dative subject candidate (c), too, is ruled out because it incurs a violation of the highest-ranking constraint IDENT-O_fO_m(VOL), since the value of [VOL] in the f-structure does not match that in the m-structure of the word in c-structure. It further violates DEP-O_fO_m(AF), since the value of the feature AF (i.e., GOAL) introduced by the dative case marker does not re-appear in the f-structure.

Ergative/Nominative Alternation in Class 1, 2 Verbs

This section provides an OT-LFG analysis of the ergative/nominative alternation in Class 1, 2 verbs. Let us begin with Class 1 verbs. As discussed in section 2.3.2, the case on the subject of Class 1 verbs must be ergative when the verb carries perfective morphology. Otherwise, it is nominative. Semantically, the action referred to by Class 1 verbs must be deliberate. As presently formulated, the higher argument of Class 1 verbs is associated with a positive specification for volitionality in the lexical a-structure of the verb, which is part of the input. As already shown above, the constraint ranking in (44), repeated in (47), predicts that the higher argument must be in the ergative in the perfective clause: nominative and dative are not allowed, due to the higher ranking of IDENT-O_fO_m(SEM) and ERG_{perf}.

(47) **Ranking for Hindi**:
IDENT-O_fO_m(SEM) $\gg$ MAX-O_fO_m(AF), DEP-O_fO_m(AF) $\gg$ ERG_{perf} $\gg$ *ERG $\gg$ FAITH-O_fO_m(SEM) $\gg$ MARKEDNESS

The imperfective of Class 1 verbs is illustrated by Tableau 1 in (48). In the tableaux that follow, I will indicate morpholexical specifications that are relevant to faithfulness evaluations within [ ]. Although I do not show the syntactic f-structures associated with each candidate, they should be understood as containing all input information together with case features; also, I just list the candidates with ergative, nominative and dative cases, but we must assume that candidates with other cases are generated by GEN.

In Tableau 1, due to the high ranking of the faithfulness constraints IDENT-O_fO_m(VOL) and DEP-O_fO_m(AF), candidate (c) with the dative subject is ruled out immediately, leaving candidates (a) and (b). Here

the positive markedness constraint ERG$_{perf}$ does not crucially distinguish the candidates shown in the tableau, as their verb forms are assumed to be faithful to the input ASPECT specification, i.e., imperfective here. So, the decision on the case of the subject is left to the lower-ranking constraints. As can be seen, the nominative candidate (b) is selected as the winner, as it incurs no violation of the markedness constraint *ERG.

(48) Tableau 1. Subject Case of Class 1 Verbs (imperfective)

Input: [GF$_1$ [PRED 'Raam', SEM [VOL +]], GF$_2$ [...], ASP IMPERF, PRED 'lift ⟨arg$_1$, arg$_2$⟩']	IDENT-O$_f$O$_m$(VOL)	MAX-O$_f$O$_m$(AF), DEP-O$_f$O$_m$(AF)	ERG$_{perf}$	*ERG	MAX-O$_f$O$_m$(VOL)	*SUBJ/DAT	*NOM
a. S$_{erg}$[VOL +] ...				*!			
☞ b. S$_{nom}$[ ] ...					*		*
c. S$_{dat}$[VOL −, AF GOAL] ...	*!	*				*	

Now let us move to Class 2 verbs, which systematically allow an ergative/nominative alternation in the perfective clause. As discussed in section 2.3.2, this alternation correlates with a semantic difference in volitionality or control over the action (Mohanan 1994, Butt 2001). In other words, Class 2 verbs are compatible with both volitional and non-volitional interpretations, and the precise interpretation is contextually dependent.

The influence of context on case selection in Class 2 verbs can be straightforwardly modeled in the present OT-LFG system by underspecification of volitionality, i.e., by not associating volitionality with verbs in the lexical representation. Accordingly, when volitional or nonvolitional interpretation is brought out in a particular context, the input is specified as [VOL ±] information. As the tableaux in (49) and (50) show, this information plays a role in selecting the optimal case patterns for the relevant verbs, by activating the IDENT-O$_f$O$_m$(VOL) and MAX-O$_f$O$_m$(VOL) constraints. When the higher argument is positively specified for volitionality, as in the input in Tableau 2, the ergative is preferred.

(49) Tableau 2. Subject Case of Class 2 Verbs I (perfective)

Input: $\begin{bmatrix} \text{GF}_1 & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & + \end{bmatrix} \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{'shout } \langle \text{arg}_1 \rangle \text{'} \end{bmatrix}$	Ident-O$_f$O$_m$(vol)	Max-O$_f$O$_m$(af), Dep-O$_f$O$_m$(af)	ERG$_{perf}$	*Erg	Max-O$_f$O$_m$(vol)	*Subj/Dat	*Nom
☞ a. S$_{erg}$[vol +] ...				*			
b. S$_{nom}$[ ] ...			*!		*		*
c. S$_{dat}$[vol −, af goal] ...	*!	*	*			*	

In case the action is nondeliberate, then a different candidate is the winner: as Tableau 3 shows, the ergative candidate (a) loses to the nominative candidate (b), as the [vol +] information specified by the ergative case marker is incompatible with the meaning of the clause.

(50) Tableau 3. Subject Case of Class 2 Verbs II (perfective)

Input: $\begin{bmatrix} \text{GF}_1 & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{SEM} & \begin{bmatrix} \text{VOL} & - \end{bmatrix} \end{bmatrix} \\ \text{ASP} & \text{PERF} \\ \text{PRED} & \text{'shout } \langle \text{arg}_1 \rangle \text{'} \end{bmatrix}$	Ident-O$_f$O$_m$(vol)	Max-O$_f$O$_m$(af), Dep-O$_f$O$_m$(af)	ERG$_{perf}$	*Erg	Max-O$_f$O$_m$(vol)	*Subj/Dat	*Nom
a. S$_{erg}$[vol +] ...	*!			*			
☞ b. S$_{nom}$[ ] ...			*		*		*
c. S$_{dat}$[vol −, af goal] ...		*!	*			*	

In imperfective clauses, however, the case on the subject must be nominative regardless of volitionality. As the tableaux in (51) and (52) show, this fact precisely results from the same constraint interaction that accounts for the ergative/nominative alternation in a perfective clause.

(51) Tableau 4. Subject Case of Class 2 Verbs III (imperfective)

	Input: [GF$_1$ [PRED PRO; SEM [VOL +]]; ASP IMPERF; PRED 'shout ⟨arg$_1$⟩']	Ident-O$_f$O$_m$(vol)	Max-O$_f$O$_m$(af), Dep-O$_f$O$_m$(af)	erg$_{perf}$	*erg	Max-O$_f$O$_m$(vol)	*subj/dat	*nom
	a. S$_{erg}$[vol +] ...				*!			
☞	b. S$_{nom}$[ ] ...					*		*
	c. S$_{dat}$[vol −, af goal] ...	*!	*				*	

(52) Tableau 5. Subject Case of Class 2 Verbs IV (imperfective)

	Input: [GF$_1$ [PRED PRO; SEM [VOL −]]; ASP IMPERF; PRED 'shout ⟨arg$_1$⟩']	Ident-O$_f$O$_m$(vol)	Max-O$_f$O$_m$(af), Dep-O$_f$O$_m$(af)	erg$_{perf}$	*erg	Max-O$_f$O$_m$(vol)	*subj/dat	*nom
	a. S$_{erg}$[vol +] ...	*!			*			
☞	b. S$_{nom}$[ ] ...					*		*
	c. S$_{dat}$[vol −, af goal] ...		*!				*	

The Absence of Case Alternation in Class 3 Verbs

Let us next consider Class 3 verbs, which cannot take ergative subjects. As Mohanan (1994:73) points out, the action referred to by this class of verbs is largely nondeliberate. Hence I assume that the higher or only argument of these verbs is specified as [vol −] in the a-structure. Tableau 6 illustrates the evaluation of the case on the subject of the unaccusative intransitive verb 'fall', occurring with a perfective form.

(53) Tableau 6. Subject Case of Class 3 Verbs I (perfective)

Input: [GF$_1$ [PRED 'Raam'; SEM [VOL −]]; ASP PERF; PRED 'fall ⟨arg$_1$⟩']	IDENT-O$_f$O$_m$(VOL)	MAX-O$_f$O$_m$(AF), DEP-O$_f$O$_m$(AF)	ERG$_{perf}$	*ERG	MAX-O$_f$O$_m$(VOL)	*SUBJ/DAT	*NOM
a. S$_{erg}$[VOL +] ...	*!			*			
☞ b. S$_{nom}$[ ] ...			*		*		*
c. S$_{dat}$[VOL −, AF GOAL] ...		*!	*			*	

It is obvious that with the given constraint ranking, neither ergative nor dative can appear: ergative would violate IDENT-O$_f$O$_m$(VOL), and dative would violate DEP-O$_f$O$_m$(AF).

In the imperfective form of the verb, nothing is shifted in the realization of case, even if ERG$_{perf}$ is irrelevant, as shown in Tableau 7.

(54) Tableau 7. Subject Case of Class 3 Verbs II (imperfective)

Input: [GF$_1$ [PRED 'Raam'; SEM [VOL −]]; ASP IMPERF; PRED 'fall ⟨arg$_1$⟩']	IDENT-O$_f$O$_m$(VOL)	MAX-O$_f$O$_m$(AF), DEP-O$_f$O$_m$(AF)	ERG$_{perf}$	*ERG	MAX-O$_f$O$_m$(VOL)	*SUBJ/DAT	*NOM
a. S$_{erg}$[VOL +] ...	*!			*			
☞ b. S$_{nom}$[ ] ...					*		*
c. S$_{dat}$[VOL −, AF GOAL] ...		*!				*	

Now, all instances of Class 3 verbs are not necessarily associated with nonvolitionality; there are a few instances of transitive verbs like *bol* 'speak' and *laa* 'bring' that do not conform to the canonical association between ergative and volitionality. These verbs may be associated with

volitionality, but cannot take ergative subjects. In the present approach, a clear distinction is made between such lexical exceptions ("quirky" or "lexical" case) and predictable semantic case. Only the former kind of case is truly idiosyncratic in that its distribution is indeed unpredictable, and therefore must be lexically stipulated. Semantic case, in contrast, is viewed as having semantics of its own, rather than being licensed by any particular feature or lexical item. The following subsection examines further consequences of this distinction.

Case Patterns of Class 4 Verbs and Burzio's Generalization

Verbs that belong to Class 4 are referred to as 'unaccusative transitives' (Mohanan 1994) or 'nonvolitional transitives' (Joshi 1993). Recall from section 2.3.3 that the subjects of these verbs can only appear in the dative and the objects in the nominative. The appearance of dative on subjects correlates with nonvolitionality and a goal/recipient.

(55) Tableau 8. Subject Case in Class 4 Verbs

Input:	Ident-O$_f$O$_m$(vol)	Max-O$_f$O$_m$(af), Dep-O$_f$O$_m$(af)	ERG$_{perf}$	*Erg	Max-O$_f$O$_m$(vol)	*Subj/Dat	*Nom
a. S$_{erg}$[vol +] ...	*!	*		*			
b. S$_{nom}$[ ] ...		*!	*		*		*
☞ c. S$_{dat}$[vol −, af goal] ...			*			*	

The distribution of dative in 'unaccusative transitives' is not lexically stipulated, but follows from the higher ranking of the faithfulness constraints (Ident-O$_f$O$_m$(vol) and Max-O$_f$O$_m$(af)) above the markedness constraint against a dative subject (*subj/dat). As we see from Tableau 8, the candidate with an ergative subject has a fatal violation of Ident-O$_f$O$_m$(vol), as it contains a conflicting value for the feature [vol] in its f-structure and m-structure. Of the remaining candidates,

the nominative subject candidate (b) is eliminated by MAX-$O_f O_m$(AF), and hence the dative candidate (c) is selected as optimal.

Turning to the analysis of object case, the crucial properties of unaccusative objects to be accounted for are the following:

(56) The case properties of unaccusative objects:

a. The case of unaccusative objects is invariably nominative.

b. Unaccusative objects are not differentially case-marked; they are always unmarked regardless of animacy/definiteness.

The key to a successful account of the lack of accusative on the unaccusative objects (the generalization (56a)) resides in the very fact that unaccusative transitives have a grammatical object but not a logical object (Mohanan 1994:97–98). Thus, the unaccusative objects are subject to the following markedness constraints (repeated from (36b) and (37)):

(57) Markedness constraints on object case:

a. *OBJ/NOM (GF/CASE correspondence)

b. *∼L-OBJ/ACC (AF/CASE correspondence)

In terms of GF/CASE association, the nominative marking of objects is worse than accusative marking, because it will cause a mismatch between a case hierarchy (NOM > ACC) with a hierarchy of grammatical functions (SUBJ > OBJ). However, in terms of AF/CASE association, accusative, the unmarked case for a patientive argument in accusative languages, is more marked than nominative as the case of an unaccusative object, which is not a logical object. Hindi and the majority of languages with accusative case resolve this conflict in favor of the unmarked AF/CASE association. In other words, *∼L-OBJ/ACC is crucially ranked above *OBJ/NOM, which is in turn ranked above the context-free markedness constraints, *ACC and *NOM, as shown in (58):

(58) Ranking for the objects of unaccusative transitives:
*∼L-OBJ/ACC ≫ *OBJ/NOM ≫ *ACC ≫ *NOM

This ranking thus accounts for the crucial phenomena covered by BG — the link between agents and accusative objects and the presence of nominative on unaccusative objects. The above analysis shows that under the present OT-LFG approach, BG follows as an epiphenomenon of the relative ranking of markedness constraints that are independently motivated — without any derivational operations or special procedural case licensing mechanisms. Further, this account provides a clear answer to the question why BG should hold, i.e., the near-universality of the

ranking in (58), which expresses the relative unmarkedness of nominative compared to accusative on a non-canonical object.[17]

Lastly, let us consider how the present account captures the generalization (56b). Given the parallel optimization-based model, the crucial idea is that obligatory zero-marking of unaccusative objects (the absence of DOM) follows from optimization in case forms, which proceeds in parallel to featural optimization.

The relevant constraints were already proposed in section 2.4 and are repeated in (59):

(59) **Ranking yielding an iconic mapping between case forms and features:**
*Overt/nom ≫ *Zero/∼nom ≫ *Struc$_{case}$

As discussed in section 2.4 (see (25)), this ranking produces the pattern in which the nominative is morphologically unmarked, while other cases have a morphological exponence. This ranking interacts with Aissen's iconicity constraints favoring overt marking of high-prominence objects in the overall case system of language. Specifically, it is assumed here that *O/HumPro & *∅, the highest-ranking constraint among Aissen's constraint hierarchy (see (23)), occurs between the case form/feature mapping constraints and the economy constraints in (59) (*O/HumPro & *∅ is abbreviated as MarkO/HumPro in (60)):

(60) **Ranking for object marking in Hindi**:
*Overt/nom ≫ *Zero/∼nom ≫ MarkO/HumPro ≫ *Struc$_{case}$

The set of constraints on case marking and features are joined in a single ranking for Hindi, as shown in (61). As before, *∼L-obj/acc is assumed to be an undominated constraint in Hindi.

(61) **Ranking for object case in Hindi**:
*∼L-obj/acc ≫ *Overt/nom ≫ *Zero/∼nom ≫ MarkO/HumPro ≫ *Struc$_{case}$ ≫ *obj/nom

[17] Although the generalization that the object of unaccusative verbs is nominative is clearly robust as a crosslinguistic generalization, there are well-documented exceptions. Faroese is a well-known counterexample to this generalization, which disallows nominative objects in all active constructions including dative subject constructions (Barnes 1986, Taraldsen 1996). Instead, the object is accusative. This pattern would follow from the alternative ranking of *∼L-obj/acc and *obj/nom, shown in (i):

(i) Ranking for Faroese:
... gf/case correspondence ≫ af/case correspondence ≫ ... ... *obj/nom ≫ *∼L-obj/acc ≫ *acc ≫ *nom

(62) Tableau 9. Object Case in Class 4 Verbs (human-pronoun object)

Input: [GF$_1$ [PRED 'Anuu'; SEM [VOL −]; AF GOAL]; GF$_2$ [PRED PRO; AF ¬L-OBJ]; ASP PERF; PRED 'appear ⟨arg$_1$, arg$_2$⟩']	*∼L-OBJ/ACC	*OVERT/NOM	*ZERO/∼NOM	MARKO/HUMPRO	*STRUC$_{case}$	*OBJ/NOM
a. O/Overt$_{acc}$ ...	*!				*	
b. O/∅$_{acc}$ ...	*!		*	*		
c. O/Overt$_{nom}$ ...		*!			*	*
☞ d. O/∅$_{nom}$ ...				*		*

(63) Tableau 10. Object Case in Class 1 Verbs (human-pronoun object)

Input: [GF$_1$ [PRED 'Raam'; SEM [VOL +]]; GF$_2$ [PRED PRO; AF L-OBJ]; ASP PERF; PRED 'lift ⟨arg$_1$, arg$_2$⟩']	*∼L-OBJ/ACC	*OVERT/NOM	*ZERO/∼NOM	MARKO/HUMPRO	*STRUC$_{case}$	*OBJ/NOM
☞ a. O/Overt$_{acc}$ ...					*	
b. O/∅$_{acc}$ ...			*!	*		
c. O/Overt$_{nom}$ ...		*!			*	*
d. O/∅$_{nom}$ ...				*!		*

This ranking simultaneously ensures (i) obligatory zero-marking of nominative objects of unaccusative transitives and (ii) obligatory overt

marking of accusative objects of canonical transitives. The tableaux in (62) and (63) show how the correct candidate is selected.

Thus in this analysis, the generalization that in the majority of DOM languages high-prominence objects are case-marked with the accusative rather than the nominative is not stated as an independent principle of language. Rather, it turns out to be a purely epiphenomenal consequence of formal and featural optimizations that proceed in parallel. The main advantage of this account is that it further accounts for the existence of non-categorical DSM/DOM in languages like Japanese and Korean, in which the referential properties of arguments do not align categorically either with the ergative/nominative distinction or with the accusative/nominative distinction. This fact receives no explanation under most other approaches to case which identify DSM and DOM, which are essentially case *marking* splits, with case feature splits (split ergativity/split accusativity).[18]

2.6 Conclusion

In this paper I have presented a new OT approach to case, inspired by the idea of 'output-to-output correspondence' in OT phonology and a lexicalized theory of faithfulness (Bresnan 2000, Kuhn 2001a,b). An interesting consequence of this approach, incorporating LFG's parallel correspondence-based architecture, is that systematic lexical properties (e.g., which grammatical function case-marked nominals canonically appear with and which morphosyntactic context they appear in, etc.) need no longer be stipulated at the level of lexical entries, as in the LFG model of constructive morphology. Instead, they are derived by the ranking of faithfulness constraints amongst markedness constraints. This leads to a radical simplification of the lexicon component of LFG.

A further result of treating case patterns as the result of constraint interaction is that apparently idiosyncratic case alternations in particular languages as well as the language-internal distributonal facts are derivable from the same constraint interactions that are motivated by crosslinguistic typological generalizations. Moreover, the present OT-LFG approach to case, when coupled with stochastic evaluations, is able to account for essential similarities in case marking patterns between split ergative/accusative languages and pure nominative/accusative languages, beyond the traditional dichotomy of ergative vs. accusative sys-

[18] Although I will not show it here, this analysis can be extended naturally to account for a similar problem that occurs in many languages with a categorical DSM system — obligatory zero-marking of intransitive subjects (the absence of DSM in intransitive clauses). I hope to discuss the account of this problem in work in progress.

tems. This demonstrates that constraint violability and constraint ranking allow greatly increased generality not only for constraints but also for the entire system, thus helping us create a more integrated theory of morphosyntax.

Although a treatment of a number of other important problems in the dompain of case has not been provided here, I hope that the ideas sketched here can constitute a small contribution to the ongoing and subsequent crosslinguistic exploration of principled interactions between the lexicon and syntax.

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3

Discourse Clitics and Constructive Morphology in Hindi

Devyani Sharma

3.1 Introduction

Case marking in Hindi has been studied in greater detail in the literature than discourse marking (Mahajan 1990, Mohanan 1994, Butt and King 2002).[1] Furthermore, similarities in the licensing of case and focus have been observed in several studies, but they have generally been oriented toward *structural* licensing (Horvath 1995, Butt and King 1996). In the present paper, I examine similarities in case and discourse marking that are independent of positional or structural licensing and suggest a unified morphological analysis.

Traditionally in Lexical Functional Grammar (LFG), grammatical functions have been identified by functional descriptions stating relations such as (↑ OBJ)=↓ and (↑ CASE)=ACC. Nordlinger (1998), building on work by Andrews (1996) and Simpson (1991) among others, proposes constructive functions for case markers, such as (SUBJ ↑), in order to account for various properties of case morphology in nonconfigurational languages. In this paper, the extension of constructive morphology to discourse marking captures the similar ways in which case and discourse clitics contribute clausal information about their hosts independently of

[1]I am indebted to Joan Bresnan and Peter Sells for detailed suggestions and insights on earlier drafts of this paper. I also owe thanks to two anonymous reviewers, the editors of this volume, and the audience of the 1999 Lexical Functional Grammar Conference in Manchester (UK) for many helpful comments. Any remaining errors are my own.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

configurational positions. This constructive morphology analysis of discourse markers constitutes the main aim of the present study, namely to account for the establishment of grammatical and discourse functions via cliticization in NPs in Hindi and to describe the similarities and differences in the syntactic behavior of case and discourse clitics.

A secondary goal of the paper is to distinguish between syntactic and semantic effects of discourse clitics in particular. Mohanan and Mohanan (1999) discuss the need for a disjunctive analysis of syntactic and semantic representations in discourse marking in Malayalam. In their data, which show rather distinct properties from the present data, the semantic scope of the focus marker does not correspond to a syntactic constituent, leading the authors to argue in favor of a multidimensional model that allows for mismatches in the structure of syntactic and semantic representations. The present data exhibit a different kind of mismatch, namely a mismatch between the NP that is identified as syntactic focus by a discourse marker and the actual semantic scope of that discourse marker. The analysis that is presented primarily provides a morpholexical principle for the identification of the syntactic focus (or topic) function; however, I also propose that focus or topic clitics require a distinct semantic mapping to establish fine-grained scope interpretations, as this information cannot be read directly off the f-structure representation (Dalrymple 1993, Andrews and Manning 1999).

In section 3.2, I give an overview of the behavior of certain discourse markers, providing evidence that they are similar to case markers in being clitic-like. Section 3.3 provides a more detailed discussion of the syntactic properties of these clitics. In section 3.4, I provide an analysis for Hindi case clitics using constructive morphology, and then extend this analysis to discourse clitics. Finally in section 3.5, I distinguish between the 'flattening' constructive function developed for syntactic discourse function identification and the semantic scope of discourse markers.

3.2 Structural Status of Discourse and Case Markers

Information structure in Hindi can be expressed using any of a number of mechanisms. Discourse markers, intonation, and clause position are all available for the expression of new and old discourse status (Kidwai 1999:227). A focused element, for instance, may be marked with intonation alone, or additionally with a focus marker, preverbal positioning, or both. The interaction among these three mechanisms of information status is far too complex and unexplored to be accounted for here (see Gambhir (1981) and Kidwai (2000) for more detailed discussions). As the present discussion is concerned with discourse markers, it is only

relevant at this point to note that other mechanisms for signalling information status are available in the language, and that the use of discourse markers is optional in Hindi.[2]

The main discourse markers used in Hindi are listed in (1):[3]

(1) *hī* exclusive contrastive focus ('only')
bʰī inclusive contrastive focus ('also', additive/scalar)
tō contrastive topic

More restricted markers:
tak scalar endpoint marker ('even')
bʰar entirety ('all')

Hī marks exclusive focus, similar in some ways to *only* in English. It identifies a particular member out of a possible set. *Bʰī* indicates inclusive focus, including a particular element in an existing set.[4] Finally, *tō* performs a topic contrasting function. More semantically and syntactically restricted clitics include *tak* and *bʰar*.

The first three clitics listed in (1) appear very frequently in conversational speech and perform a range of pragmatically and semantically restrictive functions. The definitions in (1) are somewhat coarse approximations of the complex functional range of each marker. In example (2) I show instances of their use.[5]

(2) a. Exclusive focus:
rādʰā=nē=**hī** bacchõ=kō kahānī
Radha=ERG=EXCL FOC children=ACC story-F.NOM
sunāyī
hear-caus-PERF.F.SG
'It was (only) Radha who told the children a story.'

[2]This is unlike languages such as Somali, in which the presence of appropriate discourse markers is obligatory (Lunella Mereu, p.c.).

[3]For discussions of the classification of discourse types, see Dik et al. (1981), Prince (1992), Vallduví (1992), and Lambrecht (1994) among others. The notions of grammaticalized focus and topic representations in the f-structure assumed here are based on the classification of discourse functions in Choi (1996) and Bresnan (2001:115).

[4]The discourse marker *bʰī* in particular shows specific negative polarity properties when used in certain constructions (Lahiri 1998).

[5]Aside from straightforward case and discourse function abbreviations, the glossing and grammaticality marking conventions used in this paper are as follows:
=: cliticization (case or discourse markers);
−: lexical or affixal information;
%: sentence judged grammatical by a subset of speakers;
#: sentence judged pragmatically infelicitous.

b. Inclusive focus:
rādʰā=nē**=bʰī** bacchõ=kō kahānī
Radha=ERG**=**INCL FOC children=ACC story-F.NOM
sunāyī
hear-caus-PERF.F.SG
'*Radha* (also) told the children a story.'

c. Contrastive topic:
mōmbattī**=tō** milī, lēkin abʰ
the candle-F.NOM**=**TOP found-PERF.F.SG but now
māchis gum gayē
match-NOM lost go-PERF.PL
'*The candle* was found but now the matches are lost.'

In (2a) 'Radha' is exclusively focused; in (2b) 'Radha' is inclusively focused; and in (2c) the topic 'candle' is contrasted with the new information in the sentence. These examples show that discourse clitics identify the constituent which they immediately follow as marked for certain discourse roles. The discussion here is restricted to the nominal domain, but it must be noted that discourse clitics may also modify non-nominal elements in a clause, including verbal elements and adjuncts. Although the full range of these uses cannot be adequately addressed here, these facts are in keeping with the general property of discourse markers as identifying the focus of a clause, whether nominal or not. In fact, the analysis provided here for the nominal domain could ultimately be generalized to include further uses of discourse markers, as I discuss briefly in section 3.4.4. For purposes of consistency and due to space limitations, I will restrict most of the discussion in this paper to the focus marker *hī*.

3.2.1 Clitic Analysis

The analysis of Hindi case markers as syntactic clitics in Mohanan (1994:60) and Butt and King (2002) provides the criteria for a parallel analysis of discourse markers, which I also treat as syntactic clitics rather than morphological affixes. Some arguments in favor of this view are presented in this section, through a comparison of case and discourse markers.

One indicator of cliticization of case markers, as opposed to affixation, is that they can take phrasal scope over conjoined nominals. The examples in (3), from Butt and King (2002:5), show this difference between clitic and affix behavior.

(3) a.	b.
*[kutt- aur gʰoṛ]-ē]	[kutt-ē aur gʰoṛ-ē] =kō
dog and horse-OBL	dog-OBL and horse-OBL ACC
'the dog and horse (OBL)'	'the [dog and horse]-ACC'

In (3a), the oblique affix cannot take scope over the conjoined nominal stems. In (3b), however, the single case marker *can* mark the conjoined stems. Discourse markers pattern like case markers in this regard. They can also take phrasal scope over conjoined elements, as in (4).

(4) [kutt-ē aur gʰoṛ-ē] =hī
dog-OBL and horse-OBL FOC
'[dogs and horses]-FOC'

A second characteristic of syntactic clitics is that although they are attached to a host, they show greater phonological independence from their hosts than affixes do. In the case of Hindi case markers, pauses may intervene between nominals and their case markers (Mohanan 1994:60). Discourse markers show the same property. By contrast, it is impossible to insert a pause between a nominal stem and an affix such as -*ē* in (3b).

Another indication of the phonological independence of case and discourse markers is their lack of stress interactions with their host. Nominal agreement affixes affect the stress pattern of a noun, whereas case clitics do not (Butt and King 2002:5). Again, discourse markers pattern like case markers in this regard and do not affect stress.

Finally, discourse clitics and case clitics can be mutually reordered, suggesting a degree of structural flexibility in relation to their host word (although the range of reordering possibilities is subject to dialectal variation). Affixes do not exhibit this mutability in ordering, and neither type of clitic can intervene between the nominal stem and regular affixes.

3.2.2 Host-adjoining Clitics

Assuming that discourse markers in Hindi are also clitics, as case markers are, it is fairly straightforward to argue that, like case, they are markers of the type that attach to a constituent rather than markers that occupy a clausal position, for example, directly under S. Several phenomena may be taken as evidence for this assumption.

First, discourse clitics may appear *within* NPs with correspondingly restrictive scope. If these clitics appear in a position directly dominated by S or IP, their NP-internal positioning and scope cannot be easily accounted for. This is discussed in more detail later, in conjunction with the examples in (13) and (33).

Second, discourse markers only take scope over constituents to their left. This is distinct from non-constituent discourse particles which occur in other languages. Koenig (1991) distinguishes between adverb-like and clitic-like behavior of focus particles crosslinguistically. In the English examples in (5), the particle *only* shows adverb-like properties as its position and relative scope is fairly flexible. Upper case indicates the scope of *only*; in one case, it can have scope over the goal and in the other the recipient, both from the same preverbal position.

(5) a. Maya **only** gave Anu A BOOK.
b. Maya **only** gave ANU a book.

The focus marker *hī* in Hindi contrasts with the behavior of *only* in (5) in exhibiting a stricter, constituent-like or clitic-like behavior, as shown in the three examples in (6a–c).

(6) a.*māyā=nē **hī** anū=kō KITĀB dī
Maya=ERG FOC Anu=DAT book-NOM give-PERF.F.SG
'Maya only gave Anu A BOOK.'
b.*māyā=nē **hī** ANŪ=KŌ kitāb dī
Maya=ERG FOC Anu=DAT book-NOM give-PERF.F.SG
'Maya only gave ANU a book.'
c. MĀYĀ=NĒ **hī** anū=kō kitāb dī
Maya=ERG FOC Anu=DAT book-NOM give-PERF.F.SG
'Only MAYA gave Anu a book.'

In (6a) and (6b) it is not possible for *hī* to have focal scope over any constituent that follows it. It can only focus the immediately preceding constituent, *Maya=nē*, as shown in (6c). Furthermore, as (7a) and (7b) show, it cannot have scope over the subject from a preverbal position, as in this case it must be adjoined to the goal and thus have scope over that argument alone.

(7) a.*MĀYĀ=NĒ anū=kō kitāb **hī** dī
Maya=ERG Anu=DAT book-NOM FOC give-PERF.F.SG
'MAYA only gave Anu a book.'
b. māyā=nē anū=kō KITĀB **hī** dī
Maya=ERG Anu=DAT book-NOM FOC give-PERF.F.SG
'Maya only gave Anu A BOOK.'

These characteristics suggest that Hindi case and discourse clitics are host-adjoining and not adverb-like in their behavior.

3.2.3 Morphologically Incorporated Discourse Markers

In order to consider the full range of positions that case and discourse clitics may occupy in NPs, an exception to the clitic generalizations listed

in section 3.2.1 must first be taken into account. This is a set of forms in which *hī* shows signs of being incorporated into its nominal host.

Since *hī* follows the element it modifies, it commonly follows case markers too (Verma 1971). However, when *hī* does occur between pronominals and their case markers, it usually shows signs of incorporation (Koul 1990, McGregor 1995). I list the personal and demonstrative pronominal forms with incorporated focus in (8).

(8)

UNFOCUSED FORM	FOCUSED FORM	GLOSS OF FOCUSED FORM
muj^{h}	*mujhi*	me-FOC (obl.)
tum/tuj^{h}	*tumhi/tujhi*	you-FOC (obl.)
yah	*yahi*	he/she/it-FOC (prox.)
vah	*vahi*	he/she/it-FOC (distant)
is	*isi*	he/she/it-FOC (obl., prox.)
us	*usi*	he/she/it-FOC (obl., distant)
ham	*hamhĩ*	I/we-FOC
tum	*tumhĩ*	you.pl-FOC
in	*inhĩ*	they-FOC (obl., prox.)
un	*unhĩ*	they-FOC (obl., distant)

We can take *hī* to be incorporated in these forms based on several characteristics:

(9)

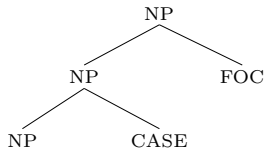
(a)	Stress distinctions:	* is=*hī*=nē	'this=ERG'
(b)	Phonological reduction:	is=hī → isi	(Koul 1990:30)
(c)	Nasalization:	[i] hamhĩ	'1ST.PL.FOC'
		[ii] ham=hī	'1ST.PL=FOC'
(d)	Gaps in the paradigm:[6]	* mai=hī=nē	'I=FOC=ERG'

The incorporated focus morphemes in (8) affect the morphological stress of the resulting word and cannot carry focal stress. Various types of phonological reduction also take place in the formation of these new forms. For instance, nasalization of the /i/ vowel occurs in the case of incorporation but never in cliticization. And finally, gaps occur in the paradigm of forms which show these characteristics, suggesting a closed lexical set of incorporated forms. None of the phenomena in (9) occurs with regular *hī* cliticization.

[6]The absence of an incorporated form *mai-hi* (I-FOC (dir.)) simply means that the first person pronominal form is focused as a regular noun would be, for example *mai=nē=hī* (I=ERG=FOC).

To summarize the data discussed so far, I have argued that both case and discourse markers are clitic-like in nature; discourse markers tend to follow case markers if both appear with a nominal; and instances of the reverse ordering, i.e. NSTEM-DISC-CASE, are often cases in which the focus marker is morphologically incorporated into a pronoun. A simplified representation of these generalizations is shown in (10). This structure will be refined in the next sections.

(10)



3.3 Syntactic Properties of Nominal Clitics

In this section I turn to various syntactic properties of case and discourse clitics, and draw attention to similarities and differences between the two in terms of position with regard to phrasal boundaries, clausal cooccurrence, and domain restrictions. The clitic analysis in section 3.2 and the syntactic properties in the present section will form the basis for the constructive morphology analysis of discourse markers proposed in section 3.4.

3.3.1 Discourse Marking on NP Constituents

As mentioned already, discourse clitics attach to the right edge of the focused or topicalized constituent. The appearance of discourse clitics on an NP does not require any changes in word order, as shown in (11).

(11) a. alkā=nē mohan=kō**=hī** dēkʰā
Alka=ERG Mohan=ACC=EXCL see-PERF.M.SG
'Alka saw (only) *Mohan.*'

b. alkā=nē**=hī** mohan=kō dēkʰā
Alka=ERG=EXCL Mohan=ACC see-PERF.M.SG
'(Only) *Alka* saw Mohan.'

Unlike agreement affixes on nouns, discourse clitics do not contribute values for attributes within the f-structure of the NP but rather specify the values of attributes in the f-structure of the *outer clause which contains the NP.* They identify their NP, or a part of their NP, as the TOP or FOC of the main clause. In this capacity, they resemble case clitics since they perform a *clause-level* function.

In terms of cliticization positions, Hindi case clitics must be adjoined to the right of the nominal head; this can be seen in (12). (12b) and (12c)

show that case cannot appear on a modifier inside the noun phrase, and (12d) shows that case cannot be multiply iterated in a single noun phrase.

(12) a. in tīn laḍkõ**=kō**
these three boys=DAT
'These three boys'
b.*in tīn**=kō** laḍkõ
these three=DAT boys
c.*in**=kō** tīn laḍkõ
these=DAT three boys
d.*in**=kō** tīn**=kō** laḍkõ**=kō**
these=DAT three=DAT boys=DAT

Discourse clitics, on the other hand, may attach to a wider range of constituents in the NP, as shown in (13).[7]

(13) a. in tīn laḍkõ=kō**=hī** chōṭ lagī
these three boys=DAT=FOC hurt-F.NOM be-applied-to-PERF.F.SG
'(Only) *these three boys* got hurt.'
b. (%) in tīn laḍkõ**=hī**=kō chōṭ lagī
'(Only) these three *boys* got hurt.'
c. in tīn**=hī** laḍkõ=kō chōṭ lagī
'(Only) these *three* boys got hurt.'
d. in**hĩ** tīn laḍkõ=kō chōṭ lagī
'(Only) *these* three boys got hurt.'

(13b) and(13c) contrast with (12b) and (12c) in allowing the focus marker to appear on modifiers. Note that (13d) involves focus marking which is morphologically incorporated into the demonstrative. An advantage of the constructive analysis, which I will describe shortly, is that the morphological rather than syntactic appearance of *hī* in (13d) does *not* affect the establishment of clausal focus.

Finally, although a wider range of positions is possible for the discourse markers, they cannot be instantiated more than once in the NP, as seen in (14).

[7]Note that (13b) is subject to dialectal variation. McGregor (1995) cites a restriction on the positioning of 'emphatic particles' (*hī*) before case markers, but he specifically observes that this restriction is not necessarily adhered to strictly by all speakers. Furthermore, while *hī* shows some speaker variation in the permissibility of the order in (13b), *bʰī* and *to* are more clearly restricted to the outer position in the NP. Koul (1990) offers the following example as ungrammatical:

(i) *ghar=bʰī=mẽ garmī hai
house=FOC=LOC heat be-PRES.SG
'It's even hot in the house.'

(14) # in**hĩ** tīn**=hī** laḍkõ=kō**=hī**
these=FOC three=FOC boys=DAT=FOC
'These three boys'

This restriction on multiple discourse marking of a constituent resembles the case restriction in (12d). I assume for now that the cooccurrence restriction derives from a semantic incompatibility, as discussed later in section 3.5, rather than a structural restriction.

3.3.2 Clause-level Discourse Function Identification

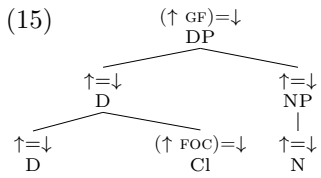
Even when the focus marker occurs in an NP-internal position, as in (13b–d), *the whole NP* is identified as clausal focus in terms of syntactic behavior. Certain word order and syntactic focus phenomena support this generalization.

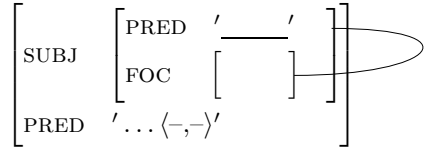
Multiple Foci

One indication of this syntactic identification of the NP as focus can be found in cases of multiple foci. There is a restriction on having two morphologically focused arguments in the same clause in Hindi unless the speaker resorts to very marked intonation in unusual contexts.[8] This cooccurrence restriction implies that the two uses of *hī* are identifying two different values for a single focus function in a clause, resulting in a violation of the principle of Coherence.

However, if a focus marker is *within* an NP, a regular (outside-in) function such as (↑ FOC) = ↓ would not rule out such a cooccurrence. For example, if a modifier inside an NP has a clitic with the annotation (↑ FOC) = ↓, focus would simply map as an NP-internal attribute, as the simplified f-structure in (15) shows. Consequently, if two focus markers appear within two different NPs, each NP would simply have a focus attribute inside it and no clause level clash would be registered.[9]

(15)





The examples in (16) show that NP-internal discourse marking must in fact percolate up to the clausal f-structure. In these examples, the

[8] A more refined representation of scalar discourse prominence would eventually be necessary to permit a precise generalization of cooccurrence restrictions.

[9] For reasons of consistency, I generally refer to arguments as NPs in this paper, even when the referent is sometimes a DP or a KP.

discourse markers occur on specifiers within NPs to show that in spite of being embedded inside NPs they are 'visible' at the clause level and can clash with a second use of *hī*.

(16) a. [us=kē**=hī** jūtē] [mērē kamrē=mẽ] t^{h}ē
he=POSS.PL=FOC shoes my room=LOC be-PST.M.PL
'*His* shoes were in my room.'

b. [us-kē jūtē] [mērē**=hī** kamrē=mẽ] t^{h}ē
he=POSS.PL shoes my=FOC room=LOC be-PST.M.PL
'His shoes were in *my* room.'

c. # [us-kē**=hī** jūtē] [mērē**=hī** kamrē=mẽ] t^{h}ē
he=POSS.PL=FOC shoes my=FOC room =LOC be-PST.M.PL
'*His* shoes were in *my* room.'

In (16a), *hī* marks the possessive modifier of the subject and in (16b) it marks the possessive modifier of the locative. In (16c), despite the fact that the two discourse clitics are structurally within NPs, a clausal cooccurrence is registered, resulting in an infelicitous sentence.

The general classification of *hī* and *b*^{h}*ī* as types of focus and *to* as a type of topic predicts further that the former two cannot occur multiply but they may cooccur with *to*.

(17) [us-kē**=tō** jūtē] [mērē**=hī** kamrē=mẽ] t^{h}ē
he=POSS.PL=TOP shoes my=FOC room =LOC be-PST.M.PL
'His_{top} shoes were in my_{foc} room.'

(17) supports this prediction, showing that a topic function and a focus function can legitimately cooccur. This contrast is a further indication that the clausal f-structure is sensitive to NP-internal discourse markers.

Preverbal Focus Position

Aside from allowing clitics to mark discourse functions, Hindi is also a discourse-configurational language in that it associates several distinct clause positions with specific discourse functions (É. Kiss 1995). The clause-level f-structure identification of focused NPs through clitics can therefore also be verified by examining the interaction of clitic marking with the grammaticalized focus *position*, which in Hindi is the preverbal position (Butt and King 1996, Kidwai 1999). When a part of an NP is focused, the entire NP may occupy this focus position. In (18a), the NP containing the focus marker is in situ. Note that *hī* is not adjoined to the entire NP; rather, it is NP-internal and its semantic scope is restricted to the demonstrative 'these' within the NP. If an NP-internal focus marker *hī* of this type did not percolate upward and mark its entire containing NP as clausal focus, then a clash in focus values would be predicted for

(18b), where the entire NP occupies the preverbal focus position. The predicted clash would be between the demonstrative 'these' (marked as focus by *hī*) and the entire NP (marked as focus by position). However, this clash does not occur, and (18b) is equivalent to (18a).

(18) a. Canonical order:
mai=nē [in**hī̃** tīn laḍkõ=kō] kamrē-mẽ
I=ERG these=FOC three boys=DAT room=LOC
bʰējā
send-PERF.M.SG
'I sent [*these* three boys] to the room.'

b. Focused NP in preverbal position:
mai=nē kamrē-mẽ [in**hī̃** tīn laḍkõ=kō]
I=ERG room=LOC these=FOC three boys=DAT
bʰējā
send-PERF.M.SG
'I sent [*these* three boys] to the room.'

This provides further evidence that the preverbal position and the focus marker *hī* both attribute the value of *syntactic* focus to a whole NP. This syntactic focus entity is distinct from the precise semantic scope of the focus marker, which extends only over a subpart of the NP, namely the demonstrative.[10]

Focus Domain

Finally, it is important to establish the syntactic domain of focus in Hindi. In other words, what is the limit beyond which cooccurrences are permissible? Based on the contrast in (19), I take the finite clause to be the domain within which restrictions on multiple foci must hold.

(19) a. # rām=nē**=hī** anu=kō**=hī** bulāyā
Rām=ERG=FOC Anu=ACC=FOC call-PERF.M.SG
'*Ram* called *Anu*.'

b. rām=nē**=hī** anu=kō bolā
Rām=ERG=FOC Anu=ACC told
[ki vah director=sē**=hī** bāt karē]
that she director=INSTR=FOC talk do-SUBJUNCTIVE
'*Ram* told Anu that she should talk to the *director*.'

(19a) is infelicitous due to the occurrence of two focus values within one finite clause. This contrasts with (19b), which contains an embedded

[10]See Mohanan and Mohanan (1999) for a discussion of rather different data on focus marking in Malayalam, which also results in a disjunction between semantic and syntactic representations.

finite clause with focus. Thus, the cooccurrence restriction illustrated in (16c) is limited to the finite clause boundary.

3.4 Parallel Analysis of Discourse and Case Clitics

This section provides an analysis of the discourse clitics using the mechanism of constructive morphology to account for the characteristics presented in sections 3.2 and 3.3.

3.4.1 Constructive Case and Discourse Clitics

A regular annotation for identifying the grammatical function of an NP in a c-structure, for instance (↑ SUBJ) = ↓, defines a path from the clausal f-structure down to the value of its SUBJ attribute. (See Nordlinger (1998) and Bresnan (2001) for a more detailed discussion).

In Nordlinger's use of constructive morphology for case, however, case-markers themselves constructively identify the grammatical relations of arguments to the verb. When a case clitic bears a constructive specification, it contributes information about the higher f-structure within which it is contained, via an inside-out (IO) function application.

For example, if a case marker bears the functional description (SUBJ ↑), the whole expression (SUBJ ↑) represents an attribute-value pair which exists in the higher f-structure. The ↑ indicates that the nominal itself is the value of a SUBJ attribute in a *higher* f-structure, so that the expression (SUBJ ↑) states that 'there is a SUBJ function in the outer clause whose value is this NP'. The annotation thus defines a path outward, from the lexical item to the clausal f-structure.

Some of the features of Hindi grammar are in keeping with Nordlinger's original arguments in favor of a constructive approach to case. Hindi is a discourse configurational language and allows considerable freedom in argument positioning; it shows little evidence of configurationally licensed grammatical functions.

Furthermore, mood, aspect, and semantic information can be contributed by the presence of certain case markers. For example, the dative marker *kō* can imply specificity and the ergative marker *nē* has been argued to indicate conscious choice (Mohanan 1994:72) on the part of the subject.

(20) a. lakshmī zōr=sē cʰilāyī
Lakshmi-NOM force=ABL yell-PERF.F.SG
'Lakshmi yelled loudly. (non-volitional)'

b. lakshmī=nē zōr=sē cʰilāyā
Lakshmi=ERG force=ABL yell-PERF.M.SG
'Lakshmi yelled loudly. (volitional)'

In (20), the only distinction in interpretation between the two sentences is in whether the action was deliberate on the part of the subject. The alternation in case marking in such examples has generally been taken to be the locus of volitionality distinctions, rather than the alternation in agreement. Since agreement in Hindi is with the highest nominative argument, the absence of a case marker on the subject in (20a) results in gender agreement with the subject; the verb in (20b) exhibits default masculine agreement due to the absence of a nominative argument.

Annotations on case clitics have therefore been argued to contribute both syntactic and semantic information to the clause level (Mohanan 1994, Butt and King 2002, and Lee 1999). This assumption is in keeping with Nordlinger's (1998:74) discussion of encoding semantic restrictions within the case marker.

Most importantly for the discussion here, a constructive view allows us to unify under a single analysis the shared patterns of "bottom up" function identification found in Hindi clitic behavior.

The generalization in (21) shows how case and discourse clitics on nominals can employ similar constructive functions to indicate the clausal function(s) of their NP hosts. In (22), the lexical entries for the ergative marker *nē* and the focus marker *hī* are given as examples of each type of clitic.[11]

(21)

Cl_{case}	Cl_{disc}
(GF ↑)	(DF ↑)

(22) a. *nē* (SUBJ ↑) (↑ CASE) = ERG

b. *hī* (FOC ↑)

Case clitics thus identify the grammatical function of the NP, while discourse clitics identify which of a set of possible discourse functions the NP is associated with.

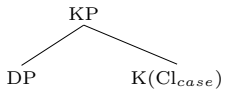
[11] These clitics appear within NP nodes which are annotated with (↑ GF) = ↓. I assume that GF in this annotation refers to the broad set of grammatical functions, including argument, discourse, and ADJ functions. As discussed by Nordlinger (1998:67), multiple case marking can be ruled out by general well-formedness principles (Bresnan 2001). In the extension here, it is, in fact, a desirable feature for the annotation to permit identification of the NP as having both an argument function *and* a discourse function. Since function-argument uniqueness will rule out the assignment of incompatible argument functions to a single NP, the single annotation (↑ GF) = ↓ need not be restricted to allowing an NP to be associated with only a single GF.

3.4.2 Structural Positions of Case and Discourse Clitics

I have already indicated some important differences between the two types of clitics. Although they share similar lexical properties, they have distinct syntactic positions.

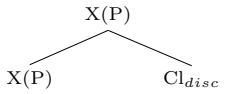
As (12) showed, case markers must cliticize only to the right edge of the NP. I follow Butt and King (2002) in assuming the structure for case given below, in which the case clitic serves as the head of the functional projection KP. On the analysis here, DP is the sister of K and specifier functions are within DP.[12]

(23)



Discourse markers, on the other hand, may adjoin to any part of the NP and in fact are not even restricted to nominal elements. To cover this range, I assume the simple structure in (24) for now:

(24)



The important difference here is that case clitics head their own functional projection while discourse clitics merely adjoin under their sister's category. This accounts for the distributional differences between the two types of clitics.[13]

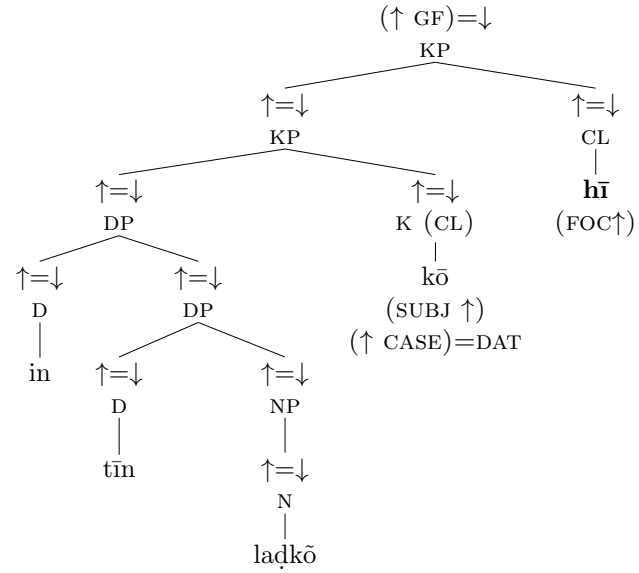
3.4.3 Constructing Discourse Functions from within the NP

The identification of grammatical functions via inside-out function specifications in the lexical entries of case clitics was indicated in section 3.4.1 and is discussed in detail in Nordlinger (1998), Bresnan (2001), Butt and King (2002), Lee (1999), among others. Under the present analysis, discourse functions are identified through a similar mechanism. The set of examples in (25) correspond to the focus-bearing sentences that were introduced in (13).

[12]The assumption that case heads its own functional projection is not crucial in the analysis presented here. It is one of several possible structural descriptions of case, but may be supported by certain head-like phenomena of case crosslinguistically.

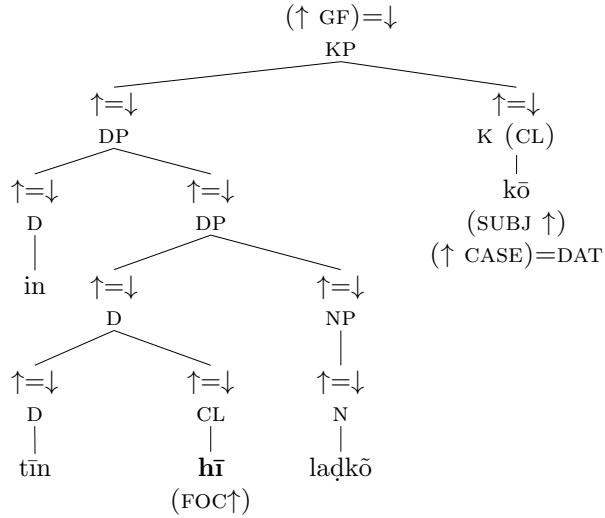
[13]Another difference between the two types should be noted in passing. Constructive case clitics will ensure that their NP is identified with an argument required by the verb's argument structure (Nordlinger 1998:68). However, discourse functions are not licensed in this way. Thus, one interpretation of the analysis for discourse markers here is that their f-description (DF ↑) actually requires a minimal f-structure containing that DF attribute.

(25) a. in tīn laḍkõ=kō**=hī**
these three boys=DAT=EXCL
'(Only) *these three boys...* '

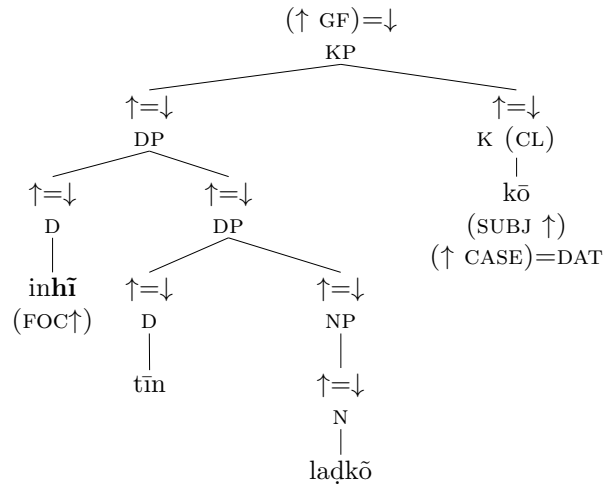


$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{CASE} & \text{DAT} \\ \text{PERS} & 3 \\ \text{NUM} & \text{PL} \\ \text{COUNT} & 3 \\ \text{DEIX} & \text{PROX} \\ \text{PRED} & \text{'boys'} \end{bmatrix} \\ \text{FOC} & \begin{bmatrix} \quad \end{bmatrix} \\ \text{PRED} & \text{'}\ldots\langle -,- \rangle\text{'} \end{bmatrix}$$

b. in tīn**=hī** laḍkõ=kō
these three=EXCL boys=DAT
'(Only) these *three* boys…'



c. in**hĩ** tīn laḍkõ=kō
these-EXCL three boys=DAT
'(Only) *these* three boys…'



These examples show that in spite of the repositioning of *hī* within an NP, the f-structure of the NP in each case is 'flattened' in an identical manner due to the constructive function mapping of the FOC attribute.[14]

In (25a), the focus marker is on the right edge of the whole NP; in (25b) it is adjoined to the numeral and in (25c) it is incorporated into the demonstrative pronoun. (25c) shows that the incorporated focus forms discussed in section 3.2.3 are equally accounted for by this analysis.

In each case, the NP is established as clausal focus in the f-structure because (FOC ↑) identifies the entire NP f-structure as the value of the outer f-structure's focus function. Consequently, all three c-structures share the single f-structure in (25a). In section 3.3.2, the clause-level function identification property of these clitics was discussed; the fact that a single f-structure results from several different c-structures in the example above reflects this identification of *syntactic* focus by the discourse marker. The f-structure does not reflect the more fine-grained semantic scoping differences among the different c-structures, only the identification of primary grammatical and discourse functions.

3.4.4 Multiple Embedding

The examples in (25) describe structures in which functional projections carry a focus marking. For these situations, the mapping of the constructive function is straightforward, as a direct path of ↑=↓ allows access to the outer clausal f-structure. Multiply embedded constituents do not permit a direct mapping of the constructive function to the clause level.

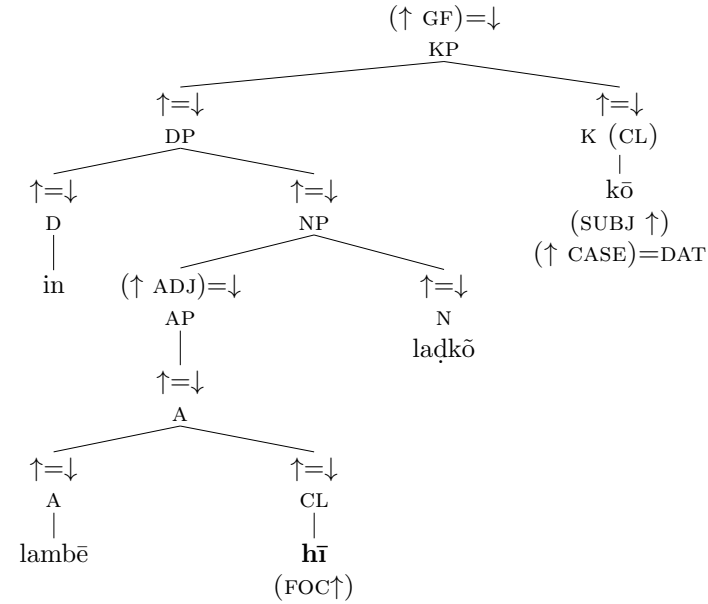
It is important to first note that several speakers considered focus-marking on adjectives much less acceptable than focus-marking on determiners like possessives.[15] In the absence of a more comprehensive corpus study, the solution given here is somewhat tentative and subject to dialectal restrictions. However, it is an intuitive extension and can in fact accommodate the observed speaker variation.

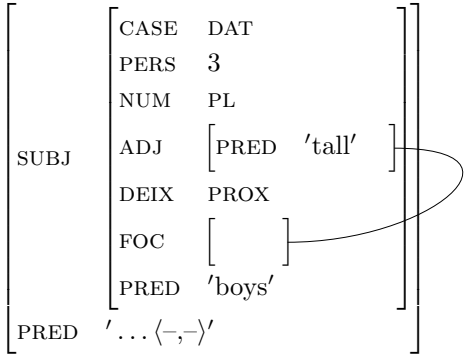
Assuming that these cases are possible for some speakers, the problem that arises for analysing this variety is that an intervening node, annotated (↑ ADJ)=↓, prevents a direct identification of focus at the clause level. The inside-out function path only leads to the next outer f-structure. As a result, the ADJ will be identified as focus within the NP, as shown in the 'incorrect' f-structure in (26).

[14] Two DP rules are assumed in order to allow for more than one determiner: DP → D DP and DP → D NP. This is not a crucial assumption in the analysis; multiple specification of a single DP is a possible alternative, as is the projection of a Number Phrase (NumP) above a DP.

[15] In such cases, these speakers generally claimed a preference for an NP-final clitic with intonational marking of the adjective.

(26) in lambē=hī laḍkõ=kō
these tall=EXCL boys=DAT
'Only these *tall* boys. . . '





This example does not identify the NP as the focus of the clause because the intervening ADJ f-structure maps focus to the outer NP f-structure only. However, as (27) below indicates, adjectives are no different than other NP-internal sites in terms of clausal focus identification.

(27) a. [us-kē purānē**=hī** jūtē] [mērē kamrē=mẽ] tʰē
his old=FOC shoes my room=LOC be-PST.M.PL
'His *old* shoes were in my room.'

b. # [us-kē purānē**=hī** jūtē] [mērē**=hī** kamrē=mẽ] t^{h}ē
his old=FOC shoes my=FOC room=LOC be-PST.M.PL
'His *old* shoes were in *my* room.'

For speakers who allow (27a), (27b) is bad due to the identification of two focus values. This is the same effect as in (16c), suggesting that focus markers on adjectives must be equally visible at the clause level.

In addition to adjectives, certain speakers' judgements indicate that focus in embedded *infinitives* also percolates to the finite clause level, disallowing other instantiations of focus marking in the entire clause. This phenomenon is shown in (28), where the embedded instance of *hī* clashes with a second use of the morpheme in the main clause.

(28) (%) # rām=nē**=hī** anū=kō
Rām=ERG=FOC Anu=ACC
[director=sē**=hī** bāt karnē=kō] bōlā
director=INSTR=FOC talk do-INFIN=ACC told
'*Ram* told Anu to talk to the *director*.'

Both of these embedded contexts — adjectival modifiers and infinitival complements — are problematic for a (FOC ↑) annotation because a second intervening node is annotated (↑ GF) = ↓. This node blocks percolation of the focus to the top clausal f-structure of the finite clause.

I account for these provisionally with a simple extension of the analysis given so far. The (DF ↑) annotation can be substituted with the inside-out functional uncertainty equation in (29) (Kaplan and Zaenen 1995, Dalrymple 1993, Bresnan 2001).

(29) ((GF* ↑) DF)=↑

This description states that the end value of an unspecified string of attributes is associated with a discourse function. Because of the uncertainty of the string, this can accommodate *both* NP-internal ADJ functions as well as embedded infinitives, in addition to the simpler cases.

Furthermore, the speaker variation in allowing or disallowing these multiply embedded foci can be accommodated with a simple dialectal distinction in the lexical entries of discourse clitics:

(30) a. Dialects which allow discourse marking at multiple levels of embedding: ((GF^{+} ↑) DF)=↑

b. Dialects which allow discourse marking only within one level of embedding: ((GF ↑) DF)=↑

The description in (30a) requires one or more attributes in the GF string. The description in (30b), on the other hand, is equivalent to the original proposal of (FOC ↑) and allows only one level in the functional

chain.[16] An added advantage of this representation is that it can be extended beyond the nominal domain. As mentioned in the presentation of the initial data, discourse markers can also appear on non-nominal elements in a clause, particularly verbal morphemes. In such cases, the GF in the annotations suggested in (30) may itself be optional, allowing the annotation to reduce to a simple statement of (↑ DF)=↑.[17]

The above extensions allow deeper embedding of the constructive function. However, this flexibility calls for a consideration of the outer limits of the functional chain as well. In section 3.3.2 we established that the finite clause is the domain of focus in Hindi. In order to ensure that the outer limit of the focus domain is the finite clause, we need a second functional description in the lexical entries of all discourse clitics stating the existential constraint in (31):

(31) ((FOC ↑) TENSE)

This is in keeping with Nordlinger's (1998:122) use of clause-level information specification. Synthesizing the latest two additions, the functional descriptions in (30) associate a DF with a GF, and the addition of (31) in the lexical entry states that the association must be such that the focus attribute is in an f-structure which also bears a tense attribute. This takes care of attribute strings which would otherwise stop short of the clausal f-structure in their mapping.

A prediction of this domain restriction is that one should not find stranded instances of discourse marked NPs. The example in (32) shows that this appears to be the case:

(32) a. billī=kō kaun kʰilātā hai?
cat=ACC who-NOM feed-PROG.M.SG do
'Who feeds the cat?'

b. [i.] rām
Ram-NOM
'Ram.'
[ii.] *rām=hī
Ram-NOM=FOC
'*Ram.*'

[16] The expanded expression in (30b) simply states that this f-structure is the value of a focus attribute as well as the value of some GF. The simpler inside-out function application lacks the additional GF requirement but this can be ensured by Extended Coherence, whereby any discourse function must be associated with a GF.

[17] At this point, the analysis would encounter the problem discussed by King (1997), whereby the focus mapping automatically subsumes the entire clause as the value of FOC rather than restricting focus to the relevant subparts of a verbal f-structure.

[iii.] rām=hī kʰilātā hai
Ram-NOM=FOC feed-PROG.M.SG do
'*Ram* feeds (it).'

In response to "Who feeds the cat?" in (32a), just saying *Ram* is perfectly acceptable. However, if *hī* is adjoined to *Ram*, then *Ram=hī* cannot be a complete utterance; it requires a tensed verb as in (32b(iii)).

To summarize, this section has shown how discourse clitics may mark various parts of an NP and still identify the whole NP as the focus of the clause. Discourse clitics exploit constructive functions in a manner similar to case, and in some dialects appear to be restricted to one level of embedding. In those dialects that allow further embedding within the NP, functional uncertainty and the requirement that focus percolate to a tense-bearing f-structure ensures the appropriate mapping.

3.5 Semantic Interpretation at S-structure

The discussion so far has specifically addressed syntactic functions. However, if we return to the examples in (13), repeated below in (33), we can see from the English translations that semantic scope differences actually emerge when the clitic is repositioned within the NP. Such NP-internal scope distinctions based on the position of discourse markers are discussed specifically with regard to Hindi in Verma (1971:85) and can be observed in many other languages as well.

(33) a. in tīn laḍkõ=kō**=hī** chōṭ lagī
these three boys=DAT=FOC hurt-F be-applied-to-PERF.F.SG
'(Only) *these three boys* got hurt.'

b. (%) in tīn laḍkõ**=hī**=kō chōṭ lagī
'(Only) these three *boys* got hurt.'

c. in tīn**=hī** laḍkõ=kō chōṭ lagī
'(Only) these *three* boys got hurt.'

d. in**hĩ** tīn laḍkõ=kō chōṭ lagī
'(Only) *these* three boys got hurt.'

The constructive mechanism does not account for these scope differences. Precisely because of its outward mapping, the constructive function overgeneralizes focus and does not represent these scope and meaning differences directly at the f-structure. The constructive mapping only serves to identify the value of the syntactic discourse function of focus.

This type of distinction between syntactic behavior and semantic interpretation can be seen in various other crosslinguistic phenomena. One possible example is wh-feature percolation:[18]

[18] I am grateful to Peter Sells for suggesting this example.

(34) [In return for how much money] will you let us go free?

In (34), the wh-expression is contained *within* the constituent appearing in the clause-initial position (McCawley 1988:477). There is a distinction between the semantic interpretation of the wh-subconstituent and the syntactic behavior of the entire, containing constituent. An equivalent case of focus feature percolation was presented in (18c), which showed that the entire focus-containing NP can appear in the syntactic preverbal focus position in Hindi.

Another instance of subtle semantic distinctions that are not accounted for by the syntactic functional specification of FOC can be seen in the reordering of focus and instrumental case clitics. Noguchi and Harada (1990) discuss a similar phenomenon in Japanese, in which the reordering of *dake* ('only') and *de* ('by') results in distinct semantic interpretations. They describe these as **absolute** (*de-dake*) and **minimal** (*dake-de*) restriction readings. I adopt this basic terminology for the examples in (35). From the meaning distinctions in the English translations in (35), we can see that (35a) implies an absolute necessity restriction, while (35b) means that a bicycle is minimally sufficient (but not absolutely necessary).

(35) a. mai saikal=sē**=hī** pahũch saktī
I=NOM.SG bicycle=LOC=FOC reach can-PROG.F.SG
hũ
be-PRES.SG
'I can get there only with a bike.' (absolute necessity)

b. mai saikal**=hī**=sē pahũch saktī
I=NOM.SG bicycle=FOC=LOC reach can-PROG.F.SG
hũ
be-PRES.SG
'I can get there with only a bike.' (minimal sufficiency)

Reading these fine semantic relations directly off the f-structure is inadequate due to the 'flattening' of the NP. Andrews and Manning (1999:11) discuss how the flattening of f-structure is necessary for certain syntactic associations, but that it is often an insufficient guide for semantic interpretation. Their examples include 'concentrically scoped' modifiers and complex predicates, and they argue against the mediation of semantics by the f-structure. In their 'subset' view, where projections represent groupings of information, certain attributes may be shared while others are restricted. The semantic distinctions arising in the data presented here call for a similar treatment.

I do not provide an account of the semantics of these clitics here;[19] however, I argue that all aspects of the behavior of focus markers in Hindi cannot be accounted for within a single level of representation, whether at f- or s-structure. For the present data, a comprehensive analysis must distinguish the mapping of syntactic functions proposed earlier from the fine-grained semantics alluded to in this section.[20] In other words, in the syntax the entire NP is constructively identified as clausal focus, regardless of position of discourse clitics within NP; however, semantically, meaning differences emerge based on clitic adjunction.

3.6 Conclusions

This paper has presented a preliminary account of the status of discourse clitics in Hindi as being parallel in many ways to that of case clitics. While further research is still necessary for a more complete account of the intricacies of clitic behavior, I have argued in favor of several generalizations. Under the analysis presented here, case and discourse clitics share similar constructive annotations, through which they are able to identify the clause-level syntactic (grammatical or discourse) function of their host NP. This enables us to account for the apparent restrictions on multiple foci, particularly in examples where clause-internal f-structures appear to be 'transparent' and allow embedded focus markers to be visible at the clause level. The more restricted distribution of case clitics is accounted for by differences in the structural cliticization possibilities of case and discourse clitics. The dialectal variation found in the degree of embeddedness allowed for discourse morphemes, as well as their restriction to the finite clause domain, can also be accounted for by inside-out function specifications. Like case clitics, discourse clitics additionally contribute semantic information which can and should be mapped independently from their NP's syntactic function. While scope distinctions are more fine-grained and need to be independent of f-structure, syntactic discourse function identification is established at f-structure by constructive morphology.

[19] Another approach to retaining the semantic distinctions of discourse marking would be to annotate the c-structure such that it maps to a highly embedded f-structure. There are several disadvantages to this approach: (a) it builds into the f-structure information which seems to belong in a distinct level of representation; (b) multiple annotations would be required at each detailed projection within the NP to allow the constructive function to reach the clause level; (c) the syntactic behavior of the entire NP as the grammaticized discourse function would not be predicted.

[20] This positional sensitivity of semantic interpretation may ultimately also account for other scoping interactions of focus with semantic information such as definiteness, volitionality, and negation.

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4

Coordination and Asymmetric Agreement in Welsh

Louisa Sadler

4.1 Introduction

We explore a set of morphosyntactic feature asymmetries in coordinate structures in Welsh in the light of the theories of agreement and coordination in LFG, and draw out some consequences for the theory of agreement in LFG.[1] In classic LFG, a very simple view is taken of agreement phenomena such as person, number and gender agreement between finite verbs and their subjects, NP-internal concordial agreement between determiners, adjectives and nominals in number, gender and case, and similar phenomena. Agreement is generally modelled by means of constraints stated over the grammatical features PERS, NUM, GEND, CASE of the controller argument: a unitary, f-structure based view is taken of agreement and concord. It is well known that agreement with coordinate structures may require some computation of controller agreement features and Dalrymple and Kaplan (2000) show how the LFG formalism may be straightforwardly extended to express such feature resolution principles, again treating agreement at f-structure. In this paper the main focus is on a different pattern of agreement under coordination,

[1] Versions of this paper have been presented at the 1999 LFG conference, the 2001 NWCL conference on Coordination, to departmental seminars at SOAS and the University of Edinburgh, at a meeting of the ESRC-funded FRIM morphology workshop and at the Gregynog Welsh Syntax Seminar. I am very grateful to Bob Borsley, Andrew Spencer and audiences at those events for feedback and helpful comments, and in particular to two anonymous reviewers for extremely helpful comments on the current version. All remaining errors are my own.

Nominals: Inside and Out.
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that of single conjunct agreement (SCA), and we consider the consequences of this pattern for the treatment of Welsh coordination and agreement in LFG. A crucial fact about the Welsh data is the availability under coordination of both resolved and unresolved agreement features as controllers of grammatical processes. We argue that these data suggest the need for a more sophisticated view of agreement and propose a separation between AGR features and INDEXical agreement features. We conclude with some discussion of the nature of the AGR features.

The paper is organised as follows. Section 4.2 introduces various agreement phenomena in Welsh and their co-occurrence with coordinate structures as agreement controllers, exemplifying head agreement patterns (verb-subject agreement, agreement of prepositional heads with their arguments and agreement of nominal heads with possessor arguments), pronominal anaphora and the agreement of predicate nominals. The purpose of section 4.3 is to place the Welsh coordinate structure agreement data in the wider crosslinguistic context by showing that head agreement with just one conjunct is quite widely attested, although the factors determining the occurrence and distribution of asymmetric agreement are not the same in all these cases. We do not claim that the proposals made for Welsh in this paper extend to all these cases of single conjunct agreement, though it is likely that some of these cases are amenable to a similar treatment. Section 4.4 reviews the theories of coordination and agreement in LFG. In section 4.5 we consider the alternative of treating Welsh coordinate structures as head-adjunct structures at f-structure and present evidence of various sorts that supports the standard LFG set-based analysis over alternatives. Finally, section 4.6 explores several approaches to the agreement puzzle and argues in favour of positing an additional set of agreement features for the features of the first conjunct. Section 4.7 then concludes.

4.2 Welsh Agreement Patterns

Welsh is a rigidly head initial language with a relatively rich agreement system in which arguments control person and number agreement on finite verbal heads, and person, number and gender agreement on non-finite verbs, nominal and prepositional heads.[2] Only pronominal arguments are agreement controllers, however: heads do not agree with their non-pronominal arguments, but appear in the default 3s form.[3]

[2]We do not exemplify object agreement on non-finite verb forms here, but it is parallel to the cases we do discuss, and identical in form to possessor agreement.

[3]That is, there is no agreement marker associated with non-finite verbs and nominal and prepositional heads in this case, and the finite verb appears in the default or unmarked third singular form with all non-pronominal subjects.

Thus finite verbs agree with pronominal subjects in person and number, and take the unmarked third person singular form with all non-pronominal subjects, as illustrated in the examples (1)–(2) below.

(1) Daeth y dynion.
Came-3S the men
'The men came.'

(2) Daethan (nhw).
came-3PL (they)
'They came.'

As (2) shows, a form inflected for the person, number and (sometimes) gender of a (pronominal) argument, such as *darllenasant* 'read-3PL', *arnoch* 'on-2PL' or *dy dŷ* '2S house' is in fact ambiguous between a pure *agreement* and a *pronominal incorporating* interpretation. That is, agreement with a pronominal argument is obligatory in Welsh and the pronominal argument itself is optional. This last statement finesses the situation very slightly, and in a manner which is orthogonal to the present discussion — in fact, finite verbs do not obligatorily agree with their pronominal objects, although they may take agreeing/incorporating forms in the presence of a set of lexically specified presentential particles.

Under coordination, finite verbal heads exhibit an 'asymmetrical' agreement pattern, agreeing with the first conjunct of a coordinate subject, so long as it is pronominal. The examples below illustrate this. In (3a) and (3b) the verb appears in the 'unmarked' 3rd singular form with a plural coordinate subject where the first conjunct is non-pronominal, while in (3c) it agrees with the pronominal first conjunct. Precisely the same pattern is illustrated in (4a) and (4b).[4]

(3) a. Daeth Siôn ac Efyn.
came-3S Siôn and Efyn
'Siôn and Efyn came.'

b. Daeth Siôn a minnau.
came-3S Siôn and 1S
'Siôn and I came.'

c. Daethost ti a minnau/Siôn.
came-2S 2S and 1S/Siôn
'You and I/Siôn came.'

[4]The form *minnau* (with variants *innau*, and *finnau*) is an extended form of the pronoun used (in place of a 'simple' pronoun) to provide contrastive, balancing or emphatic effect. The 'simple' first person singular pronoun is *i* (with variants *fi* and *mi*): of these, *i* and *fi* are often interchangeable, but *fi* is always selected after a conjunction. The distribution of *mi* is very restricted. The form *thitau* in (7b) is an extended form of the 2S pronominal.

(4) a. Roedd Mair a fi i briodi.
was-3S Mair and 1S to marry
'Mair and I were to marry.'
b. Roeddwn i a Mair i briodi.
was-1S 1S and Mair to marry
'I and Mair were to marry.'

An identical agreement pattern shows up in nominal structures containing possessor phrases. In Welsh, nominal heads take a proclitic agreeing with pronominal (but not non-pronominal) possessors (the canonical position for possessors is post-head). This is illustrated in (5). If the possessor phrase is a coordinate structure, the nominal head agrees with the first conjunct, just in case it is pronominal (6).[5]

(5) a. brawd Siôn
brother Siôn
'Siôn's brother'
b. dy frawd (ti)
2S brother 2S
'your brother'

(6) a. brawd Siôn a Mair
brother Siôn and Mair
'Siôn and Mair's brother'
b. dy frawd ti a Mair
2S brother 2S and Mair
'your and Mair's brother'

The majority of prepositions in the language have a full inflectional paradigm, and inflect to agree with their pronominal (but not non-pronominal) objects. Again, where there is a coordinate argument, the preposition inflects to agree with the first (closest) argument, if it is pronominal, as illustrated below for the inflecting preposition *am* 'about'.

(7) a. Roedd Wyn yn siarad amdanat ti a Siôn.
was-3S Wyn PROG speak about-2S 2S and Siôn
'Wyn was talking about you and Siôn.'
b. Roedd Wyn yn siarad am Siôn a thithau.
was-3S Wyn PROG speak about Siôn and 2S
'Wyn was talking about Siôn and you.'
c. Roedd Wyn yn siarad amdanom ni a nhw.
was-3S Wyn PROG speak about-1PL 1PL and 3PL
'Wyn was talking about us and them.'

[5]The alternative reading of (6b) "your brother and Mair" is not of concern here.

Recalling our earlier remark about 'agreement morphology' alternating between an agreement reading and a pronominal incorporation, with the 'doubling pronoun' being optional, we should note that there is one significant difference between the agreement pattern found in coordinate structures and that found with simple arguments. With coordinate structures, the pronominal argument must always be independently expressed, despite the presence of agreement morphology on the head; that is, the head inflection cannot have the status of an incorporated pronominal.

To summarise, the data above shows that in Welsh, an agreeing head is subject to a single conjunct agreement pattern when the controller is a coordinate structure. However other agreement processes in Welsh access the resolved features of a coordinate structure. For example, if a coordinate structure is the antecedent for a pronominal, the pronoun agrees with the resolved features of the antecedent (PT indicates a particle):

(8) a. Fe a fi, aethon ni ddim yno.
him and me, went-1PL we not there
'Him and me, we did not go there.'

b. Pan glywodd Math a Gwydion yr hanes, roedden
when heard-3s Math and Gwydion the story, were-3PL
nhw'n drist iawn.
they-PT sad very
'When Math and Gwydion heard the story, they were very sad.'

The personal passive in Welsh is expressed analytically by means of the verb *cael* as a passive auxiliary combined with the main verb in non-finite (verb-noun) form. The non-finite main verb is obligatorily preceded by an anaphoric pronominal form agreeing with the subject. Crucially, it is the resolved features of a coordinate subject which are relevant:

(9) Ni chaffodd e a'i milwyr eu lladd yma.
NEG got-3S he and-3SM soldiers 3PL kill there
'He and his soldiers were not killed there.'

Likewise, predicate nominals agree with the resolved features of a coordinate structure. In example (10) below, the predicate *ysgrifenwyr* ('writers', singular *ysgrifennwr*) is plural, in agreement with the resolved NUM feature of the coordinate subject.

(10) Roeddwn i ac Emyr yn ysgrifenwyr rhagorol.
was-1S 1S and Emyr PT writers excellent
'Emyr and I were excellent writers.'

Reflexive anaphors also agree with the resolved features of a coordinated antecedent:[6]

(11) a. Gwelais i a'm brawd ein hunain.
saw-1S 1S and-1S brother 1PL self
'I and my brother saw ourselves.'

b. Gwelaist ti a'th frawd eich hunain.
saw-2S 2S and-2S brother 2PL self
'You and your brother saw yourselves.'

c. Gwelodd e a'i frawd eu hunain.
saw-3S 3S and-3S brother 3PL self
'He and his brother saw themselves.'

Of course, the coordinate structure may be controller or antecedent for a number of different agreement processes at one and the same time. In the example above, the agreement features of the first conjunct control verbal agreement and the resolved number of the coordinate structure controls predicate nominal agreement. Example (12) shows the combination of single conjunct verbal agreement and resolved features controlling pronominal anaphora:

(12) Dw i a Gwenllian heb gael ein talu.
am-1S 1S and Gwenllian without get 1PL pay
'Gwenllian and I have not been paid.'

4.3 Single Conjunct Agreement

In this section we show that there is robust evidence for the existence of SCA in a range of typologically distinct languages.

Starting with the Celtic languages, a very similar pattern of asymmetrical agreement is found in Irish Gaelic. The following data is taken from McCloskey (1986). The head agreement pattern is similar to that in Welsh: the finite verb agrees with a leftmost (i.e. closest) pronominal within a coordinate subject (13), a preposition with a leftmost pronominal within a coordinate object (14), and a nominal with a leftmost pronominal within a coordinate possessor (15).[7]

[6] I am grateful to Bob Borsley for reminding me of this data.

[7] The general agreement pattern in Irish differs systematically from that in Welsh in one respect however. Whereas in Welsh, as we have seen in (1b) and (5b), agreement morphology and proclitics may be optionally doubled by overt pronominals, in Irish such overt (doubling) pronominals are not possible, although emphatic or contrastive nominal particles may occur in the relevant argument position. In similar fashion, where Welsh *requires* the doubling pronominals under coordination, the emphatic or constrastive particles are *required* under coordination in Irish (while the leftmost pronominal itself is obligatorily absent if the head is marked with full agreement).

(13) Bhíos féin agus Tomás ag caint le chéile.
be(PAST S1) EMPH and Thomas talk(PROG) with each other
'Thomas and I were talking to one another.' (Irish Gaelic)

(14) liom féin agus Eoghan
with(S1) EMPH and Owen
'with me and Owen'

(15) mo ghabháltas féin agus mo mháthar
S1 holding EMPH and my mother
'my own and my mother's holding'

Notice that if the leftmost conjunct is not pronominal the head does not bear agreement features, and as in Welsh, a full pronominal may occur as the non-initial conjunct.

(16) Labhair sé le hEoghan agus mé féin.
spoke he with Owen and me EMPH
'He spoke to Owen and me.'

Though not as common crosslinguistically as resolved agreement under coordination, asymmetrical agreement patterns are found in other languages outside the Celtic family.

While the determinant of subject verb agreement in English is semantic in general, the following contrast suggests that other principles are also at work (see Morgan 1972 and Peterson 1986 for some discussion).

(17) There were two girls and a boy in the room.
There was a boy and two girls in the room.

Morgan notes that English speakers may also use a closest conjunct principle in disjunct agreement (Morgan 1972 cited in Peterson 1986):

(18) (Either) Harry or his parents *is/are coming.
(Either) Harry's parents or his wife ?is/*are coming.
There was (either) a bee or two flies in the room.
There were (either) two flies or a bee in the room.

A crucial observation about the English data, however, and a way in which it differs from the Welsh data, is that once a particular set of feature values has been associated with the coordinate NP as a whole, all agreement processes access these same values:

(19) Either Fred or Bill is shaving himself/*themselves.
Either Fred or Bill are shaving themselves/*himself.
(Peterson 1986:233)

Asymmetries may also be found in the domain of case in coordinate subject NPs in English, where instead of the expected nominative forms of pronouns, we frequently find accusative pronominals as non-initial conjuncts (see (20a)). While accusative case on non-initial conjuncts appears entirely acceptable, many speakers find (20b), in which the nominative case requirement is violated across the board, unacceptable.

(20) a. She and him/he will drive to the movies.
She and I/me took the train.

b. Me and him/Him and me will be going there tomorrow.

Swahili has a variety of strategies for determining the form of noun class agreement morphology on the verb in the presence of a coordinate subject (see Marten 2000 for discussion). These include resolved agreement, that is, using the corresponding plural noun class marker (in the case where the nouns are in the same (singular) noun class), resorting to a default class (either class 8 or class 10) and agreeing with just one conjunct. First conjunct agreement may occur only when the verb precedes the subject and last conjunct agreement may occur only when the subject precedes the verb. Additionally, Marten reports that last conjunct agreement is the more common asymmetric pattern (although it cannot be used with human (class 1) referents, where the corresponding plural class 2 is used). Two single conjunct agreement patterns are illustrated in (21) (for last conjunct agreement) and (22) (for first conjunct agreement) respectively.[8]

(21) Mguu wa meza na kiti ki-mevunjika.
3.leg of table and 7.chair 7-be broken
'The leg of the table and the chair are broken.' (Swahili)
(Marten 2000 from Bokamba 1985)

(22) A-l-kuja Haroub na Naila.
SC1-PAST-come Haroub and Naila
'Haroub and Naila came.' (Marten 2000)

There is also evidence of first conjunct agreement in (various dialects of) Arabic. In Standard Arabic verbs agree in person, number and gender with non-coordinated subjects in SV sentences, but take a third singular (masculine or feminine) form with non-coordinated non-pronominal subjects irrespective of their plurality in VS sentences. Verbs agree with the resolved features of coordinated subjects in SV sentences, but first conjunct agreement patterns are found in VS sentences. Thus the gender

[8] Unlike second or last conjunct agreement, first conjunct agreement is also possible with class 1 human referents.

marking on the verb indicates first conjunct agreement in the following examples (SA = Standard Arabic):

(23) ja:ʔ-at hindun wa zaydun.
came-FEM Hind.FEM and Zayd.MASC
'Hind and Zayd came.' (SA: Fassi Fehri 1988:134)

(24) ja:ʔ-a zaydun was hindun.
came-MASC Zayd.MASC and Hind.FEM
'Zayd and Hind came.' (SA: Fassi Fehri 1988:134)

(25) tuhibbu hiya wa axuuhaa ba'dhahu-maa.
love.3FEM.SG she and brother-her each other
'She and her brother love each other.' (SA: Munn 1999:648)

Other dialects of Arabic such as the Moroccan Arabic (MA) and Lebanese Arabic (LA) discussed by Aoun et al. (1994, 1999) and Munn (1999) differ minimally from SA in also permitting full agreement in VS order (so that 3rd plural subjects may control 3rd plural agreement in VS order). First conjunct agreement is also attested in VS structures in these dialects of Arabic, as evidenced by the following examples (note the contrast between (26) and (27)):

(26) tlaqitu ntuma w ana qəddam l-žamiʕa.
met.2PL you.PL and I in front of the-university
'You and I met in front of the university.' (MA: Munn 1999:650)

(27) ntuma w ana tlaqina.
you.2PL and I met.1PL
'You and I met' (MA: Munn 1999:651)

(28) qrat ʕalya w ʕomar nəfs lə-ktab.
read.3FS alia and Omar same the-book
'Alia and Omar read the same book.' (MA: Aoun et al 1999:675)

As pointed out by Munn (1999), although Brazilian Portuguese (BP) shows conjunct resolution when the subject precedes the verb, it shows first conjunct agreement in VS word order:

(29) As meninas e eu saímos/*saíram.
the girls and I left.1PL/*left.3PL
'The girls and I left.' (BP: Munn 1999:655)

(30) Foram as meninas e eu que compramos as flores
were.3PL the girls and I who bought.1PL the flowers
'It was the girls and I who bought the flowers.' (BP: ibid:655)

(31) Fui eu e as meninas que compramos as flores.
was-1SG I and the girls who bought.1PL the flowers
'It was me and the girls who bought the flowers.' (BP: ibid:655)

This Brazilian Portuguese data shows the same combination of SCA and resolution as the Welsh data. That is, the verb agrees with a single conjunct (in each case, the nearest), but there is clear evidence from anaphoric relations elsewhere in the sentence that the resolved features of the coordinate structure are present (*compramos* is 1PL, as expected if the antecedent is the (resolved) coordinate NP).

A variety of different subject-verb agreement patterns occur with coordinate subjects in the Slavonic languages (Corbett 1983, 1988). For example, in addition to patterns involving feature resolution, agreement with the nearest (normally first) conjunct is also possible in Russian (32), and Czech (33) also has nearest conjunct agreement.

(32) Byla v nej i skromnost', i izjaščestvo,
was-FEM.SG in her and modesty.FEM.SG and elegance.NEUT.SG
i dostoinstvo.
and dignity.NEUT.SG
'She was modest, elegant and dignified.' (Russian)
(Corbett 1988: 26)

(33) Půjdu tam já a ty.
will-go(1SG) there I and you
'I and you will go there.' (Czech) (Corbett 1983:179)

In a survey of agreement patterns, Corbett (1983) reviews data for a range of languages in which one single conjunct controls person, number and gender agreement and observes that nearest conjunct agreement is more common when the predicate precedes the subject than when the subject precedes the predicate. The essentially free word order language Latin provides examples of the latter circumstance:

(34) et ego et Cicero meus flagitabit.
and I and Cicero my will-demand(3SG)
'Both my Cicero and I will demand it.'
(Latin) (Corbett 1983:179 from Gildersleeve and Lodge 1948)

Although less frequent crosslinguistically, agreement may also be controlled by the most distant conjunct (Corbett 1983). This occurs in Latin, in Serbo-Croatian and in the following examples from Slovene:

(35) Groza in strah je prevzela vso
horror(FEM.SG) and fear(MASC.SG) has seized(FEM.SG) the-whole
vas.
village
'Horror and fear have seized the whole village.' (Slovene)
(Corbett 1983:180)

(36) Knjige in peresa so se poražile.
book.FEM.PL and pen.NEUT.PL are selves got dear.FEM.PL
'Books and pens have become more expensive.' (Corbett 1988:26)

The distribution of resolution strategies is sometimes influenced by the status of the nominals as animate or human (see above for an animacy-based class restriction on resolution patterns in Swahili). For example, Corbett (citing Edith Moravcsik, p.c.) reports that in Hungarian the verb is singular for conjoined inanimate singular subject conjuncts, but either singular or plural (preferred) for animates:

(37) A könyv és a kommentár megérkezett/*megérkezt-ek.
ART book and ART commentary arrived.SG/arrived.PL
'The book and the commentary arrived.' (Hungarian)

(38) John és Jill megérkezt-ek/megérkezett.
John and Jill arrived.PL/arrived.SG
'John and Jill arrived.' (Corbett 2001:20)

To summarise, there is robust crosslinguistic data illustrating the phenomenon of single conjunct agreement. The more common asymmetrical pattern appears to be that in which the closest conjunct to the head controls agreement (but distant agreement is also attested), and this pattern is itself more common where the predicate (agreeing head) precedes the coordinate argument. In many languages, the distribution of different agreement strategies is subject to various syntactic, semantic or discourse conditions. In Welsh there is just one, simple, grammatical pattern for head-argument agreement: finite verbs precede their clause-internal subjects and agree asymmetrically with pronominal first conjuncts; nominal and prepositional heads precede and agree with their arguments in similar fashion. Crucially, however, other agreement processes involve the resolved features of coordinate structures.

4.4 Agreement and Coordination in LFG

In this section we briefly review the theory of constituent coordination and in particular the approach to noun phrase coordination in LFG —

for extensive motivation and discussion of this approach see Kaplan and Maxwell (1988), Dalrymple and Kaplan (2000) and Dalrymple (2001).

At the level of c-structure, constituent coordination is analysed by means of phrasal expansions along the lines of the one shown in (40). A coordinate structure (which may in principle have any number of conjuncts) projects a set at f-structure, the members of which are the individual conjuncts, as in (42).

(39) John likes pears and hates apples.

(40)
$$\begin{array}{lcccc} \text{VP} & \rightarrow & \text{VP}^{+} & \text{Conj} & \text{VP} \\ & & \downarrow \in \uparrow & & \downarrow \in \uparrow \end{array}$$

Shared elements such as *John* in the example above satisfy the completeness and coherence requirements of the verb in each conjunct, and are distributed into the members of the set: the governable grammatical functions (such as SUBJ) are *distributive features* for which the following extension of function-application to sets holds:

(41) If a is a *distributive* feature and s is a set of f-structures, then $(s\ a) = v$ holds if and only if $(f\ a) = v$ for all f-structures f that are members of the set s (Dalrymple 2001:365)

(42)
$$\left\{ \begin{bmatrix} \text{SUBJ} & [1]\begin{bmatrix} \text{PRED} & \text{'JOHN'} \end{bmatrix} \\ \text{PRED} & \text{'LIKE}\langle(\uparrow\text{SUBJ})(\uparrow\text{OBJ})\rangle\text{'} \\ \text{TENSE} & \text{PRES} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'PEAR'} \\ \text{NUM} & \text{PL} \end{bmatrix} \end{bmatrix} \right. \left. \begin{bmatrix} \text{SUBJ} & [1] \\ \text{PRED} & \text{'HATE}\langle(\uparrow\text{SUBJ})(\uparrow\text{OBJ})\rangle\text{'} \\ \text{TENSE} & \text{PRES} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'APPLE'} \\ \text{NUM} & \text{PL} \end{bmatrix} \end{bmatrix} \right\}$$

Although a coordinate structure is a set at f-structure, it may also have some properties distinct from those of its members. These can only be *non-distributive* features (for otherwise, if they held of the set, they would, by definition, hold of the elements in the set). Dalrymple (2001) proposes PRECONJ (the attribute associated with English *either* and *but*) and CONJ (associated with English *or* and *and*) as non-distributive features and thus as attributes of the hybrid structure corresponding to a coordinate structure:

(43) both Lee and Eve

$$\begin{bmatrix} \text{CONJ} & \text{AND} \\ \text{PRECONJ} & \text{BOTH} \\ \left\{ \begin{bmatrix} \text{PRED} & \text{'LEE'} \end{bmatrix}, \begin{bmatrix} \text{PRED} & \text{'EVE'} \end{bmatrix} \right\} \end{bmatrix}$$

(44) If a is a *nondistributive* feature, then $(f\ a) = v$ holds if and only if the pair $<a,\ v> \in f$ (Dalrymple 2001:367)

This distinction between distributive and non-distributive features introduces a further degree of rudimentary feature typing into LFG. Dalrymple and Kaplan *appear* to suggest that agreement features (such as NUM, CASE, NCLASS, PERS) are universally typed as distributive or non-distributive, but it seems likely that this is too strong a position. For example, they take CASE to be a distributive feature, but this cannot be true for all languages. Case mismatches in coordinate structures in English are illustrated in (20a) above, and McCloskey (1986) argues that in Irish, the leftmost conjunct in a coordinated subject is in the nominative case and other conjuncts are in the (default) accusative (in the examples below *sé* is a nominative form and *é* the default form — the lexical noun in these examples does not show an overt case distinction).[9]

(45) Chuaigh sé féin agus Eoghan 'na bhaile.
went he EMPH and Owen home.
'He and Owen went home.'

(46) Chuaigh Eoghan agus *sé/é féin 'na bhaile.
went Owen and he/him EMPH home.
'Owen and he went home.' (McCloskey 1986:265)

The phenomenon of agreement feature resolution shows that the PNG agreement features are non-distributive: that is, in a sentence such as

[9]One further detail concerns features which are distributive but vague: in this case a somewhat indeterminate feature is checked against *each and every conjunct*, exemplified in (i). Intuitively, this example is grammatical because the wordform *kogo* is indeterminate enough to be able to satisfy both the requirement that it is ACC (imposed by *lubi*) and the requirement that it is GEN (imposed by *nienawidzi*).

(i) Kogo Janek lubi a Jerzy nienawidzi.
who.ACC,GEN Janek likes and Jerzy hates
'Who does Janek like and Jerzy hate? (Polish)

To accommodate indeterminacy in feature values, the LFG f-description notation is extended to include *set designation* (giving an exhaustive enumeration of the set in question), so that a feature value for a given wordform may be a set (and 'case checking' constraints check for set membership, not equality). The treatment of indeterminacy in feature values is not relevant to our concerns here.

John and Mary aren't happy the verb takes 3PL form in agreement with the PN features of the set/coordinate structure as a whole, and not with the features of the elements of the SUBJ f-structure.

In LFG agreement relations such as subject-verb agreement or case and gender concord within noun phrases are captured at f-structure. On the standard view, an agreement controller has values for the relevant grammatical features and agreeing elements are associated with equations also providing values for these same features of the agreement controller. Thus one structure (the f-structure of the controller) must be compatible with constraints introduced by two different elements. For example, the 3rd singular form of the present tense verb *likes* would be associated with the information in (47) about the agreement features of the SUBJect (see Bresnan 2001:57):

(47) likes: $(\uparrow \text{SUBJ}) = \downarrow$
$(\downarrow \text{NUM}) = \text{SG}$
$(\downarrow \text{PERS}) = 3$

In this example, both the subject and the finite verb, are associated with *defining* equations over the same f-structure. In some analyses, agreement targets introduce instead non-monotonic *constraining* equations over the values of the controller's agreement features — these are interpreted as filters over the minimal f-structure solution. This captures the intuition that the agreement relationship is asymmetric, and builds in a distinction between realizing a feature and requiring a feature. For example, Andrews (1982) provides the following entry for the 2nd person plural form of the present tense of the Icelandic verb *elska* 'to love':

(48) elsku: $(\uparrow \text{SUBJ PERS}) =_c 2$
$(\uparrow \text{SUBJ NUM}) =_c \text{PL}$

The differences between these approaches are not relevant here, though they can be rather significant in practice (for some very thought-provoking discussion see Johnson 1997). Both model agreement in terms of constraints over (the f-structure of) one element, the controller.[10]

[10]Within the morphology, on the other hand, both target and controller are specified for an inherent set of person, number and gender features. In some languages, similarity of *form* between target and controller (agreement) inflections, as in (i), may indicate that the same realizational rules apply to stems of more than one category.

(i) a. **Ki**kpau **ki**kubwa **ki**moja **ki**lianguka.
7.basket 7.large 7.one 7.fell
'One large basket fell.'

b. **Vi**kpau **vi**kubwa **vi**tatu **vi**lianguka.
8.basket 8.large 8.three 8.fell
'Three large baskets fell.' (Swahili) (Corbett 1991:43)

Returning to agreement resolution under coordination, Dalrymple and Kaplan (2000) represent the NP subject in (49) as in (50) below: the representation of the coordination is a hybrid structure in which the agreement features of the structure as a whole are derived by simple computation from the agreement features of the conjuncts. The verb specifies (or constrains) the agreement features of the coordinate structure as a whole.

(49) José y yo hablamos.
José and I speak-1PL
'José and I are speaking.' (Spanish)

(50)
$$\begin{bmatrix} \text{PERS} & 1 \\ \text{NUM} & \text{PL} \\ \left\{ \begin{bmatrix} \text{PRED} & \text{'PEDRO'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{SG} \end{bmatrix}, \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 1 \\ \text{NUM} & \text{SG} \end{bmatrix} \right\} \end{bmatrix}$$

They introduce a representation for person and gender features which enables a simple statement of the computation involved in resolution (since number determination is essentially semantic in nature, Dalrymple and Kaplan do not treat number resolution). Person features are expressed by means of marker sets encoding complex values, as illustrated in (51) (Dalrymple and Kaplan 2000:27).[11] Given this representation, resolution involves simply set union, and "resolution rules" are simply stated as annotations.

(51) {S}: 1st person singular, 1st exclusive nonsingular
{S,H}: 1st person inclusive nonsingular
{H}: 2nd person
{}: 3rd person

(52)
$$\begin{array}{lcccc} \text{NP} & \rightarrow & \text{NP}^{+} & \text{Conj} & \text{NP} \\ & & \downarrow \in \uparrow & & \downarrow \in \uparrow \\ & & (\downarrow \text{PERS}) \subseteq (\uparrow \text{PERS}) & & (\downarrow \text{PERS}) \subseteq (\uparrow \text{PERS}) \end{array}$$

The data on asymmetric agreement with coordinate structures presented in section 4.2 presents an apparent difficulty for the interaction

[11] Languages lacking the inclusive/exclusive distinction do not have the marker set {S}: {S,H} is then defined simply as first person.

of the analyses of agreement and coordination outlined in this section. Coordinate structures are sets at f-structure: properties holding of a set of f-structures are either distributed over the members of that set (distributive properties) or they hold of the set itself (non-distributive properties). In languages showing asymmetric agreement under coordination, however, neither assumption about the agreement features is correct. It seems clear that something must give — either the treatment of agreement needs amendment or some different treatment of the (coordinate) structures themselves is required. We begin by considering the adequacy of the approach to coordination for the Welsh data in question.

4.5 Welsh Coordinate Structures Reconsidered

A number of analyses in the generative literature have used agreement asymmetries to motivate a variety of different structural asymmetries in coordinate structures. For example, Johannessen (1998) argues for a headed structure for coordination at least partly on the basis of asymmetrical agreement data, and so too does Munn (1999) (although their proposals are rather different). However, Borsley (1994) presents a vigourous defence of coordination schemas such as (40), pointing out several severe deficiencies in proposals for alternative structures, which try to analyse coordinations in terms of standard X′ syntax head, complement or head, specifier structures. And note further that in any case, the observations concerning agreement do not provide arguments for asymmetrical *constituent structures* in LFG, since agreement is not treated in terms of c-structure configurations. Since these proposals for asymmetric constituent structures are therefore largely orthogonal to our concerns, we do not discuss them further.[12]

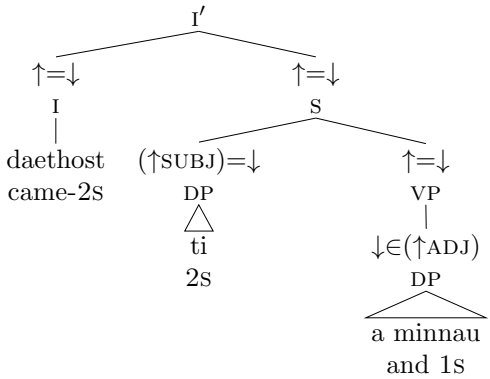
Maintaining the treatment of agreement constant, the question which then arises is whether these (coordinate) constructions in Welsh might correspond not to a set of f-structures but to some sort of head-dependent structure, with the first "conjunct" bearing the grammatical function governed by the dominating predicate and the rest of the coordinate structure having some sort of adjunctival status. There are two logical possibilities, depending on what the "remainder" of the coordinate structure is a dependent of. The first is some sort of conjunct union analysis (Hale 1975, Aissen 1985) in which the rest of the coordinate structure (that is, the non-initial conjunct(s)) is an adjunct to the governing predicate, as shown below for (3c):

[12]But note that the existence of both SCA and resolved agreement in Welsh coordinate structures does, of course, undermine any attempt to motivate a single constituent structure on the basis of agreement facts.

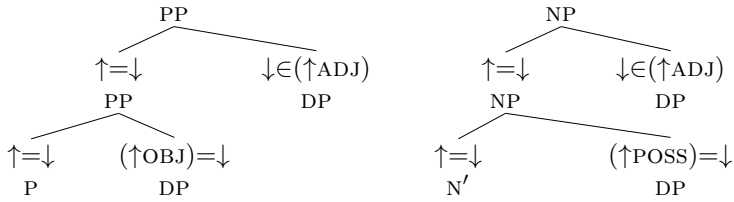
(53)
$$\begin{bmatrix} \text{PRED} & \text{'CAME } \langle(\uparrow\text{SUBJ})\rangle\text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 2 \\ \text{NUM} & \text{SG} \end{bmatrix} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{CONJ} & \text{AND} \\ \text{PRED} & \text{'PRO'} \\ \text{PERS} & 1 \\ \text{NUM} & \text{SG} \end{bmatrix} \right\} \end{bmatrix}$$

This leads to quite odd structural assumptions. For "coordinate" subjects, the trailing conjunct might be left-adjoined under the VP (the extended head of which is the I: see Bresnan (2001) for the extended head analysis and Sadler (1997, 1998) for discussion of Welsh within this model), as in (54). On the other hand, the trailing conjunct(s) must be right-adjoined to PP in cases of NP coordination under PP, and in cases of coordinated possessors, the trailing conjunct(s) must be right-adjoined to the dominating NP.

(54)



(55)

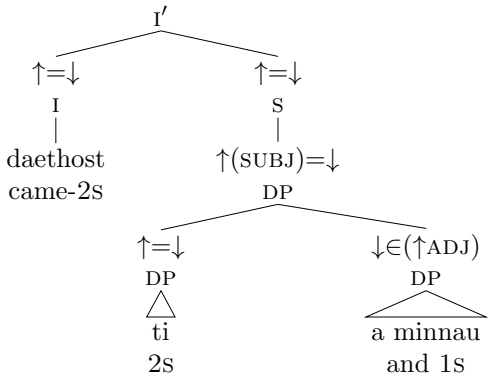


Crucially, the interpolation of other material (such as adverbials, negative markers in the case of attachment to VP) between initial and non-initial conjuncts is absolutely excluded, yet this restriction is very difficult to account for with these structures. For example, the order of elements within NPs with possessor phrases is N – (Adj) – possessor phrase – other dependents. Sadler (1998) proposes a structure in which the possessor phrase is a specifier of NP and other dependents are adjoined to NP for these noun phrases. The "adjunct" analysis of trailing conjuncts would require us to somehow ensure that the conjunct(s) adjoin to NP *lower* than the other dependents adjoin, and it is not even clear how such a stipulation could be formulated under standard assumptions. Similarly, where NP objects are coordinated in periphrastic constructions (within canonical V_{nonfin} NP PP word order in the VP), then we would have to ensure adjunction of the trailing conjunct lower (or closer) than the PP dependent.

(56) Yr oedd wedi fy ngweld i ac Emrys yn y stryd.
PT was-3S PERF 1S see 1S and Emrys in the street
'He had seen me and Emrys in the street.'

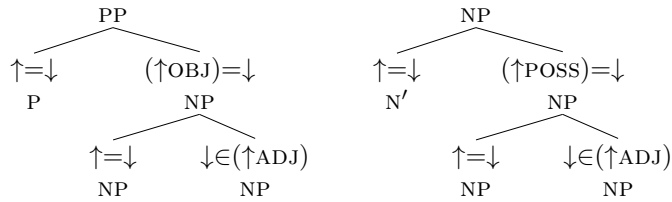
The second possibility is an analysis under which the non-initial "conjuncts" are adjuncts to the grammatical function associated with the initial "conjunct". The external coherence of the initial and non-initial portion follows more straightforwardly on this analysis (in each case, the non-initial conjunct phrase must be immediately right head-adjacent). Note that although more straightforward, of course special rules are needed to generate the structures with the conjuncts in just the right contexts. Again we illustrate with the tree and f-structure for (3c), and provide tree-structures for NP coordination under PP and coordinated possessors.

(57)



(58)
$$\begin{bmatrix} \text{PRED} & \text{`came } \langle(\uparrow\text{SUBJ})\rangle\text{'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 2 \\ \text{NUM} & \text{SG} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{CONJ} & \text{AND} \\ \text{PRED} & \text{'PRO'} \\ \text{PERS} & 1 \\ \text{NUM} & \text{SG} \end{bmatrix} \right\} \end{bmatrix} \end{bmatrix}$$

(59)

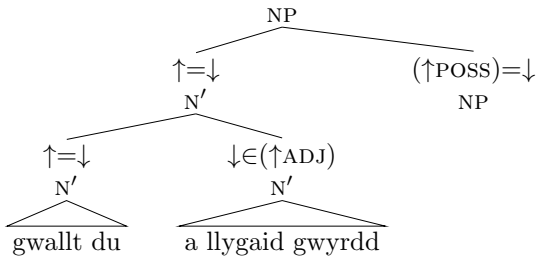


Both proposals treat non-initial conjuncts as adjuncts. But as we will see, the non-initial conjunct instead has the properties of the grammatical function it would instantiate as a member of a set of f-structures under the coordinate structure analysis rather than those of an adjunct. Consider coordination within possessive constructions, such as (60).

(60) gwallt du a llygaid gwyrdd Mair
hair black and eyes green Mair
'Mair's black hair and green eyes'

If the second conjunct *a llygaid gwyrdd* was an adjunct to the first conjunct, as in (61), then the f-structure (62) would result (the grammatical function of the entire NP is represented as GF). The interpretation under which the property of having *green eyes* is associated with *hair* is simply incoherent, and is certainly not the interpretation associated with (60), but this is the sort of interpretation we would expect for (62).

(61)



(62)
$$\begin{bmatrix} \text{GF} & \begin{bmatrix} \text{PRED} & \text{'HAIR'} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'EYES'} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'GREEN'} \end{bmatrix} \right\} \end{bmatrix} \right. \\ & \left. \begin{bmatrix} \text{PRED} & \text{'BLACK'} \end{bmatrix} \right\} \\ \text{POSS} & \begin{bmatrix} \text{PRED} & \text{'MAIR'} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Similarly, the f-structure (63) in which the second conjunct is treated as an adjunct to the dominating (presumably verbal) predicate also fails to provide the correct input for the semantics. Moreover the case of N′ coordination in (60) actually demonstrates the impossibility of the first of the two conjunct raising analyses: we need to attach the second conjunct outside the NP, but since the NP also contains the possessor phrase this is impossible without also raising the possessor, for which there is no motivation at all.

(63)
$$\begin{bmatrix} \text{GF} & \begin{bmatrix} \text{PRED} & \text{'HAIR'} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'BLACK'} \end{bmatrix} \right\} \\ \text{POSS} & \begin{bmatrix} \text{PRED} & \text{'MAIR'} \end{bmatrix} \end{bmatrix} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'EYES'} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'GREEN'} \end{bmatrix} \right\} \end{bmatrix} \right\} \end{bmatrix}$$

Crucially, the possessor *Mair* is in fact interpreted as a semantic argument of both *hair* and *eyes*, precisely as one would expect if the f-structure were a set, with the possessor distributed over the members of the set, that is, if the f-structure representation of (60) were indeed that of a coordinate structure.

One might consider weakening the adjunctival analysis to hold only of coordinations with pronominal initial conjuncts (so that cases such as (60), which do not involve a pronominal conjunct, would be treated as standard coordinate structures). But as we will now see, there is no evidence at all of any interpretational or syntactic motivation for distinguishing in this way between pronominal and non-pronominal cases.

First, note that irrespective of whether the coordination contains an initial pronominal, the coordinate structure as a whole (that is, the set

of f-structures) serves as controller in the examples (4a,b) repeated here for convenience:

(64) a. Roedd Mair a fi i briodi.
was-3S Mair and 1S to marry
'Mair and I were to marry.'

b. Roeddwn i a Mair i briodi.
was-1S 1S and Mair to marry
'I and Mair were to marry.'

Second, the *a/ac phrase* in all coordinate structures fails to have the sort of mobility we associate with adjuncts, but appears in an absolutely fixed position adjacent to the first conjunct (whether pronominal or not). Interestingly, there *is* a subordinating use of the conjunction *a/ac*, introducing absolute clauses, and the adverbial clause so introduced can precede, interrupt or follow the clause which it modifies (examples from Thorne 1993:382–383).

(65) ***Ac yntau heb waith***, ni fedrai ffordio iro llaw
And 3SM without work, NEG was.able-3S afford grease hand
y swyddogion.
the officers
'And being unemployed, he could not afford to grease the palm of the officers.'

(66) Nid hawdd fu hi i JWH, ***ac yntau'n heddychwr***, foddhau
NEG easy was 3SF for JWH and 3SM-PT pacifist, please
ei eglwys yn St Albans.
3SM church in St Albans
'It wasn't easy for JWH, being a pacifist, to please his church in St Albans.'

(67) Yr oeddwn eisoes yn hen ŵr, ***a minnau'n blentyn***.
PT was-1S already PT old man, and 1S-PT child
'I was already an old man, when I was a child.'

Third, note that pronominal coordinate structures (that is, those showing asymmetric or initial conjunct agreement, for which we are currently considering (the implausibility of) a head-adjunct f-structure representation) do not differ from non-pronominal coordinate structures in terms of their interaction with other syntactic phenomena. Anaphoric pronouns and pronominal clitics show precisely the same pattern of concord with an asymmetric (pronominal initial) coordinate structure as with other coordinate structures. This can be seen in the Welsh personal passive construction, which involves an obligatory agreement marker doubling the (passive) SUBJ. As the examples (9), repeated here

as (68), and (69) show, the agreement marker agrees with the coordinate structure *as a whole*, irrespective of whether or not that subject has a pronominal initial conjunct.

(68) Ni chaffodd e a'i milwyr eu lladd yma.
NEG got-3S he and-3SM soldiers 3PL kill there
'He and his soldiers were not killed there.'

(69) Ni chaffodd Pwyll a'i milwyr eu lladd yma.
NEG got-3S Pwyll and-3SM soldiers 3PL kill there
'He and his soldiers were not killed there.'

Fourth, McCloskey (1986) notes an incorrect prediction of the conjunct union analysis, under which the first conjunct *is* the SUBJ or OBJ, and so on, while the other conjunct takes on an ADJ function. He observes that the initial (subject) conjunct does not behave like a SUBJect. In Irish, a relative clause formed on the immediately dominated subject position obligatorily involves a gap on subject position, rather than a (null) pronominal, the presence of the latter being signalled by verb agreement. This restriction does not extend to coordinate subjects, and in particular to those which are pronominal initial; thus (71) is grammatical. This suggests that the pronominal conjunct is not itself the SUBJect (in our terms, it is a member of the set of f-structures which together provide the SUBJect function).

(70) *na tithe a rabhadar ceannaithe againn
the houses COMP be(PAST P3) bought by-us
'the houses that had been bought by us' (McCloskey 1986:260)

(71) na daoine a rabhadar féin agus a gelann mhac
the people COMP be(PAST P3) EMPH and their family sons(GEN)
ábalta ar iascach.
able on fishing
'the people that they and their sons were capable of fishing' (ibid)

An analogous argument may be made for Welsh. A relative clause on a prepositional object requires the use of agreement morphology on inflecting prepositions and in literary Welsh the absence of the pronominal itself — the latter condition is suspended in the case of a coordinate object:

(72) y dyn y soniais amdano *ef
the man that spoke-1S with-3S him
'the man who I spoke to him'

(73) y dyn y soniais amdano ef ac Ann
the man that spoke-1S with-3S him and Ann
'the man who I spoke to him and Ann'

Finally, the nature of agreement patterns themselves constitute counterevidence to the argument that the SCA agreement pattern in coordination structures motivates an asymmetrical f-structure representation in which non-initial conjuncts are ADJUNCTS. Recall that pronominal and reflexive anaphora (as in (8) and (11)) and passive agreement (for example, (69)) involve the resolved features of an antecedent coordinate structure, and the same is true of predicate nominals, which reflect the resolved number of a coordinate NP, as shown in (74) and (75). Crucially, of course, the SCA agreement pattern for head agreement sometimes co-occurs with the resolved agreement pattern for other agreement phenomena (as in (68) and (74)), a circumstance which would appear to be fatal for the proposal to accommodate asymmetrical agreement in terms of either asymmetrical c-structure or asymmetrical f-structure representations.

(74) Roeddwn i ac Emyr yn ysgrifenwyr rhagorol.
was-1S 1S and Emyr PT writers excellent
'Emyr and I were excellent writers.'

(75) Mae Siôn ac Emyr yn ysgrifenwyr rhagorol.
is Siôn and Emyr PT writers excellent
'Siôn and Emyr are excellent writers.'

We conclude, therefore, that the existence of a SCA pattern for head agreement with Welsh coordinate structures does not constitute evidence for an asymmetrical representation of coordinate structures. All coordinate structures in Welsh, whether they have pronominal conjuncts or not, are represented as sets at f-structure and involve multiply-headed c-structures.

Coordinate structures with a pronominal initial conjunct differ from other coordinate structures *only* as far as the head-argument agreement between a finite verb and a subject, or a prepositional head and its object, or a nominal head and its possessor, is concerned. The puzzle that pronominal coordinate structures represent is as follows. Head-argument agreement suggests that the coordinate structure bears the agreement features associated with an initial, pronominal conjunct, but evidence from anaphora and predicate agreement suggests that the coordinate structure bears semantically resolved person and number agreement features.

4.6 Analysis of Asymmetric Agreement

If the argumentation in the previous section is correct, the solution to the dilemma posed by asymmetrical agreement under coordination must require a change to the theory of agreement in LFG.

Maintaining the partitioning of features into distributive and non-distributive, we might adapt the Dalrymple and Kaplan (2000) proposal by taking the resolved features of the coordinate structure to be essentially those of the first conjunct. For PERS and GEND this amounts to dropping the assumption that resolution is by set union, and for NUM this amounts to dropping the assumption that resolution is essentially semantically based. Instead, in Welsh, the coordinate c-structure schema would explicitly equate the value of the PERS, NUM and GEND features of the mother with those of the first daughter.[13]

(76) $\begin{array}{lcccc} \text{NP} & \rightarrow & \text{NP} & \text{Conj} & \text{NP} \\ & & \downarrow \in \uparrow & & \downarrow \in \uparrow \\ & & (\downarrow \text{PERS}) = (\uparrow \text{PERS}) & & \\ & & (\downarrow \text{NUM}) = (\uparrow \text{NUM}) & & \\ & & (\downarrow \text{GEND}) = (\uparrow \text{GEND}) & & \end{array}$

Under this analysis, the AGR features of the coordinate structure would simply match those of the first conjunct, illustrated below with the f-structure for the PP in (7a) repeated here as (77).

(77) amdanat ti a Siôn
about-2S 2S and Siôn
'about you and Siôn'

(78) $\begin{bmatrix} \text{PRED} & \text{'AM} \langle\ (\uparrow \text{OBJ})\ \rangle\text{'} \\ \text{OBJ} & \begin{bmatrix} \text{PERS} & 2 \\ \text{NUM} & \text{SG} \end{bmatrix} \\ & \left\{ \begin{bmatrix} \text{PRED} & \text{'SIÔN'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{SG} \end{bmatrix}, \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{PERS} & 2 \\ \text{NUM} & \text{SG} \end{bmatrix} \right\} \end{bmatrix}$

[13] Gender is not relevant to subject-verb or preposition-object agreement in Welsh, but it is relevant to the 3S agreement marker coding objects of non-finite verbs and the possessor within noun phrases: the 3S form *ei* differs in its mutation effect according to gender (the FEM causes aspirate mutation of the following element (the non-finite verb or head noun); the MASC causes soft mutation).

This approach has several problems however. The intuition that the target really does agree with the first conjunct is captured by means of the feature passing mechanism, but the approach is perversely at odds with the intent of the Dalrymple and Kaplan proposal which permits the grammar to express what is essentially semantic resolution in a syntactic agreement environment. Crucially, the agreement features associated with the coordinate structure as a whole are precisely *not* those required for more "semantic" agreement in other agreement contexts. As already noted, the obligatory agreement marker associated with the nonfinite verb in the personal passive construction agrees with the resolved features of a coordinate subject (see (68) and (69)), and the same is true of agreement between coordinate subjects and predicate nominals/adjectives (shown in (74) and (75)) above, and for pronominal anaphora (see (8)).

Since there is very good evidence that the *resolved* agreement features of Welsh coordinate structures are in fact precisely those which would follow from the proposal of Dalrymple and Kaplan, without further stipulation, we do not consider further the approach briefly sketched above.

In the rest of this paper, we explore the possibility that the coordinate structure itself is associated with two distinct sets of agreement features, one resolved, and one not. The resolved set of agreement features is relevant to the choice of subsequent pronouns and reflexive anaphors, and the form of predicate adjectives and nominals, while the unresolved set (equivalent to those of the first conjunct) is relevant to head agreement.[14] We begin by giving a general sketch of the "two feature bundle" approach, and then consider further the nature of the two feature bundles in question.

To do this, we invest the f-structure of the coordinate structure with two sets of (non-distributive) agreement features. As the value of the feature IND we represent the agreement features resulting from feature resolution, and we group under AGR those agreement features resulting from feature passing from the distinguished conjunct (in the Welsh case, this is always the initial conjunct).

(79) Daethost ti a minnau.
came-2S 2S and 1S
'You and I came.'

[14] An alternative might be to reformulate the statement of head agreement so that the agreement target *directly* constrains the features of the first conjunct (that is, by constraining that member of the set of f-structures which linearly precedes in c-structure the other members of the set). For some discussion of the approach, and some issues it raises, see Sadler (1999).

(80)
$$\begin{bmatrix} \text{AGR} & [1][\ldots] \\ \text{IND} & \begin{bmatrix} \text{PERS} & 1\ [\text{S,H}] \\ \text{NUM} & \text{PL} \end{bmatrix} \\ \left\{ \begin{bmatrix} \text{IND} & [1] \begin{bmatrix} \text{PERS} & 2\ [\text{H}] \\ \text{NUM} & \text{SG} \end{bmatrix} \end{bmatrix} \right. \\ \left. \begin{bmatrix} \text{IND} & [2] \begin{bmatrix} \text{PERS} & 1\ [\text{S}] \\ \text{NUM} & \text{SG} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix}$$

The rule for coordination would both copy and resolve agreement features. This can be thought of as a sort of selective liberation (the whole structure of the first conjunct is not made available, only the agreement features), reminiscent of the use of domain features to liberate elements in HPSG.

(81)
$$\begin{array}{lcccc} \text{NP} & \rightarrow & \text{NP} & \text{Conj} & \text{NP} \\ & & \downarrow \in \uparrow & & \downarrow \in \uparrow \\ & & (\downarrow \text{IND}) = (\uparrow \text{AGR}) & & \\ & & (\downarrow \text{IND PERS}) \subseteq (\uparrow \text{IND PERS}) & & (\downarrow \text{IND PERS}) \subseteq (\uparrow \text{IND PERS}) \end{array}$$

The majority of agreement processes, including head agreement with non-coordinate controllers, involve the IND features of the controller. However head agreement with coordinate structures involves the AGR features of a coordinate structure. A straightforward way to capture head agreement is to postulate the existence of both IND and AGR features on nominal feature structures, and to lexically specify the values as token identical, as shown in (82). The verb then uniformly places constraints on the AGR features of the subject, and similarly for cases of prepositional agreement, and so forth.

(82)
$$\begin{bmatrix} \text{AGR} & [1] \\ \text{IND} & [1] \end{bmatrix}$$

Constraint on Nominal Lexemes:
$(\uparrow \text{IND}) = (\uparrow \text{AGR})$

(83) *daethost*: $(\uparrow \text{SUBJ AGR PERS} = 2)$
$(\uparrow \text{SUBJ AGR NUM} = \text{SG})$

Recall that in Welsh, pronouns (which are the only nominal elements which determine full PN(G) agreement) may themselves be optionally dropped in agreement contexts, suggesting that the verbal inflection involves pronominal incorporation and thus introduces a PRED value for the argument in question. Coordinate structures are exceptional, in that a pronominal conjunct with which the agreement target agrees is not permitted to be dropped. This is consistent with the generalization

made by Corbett (2001b), which states that agreement with coordinate structures requires canonical controllers, that is, controllers which are overt. Corbett relates this to his Principle 1 which states that canonical agreement is redundant rather than informative. It is not immediately apparent in what domain an explanation for the obligatory presence of pronominal conjuncts should be sought. It is possible that it is required for balance within the coordinate structure, for without the pronoun the left conjunct would contain no lexical material. But note, however, how the (relevant part of the) f-description associated with pronominal verbal inflection interacts with the theory of coordination:

(84) $(\uparrow \text{SUBJ}) = \downarrow$
$(\downarrow \text{AGR PERS}) = 2$
$(\downarrow \text{AGR NUM}) = \text{SG}$
$((\downarrow \text{PRED}) = \text{'PRO'})$

The equation $(\downarrow \text{PRED}) = \text{'PRO'}$ is, of course, optional, as overt pronominals may (generally) appear in head agreement contexts. In the case of coordinate structures, only the disjunct without the PRED equation provides a consistent f-structure. As the PRED feature is distributive, like the governable grammatical functions, the $\text{PRED} = \text{'PRO'}$ would be distributed to every member of the set $(\downarrow)$ of f-structures, at least one of which would then end up with two values for the PRED feature. The non-distributive AGR features would, of course, (correctly) be contributed to the f-structure as a whole. Thus the observed ungrammaticality of pro-drop in coordinate structures follows from the current treatment of constituent coordination and pronominal incorporation.[15]

The question which now arises concerns the nature of the feature AGR which controls subject-verb agreement, and head agreement processes more generally in Welsh. In the rest of this section we consider the not-unrelated questions of whether the AGR feature should be taken to be a purely concordial feature and whether it should be more properly considered to be part of m-structure rather than f-structure.

[15]It should be noted, however, that it is possible to omit the pronoun and maintain only an emphatic pronominal particle in Irish Gaelic. This would only follow on the current account if *fein* itself can optionally contribute a PRED value. Alternatively, these facts might be interpreted as favouring the "direct" approach alluded to in footnote 14, under which the agreeing head directly constrains the initial conjunct itself. Under this view, the agreement and $\text{PRED} = \text{'PRO'}$ features of the agreeing head are not defined over the set, but over a member of the set. We do not pursue this hypothesis further here, but leave the matter for further research.

4.6.1 The Status of AGR

One possibility is that the distinction between these two feature sets corresponds to the distinction between agreement *ad formam*, or purely morphosyntactic agreement, and the more semantically-based agreement *ad sensum*. If this were the case, head agreement in Welsh would be a form of morphosyntactic agreement, while the other agreement processes in Welsh we have illustrated (such as pronominal and reflexive binding) would involve a set of features more closely related to the semantics.

A series of recent papers in HPSG (Kathol 1999, Wechsler and Zlatić 2000, Zlatić and Wechsler 1997) have postulated the existence of a head feature (called CONCORD by Wechsler and Zlatić, and AGR by Kathol) for morphosyntactic agreement, alongside the semantic index INDEX feature relevant to pronominal and anaphoric binding.[16] It should be noted that there are significant differences between these approaches, and detailed discussion is beyond the scope of the present paper.[17]

The proposals of Wechsler and Zlatić essentially extend the treatment of morphosyntactic concord in HPSG beyond features such as CASE to include NUM and GEND. The language which they refer to in presenting their theory of agreement is Serbo-Croatian. Concordial features are head features which are structure-shared between heads and dependents: for example, (85) shows the HEAD agreement feature of the Serbo-Croatian possessive *moja* 'my', which will be structure-shared with the features of the head noun when it is used as the specifier of that noun.

(85)
$$\begin{bmatrix} \text{HEAD} & \begin{bmatrix} adj & \\ \text{CONC} & \begin{bmatrix} \text{CASE} & nom \\ \text{NUM} & sg \\ \text{GEND} & fem \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

(Wechsler and Zlatić 2000:826)

The focus of their work is on cases of mixed agreement, and they discuss cases of mismatch between declension and concord (for example, nouns which have masculine grammatical properties and refer to males, but decline in the declension otherwise reserved for feminine nouns), mismatch between index and the actual properties of what the noun denotes (for example, a noun which governs masculine agreement even when referring to a female), and mismatch between concord and index, as for example with the Serbo-Croatian collective noun *deca* 'children'

[16] Note that this is distinct from agreement controlled by real-world anchoring conditions.

[17] See also King and Dalrymple (2002) for a recent LFG proposal to distinguish INDEX and CONCORD.

which controls feminine singular agreement on attributive modifiers and non-finite predicates, but neuter plural on coreferential pronouns:

(86) Posmatrali smo ovu dobru decu$_i$.
watched.1.PL AUX this.F.SG good.F.SG children.F.SG
Ona$_i$ su spavala.
they.N.PL AUX.3PL slept.NT.PL
'We watched those good children$_i$. They$_i$ slept.'
(Wechsler and Zlatić 2000:816)

Wechsler and Zlatić posit the following lexical information for *deca*:

(87) $\begin{bmatrix} \text{CONCORD} & \textit{fem.sg} \\ \text{INDEX} & \textit{nt.pl} \end{bmatrix}$

For Serbo-Croatian, Wechsler and Zlatić argue that determiners, attributive adjectives and secondary predicates show concord agreement, while verb-subject agreement, primary predication and bound anaphora show index agreement, consistent with Corbett's crosslinguistic Agreement Hierarchy generalization, which they show largely follows their theory of constraints on the relation between declensional class, concord, index and the semantics.[18]

(88) The Agreement Hierarchy
attributive < predicate < relative pronoun < personal pronoun
As we move rightward along the hierarchy, the likelihood of semantic agreement will increase monotonically (Corbett 1991:226)

Kathol's proposals may also be seen as developing the theory of concord in HPSG. He proposes that selector categories such as verbs bearing their own intrinsic morphosyntactic agreement features as well as selecting those of their argument, as shown schematically for English *walks*:

(89) $\begin{bmatrix} \text{CAT}\vert\text{HD}\vert\text{MORSYN}\vert\text{AGR} & \begin{bmatrix} \textit{finite} & \\ \text{PERS} & [1]\ \text{3RD} \\ \text{NUM} & [2]\ \text{SG} \end{bmatrix} \\ \text{CONT}\vert\text{WALKER} & \begin{bmatrix} \textit{index} & \\ \text{PERS} & [1] \\ \text{NUM} & [2] \\ \text{GEND} & \end{bmatrix} \end{bmatrix}$
(Kathol 1999:236)

[18] As they observe, their theory makes no predication as to whether CONCORD or INDEX controls predicate agreement, and indeed both are found in Serbo-Croatian.

Kathol posits two types of grammatical agreement, morphosyntactic and semantic, as follows, where ≈ means "structure-shared in the relevant parts":

(90) morphosyntactic AGR(selector) ≈ AGR(arg)
semantic AGR(selector) ≈ INDEX(arg)

Kathol's approach attributes hybrid cases, previously viewed in terms of a mismatch between INDEX and semantic anchoring conditions, to the operation of a combination of morphosyntactic and index agreement. Thus he treats the much-discussed hybrid case in (91) as involving *morphosyntactic* NUM agreement between verb and subject, *semantic* PERS agreement between verb and subject and semantic GEND and NUM agreement between the predicative adjective and the noun.

(91) Vous êtes belle.
2.PL are.2.PL beautiful.SG.FEM
'You are beautiful.' (French)

The question, then, is whether the agreement features which we have represented as AGR are in fact equivalent to morphosyntactic CONCORD features. There are several crucial differences which suggest that this is not the case. Firstly, concord is generally conceived of as the circumstance in which various elements (co-)specify morphosyntactic features of their (shared) f-structure, whereas head agreement in Welsh involves the head specifying features of the argument. Secondly, it is otherwise at least extremely unusual for concord to involve PERS features, perhaps because such a feature is inherently indexical (or referential).[19] More generally, the sort of head agreement we see in coordinate structures is formal (rather than meaningful) in a different sense — concord features are formal because they reflect agreement of purely morphosyntactic features (often related to morphological declensional class), but asymmetric agreement with coordinate structures is formal in the sense of failing to code the semantically relevant, resolved indexical features of the coordinate structure as a whole. For these reasons, it does not seem appropriate to equate the AGR introduced in this section with CONCORD.

In common with a number of purely morphosyntactic features, the AGR feature is not relevant to semantic interpretation, and one possibility is that all such features might be factored out of the f-structure and represented at a different level of representation, such as the level of m-structure, which can be thought of as expressing those morpholog-

[19] However, Wechsler and Zlatić do note (805:footnote 8) an isolated case of a Swahili modifier *-ote* 'all', which shows person agreement.

ical features which are syntactically (but not semantically) relevant.[20] For example, in the architecture proposed in Frank and Zaenen (2002), shown in (92), the f-structure, but not the m-structure, might be relevant to semantic interpretation:

(92) c-structure $\overset{\phi}{\longrightarrow}$ f-structure $\overset{\mu}{\longrightarrow}$ m-structure

It is a trivial matter to reformulate the treatment proposed in this section so that IND is an f-structure feature but AGR is an m-structure feature. But given that this does not have any material consequence, we do not pursue this possibility further.

4.7 Conclusion

This paper has focussed on one small set of data concerning agreement under coordination in Welsh. In these cases of coordination, the resolved features of the coordinate structure are relevant to some agreement processes, but the features of the first conjunct are relevant to cases of head agreement, that is, to verb-subject agreement, the agreement of a noun with a possessor argument and the agreement of a preposition with its object. The co-presence of both types of agreement process poses serious difficulties for any account of first conjunct agreement based on structural asymmetry. Despite the existence of asymmetric agreement patterns, we have presented evidence that coordination in Welsh is in fact correctly treated as a set at f-structure. We then consider the implications for the theory of agreement in LFG and explore several possibilities. We propose a distinction between IND which expresses the resolved features of the coordinate structure and AGR which expresses the features of the distinguished (i.e., first) conjunct. This in turn raises questions about the status of AGR, which we briefly consider.

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[20] This level is first proposed in the context of work on the development of parallel grammars in what became the ParGram project and is developed in a number of papers (Butt et al. 1996, Frank and Zaenen 2002). A typical use of m-structure is to express morphosyntactic selection in analytic (auxiliated) verbal contructions, where the f-structure is flat.

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5

Reduced Pronominals and Argument Prominence

Anna Siewierska

5.1 Introduction

The vast majority of the languages of the world have a closed set of expressions to denote the discourse roles of speaker (first person), addressee (second person), and neither speaker nor addressee (third person). The special expressions in question are typically referred to as personal pronouns. As is well known, elements which function as personal pronouns are not syntactically uniform, but may have a number of different formal realizations. In a recent paper Bresnan (1998) presents a five-way typology of the forms of personal pronouns based on their phonological and morphological substance. The typology is shown in (1).

(1) zero bound clitic weak pronoun

The pronominals in (1) are classified in terms of two parameters: overt/-nonovert and reduced/nonreduced. Zeroes are the only nonovert forms, and pronouns, by which here is meant morphologically and syntactically independent expressions of person, are the only nonreduced forms.[1]

Although pronominals in general are much more common with grammatical functions the referents of which are typically human as opposed to non-human, there appear to be no actual crosslinguistic restrictions

[1] Given that the use of the term personal pronoun for the whole set of expressions in (1) and also for just the non-reduced forms is rather confusing, I will refer to the former as pronominals and to non-reduced forms by the more familiar term free pronoun. A better term for the whole set of forms might be person markers, but I will stick to the terminology used in LFG.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

on which grammatical functions may be realized by nonreduced pronominals.[2] Reduced pronominals, by contrast, are often found only with certain grammatical functions. For instance, in some languages the only grammatical function which may be realized by a zero pronominal is the subject. In many other languages bound pronominals are restricted to subjects and objects. And in yet other languages clitics may be used for all arguments but not for adjuncts. Bresnan (1998:19) suggests that restrictions such as the above are a reflection of the existence of a relationship between reduced pronominals and argument prominence, which she formulates as in (2):[3]

(2) "reduced pronominals of all types are distributed according to a hierarchy of argument prominence, being most common with subjects and decreasing with the increasing obliqueness of arguments"

This statement of the relationship between reduced pronominals and grammatical functions is intended to apply to the reduced pronominals as a group. Assuming that the scope of (2) is both crosslinguistic and language internal, we thus have two predictions. The first, crosslinguistic (and weaker), prediction is that the crosslinguistic frequency of reduced pronominals should decrease as we proceed from left to right along the argument prominence hierarchy. The second, language internal prediction is that if a language has a reduced pronominal for a grammatical function lower on the argument prominence hierarchy it must also have a reduced pronominal for grammatical functions higher on the argument prominence hierarchy. Thus given the LFG argument prominence hierarchy in (3), the crosslinguistic prediction is that reduced pronominals as a group should more frequently realize subjects than objects, and more frequently realize objects than OBJECT2, and more frequently realize OBJECT2 than OBLIQUE.

(3) SUBJECT > OBJECT > OBJECT2 > OBLIQUE

The language internal prediction in turn is that if a language allows a reduced pronominal, say a clitic, to be used for OBJECT2, it must also allow some type of reduced pronominal, be it clitic, bound, weak or zero form to be used for both object and subject.

Both of the above predictions of the relationship between reduced pronominals and grammatical function are of considerable typological in-

[2]Data on the distribution of pronouns relative to grammatical function are available for quite a number of languages. For information on English see Biber et al. (1999), for Sacapultec Maya see Du Bois (1987), for Yagua see Payne (1990) and for Sedang see Smith (1979).

[3]Editor's note: The manuscript which this citation is taken from (Bresnan 1998) has been revised and published as Bresnan (2001a).

terest and deserving of crosslinguistic testing. However, given Bresnan's four-way typology of reduced pronominals, one cannot help wondering whether any relationship can be discerned between argument prominence and the different types of reduced pronominals. The fact that the left-to-right ordering of the pronominals in (1) is not random suggests that this may well be the case. The five pronominal forms in (1) may be seen as being ordered from left to right in terms of increasing phonological substance and/or morphological independence. Bound forms obviously have more phonological substance than zero forms, clitics are typically less phonologically reduced than bound forms and free pronouns are both phonologically and prosodically heavier than weak forms. Moreover, whereas bound forms by definition are morphologically dependent, clitics are less so as they can occur with a variety of hosts, weak forms are morphologically independent but cannot constitute a separate utterance and pronouns may, in many languages, occur on their own. Accordingly, the possibility suggests itself of interpreting the relationship between reduced pronominals and argument prominence expressed in (2) as also reflecting the left-to-right ordering of the four reduced pronominals. In such a case, (2) may be understood in three ways. The first two interpretations pertain to crosslinguistic frequency, the third to language internal distribution. The first interpretation is that each of the reduced pronominals in (1) should more frequently realize subjects than objects and objects than obliques. Thus, for example, there should be more languages with zero subjects than zero objects and more languages with bound subjects than bound objects, etc. The second interpretation is that there should be a decrease in the frequency with which each of the reduced pronominals in (1), going from left to right, realizing subjects as opposed to objects, and objects as opposed to obliques. Thus, under this interpretation, zeroes should more strongly favour subjects as opposed to objects than bound forms, and bound forms should more strongly favour subjects as opposed to objects than clitics, etc. In other words, the distribution of zero forms among the world's languages should be more common among the syntactic functions at the top end of the argument prominence hierarchy, that of weak forms more common at the bottom end. The corresponding language internal interpretation would then be that no reduced pronominal in (1) should be able to realize an argument higher on the argument prominence hierarchy than any reduced pronominal to its left. Thus there should be no languages, for example, with weak subjects and clitic objects or clitic subjects and bound objects.

Although the relationship between reduced pronominals and argument prominence expressed by Bresnan in (2) is intended to be un-

derstood as applying to the four reduced pronominals as a group and not relative to the increase in phonological substance and morphological independence reflected in their left-to-right ordering in (1), the existence of the two sets of interpretations raises the question of which, if any, is the empirically correct one. The present paper seeks to provide an answer to this question by examining the distribution of reduced pronominals in a crosslinguistic sample of 402 languages. The paper is organized as follows. Section 2.2 presents in more detail Bresnan's typology of reduced pronominals and comments on certain aspects of my classification of pronominal forms with reference to this typology. Section 2.3 briefly discusses the LFG argument prominence hierarchy and the minor modifications that I have made to it in conducting my crosslinguistic investigation. Section 2.4 considers the two sets of interpretations of the relationship between reduced pronominals and argument prominence, the group interpretation and the hierarchical interpretation, with reference to the languages in my sample. Since under the group interpretation the statement in (2) is open to two readings and under the hierarchical interpretation to three readings, for ease of reference I will label the various readings consecutively from one to five. Finally, section 2.5 summarises the findings and considers their implications for LFG.

5.2 The Typology of Reduced Pronominals

Each of the terms used to characterise the four pronominal forms comprising Bresnan's typology of reduced pronominals, i.e. zero, bound, clitic and weak appears in the literature in several senses. Therefore, a few words of clarification on how I have interpreted these terms are in order.

By zero pronominal I mean a pronominal with null structure whose referent can be the speaker, addressee or third party (or any combination of these) in singular or non-singular number depending on the context. An instance of such a referentially open zero subject pronominal is given in (4) from Mandarin.

(4) Xiaohong de meimei shuo xihuan tan gangpin
Xiaohong GEN young sister say like play piano
'Xiaohong's younger sister says that (I/you/he/she/we/you/they) love(s) to play piano.' (Mandarin, Huang 2000:66)

While zero forms can be discerned in various languages, including English, in co-ordinate structures (5a), in elliptical constructions (5b) in answer to questions (5c), and in imperatives (5d), I will be concerned only with zeroes which do not exhibit such restrictions.

(5) a. I/you, she came in and ∅ sat down.
b. (I) didn't recognize that.
c. Are you/she/they coming? — Yes, (I am/she is/they are).
d. ∅ go home!

Furthermore, in order to be considered, the zero forms must be able to occur in main clauses, as is the case in the Mandarin (6b) and not just in functionally "controlled" structures, for instance, infinitival complements, as in the English (7a,b).

(6) a. Nei chang dianying ni juede zenme yang?
that CL movie you feel how Manner
'How did you feel about the movie?'
(Mandarin, Li and Thompson 1981:658)

b. ∅ yidian dou bu xihuain ∅
(I) a little all not like (it)
'(I) didn't like (it) a bit.'
(Mandarin, Li and Thompson 1981:658)

(7) a. I/you/she want(s) to ∅ go home.

b. She told John to ∅ return immediately.

And finally the requirement that the zero pronoun be open to first, second and third person readings rules out potential instances of zeroes which may receive only a generic interpretation, as in the case of the example in (8) from Italian.

(8) Questa musica rende ∅ allegri
this music renders happy
'This music renders (one) happy.' (Italian, Rizzi 1986)

Thus in sum, the term zero pronominal will be used for null forms which receive a referential interpretation found in non-co-ordinated, non-elliptical declarative, main clauses.

This use of the term zero pronominal is to be distinguished from two other uses. The first of these is for what some linguists consider to be null pronouns accompanying overt person inflection, commonly referred to as instances of pro-drop. A case in point is illustrated in (9b) from Gumawana, an Oceanic language spoken in New Guinea.

(9) a. Kalitoni i-paisewa
Kalitoni 3SG-work
'Kalitoni worked.' (Gumawana, Olson 1992:326)

b. ∅ i-situ vada sinae-na
3SG-enter house inside-3SG (inalienable poss.)
'He entered the inside of the house.'
(Gumawana, Olson 1992:308)

In line with the LFG view of such constructions, developed by Bresnan and Mchombo (1986, 1987), I do not take (9b) as having a phonologically null subject pronoun but rather interpret the person affix on the verb as an anaphoric pronominal in agreement with a non-local controller in the preceding clause or discourse. The second use of the term zero pronominal to be distinguished from the usage here is for the zero exponent of a pronominal paradigm. Typically this is the third person singular, as in the Tibetan language Chepang.

(10)

Chepang (Caughley 1982:54–5)			
	sg	du	pl
1incl		-ŋe-ce	-ŋ-se
1excl	-ŋa	-teyh-c	-teyh-ŋi
2	-naŋ	-naŋ-je	-naŋ-se
3	∅	-ce	-ŋi/se

The zero forms may also encompass all the third person pronominal exponents of the grammatical function in question, as in the case of the subject prefixes in Seri (11), a language of Mexico.

(11)

Seri (Marlett 1990:514)		
	sg	pl
1	?-/?p-	?a-
2	m-	ma-
3	∅-	∅-

In such cases it is debatable whether the language should be seen as exhibiting no third person forms or zero forms of the third person, as depicted in (11).[4] Whatever the interpretation, as zeroes of this type are open only to a third person reading, they will not be taken into account here.[5]

The second type of reduced pronominal in Bresnan's typology is the bound form. The term, bound pronoun, is often used in the literature as a cover term for both pronominal affixes and clitics. Here, however,

[4] A good argument for the desirability of reducing the use of zeroes in paradigms in the context of LFG is presented in Börjars and Donohue (2000).

[5] If I were to be considering the distribution of reduced pronominals relative to person and/or number, I would have to treat as zeroes the third person forms in languages such as Seri.

it designates only pronominal inflections expressed by affixes, as in the Gumawana (9), or Chepang (10), or Seri (11) for example or, much less frequently, via changes to the stem, be it segmental or suprasegmental, as in Misantla Totonac (12), where the second person singular subject marker is (with some verbs) marked by suppletion of the stem.

(12) a. (kit) ?ik-án
I 1SG-go
'I go.' (Misantla Totonac, MacKay 1999:226)

b. (wiš) pin
you 2SG:go
'You go.' (Misantla Totonac, MacKay 1999:226)

c. (?út) Ø-?án
(s)he 3SG-go
'(S)he goes.' (Misantla Totonac, MacKay 1999:226)

The distinction between pronominal affix and clitic, though theoretically clear cut, is in fact notoriously difficult to draw. The term clitic is used here essentially in the sense of Zwicky's (1985) special clitics, i.e. not just for phonologically reduced full forms as found, for example, in English but for separate allomorphs of full forms displaying their own morpho-syntactic and morpho-phonological properties. Such forms resemble affixes in forming a phonological unit with a word (their host) preceding them (enclitics) or following them (proclitics). However, whereas affixes attach only to specific types of words (or stems), special clitics attach to phrases and/or specialized syntactic positions. Thus, for instance, an affixal subject pronominal will always be bound to the finite verb, while a clitic subject pronominal may attach to whatever entity occupies a designated position. A common position of argument clitics is after the first word or constituent in the utterance, as is the case in Pitjantjatjara, a language of Western Australia. We see in (13) that the subject enclitic is encliticised to an adverb in (13a), a question word in (13b), and an adjective in (13c).

(13) a. Mungartji=li pitjangu
evening-1DU came
'We two came last evening.'
(Pitjantjatjara Eckert and Hudson 1988:143)

b. Nyaaku=ya parari nyinanyi?
Why-3PL long way are sitting
'Why are they sitting a long way off?'
(Pitjantjatjara, Eckert and Hudson 1988:143)

c. Wati nyara pulkangka=ya ma-nyinanyi
man younder big-with-3PL away are sitting
'They are sitting with that big man over there.'
(Pitjantjatjara, Eckert and Hudson 1988:144)

Another common clitic position is the beginning of the verb phrase or verb complex. In Tinrin, a Melanesian language of New Caledonia, for example, the subject markers, though written separately, are in fact proclitic to the first element of the VP which may be the verb (14a), a tense/aspect particle (14b), or a verbal modifier (14c).

(14) a. Treanrü rri=fi winrô fònri
people 3PL-go follow river
'People went along the river.' (Tinrin, Osumi 1995:215)

b. U=nrâ fi wai
1SG-PROG go already
'I am going now.' (Tinrin, Osumi 1995:177)

c. rri=see saafi wake nyôrrô
3PL-neg all together always cook
'They do not always cook together.' (Tinrin, Osumi 1995:182)

Less frequently the clitic attaches to the word immediately preceding the NP argument that it encodes. This is the case in the Peruvian language Yagua in which the undergoer person enclitics attach to the last word of the clause if there is no corresponding lexical NP present (15a), but if there is such an NP the clitics attach to whatever precedes it, the subject (15b), an adverb (15c), or the verb (15d).

(15) a. Sa-suuta Rospita raruvaava=nii
3SG-wash Rospita down river-3SG
'Rospita washes him/her downriver.'
(Yagua, Payne 1990:32)

b. Sa-suuta Rospita=nii Anita
3SG-wash Rospita-3SG Anita
'Rospita washes Anita.' (Yagua, Payne 1990:31)

c. Riy-juvay-muuy-núúy-janu tiitaju=riy mununumiy
3PL-kill-COMPLT-IMPF-PAST completely-3PL savage
'They completely killed off the savages.'
(Yagua, Payne 1990:31)

d. Rodrigo saay=nii ravichu ray
Rodrigo give-3SG rock me
'Rodrigo gives me the rock.'
(Yagua, Payne 1990:34)

Thus the clitic *nii* in (15b, c, d) forms a syntactic constituent with the following object phrase but a phonological constituent with the preceding constituent. While the term clitic is often used for forms which in fact are always tied to a particular host, but are less tightly bound to it phonologically than affixes, I have taken the criterion of variable hosts as definitive.[6]

The last of the reduced pronominals, the weak form, is a category not yet firmly established in the literature. The term weak pronoun has been used for various subtypes of clitics. In particular it has been used for what are also considered to be simply the Germanic equivalent of clitics such as the reduced subject and object forms in Dutch, e.g., *'k* (I) as opposed to *Ik* or *me* (me) as opposed to *mij*. More recently, Cardinaletti and Starke (1999) have employed the term to cover "mildly deficient pronominals" that cannot be coordinated or modified and do not necessarily refer to human referents. These properties weak forms are seen to share with clitics, which are considered to be "severely deficient pronominals". Unlike clitics, however, they may bear word stress, may be deleted under ellipsis, do not form clusters and cannot be doubled by a full NP (Cardinaletti and Starke 1999:169). Two examples of a weak form in their sense of the term are the Italian forms *loro* 'them' and *egli* 'he' illustrated in (16).

(16) a. Non diro mai loro tutto
no say:FUT:1SG never them everything
'No, I will never say everything to them.'
(Italian, Cardinaletti and Starke 1999:166)

b. Egli mangia della zuppa e beve del vino
he eats of-the soup and drink of-the wine
'He eats the soup and drinks the wine.'
(Italian, Cardinaletti and Starke 1999:166)

Bresnan, on the other hand, characterizes weak pronominals as atonic free forms neither phonologically nor morphologically bound to a constituent, differing from free unaccented pronouns in form and syntactic distribution. This is also the characterization that I have adopted. A case of weak pronominals in the above sense of the term is that of what Sohn (1975) calls subjectives in Woleaian. As we see in (17), these forms are unbound and phonologically distinct from the corresponding free forms. And though they are necessarily preverbal in (18), they are not cliticized

[6]In the absence of evidence for the variable location of a form, I have interpreted it as an affix, i.e. a bound form. Somewhat controversially, I have treated as bound rather than clitics reduced pronominals attached to a catalyst particle or auxiliary complex, as is the case in various Australian languages, e.g., Djaru or Warlpiri.

to the verb. They can be separated from the verb by a negator (18a) or tense/aspect marker (18c), to which they are also not attached.

(17)

Woleaian (Sohn 1975)		
	free subject	subjectives
1sg	gaang	i
2sg	geel	go
3sg	iiy	ye
1excl	giish	gai
1incl	gaaman	si
2pl	gaami	gai
3pl	iir	re

(18) a. (Gaang) i ta weri-∅
I 1SG not see-3SG
'I did not see it.' (Woleaian, Sohn 1975:150)

b. (Gaami) gai lag!
you:PL 2PL go
'You (pl) go!' (Woleaian, Sohn 1975:151)

c. Yaremat laal ye be mas
man that 3SG FUT die
'That man will die.' (Woleaian, Sohn 1975:145)

As for differences in distribution relative to free forms, we see in (18) that the subjectives are obligatory in predicative clauses while the free forms are not. Conversely, whereas the free forms may occur in equational clauses (19a), be followed by the focus marker *mele* (19b), and be coordinated (19c), the subjectives cannot.

(19) a. Gaang (*i) Tony
I Tony
'I am Tony.' (Woleaian, Sohn 1975:147)

b. Iir mele re mwali
they FOC 3PL hid
'They are the ones who hid.' (Woleaian, Sohn 1975:71)

c. Geel me gaang si bel lag
you and I 1PLINCL will go
'You and I will go.' (Woleaian, Sohn 1987:172)

The Woleaian subjectives illustrated above do not, however, meet Cardinaletti and Starke's criteria of what constitutes a weak form, since although they indeed cannot be coordinated and do not necessarily refer to humans, they are obligatory in verbal predications and are not in complementary distribution with full NPs.

Despite the problems involved in distinguishing an affix from a clitic and a clitic from a weak form, the vast majority of the reduced pronominals occurring in the languages in my sample proved to be amenable to classification into the four types distinguished in (1).[7] The most difficult to classify were free-standing combinations of person forms fused with tense.[8] Two examples of such forms are presented below, from Boko (20), a Mande language spoken in Benin, West Africa and Iai (21), an Austronesian language spoken on the Loyalty Islands.

(20) a. ma gbɛ̃ bee-ɔ tàa 'è
I:PERF person that-PL kind see:PERF
'I saw those kind of people.'
(Boko, Jones 1998:78)

b. má ye-∅-ì
I:STATIVE want-3SG-ADES
'I want it.' (Boko, Jones 1998:134)

(21) a. örine añɔ ke ẉalun
they:PRES make a noise
'They make a noise.' (Iai, Tryon 1968:63)

b. örina he
they:FUT go
'They must go.' (Iai, Tryon 1968:49)

Such person forms are regularly encountered in Africa, for instance, among the Mande languages (e.g., Kpelle, Boko, Busa, Kono) and also the Chadic languages (e.g., Margi, Podoko Mandara), as well as in Austronesia (e.g., Tigak, Iai, Dehu, Padoe). Typically they are the result of the fusion of a subject pronoun and a following auxiliary verb. Synchronically, however, it is difficult to know whether they should be treated as auxiliary verbs inflected for person, or pronominals inflected for tense aspect, or as an atypical clitic cluster of person and tense/aspect. The first of these analyses is not very appealing since in most instances the potential auxiliary verb is rather difficult to identify. This is particularly so when the relevant forms are monosyllabic and consist of just a single vowel with only tonal differentiation, as is quite often the case in Mande. For example, consider some of the Boko subject forms together with the object markers (not inflected for tense/aspect) in (22).

[7] This is not to say that I am entirely happy with all the classifications that I have made. The distinction between clitic and weak form was particularly problematic in some instances, especially if no details were provided or the author of the grammar used the two terms interchangeably.

[8] Such forms are considered and given an LFG account in the interesting typological survey of nominal tense inflections conducted by Nordlinger and Sadler (2000).

(22)

Boko (Jones 1998:138, 142)				
	subject			object
	perfective	stative	subjunctive	
1sg	ma	má	mà	ma
2sg	ŋ	ŋ	ŋ/∅	ŋ
3sg	á	ā	aà	aà
1pl	wa	wá	wà	wá
2pl	a	á	à	á
3pl	aa	aa	aa	ŋ

Under the second analysis the relevant person markers would be weak forms inflected for tense/aspect. Such an analysis seems to be appropriate for languages such as Iai, where, as shown in (23), the subject forms look much more like inflected stems.

(23)

Iai (Tryon 1968:46-50, 87)				
	subject			object
	present	future	past	
1sg	ogeme	ogema	oge	na
2sg	umwe	unwa	uje	u
3sg	ame	ama	a	∅
1incl	ötine	ötina	ötine	ötin
1excl	ömune	ömuna	ömune	ömun
2pl	öbune	öbuna	öbune	öbun
3pl	örine	örina	örine	örin

It is of interest to note that the relevant forms do not qualify as weak in Cardinaletti and Starke's sense of the term as they can be doubled by a lexical NP (24a), though not a free pronoun, and can be modified by the article *ke* with the interpretation 'alone' (24b).

(24) a. (j)e *θ*an örine añɔ ke w̥alun
the chiefs 3PL:PRES make a noise
'The chiefs make a noise.' (Iai, Tryon 1986:63)

b. ame ke hebut *θ*ibut aiök
3SG:PRES alone goes always my wife
'My wife always goes alone.' (Iai, Tryon 1986:106)

It is debatable whether the Boko forms should be analysed in the same way as the Iai ones. Jones calls the Boko forms both clitics and subject pronouns suffixed or fused with tense/aspect. The motivation for calling the relevant forms clitics is that when followed by an object pronominal or an NP modified by a possessive pronominal the subject pronominals

form a clitic cluster with the following object or possessive pronominals. Some examples are given in (25).

(25) a. aa aà 'è ⟶ aaa 'è
3PL:PERF 3SG see:PERF
'They saw him.' (Boko, Jones 1998:131)

b. wa á da 'è ⟶ waa 'è
1pl:PERF 1SG mother see:PERF
'We saw our mother.' (Boko, Jones 1998:131)

However, as shown in (26) the subject pronominals are not phonologically attached to a following NP object. Therefore unless the fused subject/tense/aspect forms are themselves treated as a clitic cluster, the inflected weak form analysis may in fact be preferable. The fact that the subjunctive forms may be elided after aspectual verbs with the same referent (26) may be viewed as an argument in favour of the weak form as opposed to the clitic analysis.

(26) má ye (mà) gɛ
1SG:STATIVE want (1SG:SUBJUNCTIVE) go
'I want to go.' (Boko, Jones 19:133)

5.3 The Argument Prominence Hierarchy

In LFG grammatical functions are classified into argument functions and non-argument functions. The full set of argument functions as based on Bresnan (2001b:97) is shown in (27).

(27) SUBJECT OBJECT1 OBJECT2 OBLIQUE COMPLEMENT

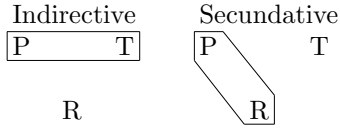
The SUBJECT, OBJECT1 and OBJECT2 functions are considered to be core functions which are unrestricted in regard to semantic role. The oblique and COMPLEMENT are the noncore functions.

The mapping of the core functions onto argument structure is taken to be dependent on alignment. In the case of the subject function the alignment categories are the familiar, accusative, ergative, active and hierarchical. Using the three terms S, A and P[9] introduced by Dixon (1972) and Comrie (1978), in accusative alignment the subject is associated with the S and A; in ergative alignment with the S and the P, in active alignment with the argument controlling the eventuality, the A and one type of S and in hierarchical alignment with the most prominent argument on a person or animacy hierarchy. The interpretation of the OBJECT1 and OBJECT2 functions also depends on alignment

[9]The term S stands for the single argument of an intransitive clause, A for the agentive argument of a transitive clause and P for the patient argument of a transitive.

though not in the sense of the term used above, but as applied to ditransitive as opposed to monotransitive clauses. The term alignment in the case of ditransitive clauses refers to how the patient and recipient are encoded relative to the encoding of the P in monotransitive clauses. Using the labels T, P and R from Haspelmath (2001) where T stands for the ditransitive patient (theme), P for the transitive patient and R for the ditransitive recipient/benefactive the two dominant ditransitive alignments, indirective and secundative are illustrated in (28).

(28)



In indirective alignment the ditransitive patient T is treated identically to the transitive P and the R is distinct (corresponding to transitive accusative alignment). An example of indirective alignment of bound person forms is presented in (29) from the Mayan language Mam.

(29) a. ma Ø-kub' -ky-tzuu-7n
REC.PAST 3SGSP-DIR-3PLA-grab-DIR
'They grabbed it.' (Mam, England 1983:193)

b. ma-a7 Ø-tzaj-ky-q'o-7n q-ee
REC.PAST-EMPH 3SGSP-DIR-3PLA-give-DIR 1PL-TO
'They gave it to us.' (Mam, England 1983:195)

Note that both the P in (29a) and T in (29b) are marked by a verbal prefix which in the case of the third person singular is zero, while the R in (29b) occurs as the object of a preposition. In secundative alignment the ditransitive R is treated in the same way as the transitive P and the ditransitive T is treated differently (corresponding to ergative alignment). A language manifesting secundative alignment in the case of first and second person forms is the New Guinea language Yimas. We see in (30) that the form of the 1st person R marker *ŋa-* in (30b) is the same as that of the P in (30a).

(30) a. ma-ŋa-tay
2SG-1SG-see
'You saw me.' (Yimas, Foley 1991:206)

b. uraŋ k- mpu-ŋa-tkam-t
coconut VI:SG-3PL-1SG-show-PERF
'They showed me the coconut.' (Yimas, Foley 1991:208)

Since the LFG OBJECT1 is associated with the primary object in the sense of Dryer (1986), in indirective alignment it corresponds to the P and T and in secundative alignment to the P and R. By the same token

OBJECT2, which corresponds to Dryer's secondary object, covers the R in indirective alignment and the P in secundative.[10]

As for the non-core functions, OBLIQUE corresponds to arguments associated with specific semantic roles, such as the third locative argument of the English verb *put*. The COMPLEMENT function designates predicate complements such as liar in *Jack is a liar* or *We thought Jack a liar*.

In my investigation of the relationship between reduced pronominals and argument prominence I utilize the LFG argument prominence hierarchy with some minor modifications. I simplify the LFG view of subjecthood and restrict my observations regarding subjects to the A argument of monotransitive clauses. By contrast, I maintain the LFG distinction between OBJECT1 and OBJECT2 as characterized above. Further, of the two non-core grammatical functions, I consider only obliques. My motivation for disregarding the complement function is a very practical one. I simply have no data on the pronominal realization of predicate complements.[11] Finally, in considering the pronominal realizations of obliques, I take into account only NP or DP constituents not adpositional ones. Many languages have reduced pronominals, bound forms or clitics, for the objects of adpositions as illustrated in (31) on the basis of Retuarã, a Tucanoan language of Colombia.

(31) a. ki-po?irã
3SG.M-to
'to him' (Retuarã, Strom 1992:74)

b. Aturu põ?irã
Aturu to
'to Aturu's' (Retuarã, Strom 1992:185)

However, as such bound and clitic forms are attached to the adposition rather than to the verb, including them in the investigation would result in a confusion of the clausal and adpositional domains. Accordingly, they have been left out of the investigation.

5.4 The Distribution in the Sample

This section discusses the distribution of reduced pronominals and argument prominence among the languages in the sample.

[10] Indirective and secundative are not the only ditransitive alignments. There are ditransitive analogs of all the monotransitive alignments, i.e. active (split-P and fluid-P), tripartite, hierarchical and neutral. For some discussion see Siewierska (2002).

[11] Given the nature of complements it is difficult to imagine that they should be realized by reduced pronominal forms.

5.4.1 Some Comments on the Language Data

The sample on which this investigation is based consists of 402 genetically and areally stratified languages which are listed in the appendix. Though originally compiled using the sampling methodology developed by Rijkhoff et al. (1993) and further developed in Rijkhoff and Bakker (1998), the sample currently contains many genetically related, even closely genetically related, languages. It must therefore be regarded as a random rather than a probability or variety sample. This must be kept in mind in interpreting the frequency generalizations.

My information on the pronominal realization of arguments in the languages in the sample is in the main drawn from reference grammars which differ widely with respect to the range of phenomena that they cover and the details they provide. On the whole, the overt pronominal encoding of the S, A and P is well discussed. That of the T and R in ditransitive clauses and of OBLIQUE arguments much less so. Therefore the data on the frequency and range of reduced pronominals in OBJECT2 and oblique functions to be presented below has to be viewed with some caution. This holds even more so for the data on zero pronominals. Information regarding the existence of zero pronominals and their interpretation is very often unavailable and incomplete. The phenomenon of pronominal reference via zero forms is therefore possibly more common than my current data suggest.

Another point that needs to be mentioned is my treatment of languages which have more than one type of reduced pronominal for a given grammatical function. This may involve two separate paradigms or occur within a single paradigm. The first of these two possibilities is found, for example, in the Uto-Aztecan language Cora. As we see in (32) the language has a set of subject prefixes used when the verb precedes its nominal arguments and a corresponding set of subject clitics used when a nominal argument precedes the verb (Casad 1984:171).

(32)

Cora (Casad 1984:297)		
	subject prefix	subject clitic
1sg	n^{y}a-	nu
2sg	pa-	pa
3sg	∅	pu
1pl	ta-	tu
2pl	sa-/ša-	su
3pl	ma-	mu

The subject prefixes are tightly bound to the verb complex and undergo phonological change depending on the vowel of the verbal stem. For

example, the second person singular *pa-* is realized as *pwa* before an *'a* or *'I*, as shown in (33).

(33) a. pa-kuh-mɨ
2SG-sleep-DESID
'You are sleepy.' (Cora, Casad 1984:324)

b. p^{w}a-'a-rá-kun
2SG-along-facing-be
'You're blind.' (Cora, Casad 1984:324)

The clitics are only loosely attached to the verb, may occur both pre- and postverbally and may be separated from the verb by nominals, particles and adverbs (34).

(34) ruíhm^{w}a'a nu=wí pu-een kɨn ya=ta-n^{y}eh-sin
tomorrow 1SG-quot ASSR-be with here=straight-arrive-DUR
'Tomorrow I am coming for this express purpose.'
(Cora, Casad 1984:325–326)

The presence of two types of reduced pronominals within the same paradigm is not very common. The example in (35) is from Fyem, a Gur language of Nigeria, in which the object forms in the singular are suffixes while those in the plural are weak forms.

(35)

Fyem (Nettle 1998:28)			
1sg	-uŋ/-iŋ	1pl	té
2sg	-o	2pl	mún
3sg	-ii	3pl	bá

That the weak forms are indeed separate phonological words is evidenced by the fact that in contrast to the suffixes they follow derivational affixes and other constituents. For instance, in serial verb constructions the object suffixes are attached to the first verb (36a) while the weak forms occur after the second verb (36b).

(36) a. taa ɓé-ŋ tu wíni
3SG:PERF come-1SG possessing water
'He brought me water.' (Fyem, Nettle 1998:44)

b. taa ɓé tu té wíni
3SG:PERF come possessing 1PL water
'He brought us water.' (Fyem, Nettle 1998:44)

In classifying the reduced pronominals in the languages in my sample, I took into account such differences in realization and thus some languages have more than one entry for a particular grammatical function.[12]

[12]I did not, however, take into account differences involving just an individual form.

5.4.2 Reduced Pronominals as a Group

Recall that the relationship between reduced pronominals as a group and argument prominence expressed in (2) may be interpreted as pertaining to the crosslinguistic frequency of reduced forms and also to their distribution within languages. Needless to say, if the distribution of reduced pronominals within languages is consistent with (2), so will be their crosslinguistic frequency. The reverse, however, does not hold. It may well be the case that reduced pronominals more frequently realize subjects than objects, etc., but that there are languages in which this does not obtain. It is therefore necessary to consider the two interpretations separately.

Let us begin with the frequency interpretation one. The possibility of any of the four grammatical functions being realized by a reduced pronominal among the languages in the sample is depicted in Table 1.

TABLE 1 Reduced pronominals (as a group) and argument prominence

Reduced Pronominals	Subject N=402	Object1 N=402	Object2 N=375	Oblique N=332
No. lgs	330	247	55	20
%	82%	67%	15%	6%

We see that the vast majority of languages have some form of reduced pronominals for subjects and just over two thirds for object1. In the case of object2, however, there is a drastic reduction of reduced pronominals and a similar radical reduction for obliques. The first interpretation of (2) is thus evidently valid.

That reduced pronominals as a group should be less frequent as one goes down the argument prominence hierarchy may be seen as being functionally and cognitively motivated. The subject function, and especially the A, typically encodes highly accessible participants in the sense of Givón (1983) and Ariel (1990, 1991), i.e. participants manifesting properties associated with the left-hand side of the hierarchies in (37) as opposed to those on the right.

(37) a. Speaker > addressee > non-participant (3rd person)
b. High physical salience > low physical salience
c. Topic > nontopic
d. Human > animate > inanimate
e. Repeated reference > few previous references > first mention
f. No intervening/competing referents > many intervening/competing referents

Accessibility in turn is viewed as having a direct bearing on formal encoding, the more accessible the referent, the less coding required. This is shown in the simplified version of Ariel's accessibility marking scale in (38).

(38) **The accessibility marking scale**
zero < reflexives < poor agreement markers < rich agreement markers < reduced/cliticized pronouns < unstressed pronouns < stressed pronouns < NP

Thus given the association between SUBJECTs and high accessibility, the fact that the overwhelming majority of languages have at their disposal some form of reduced pronominals for subjects is hardly surprising. By the same token reduced pronominals for OBLIQUE constituents which typically encode referents low in accessibility should be rare. And as Table 1 suggests, this is indeed so.

The encoding by reduced pronominals of constituents bearing semantic roles characteristic of obliques is often found in applicative constructions, as is the case in various Bantu languages and Amerindian languages. In the non-applicative, the OBLIQUE is realized by a free pronoun, in the applicative, the now applied object, by a reduced pronominal. This is exemplified in (39) from Yatzachi el bajo Zapotec where the reduced pronominal *-bo* in (39b) is bound to the verb.

(39) a. o-i?-a len ile-bo?
CONT-sit-1SG with stem-3FAMILIAR
'I am sitting with him.'
(Yatzachi el bajo Zapotec, Marlett 1985:123)

b. o-i?i-len-a-?a-bo?
CONT-sit-COM-1SG-APPL-3FAMILIAR
'I am sitting with him.'
(Yatzachi el bajo Zapotec, Marlett 1985:123)

Significantly, reduced pronominals are typically used to encode OBLIQUE participants that are human as opposed to nonhuman in accordance with the accessibility hierarchies in (37). Such is the case in many Australian languages (Blake 1987:37,101) in which as illustrated in (40) a bound pronominal may cross-reference a human allative or source.

(40) a. Vincent-nga-nta mapitya-ngu nyuntu-lakutu
Vincent-NOM-2SG:OBL go-PAST you-all
'Vincent went to you.'
(Ngaanyatjara, Glass and Hackett 1970:42)

b. mantyi-nu-rni nganku-lamartatyi kuka
get-PAST-1SG:OBL me-ABL meat
'He/she got the meat from me.'
(Ngaanyatjara, Glass and Hackett 1970:42)

As for the use of reduced pronominals with OBJECT1 as compared to SUBJECT, the fact that reduced pronominals are less frequently used for objects than for subjects again correlates with the relatively lower accessibility of the former as compared to the latter. The same holds for OBJECT1 as compared to OBJECT2 under the assumption that most of the reduced pronominals realizing OBJECT1 are Rs, which are typically human, rather than Ps, which are much less frequently so. This is not quite the case. Of the 270 reduced pronominals realizing OBJECT1, 39% are Rs, 61% Ps. Thus among the languages in the sample there are somewhat more languages exhibiting indirective alignment of reduced pronominals than secundative. Nonetheless, a good proportion (40%) of the languages with indirective alignment of reduced pronominals have not only some form of reduced pronominals for OBJECT1 but also for OBJECT2. In fact all the reduced pronominals realizing OBJECT2 but for one are from indirective as opposed to secundative alignment, i.e. they are Rs as opposed to Ts. This is fully in line with the accessibility hierarchies. Given the high accessibility of recipients over patients there is obvious motivation for a language to develop reduced pronominals for recipients in indirective alignment but not for patients in secundative.

Let us now turn to the language internal distribution of reduced pronominals. If the second interpretation of (2) is valid then no language should exhibit reduced pronominals for a grammatical function if it does not also have reduced pronominals for functions higher in the argument prominence hierarchy. The distribution of reduced pronominals in the overwhelming majority of the languages in the sample is in conformity with the above. There are, nonetheless, a very small number of exceptions.

The major group of exceptions is that of languages which have bound or clitic forms for OBJECT1 but no reduced subject forms. These include Ani, Barai, Bimoba, Gilyak, Karo-Batak, Noon, Panyjima (only one bound object form for 1SG) and Sema (only bound objects for 1SG and 2SG).[13] Interestingly enough in all these languages the reduced object forms are quite restricted. For example, in Panyjima (Dench 1991:159) they are found only with the first person patient or recipient/benefactive.

[13]Given my identification of the subject with the A, one could also list here the few languages which have person affixes or clitics for the S and P but not the A (and no apparent other reduced pronominals) such as Palikur, and Karitiana. This would, however, just be an artifact of the procedure that has been adopted here.

In Sema (Sreedhar 1980:81–82) they occur only in the 1SG and 2SG. In Gilyak (Gruzdeva 1998:34) the relevant forms are found only in the imperative. In Ani, there is a full paradigm but according to Heine (1999:29) it is not used all that frequently. And in Barai (Olson 1975:475–476) the object suffixes occur only with some verbs.

Two other exceptional languages are the Chadic language Gude and the Papuan language of the Ismrud family Waskia. According to Hoskison (1983:110) Gude has no reduced pronominals for either subject or OBJECT1 but does have (in some dialects) a bound OBJECT2 form which is attached to the verb stem between the verb root and the following applicative extension. Compare (41a) with the free pronoun *ci* and (41b) featuring the bound form *nə*.

(41) a. kə vii Musa kwaba ka ci
compl give Musa money to him
'Musa gave money to him.' (Gude, Hoskison 1983:110–111)

b. kə ka-nə-paa Musa buura
compl set down-3SG.M-APPL Musa bag
'Musa set down the bag for him.'
(Gude, Hoskison 1983:110–111)

Waskia (Ross and Natu 1978:43) in turn has bound person forms fused with tense for the subject and in the case of the verb 'give' also for OBJECT2. It does not, however, have any reduced forms for OBJECT1. The bound forms for OBJECT2 are of a special type, i.e. they involve stem change. The language has four stems of the verb 'to give' dependent on the person in the singular and number in the plural: *asi* for 1SG; *kisi* for 2SG, *tuw* or *tuiy* for 3SG and *idi* for all persons in the plural.[14]

5.4.3 The Four Types of Reduced Pronominals

As in the case of the group interpretation of the relationship between reduced pronominals and argument prominence expressed in (2), I will first consider the two crosslinguistic frequency readings of (2) and then turn to matters of language internal distribution. The third interpretation of (2) is that each of the reduced pronominals in (1), zeroes, bound forms, clitics and weak forms, more frequently realizes subjects than OBJECT1, and more frequently realizes OBJECT1 than OBJECT2, etc. In order to determine whether this is indeed so, we must take a look at the use of each of the four types of reduced pronominals relative to grammatical function in the languages in the sample. The relevant data is shown in Table 2.

[14]The use of separate stems to mark person with the verb 'to give' is not an isolated phenomena. Various examples are discussed in Comrie (2001).

TABLE 2 The distribution of the four types of reduced pronominals relative to argument prominence

	Subject	Object1	Object2	Oblique	Total
Zero	22	24	1	0	47
Bound	249	195	40	14	498
Clitic	46	48	13	6	113
Weak	13	4	1	0	18

The first point that needs to be made is that the frequency of the four types of reduced pronominals among the languages in the sample differs enormously. Nearly three quarters (73%) of the reduced pronominals are bound forms. This holds not only as a whole but also for each grammatical function individually. Secondly, weak forms are very poorly represented other than for subjects. To what extent this is due to my ignoring obliques realized as adpositional phrases is not completely clear. Nonetheless, that this may be so has to be kept in mind.

As for the distribution of the reduced pronominals relative to grammatical function, we see that with two minor exceptions the frequency of each of the four types of reduced pronominals decreases as we proceed down the argument prominence hierarchy. The decreases in frequency are all substantial and thus may be taken as significant. In the case of zeroes and clitics, however, there are marginally more languages exhibiting object1 than subjects.[15] Given the nature of my sample, such marginal differences in frequency cannot be taken as suggestive of zeroes or clitics favouring object1s over subjects. They can, on the other hand, be interpreted as suggesting that zeroes and clitics, unlike affixes and weak forms, do not favour subjects over objects. Thus the third interpretation of the relationship between reduced pronominals and argument prominence holds only for two of the four reduced pronominals.

Turning to the fourth interpretation of (2), it too is borne out only in part. The fourth interpretation is that there should be a relative decrease in the occurrence of zeroes as compared to bound forms as compared to clitics, etc. as we proceed down the argument prominence hierarchy. Thus the proportion of zeroes, for example, among subjects should be considerably higher than among object1 and among object1 higher than among object2, etc. And conversely the proportion of weak forms among subjects should be lower than among object1 and among object1 lower than among object2, etc. The extent to which the above distribution is exhibited by the data can be appreciated on

[15] In his 100-language sample, Gilligan (1988) also found there to be a few more languages with zero objects than zero subjects.

the basis of the figures in Table 3 which represent the frequency of each reduced pronominal relative to the set of reduced pronominals realizing each grammatical function. As Table 3 reveals, the distribution of bound forms and clitics is in line with interpretation four, but not of zeroes or weak forms. The proportion of bound forms among the pronominals decreases as we go down the argument prominence hierarchy from 75% with subjects to 70% with obliques. The proportion of clitics increases as we go down the argument prominence hierarchy, from 13.9% with subjects to 30% with obliques.

TABLE 3 Frequency of the four types of reduced pronominals relative to each other in the four grammatical functions

	Subject N=330	Object1 N=270	Object2 N=55	Oblique N=20
Zero	6.6%	8.5%	1.8%	0%
Bound	75.5%	72.2%	72.7%	70%
Clitic	13.9%	17.8%	23.6%	30%
Weak	3.9%	1.4%	1.8%	0%

The fifth and last interpretation of the statement in (2) to be considered here is that pertaining to the language internal distribution of the reduced pronominals. The relevant reading is that no reduced pronominal in (1) should be able to realize an argument higher on the argument prominence hierarchy than any reduced pronominal to its left.

As one would expect, there are somewhat more languages in the sample which counter this prediction than in the case of interpretation two, where the reduced pronominals were considered as a group. First of all there are languages which allow for zero objects but not subjects as is the case in Kewa, Finnish and Chamorro (42).

(42) in-bisita (qui') q' espitatt
1PL-visit (him) LOC hospital
'We visited (you, him, them) at the hospital.'
(Chamorro, Chung 1984:120)

As one would expect, all the languages in question have bound subjects. Secondly, there is one language which has a zero OBJECT2 but does not allow zeroes for OBJECT1. This is Trumai, a genetic isolate of Brazil, which displays various ergative characteristics. Guirardello (1999) documents that both As and recipients in ditransitive clauses may be rendered by zero pronominals, given the right pragmatic conditions, but Ss or Ps cannot. Compare the use of the dative pronoun in (43a) with the examples of zero anaphora in (43b, c).

(43) a. kiki-k atlat-∅ kïţi hai-tl
man-ERG pan-ABS give I-DAT
'The man gave the pan to me.' (Trumai, Guirardello 1999:259)

b. ni'de esak-∅ chi-in kach hai-ts kïţi ke[16] ∅
this hammock-ABS tense-FOC later I-ERG give Ke DAT
'I will give (you) this hammock.'
(Trumai, Guirardello 1999:353)

c. hai-ts chi(-in) de oke yi-∅ kïţi ∅
I-ERG tense-FOC already medicine Yi-ABS give DAT
'I have already given medicine (to her).'
(Trumai, Guirardello 1999:259)

Under the same discourse circumstances an S or P will be rendered either by a free pronoun or, in the case of the third person, by the pronominal clitic *-n* which is attached to the last constituent in the VP. The second of these two possibilities is exemplified in (44).

(44) ha adif-atl chi-in hai-ta kïţi-n
1SG brother-DAT tense-FOC I-ERG give-3ABS
'I gave (it/her) to my brother.' (Trumai, Guirardello 1999:343)

Thirdly, there are languages, which have bound objects but weak forms for subjects. This pattern is particularly frequent among the languages of Micronesia. It is found, for example, in Kusaiean, Ponapean, Tigak, Woleaian and Yapese. As shown in (45) from Yapese, the subject may occur in a full form as in (45a) or a weak form as in (45b). The object, on the other hand, is bound to the verb.

(45) a. Gamow raa guye-eem
1:DL:EXCL FUT see-2SG
'We will see you.' (Yapese, Jansen 1977:194)

b. Ku gu guy-eew
PERF 1:EXCL see-3DUAL
'We saw it.' (Yapese, Jansen 1977:192)

And finally there are languages that have bound objects, but clitic subjects. Among them are Burunge, Halkomelem, Kutenai, Lower Umpqua, Mundari (46) and Southeastern Tepehuan.

(46) Samu ceneko-e lel-ko-tan-a
Samu birds-3SG look-3PL-PRES:INDIC
'Samu is looking at the birds.' (Mundari, Cook 1965:239)

[16] *Ke* is a morpheme that is placed after the verb whenever the P occurs in any position other than immediately preverbal.

Though the distribution of reduced pronominals does not directly reflect the hierarchy of argument prominence in all languages, there is nonetheless a strong crosslinguistic tendency for reduced pronominals to be distributed in line with the argument prominence hierarchy. Of the 402 languages in my sample only 43 (11%) utilize a more reduced pronominal for some argument lower in the argument prominence hierarchy than for an argument higher on the hierarchy. Thus though interpretation five does not hold as an absolute universal, it does hold as a statistical one.

5.5 Concluding Remarks

My investigation of the five interpretations of the relationship between reduced pronominals and arguments prominence in (2) revealed that of the three interpretations pertaining to crosslinguistic frequency, only the first interpretation definitely holds. Reduced pronominals as a group are distributed according to a hierarchy of argument prominence, being most common with subjects and decreasing with the increasing obliqueness of arguments. By contrast, it is not the case that each reduced pronominal more frequently realizes SUBJECT than OBJECT1, and OBJECT1 than OBJECT2 etc. (interpretation three). Such a distribution is manifested by bound and weak forms but not by zeroes and clitics. The latter cannot be seen to exhibit a preference for subjects over objects. Nor is there a relative decrease in the occurrence of zeroes as compared to bound forms as compared to clitics as compared to weak forms as we proceed down the argument prominence hierarchy (interpretation 4). In this case it is the bound forms and clitics that exhibit a distribution along the above lines but not the zeroes and weak forms. While bound forms are the most common type of reduced pronominal with all four types of grammatical functions, their frequency relative to the other reduced pronominals exhibits a very small but steady decrease as we proceed down the argument prominence hierarchy, from 76% with subjects to 70% with obliques. This decrease is picked up by clitics which in turn show a small increase in frequency from 14% with subjects to 30% with obliques.

As for the language internal distribution of reduced pronominals, neither when viewed in hierarchical terms or even as a group do they pattern in strict compliance with (2). Nonetheless, in the overwhelming majority of languages more reduced forms of pronominals are used for arguments higher on the argument prominence hierarchy than those for lower on the hierarchy. Virtually the only exceptions to this involve subjects and OBJECT1. In a relatively small number of languages more

reduced forms of pronominal encoding are available to OBJECT1 than to subjects, either zeroes as opposed to bound forms, or bound forms as opposed to clitic or weak forms. The former, i.e. the combination of a zero form for object with a bound form for subject may be seen to follow from the stronger tendency for subject pronominals to grammaticalize into person agreement markers than object pronominals, noted by many linguists (e.g., Givón 1983, Lehmann 1982, Bresnan and Mchombo 1987, Siewierska 1999). If pronominal subjects are rendered by bound forms and pronominal objects by free forms, the possibility arises of zero forms for objects developing in certain contexts. Needless to say, such a possibility is no longer available for the subjects. The second exceptional pattern, the existence of bound objects and clitic or weak subjects has been attributed by Song (1994) to the closer relationship between the verb and its object than to that between the verb and its subject.[17] An alternative possibility is to view such patterns as the result of the greater likelihood of fusion in post-stem than in pre-stem position observed by Hall (1988) and Bybee et al. (1990), for example. Many of the instances of clitic or weak subjects and bound objects are from SVO languages where the object is a suffix and the pronominal subject a proclitic or weak form preceding the verb. Yet another explanation relevant for languages in which the subject form is sensitive to tense is that the current weak form is in fact a former bound form, and as such, the pattern in question does not constitute a counter example to the tendency for languages to use more reduced forms of pronominals for arguments higher on the argument prominence hierarchy than those for lower on the hierarchy.

In the light of the above investigation, a number of additional points in regard to the distribution of reduced pronominals can be made. First of all, not all the reduced pronominals appear to be open to all the positions on the argument prominence hierarchy. There are no languages with zero obliques in the sample and the only language that I am aware of other than Trumai that allows zero forms to be used for OBJECT2 is Colloquial Sinhala.[18] Secondly, and not very surprisingly, languages tend to have only one type of reduced pronominal for a given grammatical

[17]Song (1994) actually posits this explanation only for languages in which the object markers exhibit anaphoric as opposed to grammatical agreement. However, as I consider the distinction between anaphoric and grammatical agreement to be a gradual rather than a dichotomous one, I do not see why it should be applied only for anaphoric markers.

[18]Recall that the complements of adpositions have not been considered here. As pointed out by an anonymous reviewer, even English may be seen as having zero pronominals with adpositions, as, for example, in *Where is Max sitting? Behind (me)/(you)/(us).*

function. Thus if a language has bound subjects it tends not to have also clitic or weak ones. And if a language has clitic objects it is unlikely to also have bound ones. As noted earlier there are exceptions to this but they are not common. And thirdly, languages appear to exhibit a strong predilection for having only a restricted set of types of reduced pronominals. There is no language in the sample which regularly utilizes more than two different types of reduced pronominals for the functions that have been considered here.

Appendix

Languages in the sample (N=402) according to macro-area.

Eurasia 55 (14%)

Abkhaz, Ainu, Akkadian, Albanian, Armenian (Eastern), Basque, Brahui, Burushaski, Chepang, Chinese (Mandarin), Chukchi, Crimean Tatar, Dagur, Dong, Dutch, English, Evenki, Finnish, French, Garo, Georgian, German, Gilyak, Greek (Modern), Hindi, Hittite, Hungarian, Hunzib, Ingush, Irish, Italian, Japanese, Ju chen, Kannada, Kashmiri, Ket, Khalkha, Korean, Kurdish (Central), Lak, Latvian, Lezgian, Mundari, Nenets, Ossetic, Persian, Polish, Remo, Russian, Spanish, Sumerian, Turkish, Udihe, Welsh, Yukaghir (Kolyma)

Africa 81 (20%)

Amharic, Ani, Arabic (Egyptian), Babungo, Bagirmi, Bambara, Bari, Beja, Berta, Bilin, Bimoba, Boni (Jara), Burunge, Coptic, Dagare, Diola-Fogny, Dizi, Dogon, Dongolese Nubian, Doyayo, Ewe, Fula, Fur, Geez, Grebo, Gude, Hamar, Hausa, Hebrew, Igbo, Iraqw, Kana, Kanuri, Katla, Kera, Kisi, Koh (Lakka), Kolokuma (Ijo), Koma, Kongo, Koromfe, Koyra Chiini, Kreol (Mauritian), Krongo, Kuku, Kunama, Lango, Lele, Luvale, Maale, Maba, Mbay, Mende, Mesalit, Mumuye, Mupun, Murle, Nama, Nandi, Ndonga, Ngiti, Nkore Kiga, Noon, Nupe, Oromo (Harar), Pari, Sandawe, Sango, So, Songhay (Koyraboro), Supyire, Swahili, Tamazight (Ayt Ndhi), Turkana, Wolaytta, Xu, Yaoure, Yoruba, Zande, Zulu

Australia and New Guinea 76 (19%)

Abun, Alamblak, Amele, Anem, Arabana, Asmat, Au, Awtuw, Bandjalang, Barai, Broken, Bukiyip, Cape York Creole, Daga, Dani (Lower Grand Valley), Ekari, Gapun, Gooniyandi, Gumawana, Guugu Yimidhirr, Hatam, Hua, Imonda, Kalkatungu, Kapau, Kayardild, Kewa, Kobon, Koiali (Mountain), Koiari, Labu, Lavukaleve, Maisin, Makian (West), Malakmalak, Mangarayi, Maranungku, Marind, Martuthunira, Maung,

Maybrat, Nasioi, Ngalakan, Ngankikurungkurr, Ngiyambaa, Nunggubuyu, Nyulnyul, Panyjima, Pitjantjatjara, Sahu, Salt (Yui), Selepet, Sentani, Suena, Tauya, Tawala, Tehit, Tigak, Tiwi, Una, Ungarinjin, Uradhi, Vanimo, Wambaya, Wambon, Wanuma, Wardaman, Waskia, Yava, Yeletnye, Yessan-Mayo, Yidin, Yimas, Yukulta, Yulparija, Yuwaalaraay

Southeast Asia and Oceania 62 (15%)

Acehnese, Adzera, Anejom, Atayal, Bawm, Burmese, Byansi, Chamorro, Chrau, Dehu, Fijian, Hmong Njua, Indonesian, Kaliai Kove, Kapampangan, Karo-Batak, Kayah Li, Khasi, Khmer, Khmu, Kilivila, Kiribatese, Konjo, Kusaiean, Ladakhi, Lahu, Larike, Lepcha, Limbu, Lolo (Nesu), Lushai, Malagasy, Maori, Meithei, Mlabri (Minor), Mono Alu, Muna, Nakanai, Paamese, Paiwan, Palauan, Rapanui, Rawang, Samoan, Savu, Sema, Semelai, Sundanese, Taba, Tagalog, Temiar, Thai, Tidore, Tinrin, Tolai, Tsou, Tukang-Besi, Uma, Ura, Vietnamese, Woleaian, Yapese

North America 68 (17%)

Achumawi, Acoma, Atakapa, Cahuilla, Chalcatongo Mixtec, Chinantec Lealao, Chocho, Chumash Barbareno, Comanche, Comox, Copala-Trique, Cora, Cree (Plains), Greenlandic (West), Haida, Halkomelem, Hanis Coos, Jakaltek, Jamul Tiipay, Jicaque, Karok, Kiowa, Koasati, Kutenai, Lakota, Makah, Maricopa, Mohawk, Mountain Maidu, Navajo, Nez Perce, Nootka, Oneida, Otomi (Mezquital), Passamaquoddy, Pipil, Quileute, Salinan, Seri, Sierra Popoloca, Slave, Southeastern Pomo, Squamish, SS Miwok, Takelma, Tarascan, Tepehuan (Northern), Tetelcingo Nahuatl, Tlingit, Tonkawa, Totonac (Misantla), Tsimshian (Coast), Tunica, Tzutujil, Umpqua (Lower), Wappo, Wasco-Wishram, Washo, Wichita, Wikchamni, Wintun, Yaqui, Yuchi, Yupik, Yurok, Zapotec San Lucas, Zoque (Copainala), Zuni

South America 60 (15%)

Abipon, Amuesha, Apurina, Araona, Arawak (Lokono Dian), Awa Pit, Aymara, Barasano, Bororo, Bribri, Campa (Axininca), Candoshi, Canela Kraho, Capanahua, Carib, Cavinena, Cayuvava, Chacobo, Cubeo, Epena Pedee, Guarani, Guaymi, Hixkaryana, Ika, Iquito, Jaqaru, Karitiana, Kawesqar, Kwaza, Makuchi, Mapuche, Marubo, Mataco, Miskito, Nadeb, Nambikuara, Ndyuka, Palikur, Paumari, Pech, Piraha, Quechua Imbabura, Rama, Retuarã, Sanuma, Saramaccan, Selknam, Shipibo Konibo, Teribe, Tiriyo, Trumai, Urubu Kaapor, Waorani, Warao, Warekena, Wari, Waura, Witoto (Muinan), Xokleng, Yagua

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6

French Psych Verbs and Derived Nouns

Carmen Kelling

6.1 Introduction

Since Chomsky's (1970) "Remarks on Nominalization," there has been much discussion of the similarities and differences between verbs and their corresponding derived nouns (e.g., Alexiadou 2001, Falk 2001, Grimshaw 1990, Laczkó 2000, Markantonatou 1995, to mention only a few recent publications).[1] One of the most disputed issues in these studies is the question whether the nominal[2] inherits the argument structure of its base verb or not. This paper addresses this question on the basis of an analysis of French psychological or psych verbs and their corresponding deverbal noun. I argue: (i) that the deverbal noun has the same semantic arguments as the corresponding verb (e.g., Rappaport 1983, Grimshaw 1990, Markantonatou 1995); (ii) that the arguments of the nominals are optional and realized in a different way, i.e., always as restricted functions.

The theoretical framework assumed here is Lexical-Functional Grammar (LFG) (Bresnan 2001) combined with Dowty's (1991) proto-role proposal. For the realization of the nominal's arguments, I introduce

[1]I am grateful to Miriam Butt, Bruce Mayo, Judith Meinschaefer, Marie-Therese Schepping and Christoph Schwarze for discussion of the issues in this paper. I would like to thank two anonymous reviewers for helpful comments. Special thanks go to Bruce Mayo for checking my English. Naturally, all remaining errors are my responsibility. The data presented here were collected by members of the DFG project A6 (SFB 471), University of Konstanz.

[2]I use the term nominal for nouns derived from a verbal base.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

a *nominal argument realization principle* which is different from verbal mapping principles. In addition, language-specific realization rules are needed to predict the appropriate realization of the nominal arguments.

Verbs describing mental or psychological states, so-called psych verbs, are a notorious problem for any linking theory, in that they show a puzzling variety of argument realization patterns. For many languages, two classes of psych verbs are assumed to exist. These differ as to whether the experiencer is subject and the theme is object or vice versa.

For French psych verb nominals, corpus analyses reveal a variety of patterns for the nominal's realization of the experiencer and the theme arguments, depending mainly on the class of the base verb. The analysis presented in this paper is based on a corpus of about 120 psych verbs and their derived nouns.

The paper is structured as follows. In section 6.2, I give a short introduction to the theoretical framework. LFG's linking theory, Lexical Mapping Theory (LMT), accounts for the correct mapping from verbal arguments to grammatical functions. Proto-role properties are necessary for the appropriate assignment of intrinsic features of the verb. These features steer the argument expression.

In section 6.3, I present a classification of French psych verbs, showing their different configurations of thematic relations, as well as their various aspectual behaviors. We will see that canonical LFG/LMT has difficulties in modeling the mapping behavior of psych verbs. Therefore, I present a modified analysis of verbal argument mapping within a framework of LMT/proto-roles.

Starting from the verb classes introduced in section 6.3, I give a descriptive analysis of the major nominalization types derived from French psych verbs in section 6.4. Concerning nominal argument expression, I argue that what is mainly needed is a *nominal argument realization principle* that ensures mapping onto (optional) oblique functions. As is shown, thematic roles and aspect determine the selection of the preposition of the oblique.

6.2 The Theoretical Framework

The main theoretical components assumed in my analysis are LFG (Bresnan 1982, Bresnan 2001) and Dowty's (1991) proto-role approach.

6.2.1 Lexical-Functional Grammar

In LFG, two levels of syntactic structure are distinguished, i.e., constituent structure (c-structure), accounting for constituency, and functional structure (f-structure), which models relations among the grammatical functions like subject, object, etc.

For the analysis given here, I need LFG's linking theory, namely Lexical Mapping Theory (LMT). In LMT, argument mapping is mediated by argument structure (a-structure), a level of representation in which argument positions are classified by a system of distinctive features for grammatical arguments: [±r] (for restricted and unrestricted) and [±o] (for objective and non objective). These features constrain the mapping of thematic roles onto grammatical functions. (1) shows the intrinsic features of grammatical functions (GF), (2) shows the semantic classification of a-structure roles (see Bresnan 2001:309).

(1) Grammatical Functions (GF) classified by Features

GF	Features	
SUBJ	[−r, −o]	r: restricted
OBJ	[−r, +o]	o: objective
OBJ_θ	[+r, +o]	
OBL_θ	[+r, −o]	

(2) Semantic Classification of A-Structure Roles for Function

patient-like roles	θ [−r]
secondary patient-like roles	θ [+o]
other semantic roles	θ [−o]

A mapping calculus can be constructed from the features, a thematic role hierarchy ((3)), and mapping principles ((4)) that produces the appropriate mapping of thematic roles onto grammatical functions:

(3) Thematic Hierarchy
agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

(4) Mapping Principles

a. Subject roles
The thematically most prominent role classified [−o] has to be mapped onto the subject function when initial in the a-structure. Otherwise a nonagentive, unrestricted role classified [−r] is mapped onto the subject function.

b. Other roles
All other roles are mapped onto the lowest compatible function in the partial ordering (5), where the subject is the least marked.

(5) Partial Ordering of Argument Functions
SUBJ > OBJ, OBL_θ > OBJ_θ

Well-formedness constraints ensure that every sentence has a subject ((6)), and that two arguments cannot map onto the same grammatical function ((7)) (Bresnan 2001:311):

(6) The Subject Condition
Every predicator must have a subject.

(7) Function-Argument Biuniqueness
Each a-structure role must be associated with a unique function, and conversely.

6.2.2 Dowty's Proto-Role Approach

Dowty (1991) argues that linguistic theories which utilize atomic thematic roles like 'agent', 'theme', etc. are problematic in several respects, e.g., the unclear boundaries between the role classes. Therefore he proposes to use only two roles, a proto-agent and a proto-patient role, which are more or less adequate representatives of the corresponding roles, depending on how many entailments of the list in (8) are implied for a predicate.[3]

(8) Dowty's Lists of Proto-Role Entailments

Proto-Agent
a. volitional involvement in the event or state
b. sentience (and/or perception)
c. causing an event or change of state in another participant
d. movement (relative to the position of another participant)
e. exists independently of the event named by the verb

Proto-Patient
a. undergoes change of state
b. incremental theme
c. causally affected by another participant
d. stationary relative to movement of another participant
e. does not exist independently of the event, or not at all.

In order to predict the appropriate mapping of proto-roles onto syntactic structure, Dowty proposes the principle in (9) and two corollaries (Dowty 1991:576):[4]

[3]The *e* properties are very weak properties; they will not be needed for the analysis presented in this paper.

[4]For the purposes of this paper, only the first Dowtian corollary is needed.

(9) Argument Selection Principle
In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of proto-agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of proto-patient entailments will be lexicalized as the direct object.

This principle as well as the corollary in (10) are important for the mapping behavior of psych verbs.

(10) Corollary 1
If two arguments of a relation have equal numbers of entailed proto-agent and proto-patient properties, then either may be lexicalized as a subject (and similarly for objects).

In section 6.3.4, the argument selection principle in (9) and the corollary in (10) are combined with LMT in order to explain the peculiar mapping behavior of French psych verbs, i.e., the 'mirror' mapping of subject-experiencer and object-experiencer psych verbs.

6.3 Psych Verbs

There is agreement among linguists that different classes of psychological verbs exist. However, there is no total unanimity as to how many classes should be distinguished, as this frequently depends on the criteria of distinction.

Most researchers classify psych verbs according to the syntactic expression of their arguments. Roughly, the two arguments of transitive psych verbs can be classified as to whether they correspond to the experiencing entity (the experiencer) or to the entity that triggers an experience (the theme).

6.3.1 Psych Verb Classes

Two classes of psych verbs are claimed to exist in English (Dowty 1991, Grimshaw 1990 among others). These differ as to whether the experiencer is subject and the theme is object or vice versa; this can be exemplified by predicates such as *like* and *please* in which the expression of arguments appears to have been inverted as in (11):

(11) a. The girl **experiencer subject** likes the book. **theme object**

b. The book **theme subject** pleases the girl. **experiencer object**

Verbs that show the same behavior as *like* are usually called subject-experiencer verbs, and those which behave like *please*, object-experiencer verbs. French shares these two verb classes with English: *admirer* 'admire' in (12a) is a subject-experiencer verb, and *fasciner* 'fascinate' in (12b) is an object-experiencer verb:

(12) a. La femme admire le livre.
the-F.SG woman-F.SG admire-PRES.3SG the-M.SG book-M.SG
'The woman admires the book.'

b. Le livre fascine la femme.
the-M.SG book-M.SG fascinate-PRES.3SG the-F.SG woman-F.SG
'The book fascinates the woman.'

In addition, some researchers, e.g., Ruwet (1972, 1994) for French, and van Voorst (1992) for English, subclassify psych verbs as to whether they are psych verbs in their basic reading (e.g., *aimer* 'love'), as in (14), or whether they are semantically derived from action verbs (e.g., *frapper* 'hit') as in (13). Only semantically underived psych verbs are analyzed in this paper.

(13) Action Verb
Marie frappe son petit frère.
Mary hit-PRES.3SG Poss-M.3SG little-M.SG brother-M.SG
'Mary hits her little brother.'

(14) Psych Verb
Cette ressemblance me frappe.
this-F.SG resemblance-F.SG me strike-PRES.3SG
'This resemblance strikes me.'

Other researchers (Bouchard 1995, Herschensohn 1992, Legendre 1989) claim one additional class for French, as do Belletti and Rizzi (1988) for Italian. In this third class, the experiencer is mapped onto an indirect object, and the theme onto the subject; see (15):

(15) Ce livre plaît à Max.
this-M.SG book-M.SG please-PRES.3SG to Max
theme **experiencer**
subject **indirect object**
'This book pleases Max.'

These indirect object-experiencer verbs are very limited in number in French. In the corpus, only *plaire à* 'please' is an indirect object-experiencer psych verb; in addition, there is one indirect object-theme psych verb: *compatir à* 'feel with, sympathize', consider (16):

(16) Max compatit à notre douleur.
Max feel-PRES.3SG to our-SG grief-F.SG
experiencer **theme**
subject **indirect object**
'Max feels with our grief.'

According to the corpus underlying this analysis, object-experiencer psych verbs are the most frequent; they represent more than two-thirds of all 120 French psych verbs. In this paper, I only deal with subject-experiencer and object-experiencer verbs because there are so few indirect object psych verbs in French.[5]

6.3.2 French Psych Verbs and Aspect

In an analysis of the aspectual properties of French psych verbs, drawing on the same corpus as is used here, Meinschaefer (2001) distinguishes three psych verb types: states (which are always subject-experiencer psych verbs), atelic processes, and telic events (which are always object-experiencer psych verbs). The latter two types can be called dynamic.

Stativity vs. dynamicity is tested by the paraphrase *être en train de* 'to be doing' (Smith 1997). Stative predicates are not compatible with this paraphrase ((17)), whereas dynamic predicates are ((18)).

(17) *Les enfants sont en train d' admirer
the-PL child-M.PL be-PRES.3PL doing admire.Inf
le clown.
the-M.SG clown-M.SG
'The children are admiring the clown.'

(18) Le clown est en train de
the-M.SG clown-M.SG be-PRES.3SG doing
fasciner les enfants.
fascinate.Inf the-PL child-PL
'The clown is fascinating the children.'

Atelicity vs. telicity is tested by the possibility of combining a predicate with certain aspectual adverbs (cf. Vendler 1967 for English, and Smith 1997 for French). Adverbs of duration like *pendant longtemps* 'for a long time' are only compatible with atelic predicates, whereas adverbs implying a target state like *en peu de temps* 'in little time' are less felicitous with atelic predicates and grammatical with telic predicates; consider the *a* examples vs. the *b* examples in (19)–(21):

[5] I therefore would propose to stipulate the indirect objects in the lexical entries of the predicates. The nominals of these verbs behave partially like nominals of the other verbs, see below in section 6.4.2, fn. 8

(19) a. Les enfants ont admiré le
the-PL child-PL have-PRES.3PL admire-PART.M.SG the-M.SG
clown pendant longtemps.
clown-M.SG during long time
'The children admired the clown for a long time.'

b. *Les enfants ont admiré le
the-PL child-PL have-PRES.3PL admire-PART.M.SG the-M.SG
clown en peu de temps.
clown-M.SG in little of time
'The children admired the clown in little time.'
⟶ *admirer* 'admire' denotes a state (stative, atelic)

(20) a. Le clown a fasciné
the-M.SG clown-M.SG have-PRES.3SG fascinate-PART.M.SG
les enfants pendant longtemps.
the-PL child-PL during long time
'The clown fascinated the children for a long time.'

b. *Le clown a fasciné
the-M.SG clown-M.SG have-PRES.3SG fascinate-PART.M.SG
les enfants en peu de temps.
the-PL child-PL in little of time
'The clown fascinated the children in little time.'
⟶ *fasciner* 'fascinate' denotes a process (dynamic, atelic)

(21) a. *Le clown a étonné
the-M.SG clown-M.SG have-PRES.3SG astonish-PART.M.SG
les enfants pendant longtemps.
the-PL child-PL during long time
'The clown astonished the children for a long time.'

b. Le clown a étonné
the-M.SG clown-M.SG have-PRES.3SG astonish-PART.M.SG
les enfants en peu de temps.
the-PL child-PL in little of time
'The clown astonished the children in little time.'
⟶ *étonner* 'astonish' denotes an event (dynamic, telic)

To sum up, we can assume three lexical classes of psych verbs in French, distinguished with regard to the realization of the arguments, and with regard to telicity:

(22) 1. states: subject-experiencer verbs (*admirer* 'admire')
2. processes: object-experiencer verbs (*fasciner* 'fascinate')
3. events: object-experiencer verbs (*étonner* 'astonish')

I adopt Meinschaefer's classification for the present paper and show that this classification is crucial for the mapping behavior of the verbs and the nominals. In the LMT/proto-role setting, the aspectual classes are represented by the proto-role properties 'causally affected' and 'undergoes change of state' (see section 6.3.5).

In the following section, I deal with the mapping behavior of the different psych verb classes within LMT.

6.3.3 The Mapping of Verbal Arguments in Standard LMT

A variety of approaches exist which analyze the linking behavior of psych verbs. For example, Belletti and Rizzi (1988) and Herschensohn (1992) analyze psych verbs in a Government and Binding framework; van Voorst (1992) gives an aspectual semantics account; Legendre (1989) utilizes Relational Grammar for her analysis. Zaenen (1993) and Markantonatou (1995) are papers in an LFG/LMT setting which investigate, among other things, psych verbs. Kordoni (2001) gives an LMT/optimal linking analysis of Modern Greek psych verbs. However, these approaches cannot account for the facts discussed in this paper.

Let us first take a look at how a standard LMT analysis can deal with the puzzling linking behavior of psych verbs. According to the classification in (2), the theme role is associated with a [−r] feature, and the experiencer as 'other role' with [−o].

The most prominent role with a [−o] feature is mapped onto SUBJ (see mapping principles in (4)), in this case, the experiencer, and the theme role is mapped onto OBJ. Table 1 shows the correct mapping of argument to syntactic structure for French subject-experiencer psych verbs like *admirer* 'admire'.

a-structure:	*admirer* 'admire'	<experiencer	theme>
		|	|
features:		[−o]	[−r]
		|	|
f-structure:		SUBJ	OBJ

TABLE 1 Mapping of subject-experiencer verbs

If we assume that the experiencer and the theme roles have the same intrinsic [±o]/[±r] features for subject-experiencer and object-experiencer psych verbs, and that the verbs have the same roles, it is evident that there is a problem with the 'mirror' mapping of subject-experiencer and object-experiencer psych verbs, because mapping must fail for one of the psych verb classes. Thus, for object-experiencer verbs

like *fasciner* 'fascinate', the correct mapping cannot be derived, as can be seen in Table 2:

a-structure:	*fasciner* 'fascinate'	<experiencer	theme>
features:		[−o]	[−r]
f-structure:		*SUBJ	*OBJ
but:		OBJ	SUBJ

TABLE 2 Mapping of object-experiencer verbs

The same holds for English psych verbs: the mapping of subject-experiencer verbs like *like* is successful, the mapping of object-experiencer verbs like *please* fails.

However, LMT mapping only fails if one assumes the same roles (experiencer, theme) for subject-experiencer and object-experiencer verbs, as in (11) in section 6.3.1. If we assume different roles, following Meinschaefer (2001), with the distinction of different aspectual classes, mapping comes out correctly because only for subject-experiencer verbs, i.e., stative predicates, are the roles experiencer and theme, whereas for object-experiencer verbs, we can assume the roles agent and theme. Table 3 shows the correct mapping for object-experiencer verbs (processes and events) under this assumption:

a-structure:	*fasciner* 'fascinate'	<agent	theme>
features:		[−o]	[−r]
f-structure:		SUBJ	OBJ

TABLE 3 Mapping of object experiencer verbs distinguishing aspect

The most prominent role with a [−o] feature, i.e., the agent, is mapped onto SUBJ (see the mapping principles in (4)), and the theme role with the [−r] feature is mapped onto OBJ.

This analysis is still unsatisfactory, because processes and events are not distinguished, and the fact that the object argument corresponds to the experiencing entity is not expressed. Therefore, I propose to replace discrete thematic roles, as in the thematic role hierarchy in (3), with Dowty's (1991) proto-roles, drawing on a proposal by Zaenen (1993). Under this analysis, the appropriate mapping falls out naturally for every aspectual psych verb class, expressing aspect by proto-role properties.

6.3.4 Elaborating LMT and Proto-roles

Zaenen (1993) offers an insightful combination of LFG and Dowty's proto-role proposal, explaining auxiliary selection and pre-nominal participles in Dutch by this 'mixed account'. In her account, intrinsic [±o]/[±r] features are assigned according to the number of proto-role entailments of verbal predicates. She assumes the principles in (23), which I call the [−r] principle, the [−o] principle and the equal number principle:

(23) [−r] Principle:
If a participant has more patient properties than agent properties, it is marked −r.

[−o] Principle:
If a participant has more agent properties than patient properties, it is marked −o.

Equal Number Principle:
An equal number of properties leads to the assignment of −r.

For Dutch subject-experiencer psych verbs like *vrezen* 'fear', Zaenen counts more agent entailments than patient entailments for one argument, and therefore, this argument is assigned a [−o] feature and mapped onto the subject function. Since the other argument has an equal number of agent and patient properties (i.e., none), it is assigned [−r]. Consider Zaenen's table for *vrezen* 'fear' in (24):

(24)

example verb	properties of participants	intrinsic assignment	
vrezen: 'fear'	subject:	agent: b patient: none	−o
	object:	agent: none patient: none	−r

(Zaenen 1993:149)

Exactly the same holds for French subject-experiencer psych verbs, e.g., *admirer* 'admire'. In the next section, we will investigate in detail the three psych verb classes assumed in this paper, i.e., not only so-called subject-experiencer psych verbs, as in Zaenen (1993), but also so-called object-experiencer verbs and their mapping behavior, applying Zaenen's 'mixed' approach.

6.3.5 Verbal Argument Mapping with LMT and Proto-Roles

In this section, I present my proposal for dealing with the 'mirror' mapping behavior of the different psych verb classes. In order to account for the mapping, I replace the discrete thematic roles of the hierarchy in (3) by Dowty's proto-roles and their respective entailments (see (8)). I adopt Zaenen's (1993) proposal for stative psych verbs, and extend it to process and event psych verbs. It will be shown that all verb classes can be accounted for in a straightforward way under this analysis.

States

For stative predicates such as *admirer* 'admire', there is only one proto-role entailment for a proto-agent role, expressing 'sentience', i.e., the *b* property of the properties listed in (8). Table 4 indicates the mapping from argument structure to syntactic structure:

	proto-agent	b: sentience	—
	proto-patient	—	—
a-structure:	*admirer* 'admire'	< proto-agent	proto-patient >
		|	|
features:		[−o]	[−r]
		|	|
f-structure:		SUBJ	OBJ

TABLE 4 Mapping of stative psych verbs

The argument with the only proto-agent property is assigned a [−o] feature according to Zaenen's [−o] principle in (23). It is mapped onto the subject in f-structure according to LMT mapping principles (see section 6.2.1, (4)). The argument with no proto-role properties at all is assigned the [−r] feature, as Zaenen assumes in her [−r] principle, and it is mapped onto the object grammatical function.

Processes

For process psych verbs like *fasciner* 'fascinate', there is one proto-agent property for every argument, i.e., *c* 'cause' and *b* 'sentience' respectively. One argument has no proto-patient property, and therefore it is marked [−o] (because it has more proto-agent than proto-patient properties). It is mapped onto the subject function.

The other argument has an equal number of agent and patient properties and therefore is assigned [−r] according to Zaenen's equal number principle. This argument is mapped onto the object function. Table 5 illustrates the mapping:

	proto-agent	c: cause	b: sentience
	proto-patient	—	c: causally affected
a-structure:	*fasciner*	< proto-agent	proto-patient >
	'fascinate'	|	|
features:		[−o]	[−r]
		|	|
f-structure:		SUBJ	OBJ

TABLE 5 Mapping of process psych verbs

Events

In the event psych verb case, the appropriate feature assignment is ensured by Zaenen's [−o] and [−r] principles, which is the condition for the correct mapping onto syntactic structure.

One argument has more proto-agent than proto-patient properties and is marked [−o]. This argument is mapped onto the subject function. The other argument has more proto-patient properties than proto-agent properties, and therefore it gets the [−r] feature, which is responsible for its realization as an object.

	proto-agent	c: cause	b: sentience
	proto-patient	—	a: change of state
			c: causally affected
a-structure:	*étonner*	< proto-agent	proto-patient >
	'astonish'	|	|
features:		[−o]	[−r]
		|	|
f-structure:		SUBJ	OBJ

TABLE 6 Mapping of event psych verbs

Note that the aspectual properties of the predicates are reflected in the proto-patient properties. For states, there is no proto-patient property at all; for processes, there is the *c* proto-patient property 'causally affected by another participant', and events carry the *c* and the *a* entailments, the latter implying that there is a change of state, as evidenced by the fact that verbs of this class are telic.

To sum up, the elaboration of LMT and proto-roles proposed by Zaenen (1993) not only accounts for Dutch auxiliary selection, but also correctly accounts for the mapping behavior of French psych verbs.

6.4 Psych Verb Nominals in French

In this section, I present the results of an investigation based on nominals of about 120 French transitive psych verbs.

6.4.1 General Introduction

Kailuweit, Kelling and Meinschaefer (2002) describe three main processes that derive psych verb nominals (see also Anscombre 1995):

- affixless derivation
  dédaigner (state) 'disregard' > *dédain* 'disregard'
  effrayer 'frighten' (process) > *effroi* 'terror'
  chagriner 'grieve' (event) > *chagrin* 'grief'
- derivation with the suffix *-ation*
  admirer (state) 'admire' > *admiration* 'admiration'
  fascination (process) 'fascinate' > *fascination* 'fascination'
  consterner 'dismay' (event) > *consternation* 'dismay'
- derivation with the suffix *-ement*
  ravir (process) 'delight' > *ravissement* 'delight'
  étonner (event) 'astonish' > *étonnement* 'astonishment'

The corpus shows that affixless nominals and nominals with *-ation* can be derived from all verb classes, whereas *-ement* derives only psych nominals from process and event verbs; states are not compatible with *-ement*. That is, suffixes are sensitive to the aspectual class of the verbal base. The nominals may in principle inherit the aspect of the base verb. However, as shown in Meinschaefer (2002), affixless nominals always denote states.

For the derivatives, corpus analyses reveal a variety of patterns for the nominal's realization of the arguments, depending on the thematic role of the argument and the aspectual class of the base verb.

6.4.2 Argument Realization

In contrast to English, where certain roles can map onto a prenominal possessive, French does not have a prenominal genitive possessive construction; see (25) for simple nouns and (26) for deverbal nouns. In order to express the possessive's role, French requires a *de*-phrase: *de l'institutrice* 'of the teacher' in (25) and *de la ville* 'of the city' in (26).

(25) a. la fille de l' institutrice
the-F.SG daughter-F.SG of the-SG teacher-F.SG
'the daughter of the teacher'

b. *l' institutrice fille
the-SG teacher-F.SG daughter-F.SG
'the teacher's daughter'

(26) a. la destruction de la ville par
the-F.SG destruction-F.SG of the-F.SG city-F.SG by
les barbares
the-PL barbarians-M.PL
'the destruction of the city by the barbarians'

b. *la ville destruction par
the-F.SG city-F.SG destruction-F.SG by
les barbares
the-PL barbarians-M.PL
'the city's destruction by the barbarians'

As for simple nouns, there is no such construction in French for nominals. Instead, the derivatives require prepositions to precede the noun phrase expressing a participant. In French, mainly *de* 'of', *par* 'by' and *pour* 'for' govern NPs, expressing the arguments of a psych nominal.

In the following, I offer a short overview of how the arguments of nominals derived from psych verbs can be realized in syntactic structure. For convenience, I mark the arguments with the 'sentience' proto-role property *b*: *du lecteur*.

Generally, it is not possible to have two *de*-phrases expressing two nominal arguments:

(27) *l' admiration *du* *lecteur*
the-SG admiration-F.SG of.the-M.SG reader-M.SG
du livre
of.the-M.SG book-M.SG
'the admiration of the reader of the book'

State Nominals

The examples in (28) show that the proto-agent of a nominal derived from a state verb must be realized as a *de*-phrase, and cannot be realized as a *par*- or a *pour*-phrase. The proto-patient can be a *de*-phrase or a *pour*-phrase ((29)).

(28) a. l' admiration *du* *lecteur*
the-SG admiration-F.SG of.the-M.SG reader-M.SG

b. *l' admiration *par le* *lecteur*
the-SG admiration-F.SG by the-M.SG reader-M.SG

c. *l' admiration *pour le* *lecteur*
the-SG admiration-F.SG for the-M.SG reader-M.SG
'the admiration of/by/for the reader'

(29) a. l' admiration du livre
the-SG admiration-F.SG of.the-M.SG book-M.SG

b. *l' admiration par le livre
the-SG admiration-F.SG by the-M.SG book-M.SG

c. l' admiration pour le livre
the-SG admiration-F.SG for the-M.SG book-M.SG
'the admiration of/by/for the book'

If both arguments are realized, the proto-agent occurs next to the nominal:

(30) a. l' admiration *du* *lecteur* pour
the-SG admiration-F.SG of.the-M.SG reader-M.SG for
le livre
the-M.SG book-M.SG
'the admiration of the reader for the book'

b. *l' admiration pour le livre
the-SG admiration-F.SG for the-M.SG book-M.SG
du *lecteur*
of.the-M.SG reader-M.SG
'the admiration for the book of the reader'

Process Nominals

The proto-patient of a process nominal can only be realized as *de*-phrase ((31)), the proto-agent can be a *de*-phrase or a *par*-phrase ((32)).

(31) a. la fascination *du* *lecteur*
the-F.SG fascination-F.SG of.the-M.SG reader-M.SG

b. *la fascination *par le* *lecteur*
the-F.SG fascination-F.SG by the-M.SG reader-M.SG

c. *la fascination *pour le* *lecteur*
the-F.SG fascination-F.SG for the-M.SG reader-M.SG
'the fascination of/by/for the reader'

(32) a. la fascination du livre
the-F.SG fascination-F.SG of.the-M.SG book-M.SG

b. la fascination par le livre
the-F.SG fascination-F.SG by the-M.SG book-M.SG

c. *la fascination pour le livre
the-F.SG fascination-F.SG for the-M.SG book-M.SG
'the fascination of/by/for the book'

The proto-patient has to be realized next to the nominal if both arguments are expressed:

(33) a. la fascination *du* *lecteur* par
the-F.SG fascination of the-M.SG reader-M.SG by
le livre
the-M.SG book-M.SG
'the fascination of the reader by the book'

b. *la fascination par le livre
the-F.SG fascination-F.SG by the-M.SG book-M.SG
du *lecteur*
of.the-M.SG reader-M.SG
'the fascination by the book of the reader'

Event Nominals

Event nominals can express their proto-patient argument only by a *de*-phrase ((34)) and the proto-agent only by a *par*-phrase ((35)).

(34) a. l' étonnement *du* *lecteur*
the-SG astonishment-M.SG of.the-M.SG reader-M.SG

b. *l' étonnement *par le* *lecteur*
the-SG astonishment-M.SG by the-M.SG reader-M.SG

c. *l' étonnement *pour le* *lecteur*
the-SG astonishment-M.SG for the-M.SG reader-M.SG
'the astonishment of/by/for the book'

(35) a. *l' étonnement du livre
the-SG astonishment-M.SG of.the-M.SG book-M.SG

b. l' étonnement par le livre[6]
the-SG astonishment-M.SG by the-M.SG book-M.SG

c. *l' étonnement pour le livre
the-SG astonishment-M.SG for the-M.SG book-M.SG
'the astonishment of/by/for the book'

The proto-patient argument is realized first in those cases where both arguments are present:

(36) a. l' étonnement *du* *lecteur*
the-SG astonishment-M.SG of.the-M.SG reader-M.SG
par le livre
by the-M.SG book-M.SG
'the astonishment of the reader by the book'

[6]Some native speakers accept *par*, others do not. Examples in the corpora are very rare, speakers seem to avoid this construction.

b. *l' étonnement par le livre
the-SG astonishment-M.SG by the-M.SG book-M.SG
du *lecteur*
of.the-M.SG reader-M.SG
'the astonishment by the book of the reader'

Summary

Thus, several prepositional phrases are available for the syntactic realization of the nominal's arguments, depending on whether both arguments are expressed and depending on the thematic role of the argument as well as on the aspect of the verb and the nominal.

In some cases, prepositions other than those discussed above are possible for the expression of the argument that does not correspond to the experiencing entity, e.g., *devant* 'in front of' in (37), or *envers* 'against' in (38).

(37) mon admiration *devant* certaines
my-SG admiration-F.SG in front of certain-F.PL
flammes de son génie (...)
flames-F.PL of his-M.SG genius-M.SG
'my admiration in the face of certain manifestations of his genius'
(Frantext[7])

(38) une sincère admiration de ses
a-F.SG sincere-SG admiration-F.SG of his-PL
collaborateurs *envers* le vieux chef
collaborators-M.PL against the-M.SG old-M boss-M.SG
'a sincere admiration of his collaborators for the old boss'
(Frantext)

An investigation of the sequences *admiration de* — *admiration pour* — *admiration devant* — *admiration envers* 'admiration of/for/in front of/against' in the entire Frantext corpus has shown that sequences with the prepositions discussed above are far more frequent than the others:

(39) *admiration de*: 1112 occurrences
admiration pour: 929 occurrences
admiration devant: 82 occurrences
admiration envers: 4 occurrences

[7]Frantext is a large corpus of machine readable French texts from the 16th to the 20th century, developed by INaLF (Institut National de la Langue Française), CNRS (Centre National de la Recherche Scientifique), France.

Clearly, prepositions like *envers* and *devant* are by far less frequent than *de*, *par* or *pour*. Therefore, only PPs with the latter prepositions are included in the analysis: they seem to represent a general pattern.

Finally, note that only the argument with a *b* 'sentience' property can also be expressed as a possessive determiner: *son admiration* 'his (= the reader's) admiration', vs. **son admiration* 'its (= the book's) admiration'. Table 7 summarizes the data presented in (28) to (36)[8]

	de-**phrase**	*pour*-**phrase**	*par*-**phrase**
state	proto-agent	proto-patient	—
admirer 'admire'	proto-patient	—	—
process	proto-agent	—	proto-agent
fasciner 'fascinate'	proto-patient	—	—
event	proto-patient	—	proto-agent
étonner 'astonish'	—	—	—

TABLE 7 Realization of the nominals' arguments

All arguments except proto-agents of event nominals can be realized as a *de*-phrase, only proto-patients of state nominals can be expressed as a *pour*-phrase, and proto-agents of process and event nominals can be expressed as a *par*-phrase.

[8] As mentioned in section 6.3.1, nominals derived from indirect object psych verbs behave partially like those derived from other psych verbs ((i)–(ii)). However, they may also inherit the preposition *à* 'to' ((iii)). Consider the following examples for *compassion* 'sympathy':

(i) la compassion du jury
the-F.SG sympathy-F.SG of.the-M.SG jury-M.SG
'the sympathy of the jury'

(ii) la compassion fondamentale de l' homme pour l' homme
the-F.SG sympathy-F.SG fundamental-F.SG of the-SG human being-M.SG for the-SG human being-M.SG
'the fundamental sympathy of human beings for human beings'

(iii) la compassion à notre travail
the-F.SG sympathy-F.SG to our-SG work-M.SG
'the sympathy for our work'

However, because of the small number of indirect object psych verbs and their derived nominals, generalizations cannot be made.

In the following section, the status of the nominal's arguments is discussed, contrasting it with that of the verb's arguments.

6.4.3 The Optionality of the Nominal's Arguments

Compared to the verbal arguments, which are obligatorily realized as subject or object, as shown in (40) for *admirer* 'admire', the expression of nominal arguments is optional. This is already clear from examples (28) to (36) in the previous subsection, where the proto-agent or the proto-patient argument (or both) are realized.

(40) a. Max admire le livre.
Max admire-PRES.3SG the-M.SG book-M.SG
'Max admires the book.'
b. *Admire le livre.
c. *Max admire.

It is also possible that no argument is expressed with the nominal, consider (41).

(41) Je l' écoutais avec admiration.
I him listen-IMPF.3SG with admiration-F.SG
'I listened to him with admiration.' (Frantext)

The assumption that nominal arguments are generally optional in French stands in contrast to Grimshaw's (1990) claims for English; she states that for event nominals like *destruction*, the *of*-phrase is obligatory if a *by*-phrase is present:

(42) a. the destruction of the city by the enemy
b. *the destruction by the enemy

The Frantext corpus attests cases like (43), which clearly show that this kind of construction is possible in French.

(43) l' étonnement par le récit incroyable
the-SG astonishment-M.SG by the-M.SG story-M.SG incredible-SG
'the astonishment by the incredible story' (Frantext)

From the examples of the last two sections it follows that the expression of the nominal's arguments is optional.

6.4.4 Previous Approaches to Nominalization

I here review earlier studies of nominalization in LFG and proto-role settings because my analysis of psych verbs used LFG as well as Dowty's proto-role analysis in order to account for the linguistic facts.

LFG Approaches

The main questions that arise in LFG approaches are:

- Do derived nominals have the same or a different argument structure as compared to their base verbs?
- Is nominalization a morphosyntactic process or not?
- Do nominals assign restricted or unrestricted functions?

One of the earliest treatments of nominalizations in an LFG setting was proposed by Rappaport (1983). She claims that verbs and deverbal nouns have shared argument structures, which does not necessarily mean that they share syntactic features, as well. In her view, the major difference between deverbal nouns and their base verbs is that nominals can only assign semantically restricted functions, whereas the verbs can assign both semantically unrestricted and semantically restricted functions.

In contrast to Rappaport, Markantonatou (1995) assumes that nominals can assign unrestricted as well as restricted functions. Central to Markantonatou's study of deverbal nouns in Modern Greek is the assumption that nominalization is a morphosyntactic operation that requires a [−r] argument in the argument structure of the verbal base and suppresses the highest [−o] argument (if there is one). Markantonatou's analysis not only accounts for canonical transitive verbs and their derivatives, but she also discusses psychological predicates. In order to account for the mapping behavior of psych verbs, she stipulates that the theme role can be classified as either [−o] or [+r]. However, Markantonatou's approach does not carry over to the French data discussed in this paper, because she does not distinguish the aspectual classes that we need for the data presented here.

Like Rappaport (1983), Laczkó (2000) assumes that event nominals preserve the arguments of their base verb, event nominalization being a morphosyntactic process. However, in his approach, nominals, like verbs, can assign both semantically restricted and semantically unrestricted (POSS) functions, but he concedes that this is still a matter for further investigation.

In section 6.4.5, I argue that the nominals inherit the semantic part of the verb's arguments, that nominalization is a morphosyntactic process, and that nominals can only assign restricted grammatical functions.

Proto-role Approaches

Dowty (1991) does not deal with argument realization in nominals, and Barker and Dowty (1993) mainly discuss proto-roles of typical nouns, i.e., morphologically non-derived nouns and nouns that do not denote an event. The latter assume that nominal proto-roles are different from verbal ones and that the nominal proto-roles "proto-part" and "proto-whole" do not apply to the argument selection of deverbal nouns. Rather,

they suggest that "the argument selection of derived nouns is predicted by verbal proto-roles in combination with the mapping relation determined by the particular derivational process involved" (Barker and Dowty 1993:59). This suggests that verbs and derived nouns share a common argument structure, which is affected by the derivational operation.

Likewise, we find no detailed discussion of nominalizations in Ackerman and Moore (2001). However, there is a short remark with regard to Estonian deverbal nouns. They argue that aspectual values are entailments of lexical predicates, and it is expected that nominals would have these properties too. This is in accordance with what I assume for French psych nominals, as is shown below.

There is thus a certain consensus that verbs and their derivatives share argument structure, but what exactly is shared and what is different remains controversial. This is the question to be addressed in the following for my LFG/proto-role approach.

6.4.5 An LFG/proto-role Approach to Nominalization

As was already indicated in the descriptive section on French psych verb nominals (section 6.3), there are various patterns for the realization of the base verb's arguments. Some researchers claim that nominalization processes have a parallel in passive formation (e.g., Grimshaw 1990), the common point being that obligatory verbal arguments become optional by argument suppression, turning into argument-adjuncts. In contrast to Grimshaw, I do not assume that suppressed arguments are argument-adjuncts. In my opinion, they are obliques, i.e., arguments with a restricted grammatical function. This contradicts the assumption that in nominal predicates, the syntactic POSS function is the verb's subject equivalent (Falk 2001, Laczkó 2000), both functions being unrestricted. However, the mapping behavior of French psych nominals, in particular the difference between processes and events with regard to *de*-phrases, leads me not to assume an unrestricted POSS function, but a restricted oblique function for the expression of the nominal's arguments.

What is more, the PPs investigated here always have a thematic role, i.e., the same role as the nominal's corresponding verb. In contrast, unrestricted syntactic functions are not restricted in the sense that they need not have any semantic role (Bresnan 2001:308).

Therefore, I follow Rappaport (1983) in analyzing all nominal arguments as semantically restricted, i.e., as having a [+r] feature. This means that verbal [−r] arguments have to be replaced by a [+r] feature. However, as Laczkó (2000) points out, changing the intrinsic feature of an argument, which would be necessary for [−r] arguments in order to

get the appropriate mapping of the nominal's arguments, is problematic because it violates the monotonicity constraint and is only possible for morpholexical operations (Ackerman 1992). However, it is not adequate to assume nominalization to be a morpholexical operation, since the semantic properties associated with predicates are not altered. We thus need a different solution: one closer to syntax.

Since it is evident that it is impossible to constrain nominal mapping by the same principles as verbal mapping, I propose not to generalize the mapping of nominals in terms of [±o]/[±r] features. Instead, I assume a general principle forcing nominals to realize their arguments as obliques. This can be formulated as in (44).

(44) **Nominal Argument Realization Principle**
Every nominal argument has an oblique grammatical function.

As pointed out in section 6.4.3, deverbal nominalization introduces optionality in the syntactic expression of inherited verbal arguments. In accordance with Alsina (1996), I assume that optionality is a default property of obliques.[9] Thus, from the nominal mapping principle in (44), optionality follows automatically.

What we need for the correct expression of the nominal arguments on c-structure, i.e., for the selection of the appropriate preposition governing the PP of the oblique function, are language-specific realization rules. For French psych verb nominals, we can formulate the following realization rules in (45), as referring to proto-roles and aspects, that is, to the semantic part of the predicate:

(45) **Realization Rules**

1. Possible obliques
   All nominal arguments can be realized as *de*-obliques except proto-agents of events.
   Proto-agents of events and processes are realized as *par*-obliques.
   proto-patients of states can be realized as *pour*-obliques.
2. Two-argument rule
   If both arguments are realized, the *de*-oblique must be realized next to the nominal, and the second argument may not be a *de*-phrase.

The rules in (45) not only account for the actually occurring obliques in (46), but also for the following facts: First, if both arguments are

[9]Since there are but few verbs that take obligatory obliques, e.g., *put* in *Mary put the book *(on the shelf)*, Alsina (1996) maintains the default property of obliques. He proposes to stipulate obligatory obliques in the lexical entries of the relevant predicates.

realized, they may not both be realized as *de*-phrases ((47)). Second, the *de*-phrase is closer to the nominal than another phrase (see section 6.4.2) ((48)).

(46) l' admiration du lecteur pour le
the-SG admiration-F.SG of.the-M.SG reader-M.SG for the-M.SG
livre
book-M.SG
'the admiration of the reader for the book'

(47) *l' admiration du lecteur du
the-SG admiration-F.SG of.the-M.SG reader-M.SG of.the-M.SG
livre
book-M.SG
'the admiration of the reader of the book'

(48) *l' admiration pour le livre du
the-SG admiration-F.SG for the-M.SG book-M.SG of.the-M.SG
lecteur
reader-M.SG
'the admiration for the book of the reader'

The argument structures and the syntactic structures for the state nominal *admiration* 'admiration', for the process nominal *fascination* 'fascination', and for the event nominal *étonnement* 'astonishment' are derived in the following sections. The argument realization behavior of the nominals is different for every aspectual class; the aspectual properties are expressed by the proto-patient entailments, as mentioned above.

State Nominals

State nominals inherit the only proto-role property from the underlying stative verbs: the proto-agent *b* 'sentience' property. As the realization rules in (45) predict, both arguments can in principle be expressed as *de*-OBL. The two-argument rule ensures that the proto-agent (= the role with the proto-agent *b* property) is expressed as *de*-oblique if both arguments are realized because it can only be a *de*-oblique, whereas the proto-patient role may also be a *pour*-oblique.

Comparing the a-structure of the corresponding verb in Table 4, repeated here for convenience as Table 9, with the a-structure of the deverbal noun in Table 8, we see that for both, verb and deverbal noun, the number of arguments is the same and they also share their proto-agent and proto-patient entailments.

	proto-agent	b: sentience	—
	proto-patient	—	—
a-structure:	*admiration*	< proto-agent	proto-patient >
	'admiration'	|	|
f-structure:		*de*-OBL	*de*-OBL
			pour-OBL

TABLE 8 Mapping of state nominals

	proto-agent	b: sentience	—
	proto-patient	—	—
a-structure:	*admirer*	< proto-agent	proto-patient >
	'admire'	|	|
features:		[−o]	[−r]
		|	|
f-structure:		SUBJ	OBJ

TABLE 9 Mapping of stative psych verbs (=Table 4)

However, there is no feature assignment for the nominal, and the realization of the nominal arguments is steered by proto-properties, the principle in (44), and the rules in (45).

Process Nominals

The structure in Table 10 for *fascination* is similar to that of *admiration*; however, it differs in terms of the inherited proto-properties, and therefore different rules apply to the realization of the arguments in f-structure. The rules in (45) correctly predict this.

	proto-agent	c: cause	b: sentience
	proto-patient	—	c: causally affected
a-structure:	*fascination*	< proto-agent	proto-patient >
	'fascination'	|	|
f-structure:		*de*-OBL	*de*-OBL
		par-OBL	

TABLE 10 Mapping of process nominals

Note that *pour*-phrases can be combined with nominals like *fascination* if they have a stative interpretation, as is evident from examples like (49).

(49) a. la fascination progressive de/par
the-F.SG fascination-F.SG progressive-SG of/by
ce livre
this-M.SG book-M.SG
'the progressive fascination of/by this book'

b. l' énorme fascination de/#par
the-SG enormous-SG fascination-F.SG of/by
ce livre
this-M.SG book-M.SG
'the enormous fascination of/by this book'

c. une énorme fascination pour
a-F.SG enormous-SG fascination-F.SG for
ce livre
this-M.SG book-M.SG
'an enormous fascination for this book'

As shown by Meinschaefer (2001), with a process interpretation in (49a), forced by the adjective *progressive* 'progressive', *fascination* is compatible with the PPs as predicted by the rules in (45). However, with the stative interpretation in (49b), forced by the adjective *énorme* 'enormous', the *par*-phrase is less felicitous, and a *pour*-phrase as in (49c) is possible. Assuming that the stative interpretation is produced by a semantic shift of the process nominal, we can nicely account for these data under our proposal. A morpholexical operation is applied, deleting the proto-role properties of the proto-patient. In this way, we get a stative reading for *fascination* 'fascination', corresponding to that of *admiration* 'admiration'. Consequently, the arguments are mapped onto syntactic structure as shown for state nominals.

Event Nominals

Finally, Table 11 shows the mapping for event nominals, which follows from the nominal argument realization principle in (44) and the realization rules in (45).

	proto-agent	c: cause	b: sentience
	proto-patient	—	a: change of state
			c: causally affected
a-structure:	*étonnement*	< proto-agent	proto-patient >
	'astonishment'	|	|
f-structure:		*par*-OBL	*de*-OBL

TABLE 11 Mapping of event nominals

To sum up, the mapping of the nominal's arguments onto syntactic structure is ensured by the nominal argument realization principle and steered by realization rules that are based on the aspectual properties and the thematic roles of the nominals and their corresponding verbs.

6.4.6 Summary

In LFG, an a-structure consists of a predicator with its argument roles, an ordering representing the relative prominence of the roles, and an intrinsic feature classification of each role (e.g., Bresnan 2001). Comparing the verbal and nominal argument structures makes explicit what we mean when we say that verbs and their deverbal nouns share their argument structures. They have the same number of arguments, and the arguments have the same proto-role entailments (cf. Ackerman and Moore 2001:110). However, the arguments map to different grammatical functions. In particular, the nominal's arguments have restricted oblique functions, whereas the verb's arguments have unrestricted subject and object functions. Therefore, it would be more appropriate to say that verbs and nominals share the semantic part of their argument structure, i.e., proto-properties and roles.

In this section, I argued for assuming restricted oblique functions for nominal arguments because, first, they inherit the thematic roles of their base verb, and, second, because they can only be expressed by certain PPs. Mapping cannot be constrained by feature assignment for nominals. I proposed a nominal argument realization principle and language-specific argument realization rules which ensure the correct mapping from semantic argument structure to syntactic structure.

6.5 Conclusion

This paper has proposed an account for argument realization of French psych verbs and their corresponding nominals.

It was argued that the correct mapping of the participants of psych verbs onto syntactic structure can be predicted via an elaboration of LFG's mapping theory with Dowty's (1991) proto-role approach, as proposed by Zaenen (1993). It was shown that the same holds for the corresponding deverbal nouns. For the mapping behavior of the latter, I introduced a nominal argument realization principle that implies that the nominal arguments are obliques, i.e. restricted functions. Optionality of the nominal's arguments follows from the assumption that optionality is a default property of obliques (Alsina 1996).

Starting from Meinschaefer's classification, distinguishing three semantically motivated psych verb classes in French (cf. Meinschaefer 2001), I have shown that this conception, together with a number of

language-specific realization rules, correctly predicts argument realization for French psych verbs and their corresponding nominals. The aspect of verbs and their derived nouns is expressed in terms of Dowty's proto-role properties in the approach proposed here.

To sum up, the question of whether the nominal inherits the verb's arguments or not can be answered in the following way: verbs and nominals share semantic argument structure, here represented as proto-role properties. However, assignment of features and mapping onto syntactic structure are different for verbs and their derived nouns.

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7

Modelling Possessor Constructions In LFG: English and Hungarian

Erika Chisarik and John Payne

7.1 Introduction

English and Hungarian are examples of languages with more than one basic possessor construction, as illustrated in (1) and (2):[1]

(1) a. [**the king's**] daughter [genitive]
b. the daughter [**of the king**] [OF-oblique]

(2) a. [**a** **király-nak**] a lány-a [dative]
ART king-DAT ART daughter-SUBJ.3
'the king's daughter'
b. [**a** **király**] lány-a [nominative]
ART king daughter-ADNOM.3
'the king's daughter'

We will refer to the English constructions in (1a) and (1b) as the genitive and the *of*-oblique respectively. In the genitive construction, the possessor is an NP in the genitive case which is a pre-head dependent and which simultaneously functions as a definite determiner. In the *of*-oblique, the possessor is a PP headed by the preposition *of* which is a post-head dependent and lacks any determiner function.

The Hungarian constructions in (2a) and (2b) are standardly known as the dative possessor construction and the nominative possessor construction (e.g., Szabolcsi 1994, Laczkó 2000). In the dative construction,

[1] In (2) we anticipate the assignment of the dative possessor to the SUBJ function and the so-called nominative possessor to a grammatical function we dub ADNOM.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

the possessor is a dative-marked NP which is structurally a predeterminer, preceding for example the definite article in (2a). The definite article can be replaced by other determiners, e.g., the indefinite article in [*a király-nak*] *egy lány-a* (ART king-DAT a daughter-SUBJ.3) 'a daughter of the king'. By contrast, somewhat like the English genitive, the so-called nominative possessor in (2b) is in complementary distribution with the definite article and, in the absence of any specific indication of the indefiniteness of the noun phrase, functions as a definite determiner. In both constructions, the possessum formally agrees with the possessor.

In a recent paper (Payne and Chisarik 2001), we have argued that the case of the possessor in (2b) is strictly not to be analysed as nominative, but rather as a new genitive resulting from reanalysis of the definite article *a/az* as a case prefix.[2] Example (2b) should therefore be treated as in (2b′):

(2) b′. [**a** **király**] lány-a [genitive]
ART king daughter-ADNOM.3
'the king's daughter'

What was originally the definite article of the matrix noun phrase has fused morphologically with undetermined possessor noun phrases and in the case of possessive pronouns in particular, this results in a distinct genitive paradigm:

(3) a. az-én lány-om
GEN-I daughter-ADNOM.1.SG
'my daughter'
b. a-mi lány-unk
GEN-we daughter-ADNOM.1.PL
'our daughter'
c. a-te lány-od
GEN-you daughter-ADNOM.2.SG
'your(sg) daughter'
d. a-ti lány-otok
GEN-you daughter-ADNOM.2.PL
'your(pl) daughter'
e. az-ő lány-a
GEN-he/she daughter-ADNOM.3.SG
'his/her daughter'

[2]This new genitive case prefix is positionally inconsistent with the suffixal and postpositional character of the pre-existing nominal paradigms in Hungarian. Such positional inconsistency is however far from uncommon. For example, modern Farsi is almost exclusively prepositional; the direct object marker *-ra* is however a postposition.

f. az-ő lány-uk
GEN-they daughter-ADNOM.3.PL
'their daughter'

Compare nominative *én* 'I', *te* 'you(sg)', *ő* 'he/she', *mi* 'we', *ti* 'you(pl)', *ők* 'they' with their corresponding genitive forms in (3). Especially notable is the third-person plural, which is identical to the third-person singular in the genitive, but has the distinctive plural marking *-k* in the nominative. In this analysis, personal proper names such as *Mari* also optionally and with dialectal variation have a distinct genitive form: *a-Mari lány-a* or *Mari lány-a* (GEN-Mary daughter-ADNOM.3) 'Mary's daughter'.

One indication that reanalysis of the article has taken place is the compatibility of these genitive forms with indefiniteness of the noun phrase. In an example like (4), the new genitive is compatible with the indefinite determiner *egyik* 'a/one':[3]

(4) az-én egyik lány-om
GEN-I a daughter-ADNOM.1.SG
'a daughter of mine'

A second indication that reanalysis has taken place comes from coordination. A nominative pronoun and a nominative proper name form a legitimate coordinate structure, as in (5a). However, such a coordinate structure cannot function as a possessor noun phrase preceded by the definite article, as shown in (5b):

(5) a. [Mari és ő] érkez-nek ma London-ból.
Mary.NOM and she.NOM arrive-3.PL today London-ELA
'Mary and she are arriving today from London.'

b. *a [Mari és ő] ruhá-i-t
ART Mary.NOM and she.NOM dress-PL.POSS.3-ACC
'Mary's and her dresses'

The grammatical version of (5b), which naturally follows from the genitive analysis, is (6):

(6) [a-Mari és az-ő] ruhá-i-t
GEN-Mary and GEN-she dress-PL.POSS.3-ACC
'Mary's and her dresses'

We will therefore refer to this construction as the genitive construction.

[3]Note that the determiner *egyik* 'a/one' in example (4) is not the same as the indefinite article *egy* 'a', though it is clearly related to it morphologically. The genitive possessor is in complementary distribution with the indefinite article, as it is with the definite article.

7.2 Grammatical functions

What grammatical function or functions should be associated with the possessors in (1) and (2)? A fairly standard view in LFG is that possessors are linked to a distinct POSS function (e.g., Laczkó 1995, 2000, Sadler 2000, Bresnan 2001, Falk 2001a,b). The motivation for the postulation of a POSS for noun phrases is typically not made explicit, but seems to be related to the idea that possession, or perhaps more generally the part-whole relation as discussed in Barker and Dowty (1993), is the prototypical semantic relation expressed in possessor constructions.

Barker and Dowty (1993) argue that the argument structure of nouns motivates a set of quintessentially nominal thematic proto-roles called Proto-Part and Proto-Whole. Nevertheless, as Barker and Dowty note, there is no simple mapping between grammatical category and the appropriate set of proto-roles. The "verbal" proto-roles of proto-Agent and proto-Patient seem more appropriate for nouns denoting events, irrespective of whether these are derived from verbs, as in *the team's performance*, or not, as in *the team's victory over the opposition.* Also, verbs like *contain* may have an argument structure which reflects the supposedly nominal proto-roles of Proto-Part and Proto-Whole. At the level of individual thematic roles, therefore, we must in principle allow nouns to have argument structures involving agents and patients, and we must allow verbs to have argument structures involving parts and wholes. The maintenance of POSS as a distinctive noun phrase function entails a special treatment for nominals with event-like argument structures. Falk (2001b), for example, following a suggestion in Bresnan (2001) for the treatment of English gerunds, suggests that POSS and SUBJ are simply identified in such nominals.

A more radical view which reflects the full variety of argument structures associated with possessor constructions is to link possessors globally with SUBJ. This appears to be the view of Sadler (2000), where the POSS function is explicitly stated to be a subspecies of the SUBJ function. Dalrymple (2001) finally eschews a special POSS function altogether and simply identifies possessors with SUBJ. This proposal has the further advantage of capturing certain parallels between clauses and noun phrases. For example, SUBJ in LFG is taken to be a discourse-related function: the subject in English clauses just like the genitive possessor in English noun phrases quite typically functions as a topic or given information. A unified treatment of anaphoric relations in clauses and noun phrases also follows naturally; for example, the identical behaviour of the reflexive pronoun *himself* in examples like *Jo criticised himself* and *Jo's criticism of himself* is defined by the presence of a SUBJ in both structures.

The goal of this paper is to show that this is not the whole story. It is indeed necessary to postulate an unrestricted and discourse-related function associated with possessors. This is the function associated with the structurally higher genitive possessor in English and the structurally higher dative possessor in Hungarian. Because of the unrestricted nature of the semantic relations involved and the close parallels with clause structure we will follow Dalrymple (2001) in identifying this possessor function with SUBJ. The lower *of*-oblique possessor in English and the genitive possessor in Hungarian cannot however be associated with the same function: we will argue that the function required is unrestricted, but not discourse-oriented. It cannot be the unrestricted object function OBJ, firstly because nouns are generally barred from taking object complements, and secondly because of the semantic range it encompasses. This range includes inter alia agent-like roles, which standard mapping principles for clause structure naturally prevent from mapping to OBJ. An English noun phrase in which the *of*-oblique has an agent role would be *the bad performance of the team in yesterday's match*, where *the team* has the same role as the clausal subject in *the team performed badly in yesterday's matc*h. Also, as we will show in section 7.6, the range of semantic roles permitted by the required function is, taking the evidence of English and Hungarian, in principle even wider than that permitted by the SUBJ function. It would not seem desirable therefore to identify this function in LFG terms as a restricted oblique function (the solution essentially proposed by Rappaport 1983). We argue that what is needed is a new complement function which we will term ADNOM.

If the basic argument functions are decomposed not just in terms of [±r] (restricted) and [±o] (objective) (Bresnan 2001:308), but also in terms of [±d] (discourse-related), and SUBJ is the only [+d] function, then ADNOM naturally fills the [−r, −o] slot in the set of [−d] functions. The range of permitted argument functions is then shown in (7).

(7)

	+d	−d	
	−r	−r	+r
−o	SUBJ	ADNOM	OBL_θ
+o		OBJ	OBJ_θ

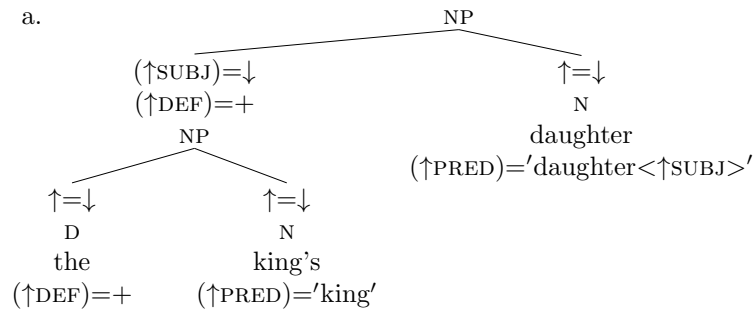
The [+o] functions are excluded from noun phrases, and ADNOM is excluded from clauses, where only a single [−r, −o] function (SUBJ) is permitted. The peculiarity of ADNOM is that it has a semantic range covering roles in noun phrase structure which match those of both SUBJ and OBJ in clause structure, but when it co-occurs with SUBJ, ADNOM is hierarchically subordinate to SUBJ.

7.3 Syntax (English)

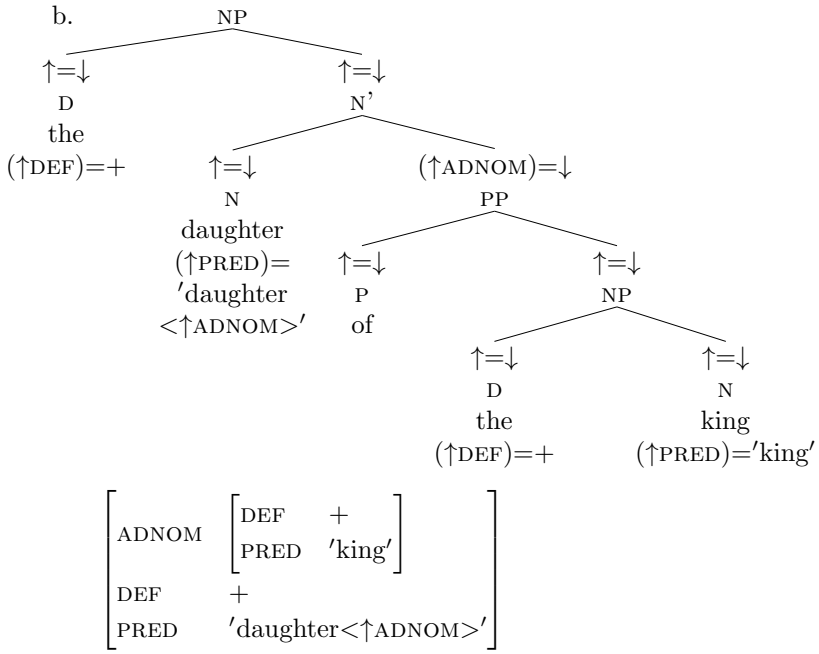
The analysis of the English examples (1a) and (1b) is then straightforward. We assume an NP analysis rather than a DP analysis, but the arguments for this are orthogonal to the analysis of possessor constructions and we will not rehearse them here. For a full discussion of the issues as they relate to English, though not in an LFG framework, see Payne and Huddleston (2002). Consider the c-structures and corresponding f-structures in (8a) and (8b).

The genitive NP *the king's* in (8a) acts as a definite determiner: the definiteness of the matrix NP follows from the (↑DEF) = + annotation on the genitive NP. Through its (↑SUBJ) = ↓ annotation, the genitive NP maps straightforwardly to the SUBJ function in f-structure. The semantic role here is one of kin relationship. The same semantic role of kin relationship is also associated with the ADNOM function in (8b), where *of the king* is an *of*-oblique. Here we take the (↑ADNOM) = ↓ annotation to be associated with the PP node. Note that the preposition *of* in (8b) is then treated as having no f-structure annotation itself, and consequently contributes nothing to the f-structure representation. This reflects the longstanding idea that the preposition *of* in these constructions has no semantic value and serves merely to create a syntactically oblique PP complement for the head noun. The analysis of the preposition *of* in the ADNOM construction would then contrast with the analysis of prepositions heading PPs which map to semantically restricted OBL_θ functions, the value of θ being individually supplied by the preposition concerned.

(8) a.



$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{DEF} & + \\ \text{PRED} & \text{'king'} \end{bmatrix} \\ \text{DEF} & + \\ \text{PRED} & \text{'daughter<}\uparrow\text{SUBJ>'} \end{bmatrix}$$



7.4 Selection of SUBJ vs. ADNOM

A number of factors are involved in the selection of the SUBJ rather than the ADNOM function. The syntactic and pragmatic factors include pronominal status and weight (Jucker 1993, Payne and Huddleston 2002).

7.4.1 Pronoun vs Non-Pronoun

Pronouns are strongly preferred as SUBJ rather than ADNOM:

(9) a. her car a′. ??the car of her
b. her only portrait b′. the only portrait of her

It is tempting and plausible to relate this preference to the discourse-oriented nature of SUBJ: the unmarked role of an overt pronoun in English is to function as a topic, and pronouns gravitate to the discourse-related function within NP. In (9a), for example, it is typically necessary to identify the possessor from the discourse before we can identify the car. But this is not an absolute constraint: in (9b) the pronoun can equally be an ADNOM. Semantic factors are involved in this example: *her* in (9b′) is likely to be relatively low on the thematic hierarchy, i.e. the person in the portrait, but in (9b) it can also be a creator or owner.

7.4.2 Weight

Other things being equal, relatively short, head-final NPs favour the SUBJ function and relatively long NPs with post-head dependents favour ADNOM. This is clearly related to the pre-head position of SUBJ and the post-head position of ADNOM in English rather than any deep property of the functions themselves. Compare the examples in (10):

(10) a. John's speech

a′ ?the speech of John

b. ?the delegate from the Republic of Chad's speech

b′ the speech of the delegate from the Republic of Chad

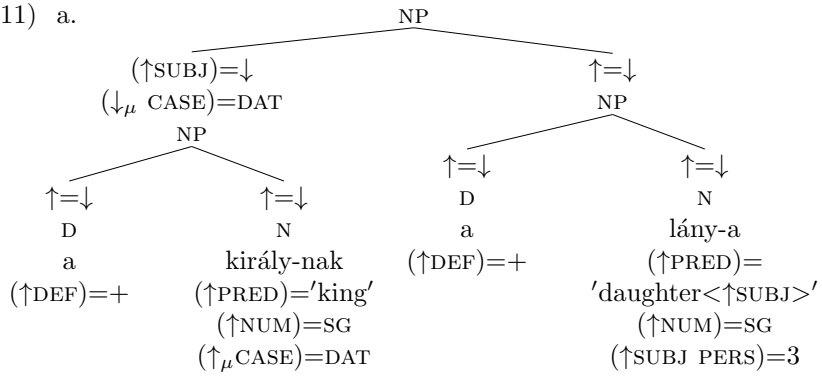
The possessor in (10a) is the short NP *John*, and the pre-head SUBJ position is preferred to the post-head ADNOM position in (10a′). By contrast, ADNOM position is preferred for the relatively long NP *the delegate from the Republic of Chad*, which itself contains a post-head dependent *from the Republic of Chad*. It can be noted that (10b′) is preferable to (10a′) even when the semantic role involved, that of agent, is high on the thematic hierarchy.

7.5 Syntax (Hungarian)

The representation of the Hungarian examples (2a) and (2b) is similar to the representation of the English noun phrases in (8a) and (8b), but it is also necessary to take into account the agreement of the possessum.[4] In (11a), the dative possessor is analysed as a predeterminer, forming a new NP-level constituent from an NP which already contains the definite article *a*. It is therefore the article rather than the possessor which is annotated with the (↑DEF) = + equation and determines the definiteness of the matrix NP.

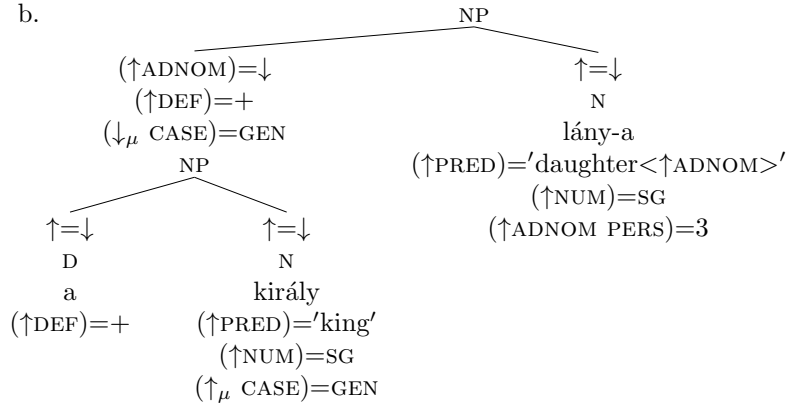
[4]While the agreement features of person and number naturally feed into the f-structure representation, we have made the decision that the case of the possessor NP is an arbitrary property of each construction and itself makes no contribution to f-structure. Some feature percolation mechanism is then needed to ensure that the syntactic case of the possessor NP matches the case of the head noun where this case has its exponence, and there are no obvious mechanisms within the existing LFG framework for achieving this. One possible move is to employ m-structure representations along the lines of Butt et al. (1996), and this is what lies behind the representation of case in (11a) and (11b). We employ this representation simply to avoid the presence of case in f-structure: whether the use of m-structures is ultimately the appropriate mechanism for achieving this is a question we will leave open.

(11) a.



$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{DEF} & + \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{PRED} & \text{'king'} \end{bmatrix} \\ \text{DEF} & + \\ \text{NUM} & \text{SG} \\ \text{PRED} & \text{'daughter<↑SUBJ>'} \end{bmatrix}$$

b.



$$\begin{bmatrix} \text{ADNOM} & \begin{bmatrix} \text{DEF} & + \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{PRED} & \text{'king'} \end{bmatrix} \\ \text{DEF} & + \\ \text{NUM} & \text{SG} \\ \text{PRED} & \text{'daughter<↑ADNOM>'} \end{bmatrix}$$

Evidence for the constituent structure assumed here comes from co-ordinate constructions: a single possessor can act as predeterminer to conjoined NPs, as shown in (12):

(12) a **király-nak** [$_{\text{NP}}$ [a fi-a] és [a lány-a]]
ART king-DAT ART son-SUBJ.3 and ART daughter-SUBJ.3
'the king's son and daughter'

By contrast, in (11b) the genitive possessor stands in complementary distribution with the definite article and acts, as in English, as a definite determiner. The genitive NP itself therefore bears the (↑DEF) = + equation. Although the dative possessor and genitive possessor cannot co-occur, the fact that the dative possessor is invariably a predeterminer rather than a determiner suggests that it is structurally higher than the genitive possessor. This is reflected in the mapping of the dative possessor to the SUBJ function in f-structure, and the mapping of the genitive possessor to ADNOM. It should be noted that, from a universal point of view, these mappings do not depend on the particular cases employed, or whether there is exponence through adpositions or cases. The case called genitive in English maps to SUBJ, while the case called genitive in Hungarian maps to ADNOM. The exponence of ADNOM in English is prepositional, but in Hungarian it involves morphological case. These are purely surface phenomena: the mapping of the possessor NP to SUBJ or ADNOM is rather determined by the hierarchical syntactic and semantic relationships involved, and by the discourse-related nature of SUBJ.

The agreement of the head noun with the possessor in Hungarian is straightforwardly handled by the annotations (↑SUBJ PERS) = 3 and (↑ADNOM PERS) = 3 on the agreeing head nouns in (11a) and (11b) respectively. It should be noted that the possessum *lány-a* 'daughter' in examples (11a) and (11b) requires only that the possessor NP be third person: there is no specification of number. The same form in *-a*, which is identical to the form which shows agreement with singular third-person pronouns as shown in example (3e), co-occurs both with singular and plural possessors if these are headed by non-pronouns.

There is however a small but significant difference in agreement between the SUBJ and ADNOM functions: plural ADNOMs are incompatible with a possessum distinctively marked for a plural possessor, but SUBJs are not. Compare (13a–d):

(13) a. a lány-ok macská-ja
ART girl-PL cat-ADNOM.3
'the girls' cat'

b. *a lány-ok macská-juk
ART girl-PL cat-ADNOM3.PL

c. a lány-ok-nak a macská-ja
ART girl-PL-DAT ART cat-SUBJ.3

d. a lány-ok-nak a macská-juk
ART girl-PL-DAT ART cat-SUBJ.3.PL

Example (13a), with a plural ADNOM and general third-person agreement in *-a*, is grammatical, but (13b), with distinctively plural third-person agreement in *-juk*, is excluded. Both forms of agreement are however permitted with a plural SUBJ as in (13c) and (13d). A full treatment of the agreement system requires firstly that a proper distinction be made between pronoun incorporation and agreement, and secondly that agreement with pronouns and non-pronouns is differentially treated, perhaps invoking binding features along the lines of Bresnan (2001:146). The point made here is simply that, although the agreement paradigms of head nouns with SUBJ and ADNOM arguments largely overlap, they are not completely identical. It is therefore an advantage rather than a defect of the present analysis that the lexicon must contain two representations of head nouns such as *lány-a* 'daughter' in (11a) and (11b), one with the annotation (↑PRED) = 'daughter<↑SUBJ>' and one with the annotation (↑PRED) = 'daughter<↑ADNOM>'. The fact that the paradigms overlap can be handled by lexical redundancy rules.

As in English, the two constructions display syntactic and pragmatic differences. These include syntactic type and pro-drop.

7.5.1 Syntactic type

A number of NP types cannot appear in the ADNOM construction, for example NPs containing demonstratives:

(14) a. *[ez a lány] ruhá-ja
this.GEN ART girl.GEN dress-SG.ADNOM.3
'this girl's dress'

b. [en-nek a lány-nak] a ruhá-ja
this-DAT ART girl-DAT ART dress-SG.SUBJ.3
'this girl's dress'

In Payne and Chisarik (2001), we handle such restrictions by assuming a paradigm gap. The demonstrative, which agrees in case with the NP, has a dative but not a genitive form.

7.5.2 Pro-drop

The possessum forms can occur on their own, with pro-drop. For example, *a lány-om* (ART daughter-SUBJ1.SG) is the unmarked form for 'my daughter'. Not only are overt topic pronouns omitted in the SUBJ function, but it is actually ungrammatical to insert them: **nekem a lány-om*

(I-DAT ART daughter-SUBJ.1.SG).[5] This can be straightforwardly handled using the mechanism proposed by Bresnan (2001:146), viz *lány-om* is lexically specified as follows:

(15) lány-om: (↑PRED) = 'daughter<↑SUBJ>'
(↑NUM) = SG
(↑SUBJ PRED) = 'PRO'
(↑SUBJ NUCL) = −
(↑SUBJ PERS) = 1
(↑SUBJ NUM) = SG

When the annotation (↑SUBJ PRED) = 'PRO' is present, the form *lány-om* itself creates a predicate with the value 'PRO' in f-structure and this is incompatible with an overt pronoun.

By contrast, overt pronouns do occur in the ADNOM function, in which case the pronoun is focussed: *az-én lány-om* (GEN-I daughter-ADNOM1.SG = 'MY daughter'). In this case, *lány-om* must be lexically specified as follows:

(16) lány-om: (↑PRED) = 'daughter<↑ADNOM>'
(↑NUM) = SG
(↑ADNOM NUCL) = −
(↑ADNOM PERS) = 1
(↑ADNOM NUM) = SG

Here the absence of the annotation (↑ADNOM PRED) = 'PRO' will require the form *lány-om* to co-occur with an ADNOM whose predicate value is independently specified, and the remaining annotations will force this to be a first person singular non-reflexive pronoun.

The distribution of pro-drop and overt pronoun forms here is not accidental. Pro-drop is naturally compatible with a topic discourse-orientation of the subject function, while, in Hungarian at least, focus is not. Focussing through the use of stressed pronominal forms is compatible with any non-subject argument function, including ADNOM.

7.6 Semantic roles

The formation of the possessum of an ordinary, non-relational noun is a lexical process:

[5] Although *nekem a lány-om* (I-DAT ART daughter-SUBJ1.SG) with a dative pronoun is considered ungrammatical by most speakers, some speakers do use it. For these speakers, the annotation (↑SUBJ PRED) = 'PRO' in (15) is optional.

(17) macska: N, (↑PRED) = ′cat′, λy[cat(y)]

macská-ja: N, (↑PRED) = ′cat< ↑ADNOM>′,
λxλy[π (x,y) and cat(y)]
(↑ADNOM PERS) = 3

Semantically, this process forms a two-place predicate from a one-place predicate, introducing an arbitrary relation π, from the set of possible relations Π, between possessor x and possessum y (Barker 1995). The new two-place predicate combines with a suitable argument (e.g., *Mari*) to form a construction (e.g., *Mari macská-ja*) which again has the semantics of a one-place predicate. In the case of relational nouns, e.g., *lány* 'daughter', we can think of the relation involved directly as a member of Π: *lány-a* translates as λxλy[daughter(x,y)]. The lexical mapping rules then simply associate a [−r, −o] function with the argument x, and this can freely map either onto SUBJ or ADNOM for most relations π.

If we consider the set of possible relations Π, abstracting away from the syntactic and pragmatic differences between the SUBJ and ADNOM constructions in English and Hungarian, the range of semantic relations permitted by each construction is strikingly similar in the two languages. Natural subgroups for the SUBJ function are (adapted from Payne and Huddleston (2002)) shown in (19).

All these types of relation are equally possible for the ADNOM function, straightforwardly in Hungarian, and with sufficiently heavy NPs in English, for instance:

(18) a. the green eyes of the girl sitting opposite me (BODYPART)

b. the sister of the man who had been arrested (RELATION)

c. the debut of the young flautist from Abergavenny (AGENT)

d. the new house of the Vice-Chancellor elect (OWNER)

The sheer range of semantic relations involved, encompassing for example both agent and theme, leads us to treat the ADNOM function as an unrestricted function.[6]

[6]Unrestricted functions naturally permit expletive elements which have no semantic value (Bresnan 2001:308). It is well-known that expletives are excluded from English NPs: compare the expletive *it* in *It is thought that the universe will expand forever* with **its thought that the universe will expand forever*. In Hungarian, as pointed out by Kenesei (1994:319) expletives are permitted: *annak a gondolat-a, hogy a fogorvos-hoz kell mennie* (that.DAT ART thought-SUBJ.3, that ART dentist-ALL must go) 'the thought that he must go to the dentist'. The expletive is the distal demonstrative, and since demonstratives in general lack genitive case, expletives only occur in the SUBJ function.

(19) Natural subgroups for the SUBJ function

English SUBJ	Hungarian SUBJ	Relation[7]	
Mary's back	Mari-nak a hát-a	(HAVING) BODYPART	
Mary's older sister	Mari-nak a nővér-e	*Kin*	RELATION
Mary's boss	Mari-nak a főnök-e	*Superior*	
Mary's friend	Mari-nak a barát-ja	*Equal*	
Mary's team	Mari-nak a csapat-a	MEMBER	
Mary's debut	Mari-nak a bemutatkozás-a	*Performer*	AGENT
Mary's book	Mari-nak a könyv-e	*Creator*	
Mary's new house	Mari-nak az új ház-a	OWNER	
Mary's honour	Mari-nak a becsület-e	(HAVING) CHARACTER	
Mary's anger	Mari-nak a harag-ja	EXPERIENCER	
Mary's letter	Mari-nak a level-e	RECIPIENT	
Mary's biography	Mari-nak az életrajz-a	*Descriptum*	THEME
Mary's surgery	Mari-nak a rendelő-je	*Undergoer*	
the sun's rays	a nap-nak a sugar-ai	*Emitter*	SOURCE
the conflict's origin	a viszály-nak a forrás-a	*Origin*	
the flood's consequence	az árvíz-nek a következmény-e	RESULT	
the cathedral's spire	a templom-nak a torny-a	PART	

What is more, there are some further relations which in both languages are available to the ADNOM function but ungrammatical in the

[7]In (19), *Performer* and *Creator* are taken to be subspecies of the more general AGENT relation, and so on.

SUBJ function. These include relations of quality and apposition (for further possible examples see Chisarik 1999):

(20) a. a boldogság perc-ei
ART happiness.GEN minute-PL.ADNOM.3
'the minutes of happiness'

b. *a boldogság-nak a perc-ei
ART happiness-DAT ART minute-PL.SUBJ.3

(21) a. Budapest város-a
Budapest city-ADNOM.3
'the city of Budapest'

b. *Budapest-nek a város-a
Budapest-DAT ART city-SUBJ.3

The situation is analogous to that in English, where similar relationships are excluded from the genitive construction: **happiness's minutes/*Budapest's city.*

The SUBJ relations in both languages are therefore a subset of the ADNOM relations in both languages, and the two functions, although both unrestricted, are not semantically equivalent. It remains, of course, an open question whether this pattern has any universal validity.[8]

7.7 Multiple possessors

The SUBJ and ADNOM functions are distinct, and therefore in principle not incompatible. Semantically, it is possible to iterate the function which forms two-place relations, giving possessum nouns both functions. In English, this process occurs quite straightforwardly:

(22) photo: N, $(\uparrow \text{PRED}) = \text{'photo'}$,
$\lambda y[\text{photo}(y)]$

photo: N, $(\uparrow \text{PRED}) = \text{'photo}\langle\uparrow \text{ADNOM}\rangle\text{'}$,
$\lambda x[\lambda y[\pi(x,y)\ \&\ \text{photo}(y)]]$

photo: N, $(\uparrow \text{PRED}) = \text{'photo}\langle\uparrow \text{SUBJ}, \uparrow \text{ADNOM}\rangle\text{'}$,
$\lambda x[\lambda z[\lambda y[\pi_2(z,y)\ \&\ \pi_1(x,y)\ \&\ \text{photo}(y)]]]$

[8] We do not exclude the possibility that further functions beyond SUBJ and ADNOM may be needed to capture the full range of possessor constructions in the world's languages. English for example has a third possessor construction, the genitive oblique construction illustrated by NPs like *a friend of Mary's*. The range of semantic relations permitted by this construction is somewhat restricted compared with those permitted by the SUBJ and ADNOM constructions (it basically encompasses RELATION, OWNER and AGENT), and therefore the use of restricted oblique functions might indeed be more appropriate in this case.

In the case of the noun *photo*, the relation π_2 will typically be OWNER or *Creator*, and π_1 will be DEPICTUM:

(23) Mary's photo of Bill

The lexical mapping rules in English associate a [−r, −o] function with the z argument (SUBJ) and the x argument (ADNOM). Clearly there is a hierarchical correspondence between the order in which the arguments are combined (π_2 higher than π_1) and some version of the thematic hierarchy. The thematic hierarchy for argument mapping in clause structure is assumed to be as in (24) (Bresnan 2001:307):

(24) agent > beneficiary > experiencer/goal > instrument > patient/theme > locative

From (23) we have OWNER < DEPICTUM (a subspecies of theme), and AGENT < DEPICTUM. A full analysis of multiple possessor constructions in English and other languages which permit SUBJ and ADNOM to co-occur will therefore require that the hierarchy be augmented with typical NP roles such as OWNER.

Hungarian now presents an interesting puzzle: it is impossible to have both a genitive and a dative possessor in the same noun phrase. As shown by Laczkó (1995, 2000), event nominalizations require the theme argument to be expressed as either a dative or a genitive possessor, but the agent must be treated as an adjectivalised postpositional modifier:

(25) a. a váza Edit által-i összetör-és-e
ART vase.GEN Edith by-ADJ smash-NOM-ADNOM.3
'the smashing of the vase by Edith'

b. *Edit-nek a váza összetör-és-e
Edith-DAT ART vase.GEN smash-NOM-ADNOM.3

There is therefore no mapping in Hungarian equivalent to the mapping involved in the English *Edith's smashing of the vase*.

On the basis of their incompatibility and similarity in function, analyses in the Government and Binding framework (Szabolcsi 1994, É. Kiss 1999, etc.) treat the two possessor constructions in Hungarian as related by movement. The LFG analysis of Laczkó (1995, 2000) naturally eschews this movement analysis, but treats the two possessor positions as functionally equivalent and subsumed under a single function POSS: it is then natural to account for the incompatibility of the two types of possessor using the principle of coherence (e.g., Bresnan 2001). However, we have argued that SUBJ and ADNOM are distinct functions, and coherence cannot therefore be used to account for this language-specific incompatibility. The difference between English and Hungarian requires an alternative explanation.

Two possible solutions suggest themselves: First, we might assume that there is a paradigm gap: no lexical form can realise a lexical entry annotated (↑PRED) = '<↑SUBJ, ↑ADNOM>'. This however seems arbitrary, since such lexical entries are required for the multiple possessor constructions of English. Nor does it seem plausible to relate such a paradigm gap to agreement: there seems to be no reason why a form which agreed both with SUBJ and ADNOM would be needed. After all, in transitive clauses it is typical for a verb to agree with SUBJ and not OBJ.

The second solution, which we prefer, is to suggest that two [−r] arguments are blocked in Hungarian noun phrases by an extension of the asymmetrical object parameter of Bresnan and Moshi (1990). We will call this the asymmetrical possessor parameter to reflect its applicability to noun phrases:

(26) Asymmetrical Possessor Parameter

* θ | −r θ | −r

In the case of nominalisation, all unrestricted arguments automatically acquire the value [−o]. The nominalisation of a verb with a [−o] agent and a [−r] theme will then have its agent mapped in noun phrase structure to either [−o, −r] or [−o, +r], and its theme to [−o, −r]. In a language such as Hungarian which does not permit two [−o, −r] arguments, there is no alternative but to express the theme as SUBJ or ADNOM, and to treat the agent as an oblique. In English, which does permit two [−o, −r] arguments, the higher role will map to SUBJ and the lower to ADNOM.

7.8 Conclusion

In this paper, we have argued that the existence of structurally distinct possessor constructions in languages such as English and Hungarian necessitates the postulation of more than one possessor function. We identify the structurally higher position of the possessor with the SUBJ function and postulate a new function ADNOM for the structurally lower position. The SUBJ function has topic-like discourse properties, whereas ADNOM does not. We also argue that ADNOM is an unrestricted function, since the range of semantic roles it encompasses in both languages is at least as broad as that of SUBJ. English and Hungarian differ in that SUBJ and ADNOM can co-occur in English, but are mutually exclusive in Hungarian. We account for this by an asymmetrical possessor parameter, an extension to noun phrases of the asymmetrical object parameter. When

SUBJ and ADNOM co-occur, as in English, the superordinate nature of SUBJ is, it seems, reflected in the operation of a thematic hierarchy.

The analysis we have given is, of course, a fragment based on English and Hungarian. It remains a subject for further research to see how the analysis might apply to other languages with multiple possessor constructions, and indeed to languages with a single possessor construction. We have treated SUBJ and ADNOM as unrestricted, but the evidence of the *a friend of Mary's* construction in English hints that the possibility of restricted possessor constructions should not be excluded.

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8

On Oblique Arguments and Adjuncts of Hungarian Event Nominals

Tibor Laczkó

8.1 Introduction

The paper[1] offers a revised and comprehensive LFG analysis of all the three principal modes of realizing the oblique arguments of event nouns[2] derived from verbs (of these three strategies, only two are available to adjuncts).[3] They are as follows: a) the premodifying PP and (oblique) case-marked DP adjuncts and arguments of the derived nominal head have to be "adjectivalized", i.e. combined with special elements: an adjectivizing suffix (in the case of PPs) or a "dummy" present participial form of the copula (in the case of both PPs and DPs); b) as a systematic exception to Type A, the premodifying designated oblique argument of

[1]I gratefully acknowledge that the research reported here was, in part, supported by my Széchenyi Professorial Award and, subsequently, by my István Széchenyi Grant. I wish to express my gratitude to András Komlósy and Chris Piñón for discussing parts of previous versions of this paper with me, and also to two anonymous reviewers (to be referred to as Reviewer 1 and Reviewer 2) for their valuable comments, which contributed significantly to some presentational aspects of the paper. Naturally, all remaining errors are my own responsibility.

[2]By 'event nouns' I mean Grimshaw's (1990) complex event nominals.

[3]The reader interested in lexicalist treatments of related phenomena is referred to the following works — on mixed categories: Bresnan and Mugane (2000) and Malouf (2000); on crosslinguistic variation in complex predicate formation: Ackerman and Webelhuth (1998); on the syntax of nonprojecting categories in Korean/Swedish and Swedish: Sells (1999, 2001) and Toivonen (2001), respectively.

Nominals: Inside and Out.
Miriam Butt and Tracy Holloway King (eds.).

nominals derived from a particular set of verbs can (or must) be used without adjectivalization; c) under certain circumstances arguments (including the dative possessor) and adjuncts can follow the head, and in this case adjectivalization is strictly disallowed.

Each of these types presents theoretical challenges:

- Type A: it is not clear why adjectivalization is necessary, and the status and treatment of the adjectivalizing dummy participle poses several complications;
- Type B: it is not obvious how the lack of adjectivalization in the premodifying portion of the NP can be captured in a principled manner;
- Type C: this version contrasts with Type A and they exhibit a particular tension — Type C is a simpler mode of expression, because it systematically excludes adjectivalization; however, its use is much more restricted.

In this paper I propose a modification of my previous analysis of the dummy participle in Type A, which has been motivated by some new data. Its novelty lies in the functional annotations I associate dummy participial constructions and their components with. As far as my earlier lexical incorporation analysis of Type B is concerned, I point out its problematic aspects, and then I outline an account that combines the designated oblique argument and the nominal head in the syntax in a principled fashion. As regards Type C, I present its first complete analysis in a generative framework. Its essence is that the constituents following the NP head are right-adjoined to the matrix DP and they get integrated into this constituent via outside-in functional uncertainty.

The structure of the paper is as follows. First, I demonstrate the basic facts and briefly discuss the most important previous accounts (sections 8.2.1 to 8.2.3). Then the modified or entirely new analyses are presented (sections 8.3.1 to 8.3.3). Finally, I summarize the most important points (section 8.4).

8.2 The Basic Facts and Previous Analyses

There is one non-oblique argument type in Hungarian DPs: the possessor. It has two possible realizations: either nominative or dative.[4] In the majority of cases they are interchangeable. For similarities and differences, see Szabolcsi (1994), É. Kiss (2000), Chisarik and Payne (this volume) and Laczkó (2002). In this paper I am not concerned with possessors.

[4] For a different view postulating that the two forms express two distinct functions (SUBJ and ADNOM, respectively), see Chisarik and Payne (this volume).

8.2.1 Adjectivalized Constructions

The NP core of the Hungarian DP is fundamentally right-headed, that is, under normal circumstances all the oblique arguments and adjuncts (either with or without complements) must precede the NP head (whether a derived or non-derived noun). In the first, and by far the most productive, construction type, all these modifying elements must be either adjectival or participial in form. I collectively call such phrases *adjectivalized* constituents. As Szabolcsi (1994) shows, the adjectivalization requirement in Hungarian is rather poorly understood. The reason for this is that in a number of head-final languages the head can be preceded by unadjectivalized PPs, and in Hungarian, too, adjectivalization is not needed (or, rather, it is not allowed) when the argument or adjunct follows the head, cf. section 8.2.3. As I point out in Laczkó (1987), at earlier stages in the history of the Hungarian language adjectivalization of this sort was not obligatory. Thus, this requirement in present-day Hungarian can only be stipulated.[5] A neat way of capturing it has been suggested

[5]In this connection, Reviewer 1 makes the following remark (typo corrected, T. L.). "In the adjectivized NP type, the idea that *való* modifies (i.e. adjectivizes) both the OBL argument and the adjunct is not convincing. Why would adjuncts need any kind of modification/adjectivization? The question remains how to handle the restrictions of adjuncts in the NP." On the basis of the discussion above, the following answers suggest themselves: a) there seems to be no general and principled explanation for adjectivalization to be available; b) it is unclear on what grounds Reviewer 1 suggests that the adjectivalization of the arguments and that of the adjuncts of derived nominals should be treated differently.

Reviewer 2 also comments on adjectivalization. They make the following interesting suggestions as regards some possible sources for this phenomenon. "(i) Premodifying constituents have the verbal properties because the head noun of a deverbal nominal shares the same argument structure as the verb. (ii) The verbal properties come from an aspectual structure of the verb inherited to the deverbal nominal through combination with *-i* or *való*." My response to these observations is as follows. A) If adjectivalization were treated by the help of generalized assumptions like these, which appear to be rather elegant, then it would not be easy (or at all possible) to explain, in a principled manner, why postmodifying oblique arguments and adjuncts strictly reject this device. B) The premodifiers of ordinary, underived noun heads must also be adjectivalized. However, these nouns do not possess either argument structure or aspectual structure, cf.:

(i) a ház mellett-i fa
the house near-AFF tree
'the tree near the house'

C) In Laczkó (1995a) I briefly discuss an alternative treatment of adjectivalization, inspired by Sells (1995). In Sells' analysis, certain Korean and Japanese bound morphemes do not change the categories of the stems they attach to. Instead, they are combinatoric type-changers licensing the combination of the constituent headed by their stem with a particular category. In the case at hand, they carry the N-SIS feature, which means that the constituents containing them can (or, rather, must) occur as sisters of an N^n category. In Laczkó (1995a), however, I reject the adop-

by Chris Piñón (p.c., 1992): we can impose a categorial restriction on the premodifying constituents combining with N′ in the Hungarian NP to the effect that they must have the [+V] feature. This gives us APs and (participial) VPs and excludes PPs and case-marked NPs (or DPs). Consider the following examples.[6]

(1) a. János (váratlan-ul) meg-érkez-ett Budapest-re.
John (unexpected-ly) PERF-arrive-PAST.3SG Budapest-onto
'John arrived in Budapest (unexpectedly).'

b. *János(nak a) (váratlan) Budapest-re
John(DAT the) (unexpected) Budapest-onto
meg-érkez-és-e
PERF-arrive-NOM-his
'John's (unexpected) arrival in Budapest'

c. János(nak a) (váratlan) Budapest-re való
John(DAT the) (unexpected) Budapest-onto BEING
meg-érkez-és-e
PERF-arrive-NOM-his
'John's (unexpected) arrival in Budapest'

(2) a. *Edit(nek az) ebéd után levizsgáztat-ás-a
Edith(DAT the) lunch after examine-NOM-her
'the examination of Edith after lunch'

b. Edit(nek az) ebéd után-i levizsgáztat-ás-a
Edith(DAT the) lunch after-AFF examine-NOM-her
'the examination of Edith after lunch'

c. Edit(nek az) ebéd után való levizsgáztat-ás-a
Edith(DAT the) lunch after BEING examine-NOM-her
'the examination of Edith after lunch'

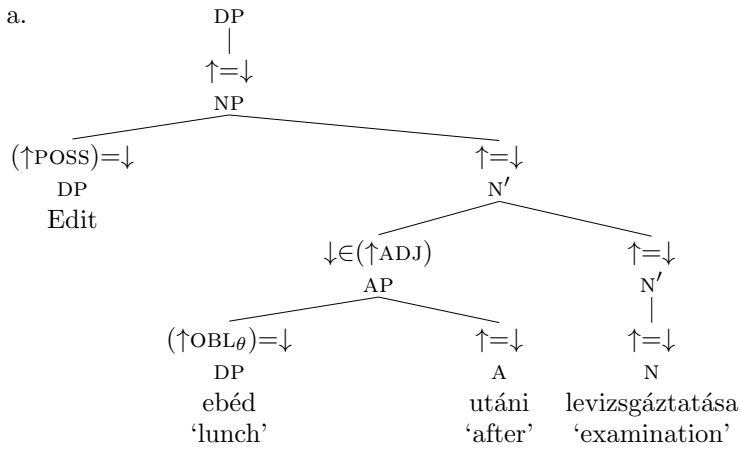
---

tion of this approach in the analysis of the relevant Hungarian phenomena for the following main reasons. On the one hand, only *-i* is a bound morpheme and its use is rather limited: it can only attach to (the majority of) Ps, but it cannot combine with case-marked noun stems. Moreover, in its other major use (when it attaches to bare noun stems), it clearly has an adjectivizing (that is, category-changing function). On the other hand, *való*, the general purpose "adjectivalizer" in combination with (complex) event nouns, can be naturally treated as belonging to the category V, as ordinary participles of several kinds can premodify noun heads. I would like to add that, even if we attributed this generalized combinatoric type-changing role to both *-i* and *való*, it would be a mystery why these elements are, as a rule, banned in the case of designated unadjectivalized premodifying oblique arguments and in the case of all oblique arguments and adjuncts following the head, cf. sections 8.2.2 and 8.2.3

[6]The following abbreviations are used in the glosses: AFF = adjectivizing suffix, NOM = nominalizing suffix, PERF = perfectivizing preverb.

The use of an adjective (*váratlan* 'unexpected') is exemplified in (1c). PPs and (oblique) case-marked DPs are adjectivalized by one of the present participial forms of the copula *van* 'be': *való*, glossed as BEING. This is illustrated in (1c) and (2c). In addition, certain kinds of PPs can also be adjectivalized by the PP head taking the general adjectivizing suffix *-i*, as demonstrated by (2b). If no adjectivalization takes place, the nominal construction is ungrammatical, cf. (1b) and (2a). The adjectivalized constituents corresponding to oblique arguments of the input verbs are true arguments of the derived nominals, because they are as obligatory as the input verbs' arguments. The analysis of PP constituents adjectivalized by *-i* is unproblematic. They are AP arguments or adjuncts of the nominals. Consider the c-structure (3a) and f-structure (3b) representation of (2b) and the lexical form for the derived nominal head (3c).

(3) a.



b.
$$\begin{bmatrix} \text{POSS} & \begin{bmatrix} \text{PRED} & \text{'Edith'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{SG} \\ \text{CASE} & \text{NOM} \end{bmatrix} \\ \text{PRED} & \text{'examination}\langle \emptyset, (\uparrow \text{POSS}) \rangle' \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'after}\langle (\uparrow \text{OBL}_\theta) \rangle' \\ \text{OBL}_\theta & [\text{PRED 'lunch'}] \end{bmatrix} \right\} \end{bmatrix}$$

c. levizsgáztatása, N 'examination$\langle \emptyset, (\uparrow \text{POSS}) \rangle'$
$(\uparrow \text{POSS}) = \downarrow$
$(\downarrow \text{PERS}) = 3$
$(\downarrow \text{NUM}) = \text{SG}$

The PP and (oblique) case-marked DP constituents combined with *való* 'being' pose a special problem. Should the participial form be analysed as an argument-taking predicate or should it be regarded as a mere formative element without any semantic content?

So far there has not been any satisfactory analysis proposed in either GB or MP. Szabolcsi (1990), working in a GB framework, briefly points out that *való* cannot be taken to be an ordinary (that is, argument-taking) predicate. She writes: "Although *való* is formally a participle, phrases like *a Péter-rel való találkozás* 'the Peter-with BEING meeting' cannot be said to contain a participial modifier since, in contrast to English for instance, the corresponding clause would almost always be ungrammatical: **A találkozás Péterrel volt* 'The meeting was with Peter'. In categorial grammar terms I would say *való* is a type-lifter" (Szabolcsi 1990:153, Fn. 3). Type-lifting, however, is not legitimate in GB; moreover, this kind of account is hardly feasible when *való* adjectivalizes an adjunct (cf. Szabolcsi 1994:260–261).

É. Kiss (2000) offers an MP analysis of the Hungarian DP. She assumes that all arguments of the nominal head in the NP core are generated in a post-head position[7] and then, with the exception of some marginally acceptable construction types, these post-head constituents have to be moved to a pre-head position and they have to be adjectivalized by *való*, some other (more meaningful) participles or the *-i* adjectivizing suffix attaching to postpositions. É. Kiss is not very explicit about the details of these processes. However, it is obvious even from her sketchy presentation of this aspect of her approach that there are at least three significant problems with it.[8]

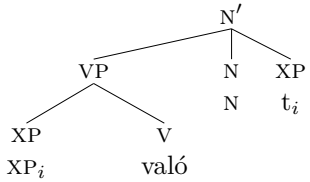
First, she lumps *való* and the other "true" participles together without any justification despite the fact that Szabolcsi (1990) and especially Laczkó (1995b) explicitly argue against treating *való* as an ordinary participle.

Second, although É. Kiss (2000) does not discuss the internal structure of the NP core of the Hungarian DP that she postulates, it is apparent that the movement of a constituent from a post-head position into a pre-head VP will violate the ECP, no matter what internal structure is assumed. For instance, if we posit a flat structure for the relevant part of the NP, as É. Kiss (1998) does, we cannot avoid the ECP violation. Consider:

[7] Interestingly, she assumes that adjuncts are generated in pre-head positions. However, she does not elaborate on the (theoretical) details and consequences of this assumption.

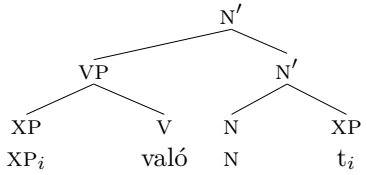
[8] For a more detailed critical overview of É. Kiss (2000), see Laczkó (to appear).

(4)



The violation remains even if the pre-head VP is assumed to be higher up in the structure because the moved constituent will still fail to c-command (or m-command) its trace, cf.:

(5)



Third, É. Kiss (2000:127) suggests that the movement of the post-head constituent is forced by her Case Constraint:

(6) a. The case suffix must cliticize to the right edge of the noun phrase.
b. The case suffix cannot cliticize to a case marked stem.

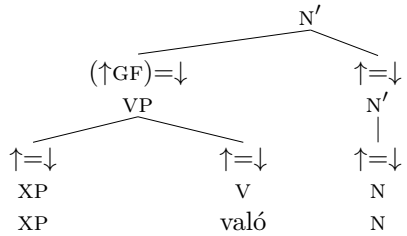
This condition, however, only partially justifies the transformation. Although it is compatible with the generation of arguments in a post-head position and motivates the movement of the constituents from that position, it says nothing about why the landing site is within a pre-head VP, that is what triggers the movement into that particular position. É. Kiss does not discuss this aspect of the transformation at all.

In Laczkó (1995a,b) I argue against regarding *való* as a true (argument-taking) participial predicate in a detailed fashion. The essence of my argumentation is as follows. Just like Szabolcsi (1994), I point out that the relevant DPs containing *való* do not have sentential counterparts with the copula *van* 'be' as the predicate (cf. the citation from Szabolcsi above). Then I go on to show that even if we disregard this problem, we cannot attribute any plausible argument structure to *való* as an argument-taking predicate, because the type and form of the constituent combined with it is always exclusively determined by the nominal head and not *való*.[9] Instead, I propose an LFG analysis (inspired by Ackerman's (1987) ac-

[9]Furthermore, as I show in section 8.3.1, a single *való* element can easily adjectivalize any combination of oblique arguments and adjuncts of the derived nominal head. This poses an insurmountable problem for its analysis as a genuine predicate taking those constituents as its own arguments. The reason is that this would make the alleged argument structure of *való* multiply ambiguous or rather vacuously vague.

count of the finite use of the Hungarian copula), which assumes that the *való* form is of category V and it functions as the c-structure and f-structure head of a VP constituent, and the PP or DP is the functional co-head of this VP; however, it is only the (head of the) PP/DP that also has a PRED feature. I annotate the entire VP with either an OBL or an ADJ function, depending on the status of the VP, and both the PP/DP and the V with the functional head equation. Consider:

(7)



The only problematic aspect of this analysis, which I was not aware of at the time, is that there can be more than one element within a *való* constituent and they can carry any mixture of OBL and ADJ functions. Consider:

(8) a. János-nak az Edit-tel Budapest-re való
John-DAT the Edith-with Budapest-onto BEING
meg-érkez-és-e
PERF-arrive-NOM-his
'John's arrival, with Edith, in Budapest'

b. János-nak a Budapest-re Edit-tel való
John-DAT the Budapest-onto Edith-with BEING
meg-érkez-és-e
PERF-arrive-NOM-his
'John's arrival in Budapest with Edith'

Budapest-re 'in Budapest' is an oblique argument and *Edit-tel* 'with Edith' is an adjunct. As (8a) and (8b) show, an adjunct and an argument can follow or precede each other.[10] Laczkó (1995b) only counts with one

[10]Reviewer 1 makes the following remarks on (8) (I have corrected some obvious typos, T. L.). "Example (8a) is marginally acceptable; (8b) is ungrammatical. This is shown more clearly when the argument of the derived nominal is a common noun rather than a geographical name. Consider:

(i) *János-nak az Edit-tel a híd mellett való találkoz-ás-a
John-DAT the Edith-with the bridge near BEING meet-NOM-his
'John's meeting with Edith near the bridge'

(ii) *János-nak a híd mellett Edit-tel való találkoz-ás-a
John-DAT the bridge near Edith-with BEING meet-NOM-his
'John's meeting, near the bridge, with Edith'

element within a *való* constituent; therefore, that analysis cannot cover the data in (8). The reason why this fact escaped me was that examples like (8) are rather rare. When speakers want to use all these constituents, they typically right-adjoin one of them to the DP.[11] In section 8.3.1, I offer a solution to this problem.

8.2.2 The Unadjectivalized Type

In this construction type, the nominal head is preceded by an oblique argument which is not adjectivalized. Consider the following examples and compare them with those in (1).

(9) a. János Budapest-re érkez-ett.
John Budapest-onto arrive-PAST.3SG
'John arrived in Budapest.'

b. János Budapest-re érkez-és-e
John Budapest-onto arrive-NOM-his
'John's arrival in Budapest'

This type is restricted to the designated oblique argument of a nominal predicate which has been derived from a verb that constitutes a special complex predicate with that designated argument. The most important kinds of complex verbal predicates that have derived nominal counterparts of this sort are as follows.[12,13]

I. The VM is a preverb.

... The ungrammaticality of such examples could be caused by the adjunct intervening between the nominal head and its OBL argument. What seems to be the case is that the OBL arguments tend to occur either in immediate nominal pre-head (not only in unadjectivized cases, but in the adjectivized cases as well), or the (?immediate) nominal post-head position (for the latter consider ?*János találkozása a repülőtéren Edittel* 'John's meeting at the airport with Edith' versus *János találkozása Edittel a repülőtéren* 'John's meeting with Edith at the airport'; the latter example is clearly better)." It is obvious that Reviewer 1 speaks and/or describes a different version of Hungarian from the version I speak and analyse in this paper. On the one hand, the former allows only one constituent in a *való* phrase, and, on the other, it requires that arguments be closer to the noun head than adjuncts, whether they precede or follow it. Consequently, for the description of this former version some appropriate restrictions have to be added to the rules I will present for the latter version of Hungarian. It is noteworthy that the characteristics of *való* phrases in the version Reviewer 1 describes could be captured by the analysis developed in Laczkó (1995b). However, for the sake of treating *való* constructions in both versions as uniformly as possible, I suggest that the account to be proposed here should be applied to both variants and the severe limitation on the number of constituents admitted in *való* structures should be added to the rule pertaining to Reviewer 1's version.

[11] On right-adjunction, see section 8.2.3.

[12] VM (= verbal modifier) stands for the designated oblique argument.

[13] For a more detailed overview, see Laczkó (1995a).

(10) a. János meg-ver-te Péter-t.
John.NOM PERF-beat-PAST.3SG Peter-ACC
'John beat up Peter.'

b. Péter meg-ver-és-e
Peter.NOM PERF-beat-NOM-his
'the beating up of Peter'

c. *Péter meg való ver-és-e
Peter.NOM PERF BEING beat-NOM-his
'the beating up of Peter'

II. The VM is (oblique) case-marked, the complex predicate is idiomatic.

(11) a. A betörő hideg-re te-tte az őr-t.
the burglar.NOM cold-onto put-PAST.3SG the guard-ACC
'The burglar did the guard in.'

b. az őr hideg-re té-tel-e
the guard.NOM cold-onto put-NOM-his
'the doing in of the guard'

c. *az őr hideg-re való té-tel-e
the guard.NOM cold-onto BEING put-NOM-his
'the doing in of the guard'

III. The VM is (oblique) case-marked, the complex predicate is stative.

(12) a. Anna gazember-nek nevez-te Péter-t.
Anne.NOM bastard-to call-PAST.3SG Peter-ACC
'Anne called Peter a bastard.'

b. Péter gazember-nek nevez-és-e
Peter.NOM bastard-to call-NOM-his
'calling Peter a bastard'

c. %Péter gazember-nek való nevez-és-e[14]
Peter.NOM bastard-to BEING call-NOM-his
'calling Peter a bastard'

[14]The % symbol means that the expression is not uniformly judged: some speakers accept it while others reject it.

IV. The VM is (oblique) case-marked, the complex predicate is resultative.

(13) a. Anna piros-ra fest-ette az ajtó-t.
Anne.NOM red-onto paint-PAST.3SG the door-ACC
'Anne painted the door red.'

b. az ajtó piros-ra fest-és-e
the door.NOM red-onto paint-NOM-its
'the painting of the door red'

c. %az ajtó piros-ra való fest-és-e
the door.NOM red-onto BEING paint-NOM-its
'the painting of the door red'

V. The VM is a directional argument (cf. also (9)).

(14) a. Anna az asztal-ra helyez-te a tányér-t.
Anne.NOM the table-onto place-PAST.3SG the plate-ACC
'Anne placed the plate on the table.'

b. a tányér-nak az asztal-ra helyez-és-e
the plate-DAT the table-onto place-NOM-its
'the placing of the plate on the table'

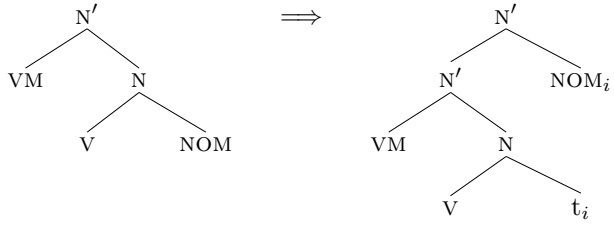
c. a tányér-nak az asztal-ra való helyez-és-e
the plate-DAT the table-onto BEING place-NOM-its
'the placing of the plate on the table'

As the examples above demonstrate, in certain cases the designated oblique argument can only be used in an unadjectivalized form ((10c), (11c)), and in other cases it can alternate with an adjectivalized counterpart in some ((12c), (13c)) or all ((9), (14)) versions of present-day Hungarian.

Here the theoretical challenge is to capture, in a principled manner, the fact that the designated argument can avoid being adjectivalized. So far two major analyses of such structures have been proposed: one by Szabolcsi (1994) and the other by Laczkó (1995a).

Szabolcsi (1994), in a GB framework, inspired by Pesetsky (1985), assumes that the oblique argument and the derived nominal form a syntactic complex predicate and then, at LF, the nominalizing suffix raises to have scope over the oblique argument + verb complex. Consider (15), which is not compatible with some basic principles of LFG: in this theory there is no LF and bound morphemes are incapable of syntactic movement.

(15)



In Laczkó (1995a), in an LFG framework, I suggest that the verb incorporates its oblique argument and they form a complex predicate in the lexicon, which is also nominalized in the lexicon. Consider:

(16) a. érkez- ⟹
arrive

b. Budapest-re érkez- ⟹
Budapest-onto arrive

c. Budapest-re érkez-és
Budapest-onto arrive-NOM

I concentrate on incorporated arguments expressed by oblique case-marked NPs and demonstrate that these NPs can never be preceded by an article in such a way that it is analysed as belonging to the incorporated constituent and not to the entire (matrix) DP headed by the derived nominal. Thus, I conclude that it is never a maximal projection that is incorporated in the lexicon, which is an important and generally accepted condition on these processes. However, if we extend the examination of the relevant data to "incorporated arguments" realized by PPs (postpositional phrases) it turns out that the correct generalization is not a restriction against maximal projections but rather a prohibition against the use of a constituent containing an article. Consider (17).

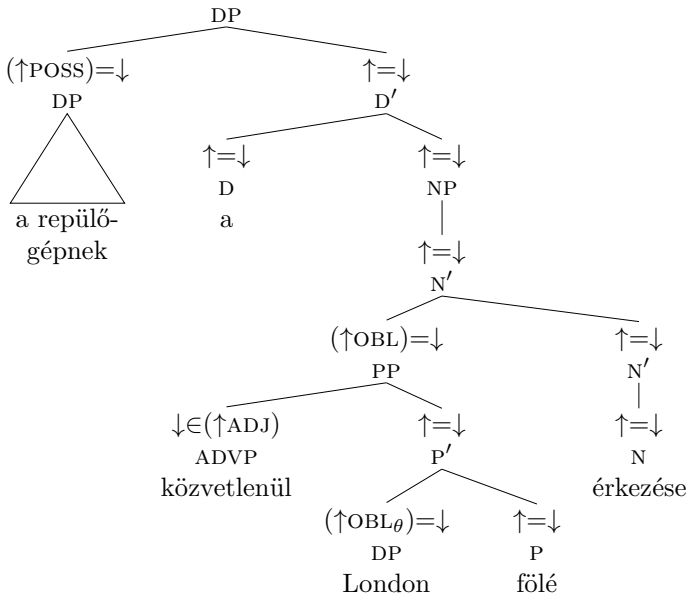
(17) a. a repülőgép-nek a közvetlen-ül London fölé
the airplane-DAT the direct-ly London above
érkez-és-e
arrive-NOM-its
'the airplane's arrival right above London'

In this example there is a fully-fledged PP expressing the designated argument.[15] Therefore, the account in Laczkó (1995a) would be forced to admit the lexical incorporation of an XP, contrary to the above-mentioned generalization. In addition, it is also a rather marked aspect of this anal-

[15]I take the adverbial modifier to occupy the specifier position of the PP. An alternative would be to regard it as being adjoined to the maximal projection of the PP. On that view, the fully-fledged nature of the PP would be even stronger.

ysis that it occasionally has to admit the lexical incorporation of a fully referential nominal, cf. *Budapest-re* 'Budapest-onto' in (16b).

(17) b.



In section 8.3.2, I propose an alternative solution which does not apply incorporation in the lexicon and which is compatible with the general principles of LFG.

8.2.3 Modifiers in Post-head Position

In the third construction type, an oblique argument or an adjunct (or even both of them) follow the derived nominal head. In this case they must not be adjectivalized. Consider:

(18) a. János meg-érkez-és-e Budapest-re tegnap
John PERF-arrive-NOM-his Budapest-onto yesterday
'John's arrival in Budapest yesterday'

b. *János meg-érkez-és-e Budapest-re való tegnap
John PERF-arrive-NOM-his Budapest-onto BEING yesterday
'John's arrival in Budapest yesterday'

c. *János meg-érkez-és-e Budapest-re tegnap-i
John PERF-arrive-NOM-his Budapest-onto yesterday-AFF
'John's arrival in Budapest yesterday'

There are several severe restrictions on its occurrence. Its use appears to be regulated by a perceptual criterion[16] as the main restriction:[17] the postnominal XP has to be easily identifiable as an adjunct or argument of the noun head as opposed to an adjunct/argument of the matrix predicate. Consider (19) below.

(19) Sok-at beszélget-t-ünk a találkoz-ás-ról Péter-rel.
much-ACC talk-PAST-1PL the meet-NOM-about Peter-with
'We talked a lot about the meeting with Peter.'

Péterrel 'with Peter' is not really felicitous as a right-adjoined constituent of the N head in (19) because it can also be interpreted as an argument of the matrix predicate *beszélget* 'talk'. In such contexts right-adjunction is best avoided. Laczkó (1987) makes the following two additional observations.

A) Ordinarily, a DP with a right-adjoined argument/adjunct is most acceptable clause-finally and least acceptable clause-internally. A possible explanation for this is that the two major constituents of these special DPs are most readily identifiable as belonging together at the end of a clause.

B) If the matrix constituent is a case-marked DP then right-adjunction is typically considerably more acceptable than right-adjunction in matrix PPs:

(20) a. $\text{DP}_{1(\text{CASE})}$ — $\text{DP}_{2(\text{CASE})}/\text{PP}_2 \Longrightarrow$ OK/(?)?
b. PP_1 — $\text{DP}_{2(\text{CASE})}/\text{PP}_2 \Longrightarrow$??/*

Compare the following examples illustrating this tendency.

(21) a. Sok ember beszélget-ett Péter
many man talk-PAST.3SG Peter.NOM
be-ugr-ás-á-ról a Duná-ba.
in-jump-NOM-POSS.3SG-about the Danube-into
'Many people talked about Peter's jumping into the Danube.'

b. Sok ember beszélget-ett Péter
many man talk-PAST.3SG Peter.NOM

[16] Cf. Laczkó (1987) and Medve (2001).

[17] One of the main reasons why I find counter-intuitive the assumption that the canonical base-generated position of the arguments of noun predicates is postnominal is the considerably restricted nature of such constructions. For instance, on É. Kiss's (2000) account the arguments can practically never remain in their base-generated position and on Medve's (2001) account, both the postnominal and the prenominal positions are admitted, but of the two it is the far more restricted one that is considered canonical.

be-mász-ás-á-ról az asztal alá.
in-crawl-NOM-POSS.3SG-about the table under
'Many people talked about Peter's crawling under the table.'

(22) a. ??Nincs kifogás-om Péter beugr-ás-a ellen a
isn't objection-my Peter.NOM jump-NOM-his against the
Duná-ba.
Danube-into
'I have no objection to Peter's jumping into the Danube.'

b. ??/*Nincs kifogás-om Péter ki-áll-ás-a ellen
isn't objection-my Peter.NOM out-stand-NOM-his against
az elnök mellett.
the president near
'I have no objection to Peter's standing by the president.'

My speculation about this contrast is that there is perhaps a perceptual reason for it. It may be the case that postpositions, as opposed to oblique case-endings, are understood as absolute markers of the right edge of a constituent. Thus, when the matrix DP is a complement of a P, this P simply blocks the possibility of right-adjunction.

É. Kiss (2000) makes the following partially different basic empirical generalizations. She claims that this type is very rare and it is basically restricted to isolated usage in titles. Consider one of her examples:

(23) Találkoz-ás egy fiú-val
meet-NOM a boy-with
'Encounter with a Boy'

She distinguishes two cases in which a constituent occurs after the NP head which is not part of a title. A) As I pointed out in section 8.2.2, she assumes that all arguments in the NP core are base generated after the head and these constituents have to be moved to a pre-head position so that her Case Constraint should be satisfied. She states that the only exception to this general rule is when the entire DP is in the nominative (because this case in Hungarian has no overt phonological exponent). In such constructions the post-head constituent may, rather marginally, remain in situ. Compare her examples.

(24) a. ??Még a találkoz-ás Péter-rel is elviselhető volt.
even the meet-NOM.NOM Peter-with also bearable was
'Even the meeting with Peter was bearable.'

b. *Még a találkoz-ás-t Péter-rel is kibír-tam.
even the meet-NOM-ACC Peter-with also stand-PAST.1SG
'I could even stand the meeting with Peter.'

c. **Még a találkoz-ás-ban Péter-rel is reményked-tem.
even the meet-NOM-in Peter-with also hope-PAST.1SG
'I hoped even for the meeting with Peter.'

In these examples, É. Kiss uses the particles *még* 'even' and *is* 'also', which according to her always surround single constituents. She intends to ensure in this way that the relevant post-head constituents are within the core NPs and are not extraposed, that is, moved out of the matrix DP. B) The other type she mentions is the extraposition of the post-head constituent. She appears to assume that this is grammatical. However, she does not exemplify it and does not discuss the rather severe restrictions on its use.

It seems to be the case that Type B) is not a classic instance of extraposition. Compare the following English and Hungarian examples.

(25) A student entered the room with long hair.

(26) a. A tegnap-i találkoz-ás Péter-rel egészen
the yesterday-AFF meet-NOM.NOM Peter-with quite
elviselhető volt.
bearable was
'Yesterday's meeting with Peter was quite bearable.'

b. Én is kibír-tam a tegnap-i találkoz-ás-t
I also stand-PAST.1SG the yesterday-AFF meet-NOM-ACC
Péter-rel.
Peter-with
'I could also stand the meeting with Peter.'

c. Én is reményked-tem a következő találkoz-ás-ban
I also hope-PAST.1SG the next meet-NOM-in
Péter-rel.
Peter-with
'I also hoped for the next meeting with Peter.'

The English example in (25) is an ordinary instance of what is normally meant by extraposition. The Hungarian examples are all grammatical in (26). From the discussion of É. Kiss's approach it should be obvious that she would analyse them as containing extraposed constituents. However, in these Hungarian constructions, as opposed to (25), no other element can intervene between the matrix DP and the allegedly extraposed constituent. Compare, for instance, (26b) and (27).

(27) *A tegnap-i találkoz-ás-t én is kibír-tam
the yesterday-AFF meet-NOM-ACC I also stand-PAST.1SG
Péter-rel.
Peter-with
'I could also stand the meeting with Peter.'

(27) is ungrammatical on the reading on which *Péter-rel* 'Peter-with' is the complement of the head noun *találkozás* 'meeting' and not the (comitative) modifier of the verbal predicate. In the light of these facts, it seems that the correct generalization is to assume that the post-head constituent is not extraposed but rather right-adjoined to the matrix DP.[18] Naturally, this adjunction analysis is not compatible with É. Kiss's approach as the adjoined constituent is still "in the way" and causes a violation of her Case Constraint. Nevertheless, there appears to be no independent evidence for the alleged extraposed constituents' ever leaving the entire DP.[19] Thus her distinction between (24) and (26) seems

[18]Here I am adopting Bartos's (2000) adjunction to DP assumption in an MP framework. Given the right-headed nature of the Hungarian NP core in our analyses, another possibility would be to postulate adjunction to the NP core. Bartos does not consider this alternative. At present I am not aware of any diagnostic that could serve as a basis for making a principled choice. As far as I can see, nothing in the analyses to be presented below hinges on this issue. Therefore, in what follows I will keep talking about adjunction to DP.

[19]It is important to note that in this discussion of É. Kiss's (2000) extraction proposal I have been concerned with OBL arguments and non-clausal adjuncts of the noun head, because it is an unquestionable fact that the dative possessor as well as relative and complement clauses can be extraposed. In these cases, there is clear evidence for extraposition: elements from the matrix clausal level can intervene between the noun head and the extraposed constituent. Consider:

(i) Az új film-jé-t még nem lát-tam Szabó István-nak.
the new movie-his-ACC yet not see-PAST.1SG Szabó István-DAT
'I haven't seen the new movie by István Szabó yet.'

(ii) János még az-t a tény-t is vitat-ja, hogy Jóska
John even that-ACC the fact-ACC also query-PRES.3SG that Joe
fel-mász-ott a fá-ra.
up-climb-PAST.3SG the tree-onto
'John even queries the fact that Joe has climbed the tree.'

(iii) János még az-t a tény-t is vitat-ja, amely-et mindenki
John even that-ACC the fact-ACC also query-PRES.3SG which-ACC everybody
más elfogad.
else accept.PRES.3SG
'John even queries the fact which everybody else accepts.'

In addition, certain complements of simple event nominals, in Grimshaw's (1990) sense, can also occur in extrapositional configurations, cf.:

(iv) Van egy vers a könyv-ben Byron-tól.
is a poem.NOM the book-in Byron-from
'There is a poem by Byron in the book.'

vacuous and her explanation circular. Moreover, in my idiolect and according to some informants, the examples in (24) are far from being as unacceptable as É. Kiss indicates.

In addition to all this, my general problem with the *még ... is* 'even' environment is that it is potentially ambiguous: these particles can be interpreted in two different ways: as modifying either the entire DP including the post-head constituent or only the post-head constituent. The latter interpretation is the more dominant.[20] This may also contribute to the fact that for several speakers, including É. Kiss, the former interpretation is much less acceptable. The reason for the ambiguity is that, quite surprisingly in the light of É. Kiss's assumptions, an allegedly extraposed constituent cannot be flanked by *még ... is* 'even', cf.:

(28) *Beszélget-tünk Péter be-ugr-ás-á-ról még a
talk-PAST.1PL Peter.NOM in-jump-NOM-his-about even the
folyó-ba is.
river-into also
'We talked about Peter's jumping even into the river.'

Here the point of interest is that none of É. Kiss's principles is violated and, therefore, (28) is predicted to be grammatical on an extrapositional reading, contrary to fact.

8.3 A New Comprehensive Account

Below, I will analyse the three modes of realizing oblique arguments and adjuncts in the order in which they were introduced in section 8.2.

8.3.1 The adjectivalized type: a modification of Laczkó (1995b)

The analysis of the type that I offer in Laczkó (1995a) and especially in Laczkó (1995b) appears to be along the right lines. However, as I have pointed out in section 8.2.1, it cannot capture one intriguing aspect of such constructions: the fact that there can be more than one element within a *való* constituent and they can have either OBL or ADJ functions. Consider (8), repeated here for convenience:

(8) a. János-nak az Edit-tel Budapest-re való
John-DAT the Edith-with Budapest-onto BEING
meg-érkez-és-e
PERF-arrive-NOM-his
'John's arrival, with Edith, in Budapest'

For the relevance and treatment of extrapositional constellations, see section 8.3.3.

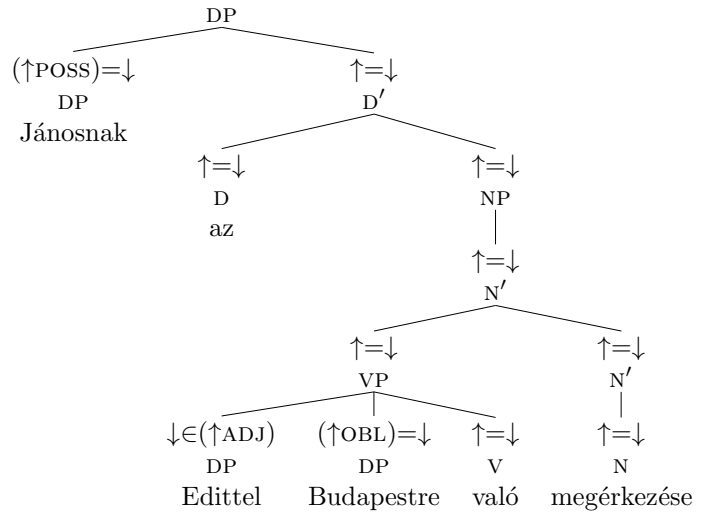
[20] In this case the post-head constituent receives heavy stress.

b. János-nak a Budapest-re Edit-tel való
John-DAT the Budapest-onto Edith-with BEING
meg-érkez-és-e
PERF-arrive-NOM-his
'John's arrival in Budapest with Edith'

In Laczkó (1995a,b) I only allow for one element within a *való* constituent; therefore, that analysis cannot cover these data. The reason for this is that it annotates the VP node itself with either an OBL or an ADJ function, thus it is incapable of capturing a possible mixture of these function types within the VP, for instance in (8). In the light of examples like this, the correct empirical generalization is that in this construction type, the noun head's arguments and adjuncts must be adjectivalized by *való* (or some other participial forms to be discussed below) but not one by one, as a single occurrence of *való* is capable of adjectivalizing several of them.

Now I would like to propose the following modification of the analysis.[21] Let us annotate the VP node with the ↑=↓ equation, instead of (↑OBL)=↓ or ↓∈(↑ADJ), and the oblique case-marked DP(s) and/or PP(s) with their appropriate (↑OBL)=↓ or ↓∈(↑ADJ) equations, instead of ↑=↓. The V node dominating *való* will continue to be associated with ↑=↓. Consider the c-structure and f-structure of (8a) in (29a,b).

(29) a.

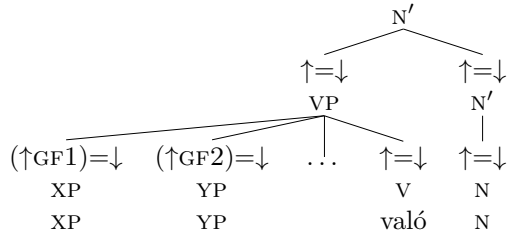


[21] My thanks are due to András Komlósy because I have benefited greatly from discussions of this issue with him.

b. $$\begin{bmatrix} & \begin{bmatrix} \text{PRED} & \text{'John'} \\ \text{PERS} & 3 \\ \text{NUM} & \text{SG} \\ \text{CASE} & \text{DAT} \end{bmatrix} \\ \text{POSS} & \\ \text{PRED} & \text{'arrival<(}\uparrow\text{POSS),(}\uparrow\text{OBL)>'} \\ \text{OBL} & \begin{bmatrix} \text{PRED} & \text{'in<OBL}_\theta\text{ >'} \\ \text{OBL}_\theta & \begin{bmatrix} \text{PRED} & \text{'Budapest'} \end{bmatrix} \end{bmatrix} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{'with<OBL}_\theta\text{ >'} \\ \text{OBL}_\theta & \begin{bmatrix} \text{PRED} & \text{'Edith'} \end{bmatrix} \end{bmatrix} \right\} \end{bmatrix}$$

The following generalized pattern emerges from this approach.

(30) a.



b. $$\begin{bmatrix} \text{GF1} & [\ \text{'XP'}\ ] \\ \text{GF2} & [\ \text{'YP'}] \\ \ldots & \\ \text{PRED} & \text{'N'} \end{bmatrix}$$

I would like to make three general remarks on this analysis.

A) The internal structure of the VPs premodifying NP heads is as flat as the propositional core of Hungarian clauses (without the discourse-functional left periphery), which É. Kiss (1998), for instance, also takes to be a VP. The fundamental difference between the two VPs is that the former is strictly right-headed and the latter is left-headed (according to É. Kiss).[22] Consider the following examples containing premodifying participial constituents.[23]

[22] A head-final flat VP constituent is not rare to find across languages. What makes this VP special and language-particular is the fact that it has no (co-)head with a PRED feature.

[23] Abbreviations in the glosses: ÓPART = present participial suffix, TPART = past participial suffix.

(31) a. a szobá-ban könyv-et olvas-ó fiú
the room-in book-ACC read-ÓPART boy
'the boy reading a book in the room'

b. a mérnök által tervez-ett épület
the engineer by design-TPART building
'the building designed by the engineer'

c. a mérnök tervez-t-e épület
the engineer.NOM design-TPART-3SG building
'the building designed by the engineer'

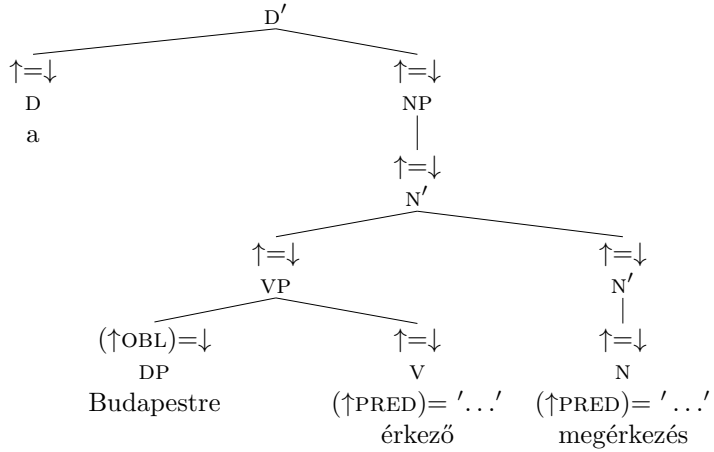
B) It is a crucial aspect of the modified account that the premodifying VP has to be annotated with the ↑=↓ equation, as opposed to (↑OBL)=↓ or ↓∈(↑ADJ), as in Laczkó (1995b). This is definitely a marked aspect of the new approach, and I leave the investigation of its consequences for the theory for future research. Its marked nature has to do with the fact that the sister of an N′ head has the status of a co-head.[24] The original solution did not pose a problem of this kind; however, as I pointed out in section 8.2.1, it failed to describe all the relevant constructions. In the modified version, all we need to do technically is to allow the association of the premodifying VP with any one of the three equations: ↑=↓, (↑OBL)=↓ and ↓∈(↑ADJ). The well-formedness or ill-formedness of the relevant constructions containing *való* and other (genuine) participles will follow from the general syntactic and semantic well-formedness principles of the theory. I have already shown why the VP containing *való* has to be annotated with the ↑=↓ equation and not with (↑GF)=↓. Let us now consider an example with an ordinary participle heading the VP and the two annotation possibilities.

(32) #a Budapest-re érkez-ő meg-érkez-és
the Budapest-onto arrive-ÓPART PERF-arrive-NOM
'#the arrival arriving in Budapest'

On the one hand, if the VP containing the participle *érkező* 'arriving' in the c-structure representation of (32) was annotated with the ↑=↓ equation, then both the NP head *megérkezés* 'arrival' and the participle, and, consequently the entire VP (including possible OBL and ADJ constituents), would contribute a PRED feature. Consider (33), which would violate the principle requiring a unique PRED feature. Note that in Hungarian, as a rule, there is no syntactic predicate composition of the type described by Alsina (1993).

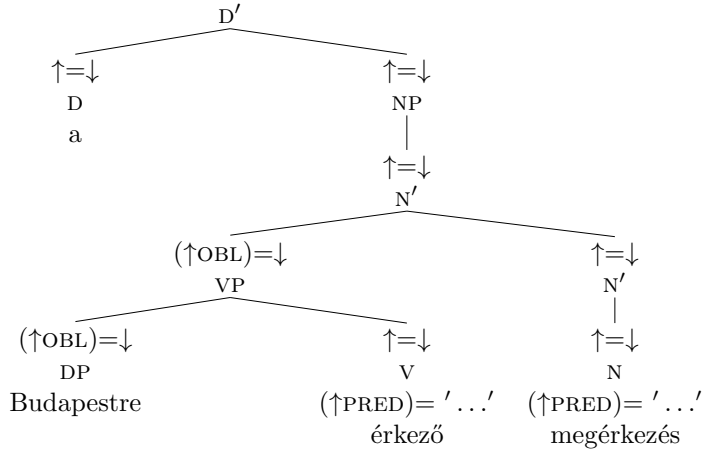
[24] For an overview of the default annotations, see Bresnan (2001).

(33)



On the other hand, if the VP was annotated with (↑GF)=↓, with (↑OBL)=↓ in this particular case, then there would arise three problems. Consider the following representation.

(34)



First, the constituent associated with the OBL function would have a participial (and not a directional) predicate. Second, the theme argument of the participial predicate would be unidentifiable, and thus the relevant part of the f-structure incomplete. To begin with, it would require some ad hoc machinery to ensure that the NP head *megérkezés* 'arrival' should be identified with the missing theme, the only theoretically possible candidate, because the premodifying constituents headed by ordinary participles are normally associated with an ADJ function. Furthermore, even if this could be achieved, the construction would be

semantically anomalous, cf. the English translation of (32). Third, if there were more constituents within the VP than one, the (↑GF)=↓ annotation would be problematic anyhow, cf. the discussion of a problematic aspect of Laczkó's (1995b) analysis in section 8.2.1.

C) So far I have only discussed the adjectivalizing property of *való*. As should be clear from the discussion, if it solely had this function, then it would be restricted to this poorly understood superficial category change to be checked at the level of c-structure. However, there is another important aspect of its use: VPs headed by it can fundamentally premodify NP heads that express complex events (in the sense of Grimshaw (1990)). Thus, it also has to encode, in one way or another, this very important combinatorial information which has to be checked in the semantic component of the grammar. In order to appreciate this point, let us take a brief look at the major adjectivalizing elements premodifying either ordinary or derived nominal heads.

The Hungarian copula, *van* 'be' has two present participial counterparts. One of them is *való*, whose use I have been discussing so far. As I have just pointed out, it adjectivalizes the (oblique) arguments and adjuncts of event nominals, whether they are expressed by case-marked DPs or PPs. The other participial form is the suppletive *lévő*, and it is best regarded as a true, that is, argument-taking, participial counterpart of the locative version of the copula.[25] A VP headed by this participle can only premodify non-event NP heads, so *való* and *lévő* are in complementary distribution, cf.:

(35) a. a ház előtt lévő/*való garázs
the house in.front.of BEING garage
'the garage in front of the house'

b. a ház-ban *lévő/való találkoz-ás
the house-in BEING meet-NOM
'the meeting in the house'

There are two additional participial forms that can also be analysed as pure adjectivalizing formatives, just like *való*.[26] They are the present and the past participial counterparts of the verb *történik* 'hap-

[25] In Laczkó (1995b) I take *lévő* (just like the locative copula, of which it is a suppletive participial form) to be a two-place predicate:

(i) lévő, V ′BEING < Th, [−r] Loc [−o] >′

[26] Cf. Szabolcsi (1994) and Laczkó (1995b). However, in this case the tests used to establish the purely formative status of *való* do not yield the same straightforward results; therefore, a true participial analysis of *történő* and *történt* is a possible alternative to consider. If this latter tack is chosen then the discussion of pure adjectivalizing formatives above has to be restricted to *való* and *-i*.

pen': *történ-ő* 'happen-ing' and *történ-t* 'happen-ed'. While *való* is compatible with both stative and dynamic event nominal heads, these forms can only be combined with non-stative nominals. Presumably this has to do with the semantics of the input verb *történik* 'happen'. In addition, *történt* must be used with events anterior to the moment of speech, and *történő* must be applied if this aspectual relationship is simultaneous or posterior. Consider the following examples.

(36) a. János-nak a csoport-hoz való/*történő/*történt
John-DAT the group-to BEING/HAPPENING/HAPPENED
tartoz-ás-a
belong-NOM-his
'John's belonging to the group'

b. az elnök-nek a tegnap-i mise után
the president-DAT the yesterday-AFF mass after
történt/*történő beiktat-ás-a
HAPPENED/HAPPENING inaugurate-NOM-his
'the inauguration of the president after yesterday's mass'

c. az elnök-nek a holnap-i mise után
the president-DAT the tomorrow-AFF mass after
*történt/történő beiktat-ás-a
HAPPENED/HAPPENING inaugurate-NOM-his
'the inauguration of the president after tomorrow's mass'

The adjectivizing suffix *-i* is compatible with both event and non-event noun heads; however, it can only attach to the majority of PPs (more precisely, to the heads of PPs) and never to case-marked DPs. Compare:

(37) a. a ház előtt-i garázs/találkoz-ás
the house in.front.of-AFF garage/meet-NOM
'the garage/meeting in front of the house'

b. *a ház-ban-i szoba/találkoz-ás
the house-in-AFF room/meet-NOM
'the room/meeting in the house'

Given these combinatorial facts, the four adjectivalizing elements[27] can be characterized in the following way.

[27] *lévő* does not belong here, because it is a true argument-taking predicate. On *történő* and *történt*, see Fn. 26.

(38)	-i	[±event]	[±dynamic]	[±anterior]
	való	[+event]	[±dynamic]	[±anterior]
	történt	[+event]	[+dynamic]	[+anterior]
	történő	[+event]	[+dynamic]	[−anterior]

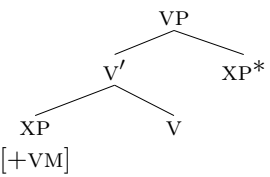
The above specifications have to be encoded in the lexical representations of these elements, and they have to be checked in the semantic component of the grammar. This means that these adjectivalizers do not merely play a role at c-structure, but they also have compatibility properties, so their presence is also felt at other levels of representation (semantic structure and, consequently, the mediating f-structure).

8.3.2 A New Analysis of the Unadjectivalized Type

In section 8.2.2 I characterized the unadjectivalized premodifying construction type and briefly mentioned two previous analyses. I pointed out that Szabolcsi's (1994) account is not compatible with the principles of LFG and my proposal in Laczkó (1995a) is problematic because it is forced to admit the lexical incorporation of maximal projections. It is an additional problem that this analysis has to admit the incorporation of fully referential nouns. Below, I suggest an alternative solution which avoids these problems.

It is generally acknowledged that the verbs occurring in the relevant (syntactic) complex predicates have two important distinguishing features: (i) in a sentence with a neutral intonation pattern, they must be preceded by their designated oblique argument and they together make up a syntactic V′; and (ii) the aktionsart of the complex predicate is very often telic, although the verb itself must not contain a perfectivizing preverb. As regards the first feature, É. Kiss (1998), for instance, assumes the following c-structure:

(39)



[+VM] below the XP in V′ means that the XP[28] has a special status: it is a "verbal modifier". The properties of this special use of these verbs allowing VM arguments has to be encoded in their lexical forms in one way or another. For the purposes of this discussion I informally assume that these verbs have a lexical form with the following specification:

[28] Note that this VM position is distinct from the focus position, which precedes the entire VP, cf. for instance, É. Kiss (1998:42).

(40) verb, V $'_{\text{VERB}} < \ldots >'$
$[+\text{VM}]$

[+VM] indicates that in a sentence with a neutral intonation pattern the verb must be immediately preceded by its designated argument, and this feature also has to be related to the fact that under clearly specifiable (default) circumstances the interpretation of the construction is telic.[29] Compare the following lexical forms.

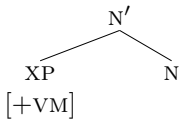
(41) a. érkez, V $'_{\text{arrive}}$ $<$ th , dir $>'$
$[+\text{VM}]$ $[-\text{r}]$ $[-\text{o}]$

b. meg-érkez, V $'_{\text{arrive}}$ $<$ th , dir $>'$
$[-\text{r}]$ $[-\text{o}]$

The fundamental difference between the two predicates is that the one in (41b) cannot be preceded by the designated directional argument in the specific VM position.[30]

My new analysis of the unadjectivalized type has the following two major components.

A) I assume that in the NP core of the Hungarian DP the "first" N′ node dominates a node with the [+VM] feature and the head in such a way that the former precedes the latter, cf.:

(42)


Thus I draw a complete structural parallel between the basic V′ in VPs and the basic N′ in NPs.[31]

B) I propose that the nominal derived from a verb with the [+VM] specification inherits this specification as well. Compare (41) and (43).

(43) a. érkez-és, N $'_{\text{ARRIVAL}}$ $<$ th , dir $>'$
$[+\text{VM}]$ $[-\text{r}]$ $[-\text{o}]$

b. meg-érkez-és, V $'_{\text{ARRIVAL}}$ $<$ th , dir $>'$
$[-\text{r}]$ $[-\text{o}]$

[29]The discussion of these circumstances lies beyond the scope of this paper.

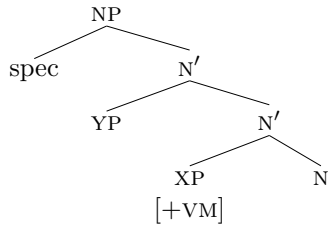
[30]However, this directional argument can precede the verb in other positions, but these instances do not concern us here.

[31]I am unaware of a similar structural pattern in any other languages. If this is really so, then this VM X^0 configuration is a language-particular characteristic of Hungarian. It is noteworthy at the same time that it applies across two categories: V and N.

In this way I can capture the empirical generalization that only specific verbs and their nominalized counterparts can (and must) be preceded by a designated argument under normal, that is unmarked, circumstances.

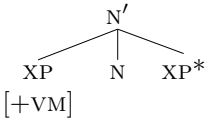
It is noteworthy that there is no parallel between the rest of the NP structure that I assume and the rest of the VP structure that É. Kiss (1998) assumes. Compare É. Kiss's VP structure in (39) with the NP structure I postulate in (44).

(44)



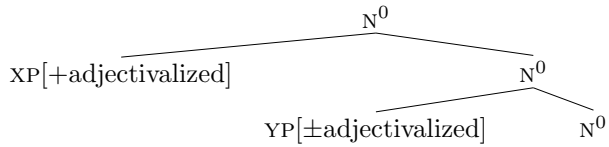
Furthermore, É. Kiss (2000) draws a parallel between the VP and NP structures. As has been pointed out in section 8.2.3, she assumes that all the arguments of the noun head are generated in post-head positions and then they are moved into pre-head positions and adjectivalized.[32] However, she does not discuss the unadjectivalized type. If she did, I think she would have to postulate exactly the same pre-head structure as I do in (44). Then the post-head portion of her NP structure would most probably be flat and dominated by the same N′ that dominates XP [+VM], cf.:

(45)



Given that in her system numerals and adjectives are adjoined to N^0 nodes, Szabolcsi (1994) cannot refer to distinct syntactic positions in order to identify the domains of adjectivalized and unadjectivalized constituents, cf.:

(46)



Her solution is that an unadjectivalized (oblique) constituent can survive in the YP position if and only if that constituent forms a complex predicate with the input verb at LF after NOM-raising has taken place.

[32] For some critical remarks, see section 8.2.3.

Let us now take a look at some of the most salient properties of the unadjectivalized type and compare the three analyses discussed in section 8.2.2 and in this section with respect to how they can capture these properties.

1) The VM and the N form one phonological word. This can be derived from a salient property of the VM + V combination: it is clearly not a morphological or syntactic word but a phonological one. This is an empirical fact which can be conveniently stated over the postulated V′ constituent. That the VM + N combination has the same phonological word status could be sufficiently captured by É. Kiss (2000). It seems to me that Szabolcsi (1994) would have to say something special about this, because in her GB framework there is the well-known bifurcation into PF and LF after S-Structure. On her account we do not know at the level of S-Structure, which serves as input to PF rules, whether the constituent is (going to be) part of a complex predicate and it should make up one phonological word with the noun head or not, because this will only turn out at LF. In my new analysis this phonological wordhood is directly captured by the postulation of parallel V′ and N′ structures and the inheritance of the [+VM] feature by the derived nominal. In my previous analysis in Laczkó (1995a) the VM + N combination is taken to be a morphological word, hence its phonological wordhood trivially follows.

2) No other element can intervene between the VM and the N, cf.:

(47) a. a váratlan Budapest-re érkez-és
the unexpected Budapest-onto arrive-NOM
'the unexpected arrival in Budapest'

b. *a Budapest-re váratlan érkez-és
the Budapest-onto unexpected arrive-NOM
'the unexpected arrival in Budapest'

Szabolcsi (1994) captures this by the dint of the following generalization: the nominalizing suffix raising at LF has to have the minimal complex predicate in its scope. In Laczkó (1995a) this fact is explained again by the assumption that *Budapestre* and *érkezés* form one morphological word in the lexicon and, thus, no other syntactic word may intervene. In the spirit of my new account, again we can simply point out that the very same ban on intervention holds for the VM + V combination. This has to be stated, and then this property will be inherited by the VM + N combination.

3) The designated argument and the preverb are in complementary distribution, cf.:

(48) a. a Budapest-re érkez-és
the Budapest-onto arrive-NOM
'the arrival in Budapest'

b. a (Budapest-re) meg-érkez-és
the (Budapest-onto) PERF-arrive-NOM
'the arrival (in Budapest)'

c. *a Budapest-re meg-érkez-és
the Budapest-onto PERF-arrive-NOM
'the arrival in Budapest'

Szabolcsi's theory captures this fact by assuming that "the nominalizing suffix must have the smallest possible fully specified conceptual structure in its scope" (Szabolcsi 1994:264). In (48a), the designated oblique argument and in (48b) the perfectivizing preverb make up a complex predicate with the verb stem. Thus these complex predicates satisfy Szabolcsi's condition, because complex predicates have fully specified conceptual structures. By contrast, in (48c) only the preverb and the verb stem can be in the scope of the nominalizer as these two elements make up the minimal fully specified conceptual structure. Consequently, the oblique argument is outside its scope and, therefore, it could only be used in an adjectivalized form, cf. (48c) and (1c). On my new account, the ungrammaticality of (48c) can be captured by the now familiar inheritance mechanism. It has to be stated in one way or another that verbal predicates containing a preverb do not allow VMs (cf. for instance, (41)), and this feature of theirs is inherited by their nominal counterparts (cf. (43)). Laczkó (1995a) refers to the complementarity of the two types of complex predicate formation in the lexicon.

4) The VM in the VM + N combination does not need to, or rather must not, undergo adjectivalization. I think this is the only property of these constructions that is most straightforwardly captured in Laczkó (1995a). The explanation is that the relevant complex verb formation and then nominalization takes place in the lexicon and the whole morphological complex is inserted below an N^0 node, while adjectivalization is a syntactic phenomenon.

If we just took the four points above into consideration, then we could easily conclude that of the three accounts, Laczkó (1995a) was superior because in the first three points it was on a par with the two alternatives and in the fourth it offered a more principled solution. However, this account has two extremely marked features, which are closely related and which strongly call its tenability into question. One of them, already mentioned in section 8.2.2, is that Laczkó (1995a) is forced to allow the incorporation of maximal projections (e.g., in the case of des-

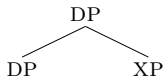
ignated arguments expressed by PPs). This is not compatible with the generally accepted notion of (lexical, that is, morphological) incorporation. The other equally marked aspect of the analysis is that it has to assume that the combination of the verb and the case-marked noun or the entire PP is one morphological word nominalized in the lexicon and then this whole complex is inserted under a single N^0 node. Furthermore, as far as the stipulation of adjectivalization in the analysis proposed here is concerned, it appears to be the case that in the characterization of *all* the three fundamental types some special aspect of the c-structure plays a significant role. A) In the adjectivalized type, on the one hand, adjectivalization is only imposed on sisters of N′ constituents and, on the other hand, the VP node is annotated with the ↑=↓ equation. B) In the unadjectivalized type, which we are now discussing, on the one hand, a VM position is postulated below the N′ level and, on the other hand, adjectivalization does not affect this constituent. C) I assume that in the post-head type, to be discussed in the next section, the postmodifying arguments and adjuncts are right-adjoined to the entire DP.

8.3.3 The Post-head Type: Right-adjunction

In section 8.2.3, I pointed out that É. Kiss (2000) postulates that all arguments are generated after the noun head and they are either preposed and adjectivalized or extraposed. I argued that on the one hand, the preposing and adjectivalizing process appears to be problematic in the MP framework she applies and, on the other hand, it does not seem to be possible to tell the base-generated and the extraposed constituents apart, because the allegedly extraposed ones and the noun heads cannot be separated by any intervening elements.

In an LFG framework, an approach along the lines of É. Kiss (2000), even if it were unproblematic in MP, cannot be adopted, as no movement is allowed in the theory. In sections 8.3.1 and 8.3.2, I have analysed, without movement, the two other construction types in which the arguments precede the head. As far as the post-head type is concerned,[33] I propose that a constituent following the head is generated in a position right-adjoined to the DP, cf.:

(49)



[33] A reminder: here I am arguing against the extraposition of oblique arguments from a base-generated post-head position. The dative possessor and (relative and complement) clauses as well as complements of simple event nominals in Grimshaw's (1990) sense can be extraposed, cf. Fn. 19.

The underlying assumptions are as follows.

- There is no evidence that the post-head constituent ever leaves the domain of the DP (as I have already pointed out, no other element can intervene between this constituent and the noun head).
- Given the extremely severe restrictions on this construction type, it is not reasonable to postulate ordinary argument and adjunct positions after the head. That is why the right-adjunction analysis can be regarded as more feasible. It is further supported by the fact that the adjoined constituent receives the same kind of strong stress as ordinary appositional constituents.[34]

At this point two related questions arise. A) If Hungarian NPs are (assumed to be) strictly head-final, what is the explanation for right-adjunction? B) If right-adjunction is available, what is the reason for its being extremely limited? My hypothesis is as follows. It is economy that motivates right-adjunction. We have seen that pre-head arguments and adjuncts have to be used in adjectivalized forms (except for the special unadjectivalized type; however, it is drastically confined to the designated argument of nominals derived from a small subset of verbal predicates). By using right-adjunction the necessity of adjectivalization can be avoided. At the same time, because of the otherwise strict head-final nature of the NP, right-adjunction can only be applied if the adjoined constituent can be easily identified as belonging to the DP and not to any other element (for instance, the verbal predicate) of the sentence in which the DP occurs. That is why the overwhelming majority of DPs with a right-adjoined constituent appear at the very end of sentences.

I suggest that the right-adjoined constituents get integrated in the "NP core" by outside-in functional uncertainty. There are two facts that motivate this directionality of functional uncertainty. (A) In Hungarian "NP cores", there are no distinguished positions for ordinary oblique arguments (except for the designated oblique argument in the second construction type; however, that argument may never follow the head). (B) Adjuncts can also follow the NP head. Thus, there is no "starting point" for functional uncertainty within the NP. Consider the following example and its simplified c-structure representation.[35]

[34] A typical example of appositional structures is as follows.

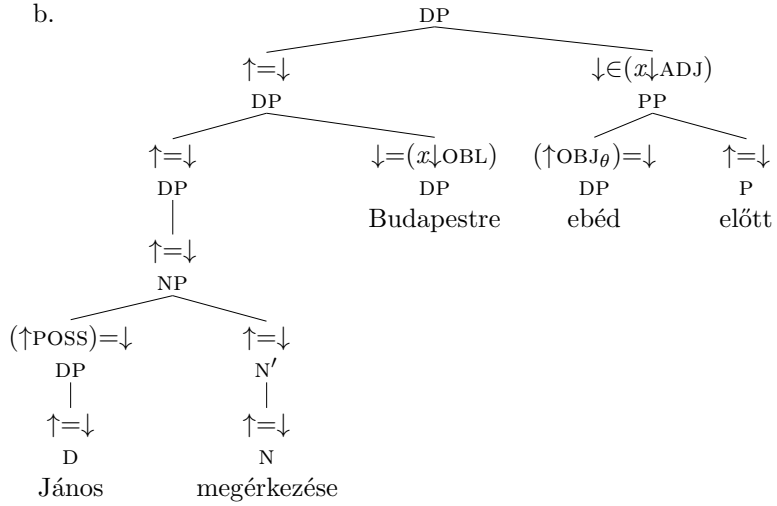
(i) a barát-om, a cég igazgató-ja
the friend-my the firm manager-its
'my friend, the manager of the firm'

Here there is a small pause after *a barátom* and then the adjoined constituent receives strong stress.

[35] The x is a variable which stands for the appropriate GF* annotations (cf. Bresnan 2001:67).

(50) a. János meg-érkez-és-e Budapest-re ebéd előtt
John.NOM PERF-arrive-NOM-his Budapest-onto lunch before
'John's arrival in Budapest before lunch'

b.



Finally, let me point out that it may well be the case that for the analysis of structures like this, that is, DPs with arguments and/or adjuncts right-adjoined to them, it would not be absolutely necessary to employ functional uncertainty. However, as I demonstrated in Fn. 19, there are particular kinds of constituents that can be extraposed from DPs. For their analysis, the use of this device is inevitable. By applying functional uncertainty to right-adjunction, too, we can achieve a uniform treatment of elements occurring outside the basic DP structure.

8.4 Concluding Remarks

I have offered a comprehensive analysis of the three ways of expressing oblique arguments and adjuncts of event nominals in Hungarian. In the first, and by far the most productive, type the arguments and adjuncts preceding the head have to be adjectivalized by means of either the adjectivizing suffix *-i* (but only for the majority of postpositions) or *való*, one of the present participial counterparts of the copula *van* 'be'. The account is a modified version of Laczkó (1995b). Its most essential aspects are as follows. *Való* is not a true argument-taking predicate: it is a formative element; however, it also carries combinatorial information. The VP headed by *való* is annotated with ↑=↓. With this assumption, we can also capture cases in which *való* simultaneously adjectivalizes more than one constituent (e.g., both an argument and an adjunct).

In the second type, which is limited to designated oblique arguments of nominals derived from a small subset of verbal predicates, the oblique argument preceding the head is not adjectivalized. As opposed to Szabolcsi's (1994) GB analysis, raising the nominalizing suffix at LF, and Laczkó's (1995a) lexical incorporation, combining the oblique argument and the verb in the lexicon and nominalizing them there, here I have proposed a new account. I have drawn a parallel between a special V′ portion of the Hungarian VP, which dominates a particular VM (verbal modifier) constituent and the V head, and a corresponding N′ portion of the NP, which dominates the same VM constituent and the nominal head. Furthermore, I assume that these nominals inherit the distinguishing feature of the input verb to the effect that the VM position has to be filled by the designated oblique argument.

In the third type the oblique argument or adjunct follows the head and must not be adjectivalized. This is rather rare and is limited to cases where the post-head constituent is clearly identifiable as belonging to the NP headed by the nominal and not to any other element (e.g., the verbal predicate) of the sentence. I argued that because of these limitations it is not reasonable to postulate ordinary post-head argument and adjunct positions (contra É. Kiss 2000). At the same time, I pointed out that no other element can intervene between the nominal and the post-head constituent; therefore, this is not an instance of ordinary extraposition. Instead, I assume that these post-head constituents are right-adjoined to the DPs in which their nominal heads occur, and they get integrated into the NPs they belong to by outside-in functional uncertainty.

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9

Hybrid Constructions in Gĩkũyũ: Agentive Nominalizations and Infinitive-gerund Constructions

John M. Mugane

9.1 Introduction

It is generally assumed that the properties of a phrase are primarily determined by the category of its head.[1] Though this traditional premise has been the core idea in modern syntactic theorizing, it has been increasingly challenged. Several studies have raised objections to the idea that pure categories exist and have shown that the notion of categorial prototypicality (Comrie 1989, Croft 1991, Dixon 1977, etc.) is a tenuous one at best. The preponderance of fuzzy categories (Comrie 1989, Taylor 1989) crosslinguistically has led some to think about categories in terms of degree or extent of resemblance (Heine 1993). Nevertheless, the controversy continues since attempts to defend the classical theory of categories have persisted in studies such as Newmeyer (2000). Another challenge facing proposals premised on pure syntactic categories comes from the study of mixed category constructions (Bresnan 1997, Borsley and Kornfilt 2000, Malouf 2000, Mugane 1997, Morimoto 1996).

[1]I am very grateful to Joan Bresnan who provided the initial encouragement and instruction that led to the writing of this paper, as well as Mark Baker for constructive and valuable discussion, and to two anonymous reviewers for a variety of helpful comments and suggestions. I am also grateful for the valuable input received from the audience of the 33rd Annual Conference on African Linguistics (Ohio University, Athens, March 21–23, 2002), to whom a portion of this paper was presented. Finally, I am indebted to Jim Coady for editorial commentary. All errors are mine.

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Miriam Butt and Tracy Holloway King (eds.).

This study presents Gĩkũyũ (Guthrie E20, also written as Kikuyu)[2] agentive nominalizations and infinitive-gerunds. It shows how they differ and presents an analysis. Koptjevskaja-Tamm's (1993) claim that the boundary between infinitives and action nominals (of which agentive nominalizations are a subclass) is small and vague is tested. Both constructions are analyzed as head sharing (Bresnan 1997) with infinitive-gerunds combining exocentricity with multiple head sharing.

The paper is organized as follows: In section 9.2, a brief statement of the issues is provided. In section 9.3, facts about the Gĩkũyũ agentive nominalization and how it can be analyzed are presented; section 9.4 discusses the Gĩkũyũ infinitive-gerund phrase; section 9.5 shows how *ku*-V constructions differ from the [Ncl-V..-i] ones and why *ku*-V forms cannot be accommodated by the analysis assumed for the agentive nominalization. Also included in the section is how the data pose difficulties for existing theoretical proposals; section 9.6 looks at the relevance of previous studies and section 9.7 is the conclusion.

9.2 The Issues

The basic issues of this paper are illustrated by the two types of constructions in (1) and (2). Both *athĩĩnji* 'slaughterers' in (1) and *gũthĩĩnja* 'to slaughter' or 'slaughtering' in (2) are nominal verbal forms referred to as the agentive nominalization and the infinitive-gerund, respectively.[3] Agentive nominalizations are formed by first affixing a noun class (Ncl) marker to a verb stem and then adding a nominalizing affix *-i* (henceforth labelled [Ncl-V..-i]). Infinitive-gerunds are formed by attaching *ku-* (class 15 gender class marker)[4] to a verb stem (henceforth *ku*-V).

[2] E20 refers to Malcom Guthrie's classification of Gikuyu within the Bantu phyllum of Niger-Congo languages.

I am grateful to all the Gĩkũyũ speakers (too numerous to mention) who have gladly shared their intuitions and fascination with the language and to Leonard Lisanza Muaka for the Logooli data.

[3] Numerals in the glosses refer to noun classes. The other abbreviations are:

A: applicative	IND: indicative	PRF: perfect
Assoc: associative	INTF: intensifier	PST: past
C: causative	Ncl: noun class	RFL: reflexive
CMPL: completive	Nzer: nominalizer	S: subject
Dem: demonstrative	O: object	sgO: singular object
FP: focus particle	plO: plural object	sgS: singular subject
Fut: future	plS: plural subject	SBJN: subjunctive
Hab: habitual	PRES: present	
IM: immediate past	PROG: progressive	

[4] Infinitive/gerunds in Gĩkũyũ are marked with *kũ-*. There is a voicing dissimilation rule in Gĩkũyũ which requires that when /k/ appears adjacent to a syllable whose onset is voiceless, it (/k/) dissimilates to the voiced velar fricative /γ/ (Mugane 1997).

(1) a-thĩnj- í mbũri ű́ű́ru acio
2-slaughter-Nzer 10goat badly 2Dem
nĩ́-má-á-tũm-a tũ-caamb-e
FP-2S-PRESPRF-make-IND 2sgS-ill reput-SBJN
'Those (people) who slaughter goats badly have given us a bad reputation.'

(2) kű́u gű́-thĩ́nj-a mbũri gwaku kaingĩ
15Dem 2-slaughter-IND 10goat 15your often
nĩ́-gũ-á-tũm-a tũ-thĩĩn-e
FP-15S-PRESPRF-make-IND 2sgS-poor-SBJN
'Your slaughtering goats often has impoverished us.'

[Ncl-V..-i] types of nominalizations contrast in interesting ways with the *ku*-V infinitive/gerunds as listed in (3) and (4) respectively. The [Ncl-V..-i] are shown to be nominal/verbal mixtures in the internal syntax but nominal in the external distribution, while *ku*-V constructions maintain their mixed (verbal-nominal) properties in both internal and external syntax.

(3) a. An [Ncl-V..-i] construction takes the same complement as the verb from which it is derived.
b. [Ncl-V..-i] constructions can have both adverbial and nominal modifiers simultaneously in the internal syntax.
c. [Ncl-V..-i] have a verbal core and nominal periphery (VP within NP).
d. [Ncl-V..-i] constructions have the external distribution of a noun phrase.
e. [Ncl-V..-i] phrases are head-sharing constructions (Bresnan 1997).

(4) a. A *ku*-V construction takes the same complements as the verb from which it is derived.
b. *ku*-V constructions are modified by both adverbs and nominal modifiers simultaneously.
c. *ku*-V constructions are multiply interspersed hybrids in which verbal elements are variably placed within the nominal (DP) projection.
d. *ku*-V clauses exhibit a subject-object asymmetry in their external distribution.
e. The *ku*-V word is a construction with an exocentric head.

Hence infinitive/gerunds are marked also with *gũ-*. Voicing dissimilation affecting stops is a common phenomenon in the intralacustrine Bantu languages and is known as Dahl's law in the literature (Herbert 1977).

9.3 Properties of [Ncl-V..-i] Constructions

In Bantu, nouns bear noun class marking and can be modified with associative 'of', concording determiners (personal and possessive pronouns), and quantifiers. Only verbs allow derivational affixation and bear agreement marking in addition to allowing adverbial modification in Bantu. Agentive deverbal nominal ([Ncl-V..-i] constructions) exhibit a mixture of nominal and verbal properties with respect to the internal syntax but bear the external distribution of noun phrases. Some supporting evidence is provided below.

9.3.1 [Ncl-V..-i] Constructions as Nouns

Like regular nouns, [Ncl-V..-i] constructions can be modified with determiners as illustrated in (5a) in which a demonstrative and possessive pronoun modify *mũthiĩnji mbũri* 'goat slaughterer' and in (5b) where the head noun *mũthiĩnji* is separated from its complement *mbũri* by the use of the associative *wa* 'of'.

(5) a. mũ-thiĩnj-í mbũri ű́yũ waku
1slaughter-Nzer 10goat 1Dem 1your
'this goat-slaughterer of yours'

b. mũ-thiĩnj-í ű́yũ wá mbũri
1slaughter-Nzer 1Dem 1Assoc 10goat
'this slaughterer of goats'

In (5b) *mbũri* is a complement introduced by the associative marker, which is the way complements of nouns are introduced, and this complement corresponds to the NP object of the verb. The agentive nominal head has the possibility of taking the same argument expressed either as the complement of a verb, as an NP as in (5a), or as the complement of a noun, as in (5b).[5]

9.3.2 [Ncl-V..-i] Constructions as Verbs

[Ncl-V..-i] constructions can be made with verb stems that have object prefixes (6) as well as those which bear reflexive prefixation (7) or both (8). [Ncl-V..-i] constructions are never made with stems which bear tense/aspect affixes (which is typical of verbs). Stems bearing tense/aspect affixation cannot be nominalized (9). Stems bearing derivational (suffixal) morphology are regularly nominalized, as in (10) which bears both applicativization *-ĩr-* and the reciprocal *-an-*.[6] The observation here is that object (6), reflexive (7), and derivational (10) morphology are

[5] See Mugane (1997) for detailed examples of Gĩkũyũ associative phrases.

[6] See Mugane (1999) for the ambiguous nature of the Gĩkũyũ verbal morpheme *-an-*.

added to the verb stem before nominalization takes place. Thus, while they are not a property of the nominalization itself, it is noteworthy that tense/aspect affixation does block nominalization. This is what appears to make (9) ungrammatical.

(6) nyamũ n-ti-thũ-ire (*ndíthũíre*) mũ-mí-on-i
9animal 9S-Neg-hate-PRF 1-9O-see-Nzer

ta mũ-mí-ánírír-í
like 1-9OBJ-squeal-Nzer
'An animal does not hate the one who sees it as much as the one who squeals on it.'

(7) andú ma-ti-thũ-íre mũ-í-end-i (*mwíendi*)
2people 2S-Neg-hate-PRF 1-RFL-like-Nzer

ta mũ-í-yámb-i
like 1-RFL-pride-Nzer
'People don't hate one who likes her/himself (selfish) as much as one who is full of her/himself.'

(8) níí n-ti-thũ-íre (*ndithũíre*) mũ-n-on-i (*mũnyoni*)
1sgPron 1S-Neg-hate-PRF 1-1sgO-see-Nzer

ta mũ-n-cuuk-i (*mũnjuuki*)
like 1-1sgOBJ-gossip-Nzer
'I do not hate the one who sees (sports) me more than the one who gossips about me.'

(9) *nyamũ n-ti-thũ-íre (*ndíthũíre*) mũ-ka-mí-on-i
9animal 9S-Neg-hate-PRF 1-FUT-9O-see-Nzer

ta mũ-ka-mĩ-anĩrĩr-i
like 1-FUT-9OBJ-squeal-Nzer
'An animal does not hate the one who sees it as much as the one who squeals (blows the whistle) on it.'

(10) a-thĩnj-án-ĩr-i mbũri
2-slaughter-Recip-A-Nzer 10goat
'those who slaughter goats for each other'

(11) shows that like regular verbs, [Ncl-V..-i] constructions can be modified by adverbs.

(11) a-thĩnj-í mbũri ũũru
2-slaughter-Nzer 10goat badly
'those who slaughter goats badly'

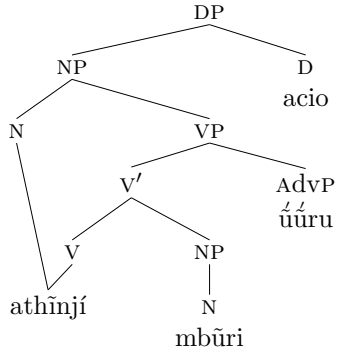
9.3.3 [Ncl-V..-i] Constructions are N/V Mixed

[Ncl-V..-i] constructions have mixed properties as in (12), where nominal modification (the demonstrative *acio* 'those') is combined with verbal modification[7] (the adverb *ũũru* 'badly'). Mixed category phrases are constructions which are basically clausal with some nominal properties. Mixed category phrases are constructions having some of the properties typical of members of more than one part of speech (Malouf 2000). In (12) *athĩnji* has the dual nominal-verbal function as verb and noun.

(12) a-thĩnj-í mbũri ṹṹru acio
2-slaughter-Nzer 10goat badly 2Dem
'those who slaughter goats badly'

Constructions such as (12) have the structure in (13) proposed in Mugane (1997), and with slight modification by Bresnan (1997), in which [Ncl-V..-i] phrases are constructions with a verbal inside and a nominal outside. [Ncl-V..-i] constructions are those in which a single word heads a phrase which is a syntactic hybrid of two different category types (Bresnan 1997), as in (13). The head *mũthĩnji* in (13) is shared by both the NP and the VP.[8] This means that the adverbs precede determiners and as (13) shows the VP occurs in whole inside of the NP.

(13)



Within [Ncl-V..-i] constructions, the determiner (demonstrative) can only occur outside of the VP, as in (12), in its preferred non-focused position or to the left in the intonationally marked position shown in (14) as discussed in Mugane (1998). This is because [Ncl-V..-i] have a verbal core and nominal periphery that makes them have coherently

[7] Adverbs only modify verbs and adjectives in Gĩkũyũ; they never modify nouns.

[8] Morimoto (1996) shows the reverse effect for Japanese which has nominal inside and verbal outside and is analyzable as a head-sharing construction (Bresnan 1997). For evidence that head-sharing constructions are a crosslinguistic phenomenon see Bresnan (1997).

mixed internal properties (VP within NP) but an external distribution that is typical of noun phrases.

(14) ácio á-thĩ́nj-i mbũri ũũru
2Dem 2-slaughter-Nzer 10goat badly
'those who slaughter goats badly'

Any attempt to violate the linear order yields unacceptable utterances as shown by (15) where the demonstrative precedes the adverb and (15′) where the demonstrative appears before the complement noun.[9]

(15) *a-thĩnj-í mbũri acio ṹṹru
2-slaughter-Nzer 10goat 2Dem badly
'those who slaughter goats badly'

(15′) *a-thĩnj-í acio mbũri ṹṹru

Since it is unacceptable to intersperse the nominal part with the verbal parts, both the NP and the VP parts remain coherent (i.e., the NP and VP structures are unviolated), as shown in (13). In (15″) the adverb cannot occur between the head and the complement because Gĩkũyũ adverbs of manner modify VP, not V, heads. Thus, the structure of [Ncl-V..-i] phrases (13) is phrasally coherent in that the VP appears within the NP as a whole insertion and not in disjointed pieces.

(15″) *a-thĩnj-í ṹṹru mbũri acio

Adjectival modification is possible with both the head and the complement, as shown by (16). The modification is distinguished by the noun class morphology, class 2 for the head and class 10 for the complement.

(16) a-thĩnj-í mbũri ngũrũ acio akũrũ
2-slaughter-Nzer 10goat 10old 2Dem 2old
'those old slaughterers of old goats'

As expected, even with increasing nominal modification, as in (17), the verbal parts (head, complement NP, adverb) precede the nominal ones (demonstrative and adjective).

(17) a-thĩnj-í mbũri ngũrũ ũũru acio akũrũ
2-slaughter-Nzer 10goat 10old badly 2Dem 2old
'those old ones who slaughter old goats badly'

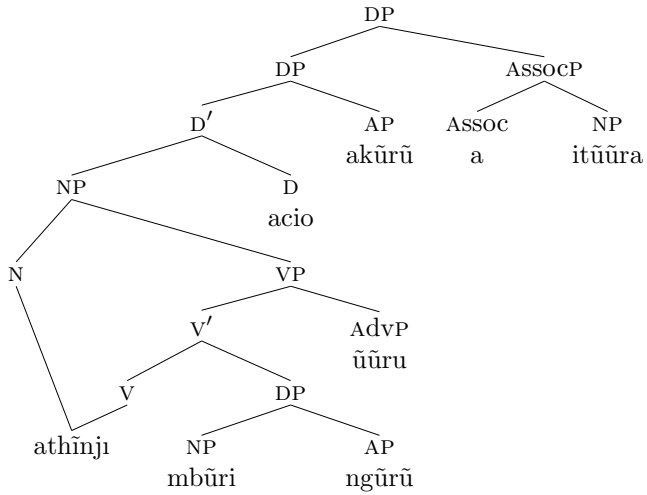
[9]Note that there is no requirement that the head be adjacent to its complement as the following example shows. In this example, the demonstrative can occur initially in the complement noun phrase, thus separating the latter from its complement.

(i) mũ-thĩnj-í [ici mbũri] ṹṹru
1-slaughter-Nzer 10Dem 10goat badly
'one who slaughters these goats badly'

A left branching structure such as (18′) for (18) captures the compositionality of adjuncts (adjectives and associative phrases) which can be stacked to form strings of arbitrary length (Mugane 1998).[10] In (18′) the head *athĩnji* 'slaughterers' is successfully modified by all constituents to its right.

(18) a-thĩnj-í mbũri ngũrũ ũũru acio
2-slaughter-Nzer 10goat 10old badly 2Dem
akũrũ a itũũra
2old 2Assoc 5settlement
'those old ones who slaughter old goats badly who are residents.'

(18′)



9.3.4 External Properties of [Ncl-V..-i]

Because the top-level category of [Ncl-V..-i] constructions is nominal (NP or DP), they can undergo extraction, while VPs cannot. Extraction of the verb's (*enda* 'like/love/want') object phrase *mũthĩnji mbũri* 'goat slaughterer' in (19) by *nĩ*-clefting is exemplified by (20). Only NPs can be *nĩ*-fronted in Gĩkũyũ.

(19) Kũí á-rá-end-a (árénda) mũ-thĩnj-í mbũri
Kũi 1s-pres-want-ind 1slaughter-Nzer 10goat
'Kũi wants a slaughterer of goats.'

[10] For a right branching NP structure proposal for Bantu, see Carstens (1991) and also Bresnan and Mchombo (1995).

(20) Nĩ́ mũ-thĩnj-í mbũri Kũí a-re-end-a ____
FP 1slaughter-Nzer 10goat Kũi 1S-PRES-want-IND
'It is a slaughterer of goats that Kũi wants.'

By extraction, [Ncl-V..-i] phrases are nominal. If they were verbal (as is the complement *ũ-ga-thĩnj-a mbũri* in (21)) such extraction could not be done (22).

(21) Kũí á-ré-end-a ũ-ga-thĩ́nj-a mbũri
Kũi 1S-PRES-want-IND 2sgS-FUT-slaughter-IND 10goat
'Kũi wants you to slaughter goats in the future.'

(22) *Nĩ́ ũ-ga-thĩ́nj-a mbũri Kũí
FP 2sgS-FUT-slaughter-IND 10goat Kũi
a-re-end-a ____
1S-PRES-want-IND
'It is for you to slaughter goats in the future that Kũi wants.'

Similarly, extraction of clausal complements is not possible, as illustrated in (24) from (23).

(23) Kũí a-úg-a (*oíga*) atĩ́ ũ-thĩ́nj-e mbũri
Kũi 1S-say-IND that 2sgS-slaughter-SBJN 10goat
'Kũi has said that you slaughter a goat.'

(24) *nĩ́ átĩ ũ-thĩnj-e mbũri Kũí
FP that 2sgS-slaughter-SBJN 10goat Kũi
a-úg-a (*oíga*) ____
1S-say-IND
'It is that you slaughter a goat that Kũi has said.'

Like regular NPs in Gĩkũyũ, [Ncl-V..-i] constructions alternate with incorporated pronouns[11] within the verb, as shown by (26) for (25).

(25) Kũí nĩ́-a-ra-on-a (*nĩ́arona*) mũ-thĩĩnj-í mbũri
Kũi FP-1S-PRES-see-IND 1slaughter-Nzer 10goat
'Kũi is seeing the one who slaughters goats.'

(26) Kũi nĩ́-á-ra-**mu**-on-et-e
Kũi FP-1S-PRES-1O-see-PRF-IND
'Kũi had seen him.'

[11] This condition holds in Gĩkũyũ where the object prefix and the object noun phrase are in complementary distribution (Bergvall 1986).

(i) *Kũí nĩ́-á-ra-**mu**-on-a mũ-thĩnj-í mbũri
Kũi FP-1S-PRES-1O-see-IND 1-slaughter-Nzer 10goat
'Kũi is seeing the one who slaughters goats.'

Thus, with regard to their external behavior and distribution as object complements (particularly their ability to induce object pronominal affixation on the matrix verb), [Ncl-V..-i] expressions are of category N.

9.3.5 Summary of [Ncl-V..-i] Types

In summary, the properties of [Ncl-V..-i] words are constructed by the nominalization of verb stems with affixal morphology (object ((6)) and reflexive ((7)) prefixes, as well as derivational suffixes ((10))) but not with stems bearing tense and aspect morphology (9). [Ncl-V..-i] constructions take the same complement as the verb from which they are derived and can be modified with adverbs and nominal elements (determiners, adjectives, and associative phrases) simultaneously in the internal syntax, as seen in (5a) and (5b). [Ncl-V..-i] have a verbal inside and nominal outside (13), which makes them exhibit coherently mixed internal properties (VP within NP) and an external distribution that is typical of noun phrases (20)–(26).

9.4 Properties of *ku*-V Infinitive/Gerunds

The hybridity of *ku*-V words is evident from their very gloss 'infinitive/gerund'. Usually the term 'gerund' is used to refer to a set of *-ing* verb forms in English which can be used as subjects, or as complements of verbs or prepositions, and which can have a genitive subject like *my* as in *my eating* (Radford 1997). The term 'infinitive' is used to refer to the uninflected form of a verb when the verb is the complement of a modal auxiliary like *can*, or of the infinitive particle *to* (Radford 1997). Though bearing the name infinitive/gerund, *ku*-V constructions do not display the properties of both infinitives and gerunds. Unlike English gerunds, *ku*-V constructions cannot have subjects in the internal syntax, and unlike regular infinitives, *ku*-V words can have limited inflection.

This section shows that *ku*-V constructions: take the same complements as the verbs from which they are derived; can be modified by both adverbs and nominal elements simultaneously; exhibit a subject-object asymmetry in their external distribution. *ku*-V constructions function as NPs in the sentential subject position and as VP complements of verbs, but not as object complements of verbs. It is also shown that *ku*-V constructions are multiply interspersed hybrid constructions which permit variable placement of verbal elements within a nominal (DP) projection.

9.4.1 Infinitive-gerunds as Verbs

ku-V words can be formed out of verb stems with object (27) and reflexive (28) marking, and they can only take inflectional affixation involving future tense (29) and the habitual (30).

(27) a-rá-end-a (arénda) kṹ-mu-on-a we
3S-pres-want-ind 15-3sgO-see-ind 3sgPron
'S/he wants to see him/her today.'

(28) ndí-rá-end-a (ndírénda) kṹ-í-on-a nĩĩ
1sgS-pres-want-ind 15-rfl-see-ind 1sgPron
'S/he wants to see himself/herself.'

ku-V[12] words permit future tense marking on their stems, as in (29).

(29) Kũí á-hot-a gũ-ga-ciar-á mahatha
Kũi 1s-able-ind 15-fut-bear-ind 6twin
'Kũi might (in future) give birth to twins.'

Habitual aspect marking ((30)) is allowed but not the other aspectual markers (perfect ((31)) or complete ((32))).

(30) Kũí á-hot-a gũ-ciar-ág-a mahatha
Kũi 1s-able-ind 15-bear-Hab-ind 6twin
'Kũi might (habitually) bear twins.'

(31) Kũí á-hot-a *gũ-ciar-íĩte mahatha
Kũi 1s-able-ind 15-bear-prf 6twin
'Kũi might have given birth to twins.'

(32) Kũí á-hot-a *gũ-ciar-íre mahatha
Kũi 1s-able-ind 15-bear-cmpl 6twin
'Kũi might be done bearing twins.'

That *ku-* can be attached to verbs with tense ((29)) and aspect ((30)) marking indicates that *ku-* is a specifically verbal noun class marker. Like verbs, *ku-*V permits affixation of derivational morphology: applicativization ((33)), causativization ((34)).

(33) kũ-hĩh-íŕ-ya mṹndṹ mbembé
15-roast-A-ind 1person 10maize
'to roast/roasting maize for someone'

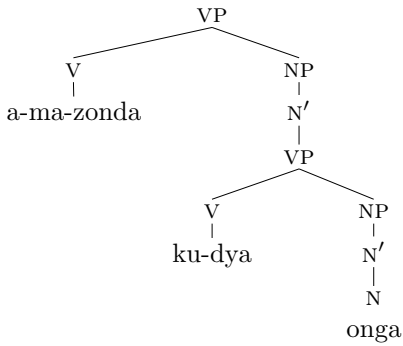
(34) kũ-hĩh-íthi-ya mṹndṹ mbembé
15-cook-C-ind 1person 10maize
'to cause/assist (causing/assisting) someone to roast maize'

[12]Other verbal prefixal morphology can occur as well. Swahili infinitive/gerunds can be negated by introducing the morpheme *-to-* into the pre-stem morphology of the base verb, as in the following example.

(i) ku-to-chez-a ngoma
15-Neg-play-ind 10drum
'not playing/to play drums'

In Bantu, only verbs can bear the kind of affixation in (27)–(30) and (33)–(34). When discussing Chichewa constructions of the same type (*ku*-V), Bresnan and Mchombo (1995:236–7) propose the structure in (35), arguing that the infinitive/gerund is an NP which is exocentric because the categorial head is not found within it. Henceforth, I utilize this exocentric analysis of infinitive/gerunds for Gĩkũyũ. An exocentric analysis has the merit of capturing the fact that the top-level semantic predicate for infinitive-gerunds is nominal; this is what permits *ku*-V constructions to appear as sentential subjects, as shown in (36′) for (36).

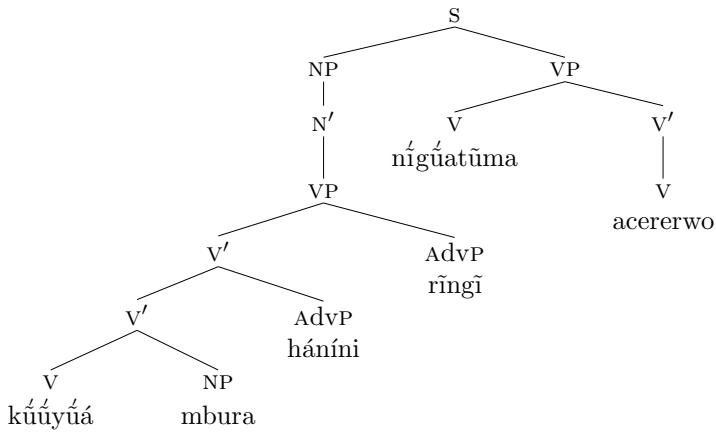
(35)



(36) kʊ́-ĺ-yʊ́-á mbura háníni rĩngĩ
15-RFL-shelter-IND 9rain a little again

nĺ-gʊ́-a-tũm-a a-cererwo
FP-15-ImPast-make-IND 1sg-late
'That sheltering of him/herself from the rain again a little has made her/him late.'

(36′)



9.4.2 Infinitive-gerunds as Nouns

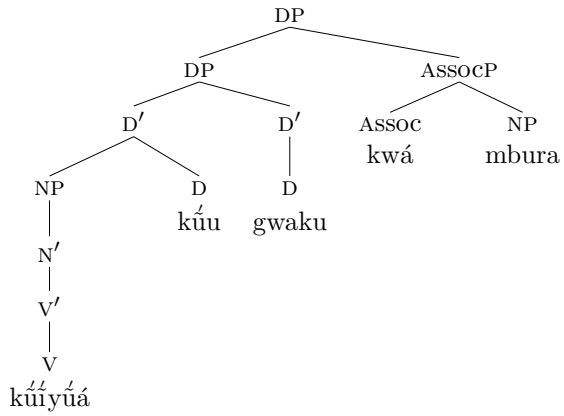
In terms of modificational possibilities, *ku*-V constructions behave as nouns do. (37) and (38) show a Gĩkũyũ *ku-V* head that is modified by determiners (demonstrative, possessive pronoun), and an associative 'of' phrase. The associative 'of' in (37) is used to modify nouns and can be used iteratively.

(37) kú-í-yú-á kúu gwaku kwá mbura
15-RFL-shelter-IND 15Dem 15your 15Assoc 9rain
ní-gú-a-tũm-a a-cererwo
FP-15-ImPast-make-IND 1sg-late
'That sheltering of him/herself from the rain has made her/him late.'

(38) kú-í-yú-á mbura kúu gwaku
15-RFL-shelter-IND 9rain 15Dem 15your
'that sheltering of yourself from rain'

An exocentric NP analysis which is amenable to the structure of Gĩkũyũ noun phrases is provided in Mugane (1998) where the D is the functional head of DP and not the lexical head of the NP (also in Abney 1987 for English). This allows a natural explanation of the placement of nominal elements (pronouns, demonstratives, and associatives) in the DP projection, as shown in (39) for (37).

(39)



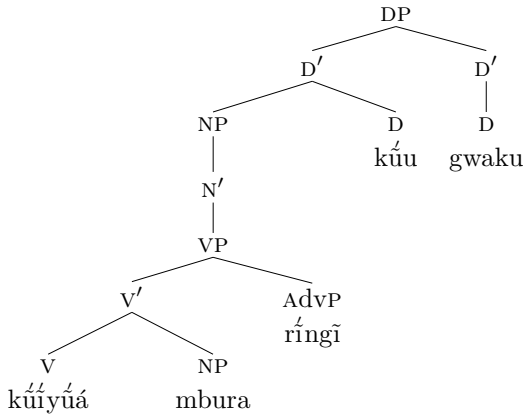
9.4.3 Infinitive-gerunds as Hybrids

A striking aspect of *ku*-V phrases is that they exhibit freedom in the interleaving of their nominal and verbal parts. Within *ku-V* constructions we can have nominal parts neatly occurring outside the verbal parts in a manner reminiscent of Lapointe's (1993) dual projecting analysis of

English gerunds (verbal inside, nominal outside). In (40), all the VP elements (the object *mbura* 'rain', and the adverb *rĩngĩ* 'again') precede the nominal parts (the determiner *gũkũ* 'this' and possessive pronoun *gwaku* 'your') which are stacked on the VP, as shown in (40′).

(40) kú-í-yú-á mbura ríngĩ kúu gwaku
15-RFL-shelter-IND 9rain again 15Dem 15your
ní-kú-o gũ-á-tũm-a tũ-cererwo
FP-15-Rel 15-PRESPRF-make-IND 1plS-late
'That sheltering of yourself from the rain again is what has made us late.'

(40′)



(41) provides an alternative arrangement of the nominal and verbal elements. In (41), the AdvP which is a part of the VP is placed within the DP, and the *ku*-V head *kú-í-yúá* is followed by its complement *mbura*, and then the nominal parts (demonstrative *kũu* and possessive pronoun *gwaku*) follow, after which comes the adverb *rĩngĩ*.

(41) kú-í-yú-á mbura kúu gwaku ríngĩ
15-RFL-shelter-IND 9rain 15Dem 15your again
ní-kú-o gũ-á-tũm-a tũ-cererwo
FP-15-Rel 15-PRESPRF-make 1pl-late
'Your sheltering of yourself from the rain again is what has made us late.'

Placing the complement *mbura* within the DP as in (42) (contrasted with (42′)) necessitates the use of the associative 'of' as is typical in the expression of complements in noun phrase constructions. The structural implication is shown in (43) with the positioning of NP and AdvP portions of the verb within the DP.

(42) kṹ-ĺ-yṹ-á kṹu gwaku kwá mbura
15-RFL-shelter-IND 15Dem 15your 15Assoc 9rain
rĺngĩ nĺ-kú-o gũ-á-tũm-a tũ-cererwo
again FP-15-Rel 15-PRESPRF-make 1pl-late
'That sheltering of yourself from the rain again is what has made us late.'

(42′) *kṹĺíyṹá kṹu gwaku mbura

The demonstrative can appear to the left where it has scope over the entire *ku*-V phrase.

(43) kṹu [kṹĺíyṹá mbura gwaku rĺngĩ]

While a mixture of nominal and verbal elements is permitted in *ku-V* structures, there are ordering restrictions in Gĩkũyũ indicated by (44) and (45). In (44) the VP structure is violated by placing the adverb immediately following the head. Since adverbs modify VPs in Gĩkũyũ, placing the demonstrative between the *ku*-V head and its complement, as in (45), is not allowed. Adverb placement within the structure is shown in section 9.5.

(44) *kṹĺíyṹá rĺngĩ mbura gwaku

(45) *kṹĺíyṹá kṹu mbura gwaku rĺngĩ

There are, in fact, more spectacular examples of multiple nominal-verbal interspersing in Bantu languages. Notable among mixed *ku*-V constructions is the Logooli (Guthrie J10) example in (46). In (46), *kukwo* 'your' and *yukwo* 'that' occur after the *ku-V* head, then the adverbial modifier *bwangu* follows, and then the associative phrase *kwu vuchima* 'of vuchima'. Under category switching theories, the head *kuruga* 'to cook/cooking' would project a construction whose complements switch between from nominal to verbal (to account for adverbial modification) and then back to nominal (to accommodate the associative phrase) as discussed in Mugane (2002). (46) typifies what is ruled out by the Phrasal Coherence Hypothesis of Malouf[13] (2000) and Bresnan (1997); we return to this in section 9.5.

(46) kuruga kukwo yukwo bwangu kwu
15cook 15your 15Dem fast 15Assoc
vuchima ku-ny-anziz-a
vuchima 15-2sgS-please-IND
'That fast cooking of vuchima that you do pleases me.'

[13]Phrasal coherence is originally attributed to a colloquium given by Robert Malouf at Stanford University in 1997.

9.4.4 External Properties of Infinitive-gerunds

In the external syntax, *ku*-V constructions function as verbal complements of VPs (47) but not as object complements (49). Gĩkũyũ post verbal *ku*-V clauses are therefore VPs and not NPs.

(47) a-rá-end-a kṹ-ĺ-yṹ-á mbura háníni
1S-PRES-want-IND 15-RFL-shelter-IND 9rain a little
'S/he wants to shelter herself/himself from the rain a little.

(48) a-rá-end-a * kṹ-ĺ-yṹ-á kwá mbura
1S-PRES-want-IND 15-RFL-shelter-IND 15Assoc 9rain
'S/he wants (needs) sheltering from rain.'

If they were NPs, they would be able to induce object prefixation just as they do subject prefixes, but they do not ((49)).

(49) *nĺ́-á-rá-kṹ-end-a
FP-1S-PRES-15O-like-IND
'She/he likes it.' (cooking cassava slowly)

This raises the question whether Bantu mixed *ku*-V clauses can occur as objects. For this, Chichewa (50) from Bresnan and Mchombo (1995:232–233) shows that the restriction is internal to Gĩkũyũ.

(50) a-ku-zónd-á kupíndá njingá uku
2S-PROG-hate-IND 15-bend 10bicycle 15this
'S/he hates this bending bicycles.'

In Gĩkũyũ *ku*-V complements of VP must be without nominal modifiers, as in (51). Only verbal modifiers are permitted, meaning that *ku*-V constructions can occur as VP. Thus, (52) is good, but not (53) where the *ku*-V construction is modified by a determiner.

(51) Kũí nĺ́-é-end-éte gṹthikĺ́rĩria kĺ́rĺ́rá
Kũi 1S-like-PRF 15listen 7orature
'Kũi likes listening to oral literature.'

(52) Kũí é-end-éte [[gṹthikĺ́rĩria kĺ́rĺ́rá] ó hánini tu]
Kũi S-like-PRF 15listen 7orature just a little INTF
'Kũi likes to listen to oral literature just a little bit.'

(53) a. Kũí é-end-éte *[kũu [gṹthikĺ́rĩria kĺ́rĺ́rá]]
Kũi 1S-like-PRF 15Dem 15listen 7orature
'Kũi likes listening to oral literature.'

b. Kũí é-end-éte [[gṹthikĺ́rĩria kĺ́rĺ́rá] *kũu]
Kũi 1S-like-PRF 15listen 7orature 15Dem
'Kũi likes listening to oral literature.'

It follows then that freely mixed (interspersed) hybrid constructions are not permitted as object complements of verbs ((54)).

(54) Kũí á-ken-er-a *[gṹthikí́rĩria gwaku kwá
Kũi S-like-PRF-IND 15listen 15your 15Assoc
ngerekano] haníni tu]
10parable a little INTF
'Kũi has been pleased by your listening to parables just a little bit.'

Like regular Bantu VP objects, the object complement of *ku*-V can be *nĩ*-fronted, as in (55), but the *ku*-V head (like V-heads of VPs) cannot be *nĩ*-fronted as indicated by (56). The whole *ku*-V phrase cannot be fronted either ((57)). This means that the *ku*-V complement of VP is not an NP. If it were it would allow (57).

(55) nĩ kí́rí́rá Kũí é-end-éte gṹthikí́rĩria ____
FP 7orature Kũi 1S-like-PRF 15listen
'It is listening to oral literature that Kũi likes.'

(56) *nĩ́ gṹthikí́rĩria Kũí é-end-éte ____ kí́rí́rá
FP 15listen Kũi 1S-like-PRF 7orature
'It is listening to oral literature that Kũi likes.'

(57) *nĩ́ gṹthikí́rĩria kí́rí́rá Kũí é-end-éte ____
FP 15listen 7orature Kũi 1S-like-PRF
'It is listening to oral literature that Kũi likes.'

The only way to make (57) acceptable is to have the *ku*-V word repeated, as indicated in (57′), and only *ku*-V words are repeated like that for emphasis. This is a most revealing structure in terms of the mixed nature of *ku*-V words. Under extraction, the *ku*-V construction provides a copy of the *ku*-V word to appear at the subject position (and therefore its NP self) and remains at the VP complement position, as in (57′), indicating the schizophrenic nature of *ku*-V constructions (abiding by both NP and VP identities) through mirroring or copying of the *ku*-V head. This is confirmed by the fact that the *ku*-V words must match for the expression to be acceptable. Thus, when the verb within *ku*-V is changed, as in (57″) and (57‴), ungrammaticality results, showing that it is the *ku*-V placed to the left which must be identical to the one that is in the verbal complement of the matrix verb position. Were it just a matter of distribution of *ku*-V words, nothing would prevent (57″) and (57‴) substitutions of *ku*-V. The same applies to VP extraction ((58)) which is awkward while (58′) is redundant with both and must be restated as in (57′).

(57′) nḯ gṹthikḯrĩria Kũí é-end-éte gṹthikḯrĩria kḯrḯrá
FP 15listen Kũi 1S-like-PRF 15listen 7orature
'It is listening (that) Kũi likes listening to oral literature.'

(57″) *nḯ kũándĩka Kũí é-end-éte gṹthikḯrĩria kḯrḯrá
FP 15write Kũi 1S-like-PRF 15listen 7orature
'It is (while) writing (that) Kũi likes listening to oral literature.'

(57‴) *nḯ gṹthikḯrĩria Kũí é-end-éte kũándĩka kḯrḯrá
FP 15listen Kũi 1S-like-PRF 15writing 7orature
'It is (while) listening (that) Kũi likes to write oral literature.'

(58) ?nḯ gṹthikḯrĩria kḯrḯrá Kũí é-end-éte gṹthikḯrĩria
FP 15listen 7orature Kũi 1S-like-PRF 15listen
'It is listening to oral literature that Kũi likes.'

(58′) ?nḯ gṹthikḯrĩria kḯrḯrá Kũí é-end-éte
FP 15listen 7orature Kũi 1S-like-PRF
gṹthikḯrĩria kḯrḯrá
15listen 7orature
'It is listening to oral literature that Kũi likes.'

In the subject position, all *ku*-V constructions occur without restriction (as illustrated in (37)–(42) and elsewhere), while none occur in the object position, as shown in (49) and (53). *ku*-V constructions bearing restricted tense and aspect marking can only occur postverbally as VP complements of verbs, as seen in (29) and (30) (repeated here for convenience) and not in subject position ((59) and (60)).

(29) Kũí á-hot-a gũ-ga-ciar-á mahatha
Kũi 1S-able-IND 15-FUT-bear-IND 6twin
'Kũi might (in future) give birth to twins.'

(59) *gũ-ga-ciar-á mahatha nĩ-gũ-ga-gũ-ken-i-a
15-FUT-bear-IND 6twin FP-15S-FUT-2sgO-glad-C-IND
'Giving birth to twins will please you.'

(30) Kũí á-hot-a gũ-ciar-ág-a mahatha
Kũi 1S-able-IND 15-bear-Hab-IND 6twin
'Kũi might bear twins.'

(60) *gũ-ciar-ág-a mahatha nḯ-gṹ-gṹ-gũ-ken-i-a
15-bear-Hab-IND 6twin FP-15S-ImFut-2sgO-glad-C-IND
'Giving birth to twins habitually will please you.'

The foregoing phenomenon prohibiting the use of tensed *ku*-V constructions as subjects appears to support Koster's (1978) constraint that

subject sentences do not exist.[14] For the purposes of this study, the point is that there is a subject-object asymmetry in the external distribution of *ku*-V. On the one hand, *ku*-V forms occur as verbal complements of verbs but are disallowed as object complements of verbs. On the other hand, *ku*-V forms can be sentential subjects, but inflected *ku*-V types (which are clearly verbal) can not.

9.4.5 Summary on Infinitive-gerunds

In summary, *ku*-V constructions take the same complements as the verb from which they are derived, and they can be modified by both adverbs and nominal elements simultaneously. *ku*-V constructions exhibit a subject-object asymmetry in their external distribution which explains why *ku*-V clauses function as NP in the sentential subject position but not as object complements of verbs. *ku*-V constructions are multiply interspersed hybrids in which verbal elements are variably placed within the nominal (DP) projection. The head of a *ku*-V construction is the *ku*-V word itself (see Bresnan and Mchombo 1995 for Chichewa *ku*-V constructions).

9.5 [Ncl-V..-i] versus *ku*-V Constructions

Gĩkũyũ [Ncl-V..-i] constructions and *ku*-V clauses have the properties listed in (3) and (4) (repeated below with indications of relevant examples). They resemble each other with respect to the (a) and the (b) parts and differ in all the other characteristics as provided in (3) and (4).

(3) a. An [Ncl-V..-i] construction takes the same complement as the verb from which it is derived ((5a) and (5b)).
b. [Ncl-V..-i] constructions can have both adverbial and nominal modifers simultaneously in the internal syntax ((12), (14), (16), (17), (18)).
c. [Ncl-V..-i] have a verbal core and nominal periphery (VP within NP as in (13)).
d. [Ncl-V..-i] constructions have the external distribution of a noun phrase ((19)–(26)).
e. [Ncl-V..-i] phrases are head-sharing constructions (13).

(4) a. A *ku*-V construction takes the same complements as the verb from which it is derived ((33), (34), (36)).

[14] An inflected tensed verb is for all intents and purposes equivalent to a sentence in Bantu, as in the example below for Gĩkũyũ.

(i) gũ-gũ-gũ-ken-i-a
15S-ImFut-2sgO-glad-C-IND
'(that which) will please you'

b. *ku*-V constructions are modified by both adverbs and nominal modifiers simultaneously ((40)–(43)).
c. *ku*-V constructions are multiply interspersed hybrids in which verbal elements are variably placed within the nominal (DP) projection ((37), (38), (40), (41), (42)).
d. *ku*-V clauses exhibit a subject-object asymmetry in their external distribution ((51)–(60)).
e. The *ku*-V word is an exocentric head of the infinitive-gerund construction as in (35) and (40′).

While the property in (3c) [Ncl-V..-i] is an instance of a crosslinguistic phenomenon of phrasally coherent constructions (Bresnan 1997 and Malouf 2000),[15] the one stated in (4c) has been ruled out in current theorizing. In other words, (4c) is structurally incoherent (should be ungrammatical) since it allows liberal interleaving of verbal and nominal parts, contrary to previous proposals on the nature of mixed category constructions (Bresnan 1997, Malouf 2000, etc.). In those recent studies, mixed constructions are expected to have the external distribution of a specific syntactic category (such as NP, VP, AP), as in (3d), but not the split exhibited by *ku*-V types where the mixed *ku*-V clauses can serve as sentential subject NPs but not as NP object complements of VP, as referred to in (4d). Indeed, *ku*-V types exhibit a double (nominal/verbal) identity under *nĩ*-extraction shown in (57′) (repeated here for convenience) where the *ku*-V clause appears as a sentential subject but also must be stated as a complement of the matrix verb. I assume that the fronted *ku*-V word is nominal because a *ku*-V word inflected for tense ((59)) and aspect ((60)) cannot be used as a sentential subject but can be used as a VP complement of verbs, as shown by (29) and (30) in section 9.3 above.

(57′) nĩ́ gṹthikĩ́rĩria Kũí é-end-éte gṹthikĩ́rĩria kĩ́rĩrá
FP 15listen Kũi 1s-like-PRF 15listen 7orature
'It is listening (that) Kũi likes listening (to) oral literature.'

[15] According to Malouf (2000:66), English verbal gerunds have the properties listed below. These properties demonstrate that the category type for English gerunds is never ambiguous, unlike the Bantu ones in (2). The contrast between Gĩkũyũ and English is that reflected in the internal and external properties (4c), (4d), and (4e) for Gĩkũyũ and (iii) and (iv) for English.

i. A verbal gerund takes the same complements as the verb from which it is derived
ii. Verbal gerunds are modified by adverbs and not by adjectives.
iii. The entire verbal gerund phrase has the external distribution of an NP.
iv. The subject of the gerund is optional and, if present, can be either a genitive or an accusative NP.

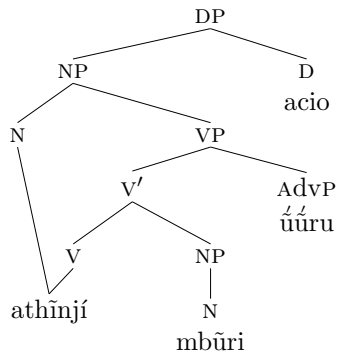
[Ncl-V..-i] constructions, unlike *ku*-V ones, cannot be used to form structures such as (57′), as illustrated by the ungrammaticality of (61), but can be fronted by *nĩ*-extraction, as in (62), which is also unlike *ku*-V constructions, as shown in (57) in section 9.3 above.

(61) *nĺ mũ-thĩĩnj-í Kũí é-end-éte
FP 1-slaughter-Nzer Kũi 1S-like-PRF
mũ-thĩĩnj-i mbũri
1-slaughter-Nzer 10goat
'It is a slaughterer of goats (that) Kũi likes.'

(62) nĩ mũ-thĩĩnj-i mbũri Kũi e-end-ete ____
FP 1-slaughter-Nzer 10goat Kũi 1S-like-PRF
'It is a slaughterer of goats that Kũi likes.'

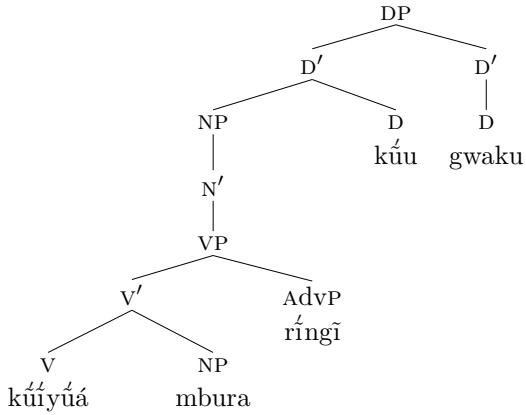
Finally (3e) and (4e) point to the structural differences between constructions headed by action deverbal nouns ([Ncl-V..-i]) and *ku-V* words. [Ncl-V..-i] types have the structure provided in (13) below. [Ncl-V..-i] phrases are constructions in which a single word heads a phrase which is a syntactic hybrid of two category types, as illustrated by (13) where the head *mũthĩĩnji* in (13) is shared by both the NP and the VP (Bresnan 1997).

(13)



In contrast to agentive nominalizations (which are head-sharing), infinitive/gerunds are constructions in which *ku*-V acts as the lexical head of VP and as an exocentric head of the top-level NP, as shown in (40′). Thus, the categorial head of NP is not found within it, and the head of the NP is the gerund itself which is the lexical head of the VP. The head of the NP is encoded in the functional structure (Bresnan and Mchombo 1995).

(40′)



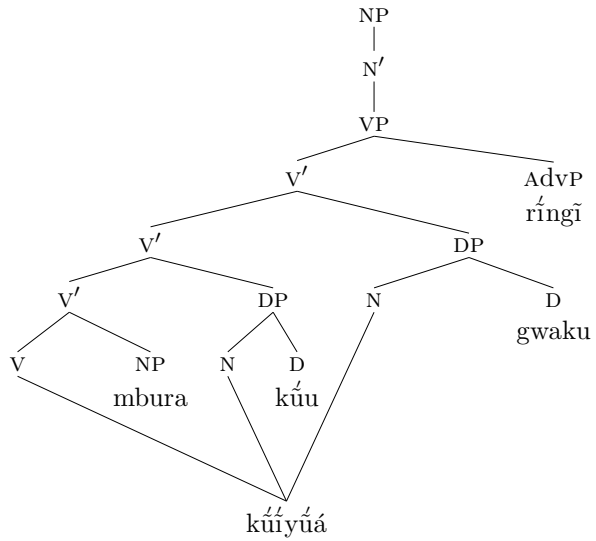
(40′) has merit in the sense that it preserves both the VP and DP parts of the structure and explains how the *ku*-V word bears a polysemy of functions. However, a limited amount of head sharing does not account for structures where the adverb such as *rĩngĩ* 'again' in (41) (repeated below) occurs higher in the structure than nominal modifiers (*kũu* 'that' and *gwaku* 'your').

(41) kú-í-yú-á mbura kúu gwaku ríngĩ
15-RFL-shelter-IND 9rain 15Dem 15your again
ní-kú-o gũ-á-tũm-a tũ-cererwo
FP-15-Rel 15-PRESPRF-make 1pl-late
'Your sheltering of yourself from the rain again is what has made us late.'

An interesting proposal is that *ku*-V constructions combine the exocentric head analysis with head sharing. We can preserve the basic intuition from previous studies that *ku*-V is a VP with an exocentric head. By adapting the head-sharing idea from the agentive nominal construction in (13), it is possible to argue that *ku*-V clauses are NP over VP but that within the VP portion, the *ku*-V word is multiply shared, as in (63). In (63), *ku*-V heads the VP and is a shared head by the nominal structures. What is fascinating in (63) is that *ku*-V head sharing in all the N positions preserves both the structure of the adjunct nominal constituents and that of its host VP.[16]

[16]For discussion on how head sharing is captured by the extended head theory see Bresnan (1997:11, 14, 15).

(63)



Turning to *ku*-V forms inflected for tense and aspect, consider (29) in contrast with (64) and (30) contrasted with (65). Both (64) and (65) show that the *ku*-Vs marking tense/aspect cannot be used as NPs. This is why using the associative 'of' to mark *mahatha* as a complement of a noun in an NP structure is unacceptable. (64) and (65) would be fine as subjects as long as the future tense and habitual inflection are omitted.

(29) Kũí á-hot-a gũ-ga-ciar-á mahatha
Kũi 1S-able-IND 15-FUT-bear-IND 6twin
'Kũi might (in the future) give birth to twins.'

(64) Kũí á-hot-a *gũ-ga-ciar-á kwa mahatha
Kũi 1S-able-IND 15-FUT-bear-IND 15Assoc 6twin
'Kũi might (in the future) bear twins.'

(30) Kũí á-hot-a gũ-ciar-ág-a mahatha
Kũi 1S-able-IND 15-bear-Hab-IND 6twin
'Kũi might (habitually) bear twins.'

(65) Kũí á-hot-a *gũ-ciar-ág-a kwa mahatha
Kũi 1S-able-IND 15-bear-Hab-IND 15Assoc 6twin
'Kũi might (habitually) bear twins.'

Since the *ku*-V forms in (29) and (30) can be modified as VPs, as in (66) and (67), (including (57′) and the explanation given concerning it), I assume that the *ku*-V forms used as complements of verbs are

VPs. They are different from the *ku*-V constructions and can appear as subjects of sentences which can be analyzed as in (63) above.

(66) Kũí á-hot-a gũ-ga-ciar-á mahatha ŕíngĩ
Kũi 1s-able-IND 15-FUT-bear-IND 6twin again
'Kũi might bear twins again (in the future).'

(67) Kũí á-hot-a gũ-ciar-ág-a mahatha kaingĩ
Kũi 1s-able-IND 15-bear-Hab-IND 6twin often
'Kũi might bear twins often (habitually (repeatedly)).'

Looking at ordering restrictions in (44) and (45) (repeated below for convenience), it is clear that Gĩkũyũ does not permit free intermingling of nominal constituents; hence, the structure in (63) is good in that it allows for the ordering of adjuncts.

(44) *kúíyúá ríngĩ mbura gwaku

(45) *kúíyúá kúu mbura gwaku ríngĩ

Evidence that the head is multiply shared and cannot be omitted in (63) comes from the study of the Gĩkũyũ noun phrase. One of the salient properties of Bantu noun phrases is that an NP is always optional and the modifiers of NP are referentially independent. This is because of a pronominal interpretation that is always present in the modifiers. Thus, in (68) we can refer successfully with dependents (Mugane 1998) as in (69a,b,c) without the head *mũthĩĩnji*.

(68) mũthĩĩnjí ű́yũ wakwa wá mbũri
1slaughter 1this 1my 1Assoc 10goat
'this one who slaughters goats well'

(69) a. wá mbũrí
1Assoc 10goat
'(slaughterer) associated with goats'

b. wakwa wá mbű́ri
1my 1Assoc 10goat
'my (slaughterer) associated with goats'

c. ű́yũ wakwa
1this 1my
'this one (slaughterer) of mine'

Interestingly, (70) shows that nominal modifiers of *ku*-V cannot appear as in (69). The fact that all DPs in (70) by themselves (without *ku-V*) are ungrammatical means that those adjuncts are part of a larger structure and have the *ku*-V word as their head. Despite the fact that constructions such as (70) form the staples of noun phrase use in Gĩkũyũ,

such structures when associated with *ku*-V are never possible regardless of how much the referents are known or established in discourse. For (70) to be grammatical the interpretation must involve noun classes other than the *ku*- class (class 15). I conclude that (70) supports the head sharing analysis provided in (63) and that the lexically unfilled N nodes in (63) must remain in the structure.

(70) a. *____ kwá mbũri
15Assoc 10goat
'that (cooking) associated with goats'

b. *____ gwaku kwá mbũri
16your 15Assoc 10goat
'that (cooking) associated with goats'

c. *____ kű́u gwaku
15Dem 15your
'that (goat-cooking) of yours'

In (46) (repeated below for convenience), the *ku*-V head *kuruga* is followed by two nominal modifiers (the possessive pronoun *kukwo* 'your' and *yukwo* 'that') which is in turn followed by the adverb *bwangu* 'fast' and, finally, the associative phrase *kwu vuchima*, with the reading that *vuchima* is the NP complement of the head *kuruga*.

(46) kuruga kukwo yukwo bwangu kwu vuchima
15cook 15your 15Dem fast 15Assoc vuchima
ku-ny-anziz-a
15-2sgS-please-IND
'That fast cooking of vuchima that you do pleases me.'

A limited amount of head sharing will not account for Bantu *ku*-V structures. In Logooli, virtually any combination of the elements in (46) is grammatical[17] so long as the *ku*-V word is the leftmost element, as seen in (46′), (46″), and (46‴).

(46′) kuruga kwu vuchima kukwo yukwo bwangu
15cook 15Assoc vuchima 15your 15Dem fast
ku-ny-anziz-a
15-2sgS-please-IND
'That fast cooking of vuchima that you do pleases me.'

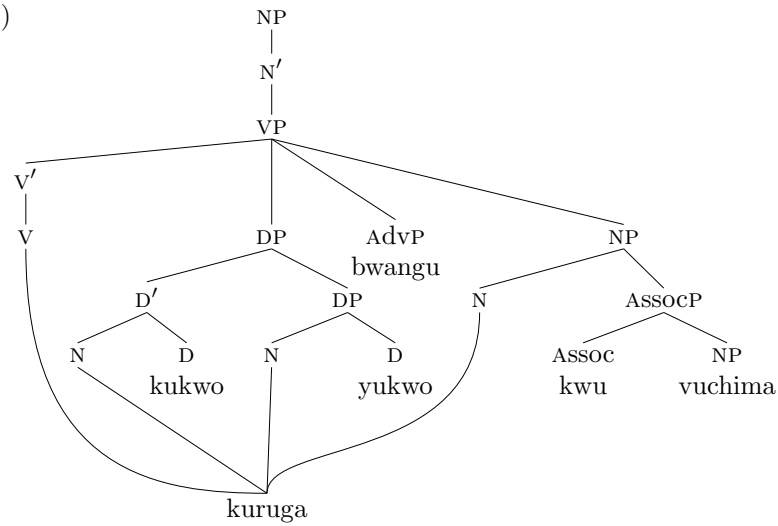
[17]Logooli admits both (69) and (70), indicating the true (typical Bantu) nominal nature of infinitive-gerunds. However, free ordering of nominal modifiers is restricted in regular Logooli NP constructions but allowed within *ku*-V constructions (Mugane 2002).

(46″) kuruga kukwo yukwo kwu vuchima bwangu
15cook 15your 15Dem 15Assoc vuchima fast
ku-ny-anziz-a
15-2sgS-please-IND
'That fast cooking of vuchima that you do pleases me.'

(46‴) kuruga bwangu kukwo yukwo kwu
15cook fast 15your 15Dem 15Assoc
vuchima ku-ny-anziz-a
vuchima 15-2sgS-please-IND
'That fast cooking of vuchima that you do pleases me.'

What this implies is that (63), which works for Gĩkũyũ by restricting the ordering of the adjuncts, will not suffice in the case of Logooli liberal ordering. Logooli ((46)) is most effectively represented by a structure such as in (71) in which the head projects a V′ which is sister to DP, AdvP, and NP in a flat structure configuration (Mugane 2002).

(71)



In (71), the *ku*-V word *kuruga* is the lexical head of the VP and the exocentric head of the NP. (71) is reminiscent of the analysis suggested by Wescoat (1994) in which a single word projects two different unordered lexical categories and hence two different maximal phrases. This proposal is attractive for the data under consideration in that all post *ku*-V elements in (71) are extrasequential, i.e., they are unordered with respect to their sisters. Extrasequentiality is descriptive of Logooli. Wescoat's idea is compatible with the fundamental LFG principle governing structure-

function association that requires the mapping to be a one-to-many function whereby one lexical token may be mapped to many terminal nodes, as in (71), but each terminal node must be linked to one and only one lexical token (Bresnan 2001). Because the head is shared, the adjunct nominal constituents concord with the *ku*-V head; otherwise, nonconcording DPs would be possible.

9.6 Previous Studies

In many previous studies of nominal/verbal mixed category constructions, the mixing of elements neatly upholds the constituency of determinate categories and disallows free mixing or interleaving of constituents of different categories (Bresnan 1997, Malouf 2000). In Dagaare action nominalizations, arguments of a noun must precede it, while the verb's complements follow it in finite clauses (Bodomo 1997, Bresnan 1997). In Italian *infinito sostantivato*, nominal constituents precede the infinitive and following the infinitive; a choice must be made between VP constituents or NP constituents (Zucchi 1993). Agentive deverbal nominals do indeed fall in this category of neatness (Mugane 1996, Bresnan 1997, Bresnan and Mugane 1999) where a VP is neatly lodged inside of a VP and a head is shared between the NP and the VP. However, free mixing or interleaving of constituents of different categories is evident and robust in Gĩkũyũ and Logooli *ku*-V constructions. The data presented in this study was not available in previous studies of mixed category constructions.

Lapointe's (1993) analysis of English gerunds as dual lexical categories X/Y^0 to explain the nominal and verbal behavior of the English gerund where X and Y are major lexical categories $<X/Y>^0$ with X determining the external syntactic properties and Y determining the internal properties of YP cannot explain the data on *ku*-V infinitive/gerunds. Simply having XP over YP will not attend to the mixed internal syntax and external syntax of *ku*-V phrases. Pullum (1993) ruled out the existence of constructions with heterogenous heads having arbitrary mixtures of syntactic characteristics from different categories. Such a restriction, while maintained in Gĩkũyũ agentive nominalizations, is ruled out by the mixtures observed of *ku*-V words in both Gĩkũyũ and Logooli.

There have also been theories of syntactic affixation (Baker 1985 and Abney 1987) where English ING is a type of nominalizing affix that combines morphologically with an XP, similar to the analysis suggested by Myers (1987) for Bantu, in violation of lexical integrity as discussed at length in Bresnan and Mchombo (1995). Malouf (2000) argues for what he calls Lexical Coherence as superior to Phrasal Coherence in his anal-

ysis of mixed category structures. Lexical coherence, which is derived from the deverbalization hierarchy of Croft (1991), depends on the stable behavior of verbs, i.e., verb forms that fully inflect like predicated verbs are associated with a set of straightforward predictions. The problem with this analysis is that both the deverbalization hierarchy and Lexical coherence do not seem to capture the subject-object asymmetry noted with *ku*-V phrases or say anything about out-of-character and in-between cases such as those observed of Gĩkũyũ in this paper. Since lexical coherence is about verbs that fully inflect, there is no provision for dealing with the partial properties of *ku*-V structures.

Finally, while the boundary between action nominals and infinitives may be small and vague crosslinguistically, (Koptjevskaja-Tamm 1993), Gĩkũyũ shows that the differences are considerable and theoretically interesting when gerund properties are factored in. Since Koptjevskaja-Tamm (1993) does not include data on gerunds, her claims cannot be evaluated relative to Gĩkũyũ and Logooli infinitive-gerund facts.

9.7 Conclusion

Agentive nominals and the infinitive-gerunds can be analyzed as head sharing constructions with the latter combining exocentricity with multiple head sharing. Agentive nominalization constructions challenge theories claiming that a phrase is consistently of one category, which is determined by the lexical head of the phrase. Infinitive-gerunds pose difficulties for theories arguing for lexical and phrasal coherence because they allow the interleaving of constituents appearing to violate phrasal constituency.

In the internal syntax, Gĩkũyũ agentive nominals ([Ncl-V..-i] constructions) take the same complement as the verb from which they are derived and can be modified with adverbs and nominal elements (determiners, adjectives, and associative phrases) simultaneously in the internal syntax. [Ncl-V..-i] have a verbal inside and nominal outside which makes them exhibit coherently mixed internal properties (VP within NP) and an external distribution that is typical of noun phrases. In contradistinction, infinitive-gerund constructions (*ku*-V types) take the same complements as the verb from which they are derived and can be modified by both adverbs and nominal elements simultaneously. *ku*-V constructions exhibit a subject-object asymmetry in their external distribution in which *ku*-V clauses function as NP in the sentential subject position (except for those inflected for tense and aspect) but not as object complements of verbs. In post-verbal positions, *ku*-V constructions must be VP complements of verbs. The head of the infinitive-gerund con-

struction is the *ku*-V word itself which projects a verbal phrase above which is an exocentric NP (Bresnan and Mchombo 1995). Within the verbal projection of *ku*-V constituents are freely mixed for Logooli and interleaved to a limited extent in Gĩkũyũ. The nominal projections within the *ku*-V construction also have the *ku*-V word as head. Thus, a limited amount of head sharing will not handle Gĩkũyũ, Logooli, and Bantu more generally. Gĩkũyũ infinitive-gerunds are multiply interspersed syntactic hybrids which are mixed verbal-nominal constructions in the internal syntax and which exhibit a subject-object distributional asymmetry in the external syntax.

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Language Index

Name Index

Subject Index

The proper treatment of nominals and nominalization has been fundamental to syntactic theory since the early 1970s. However, a satisfactory treatment of nominals and nominalization continues to prove elusive. Working within the theoretical framework of Lexical-Functional Grammar (LFG), this book discusses distributional properties of pronominals, the (inherited) predicational power of deverbal nominals, and the vexed question of the syntactic category of derived nominals. Recent developments in LFG also make it possible to draw parallels between discourse clitics and case markers, and to investigate the cross-linguistic distribution and interdependencies in case marking systems in optimality-theoretic terms. Thus this book presents a collection of papers that address "classic" issues with respect to nominals and nominalizations while introducing novel perspectives on their analysis.

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